

Appendix G

Traffic Impact Analysis (2018)





FINAL

Traffic Impact Analysis for the Coast Highway Corridor Study



Prepared for City of Oceanside
by IBI Group

August 29, 2018

IBI GROUP FINAL

TRAFFIC IMPACT ANALYSIS FOR THE
COAST HIGHWAY CORRIDOR STUDY

Prepared for City of Oceanside

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1 Introduction

This traffic impact analysis (TIA) has been prepared as part of the Coast Highway Corridor Study. The Coast Highway Corridor Study consists generally of Complete Street improvements to accommodate all modes of travel throughout the corridor within the existing public right-of-way.¹ The project corridor is located in Oceanside, CA in Northern San Diego County. The project limits extend from the northern terminus of Coast Highway at Harbor Drive through the City of Oceanside to Eaton Street near the city's southern boundary.

The development of this TIA is consistent with the guidelines established by the City of Oceanside in their General Plan Circulation Element document. The report is organized into seven sections:

- Section 1 – Introduction
- Section 2 – Project Description
- Section 3 – Analysis Methodology
- Section 4 – Existing Conditions
- Section 5 – Future Conditions
- Section 6 – Vehicle Miles Traveled
- Section 7 – Mitigations
- Section 8 – Accessibility
- Section 9 – Parking Inventory
- Section 10 – Conclusions and Recommendations
- Section 11 - Appendices

Section 1 provides a brief introduction to the purpose of this report and report content. Section 2 describes the project and its location in the City of Oceanside. Section 3 contains the methodology utilized to prepare the analysis. Sections 4, 5 and 6 document the analysis of existing and future traffic conditions for the key road segments and intersections within the study area. Section 7 identifies the mitigation measures required based on the impacts identified in Sections 4, 5, and 6. Section 8 provides an overview of the project design elements as it pertains to safety and mobility and the American with Disabilities Act (ADA). Section 9 identifies the existing parking conditions and how it will be affected in each scenario. Section 10 presents the conclusions and recommendations regarding the traffic analysis completed for the analysis of the Coast Highway Corridor Study. Section 11 contains the appendices.

¹ Complete Streets – Streets that are designed to enable safe access for all users including pedestrians, motorists, bicyclists, and transit riders across all ages. *California Department of Transportation (Caltrans)*

2 Project Description

The project study corridor is located in Oceanside, CA in Northern San Diego County. The project limits extend from the northern terminus of Coast Highway at Harbor Drive through the City of Oceanside to Eaton Street near the city's southern boundary (see Figure 2-1). The proposed Complete Street improvements for the corridor will primarily occur within the existing public right-of-way, which is typically 80-feet in width throughout the length of the study corridor.

The proposed project would transform Coast Highway into a complete street that accommodates all modes of travel in a safe and efficient manner. This planning effort is a follow up to the 2009 Coast Highway Vision and Strategic Plan (Vision Plan), which set forth a vision for land use and street improvements in the Coast Highway corridor. Key elements of the proposed project include a continuous Class II striped bicycle lane² from Harbor Drive to the south city limit, a single lane of travel for automobile traffic throughout the corridor, additional mid-block crosswalks to facilitate safe and convenient pedestrian crossings of the corridor, roundabouts in place of traffic signals where physically feasible and where the intersection traffic volumes support implementation, and other enhancements to landscaping or the roadway to implement the vision for the corridor established in the Vision Plan.

For the purposes of describing the proposed project, the Coast Highway corridor is divided into five major segments.

- Segment 1: Harbor Drive to State Route 76
- Segment 2: State Route 76 to Wisconsin Avenue
- Segment 3: Wisconsin Avenue to Oceanside Boulevard
- Segment 4: Oceanside Boulevard to Morse Street
- Segment 5: Morse Street to Eaton Street

Within each of the five segments, there can be minor differences on a block-by-block basis to accommodate variations in roadway configurations designed to provide appropriate traffic turning lanes, parking, or bicycle facilities. A description of the proposed roadway configuration on a segment-by-segment basis is provided below.

Segment 1: Harbor Drive to State Route 76 (Figure 2-2)

Between Harbor Drive and the San Luis Rey River Bridge, Coast Highway would be one lane in each direction with a center two way left turn lane (TWLTL). Class II striped bicycle lanes would be provided on both sides of the street and where street width permits, angled parking would be provided on the west side of street. On-street parking currently located along the eastern side of the roadway would be removed to accommodate the bicycle lane. The Harbor Drive and Coast Highway intersection would remain as a signalized intersection with no changes to lane geometry.

South of the San Luis Rey River Bridge, Coast Highway would remain as a two-lane roadway with Class II striped bicycle lanes on both sides of the street. On-street parking would continue to be provided on the west side of the street. The roadway and the bridge would be restriped to provide a Class II bicycle lane in both directions. A mid-block crosswalk is proposed across Coast Highway at Costa Pacifica. A two-lane roundabout is proposed at the intersection of Coast Highway and State Route 76.

² Class II Bike Lane – Striped lane for one-way bike travel on a street or highway. Bike lanes are marked with signs and pavement striping. *Manual on Uniform Traffic Control Devices (MUTCD) – Federal Highway Administration*

Segment 2: State Route 76 to Wisconsin Avenue (Figure 2-3)

Between State Route 76 and Surfrider Way, Coast Highway would provide two southbound lanes and one northbound traffic lane. Class II striped bicycle lanes would be provided on both sides of the street. A center TWLTL would also be provided. As is the case with the existing condition, no on-street parking is proposed in this section of the corridor. The outside southbound traffic lane closest to the curb would become a right turn lane at Surfrider Way. The traffic signal at Coast Highway and Surfrider Way would be replaced by a single lane roundabout.

From Surfrider Way to Pier View Way, Coast Highway would provide a single traffic lane and a Class II striped bicycle lane in each direction, with a buffer between the bicycle lane and adjacent parked cars. On-street parking would be provided on both sides of the street. A raised approximately two-foot wide center median would also be constructed. Single lane roundabouts would be constructed at the intersections of Coast Highway at Civic Center Drive and Pier View Way, replacing the traffic signals at these locations. A mid-block cross-walk would be provided across Coast Highway at Sportfisher Way on the south side of the intersection.

Between Pier View Way and Seagaze Drive, Coast Highway would continue to provide one traffic lane and a striped Class II bicycle lane in both directions. The intersections of Coast Highway at Mission Avenue and Seagaze Drive would remain signalized. Left turn and right turn pockets are proposed on Coast Highway at both intersections. As is the case in the existing condition, no on-street parking would be provided in this section of the corridor.

South of Seagaze Drive, the cross-section of Coast Highway would match the proposed section from Surfrider Way to Pier View Way, with one travel lane, a striped bicycle lane, and on-street parking provided in both directions. A raised two-foot wide median would also be provided. Single lane roundabouts are proposed to be constructed at Michigan Avenue, Washington Avenue and Wisconsin Avenue. Mid-block cross-walks are proposed at Topeka Avenue (between the west and east legs of this street), across the south leg of the intersection at Missouri Avenue, and across the south leg of the intersection at Minnesota Avenue. Unsignalized left turn movements in all directions would be removed at Topeka Avenue, Missouri Avenue, and Minnesota Avenue.

Segment 3: Wisconsin Avenue to Oceanside Boulevard (Figure 2-4)

This segment has a single proposed cross-section that would provide a single traffic lane, a Class II striped bicycle lane, and on-street parking in both directions. A raised two-foot wide median would also be constructed throughout this segment. Single lane roundabouts are proposed at West Street and Oceanside Boulevard. A mid-block cross-walk is proposed across the south leg of the intersection at Eucalyptus Avenue. Unsignalized left turn movements in all directions would be removed at Leonard Avenue, Stanley Avenue, and Eucalyptus Avenue.

Segment 4: Oceanside Boulevard to Morse Street (Figure 2-5)

This segment has a single proposed cross-section that would provide a single traffic lane, a Class II striped bicycle lane, and on-street parking in both directions. The center median would provide a center TWLTL throughout this segment, except approaching both directions of the Sprinter grade crossing, consistent with the existing condition. A single lane roundabout is proposed at Morse Street. Mid-block cross-walks are proposed across Coast Highway adjacent to the Sprinter Station south of Oceanside Boulevard and adjacent to the Loma Alta Creek footpath, south of the existing bridge. On-street parking would be added throughout this segment.

Segment 5: Morse Street to Eaton Street (Figure 2-6)

This segment has two proposed cross-sections. Between Morse Street and Kelly Street, Coast Highway would provide a single traffic lane, a Class II striped bicycle lane, and on-street parking in both directions. A raised two-foot wide median would also be constructed throughout this segment. Single lane roundabouts are proposed at Cassidy Street and Kelly Street. A mid-block cross-walk is proposed across the south leg of the intersection at Whaley Street. Unsignalized left turn movements would be removed in all directions at Whaley Street. On-street parking would be maintained in this segment.

South of Kelly Street, Coast Highway would look similar to the existing condition, with the exception of the northbound and westbound approaches to the intersection of Coast Highway and Vista Way. Northbound, Coast Highway would be reduced to a single through lane south of the intersection, with the outside through lane being converted to a right turn lane. The single northbound lane would continue north of the intersection to Kelly Street. On-street parking would be removed between Kelly Street and Vista Way along Coast Highway. Westbound Vista Way would be modified to provide one right turn lane, one through lane, and one left turn lane, with the eastbound direction of travel between Coast Highway and Freeman Street reduced to a single lane.

Project Alternative 1

The City of Oceanside has identified three alternatives to the Project described above. Project Alternative 1 proposes to maintain the existing roadway lane configuration south of Oceanside Boulevard. The differences between Project Alternative 1 and the Project are the following:

- Four travel lanes (two in each direction) from Oceanside Boulevard to just south of Vista Way
- Provide Class II striped bicycle lanes from Oceanside Boulevard to Morse Street (pre-pilot conditions) as in the existing condition
- Provide Class III³ Sharrow markings on Coast Highway between Morse Street and Vista Way
- On-street parking on Coast Highway between Oceanside Boulevard and Vista Way would not be changed from the existing condition
- Remove proposed mid-block crossing at Sprinter Station and Loma Alta Creek
- Existing signalized intersections would be maintained at Surfrider Way, Oceanside Boulevard, Morse Street, and Cassidy Street
- Provide curb-extending mid-block pedestrian crossings at Whaley Street and Kelly Street
- Provide streetscape improvements along Coast Highway between Oceanside Boulevard and Vista Way, including enhancements to sidewalks and parkway landscaping

Project Alternative 2

Project Alternative 2 proposes to maintain the existing roadway lane configuration south of Morse Street. The differences between Project Alternative 2 and the Project are the following:

³ Class III Bike Lane – Shared route with vehicles that has signs posted identifying it as a bike route and do not require pavement markings. *Manual on Uniform Traffic Control Devices (MUTCD) – Federal Highway Administration*

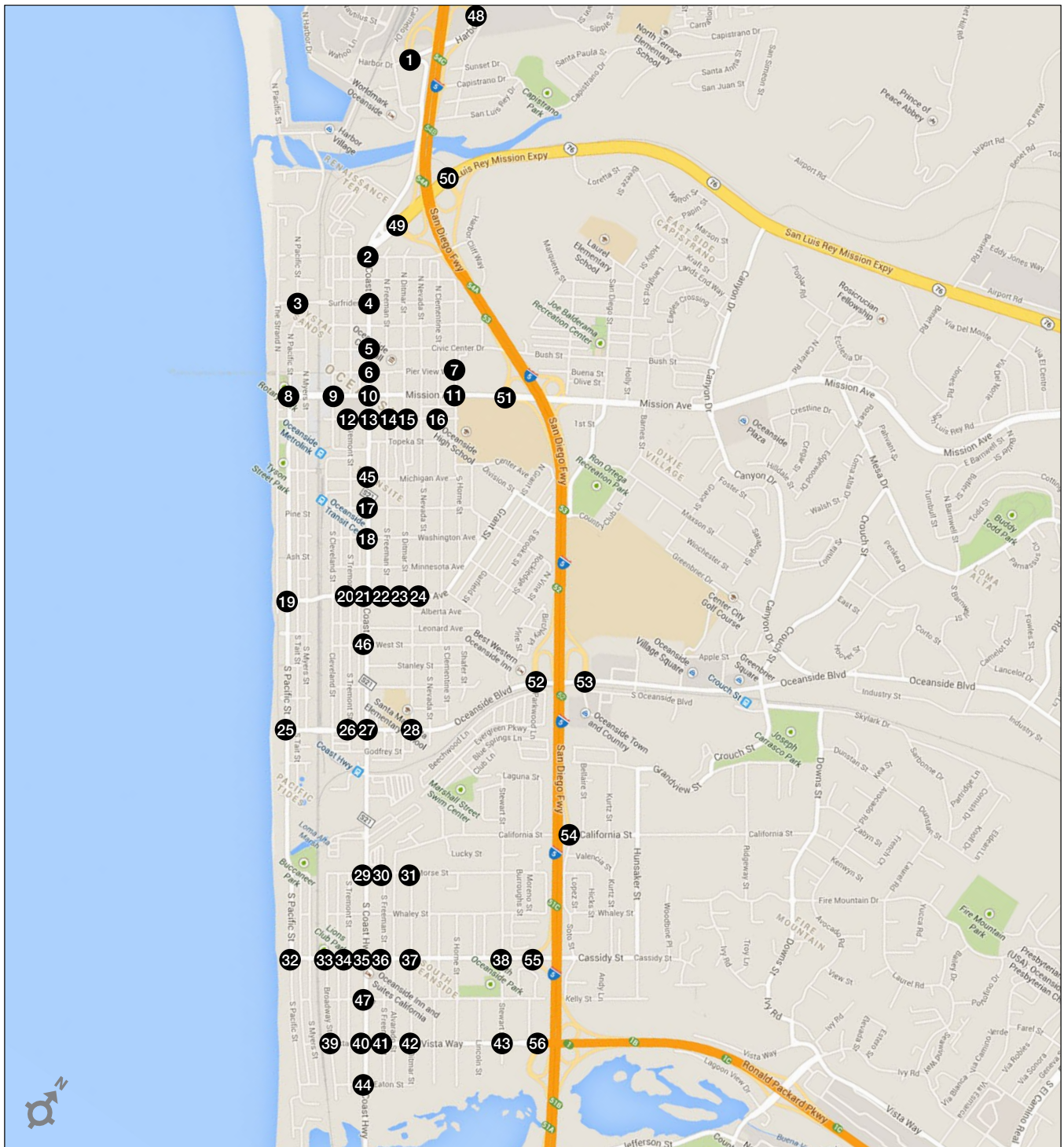
- Four travel lanes (two in each direction) from Morse Street to just south of Vista Way
- Provide Class III Sharrow markings on Coast Highway between Morse Street and Vista Way
- On-street parking on Coast Highway between Morse Street and Vista Way would not be changed from the existing condition
- Existing signalized intersections would be maintained at Surfrider Way, Oceanside Boulevard, Morse Street, and Cassidy Street
- Provide curb-extending mid-block pedestrian crossings at Whaley Street and Kelly Street
- Provide streetscape improvements along Coast Highway between Morse St and Vista Way, including enhancements to sidewalks and parkway landscaping

Project Alternative 3

Project Alternative 3 proposes to maintain the existing roadway lane configuration south of Morse Street. In addition, the proposed land use incentive overlay district would be terminated at Morse Street. Under this alternative, future land use development south of Morse Street is forecast to be consistent with the SANDAG regional growth projections and the 2035 No Project condition. The roadway network differences between Project Alternative 3 and the Project are the following:

- Four travel lanes (two in each direction) from Morse Street to just south of Vista Way
- Provide Class III Sharrow markings on Coast Highway between Morse Street and Vista Way
- On-street parking on Coast Highway between Oceanside Boulevard and Vista Way would not be changed from the existing condition
- Existing signalized intersections would be maintained at Surfrider Way, Oceanside Boulevard, Morse Street, and Cassidy Street
- Provide curb-extending mid-block pedestrian crossings at Whaley Street and Kelly Street. Provide streetscape improvements along Coast Highway between Oceanside Boulevard and Vista Way, including enhancements to sidewalks and parkway landscaping

Figure 2-1 Study Area



Legend

- Project Intersections

Figure 2-2 Segment 1 – Project Cross Sections

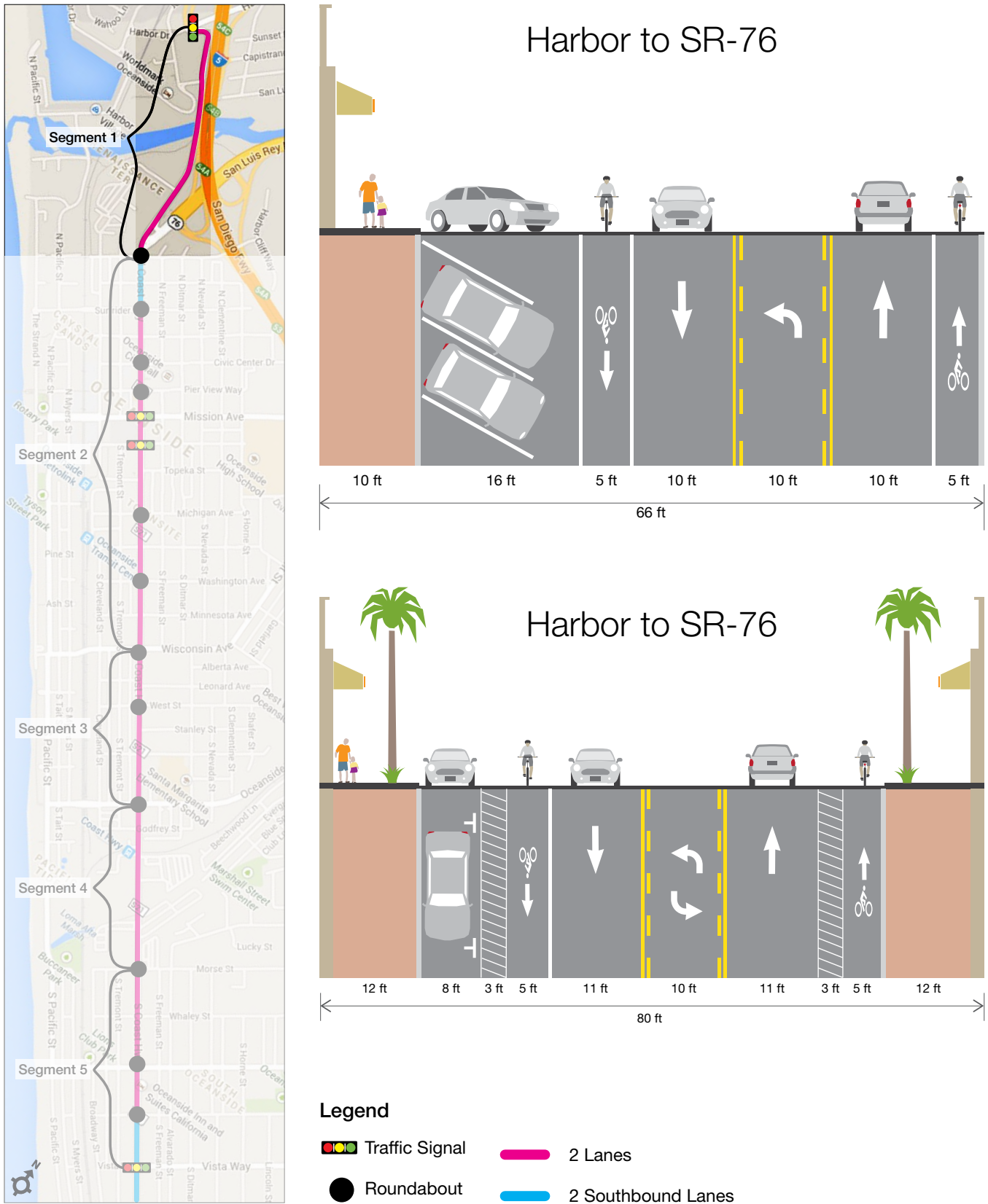


Figure 2-3a Segment 2 – Project Cross Sections

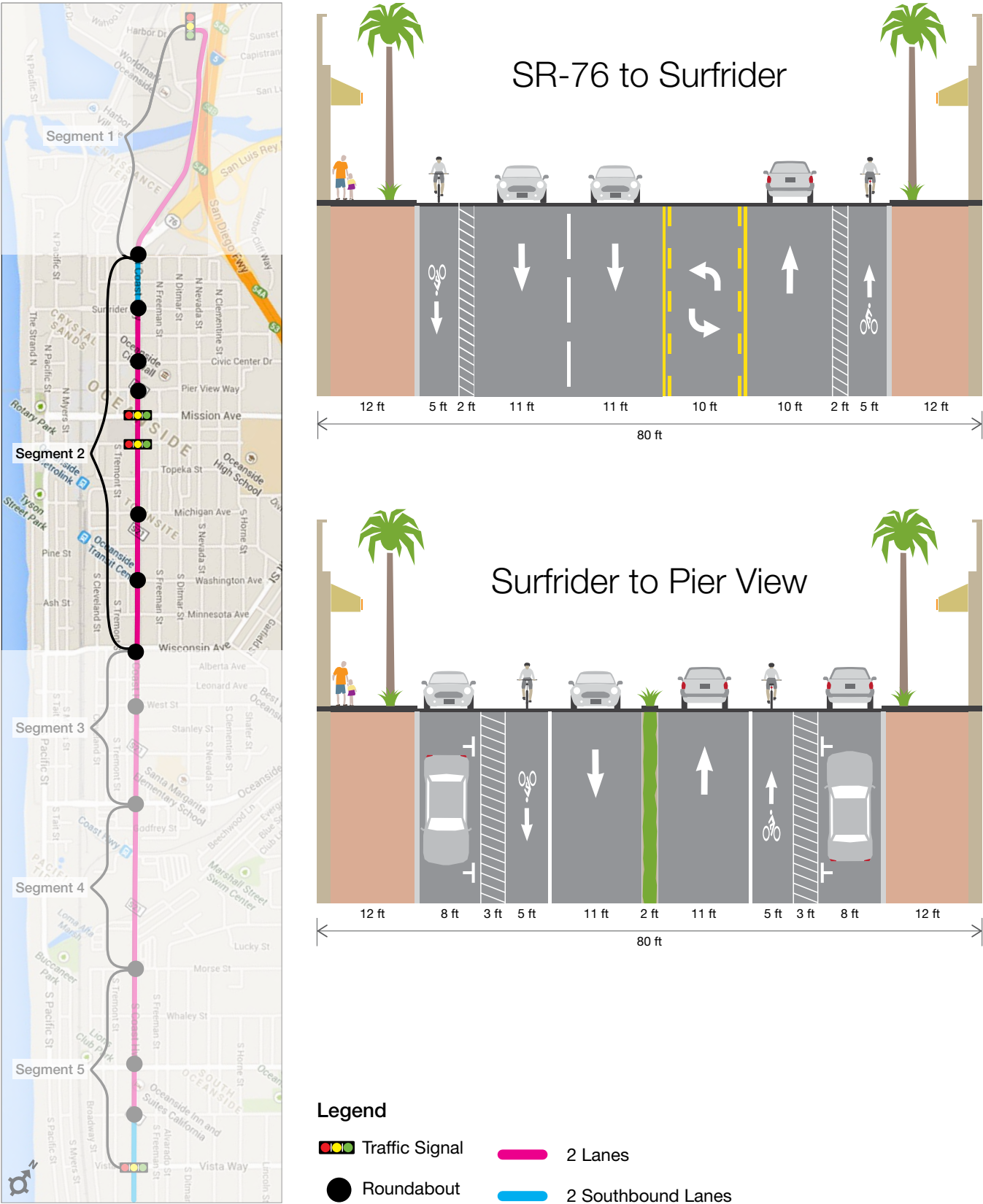


Figure 2-3b Segment 2 – Project Cross Sections

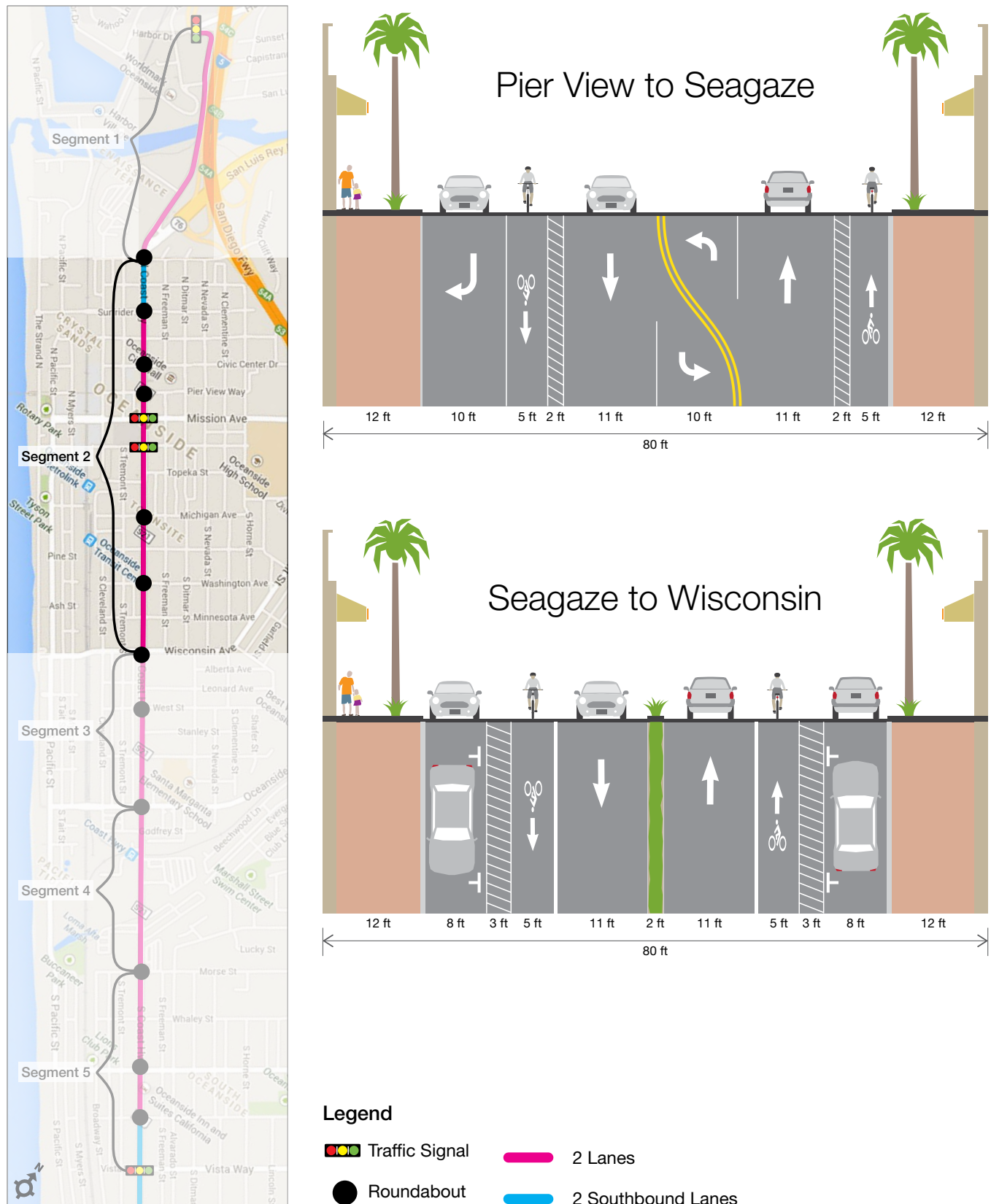
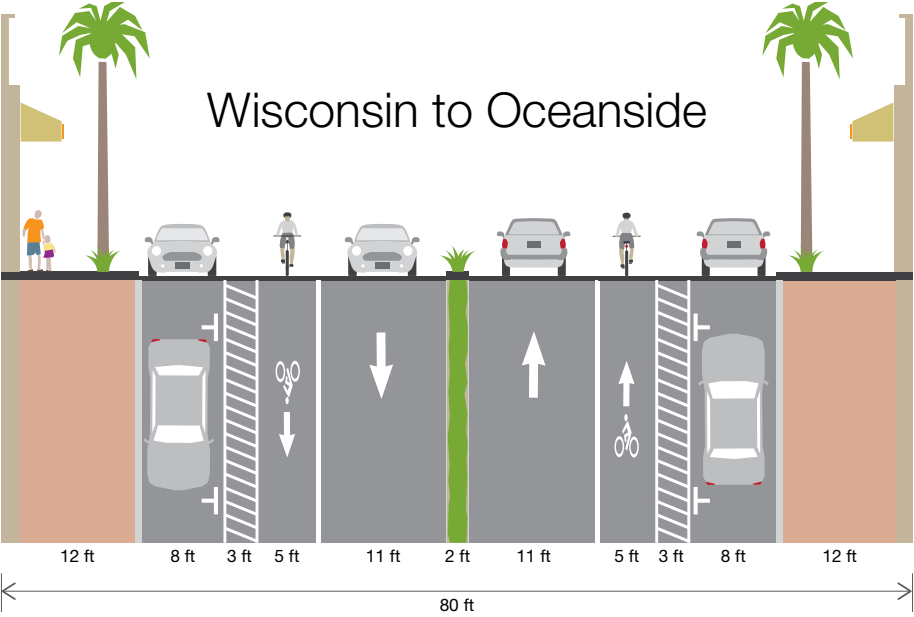
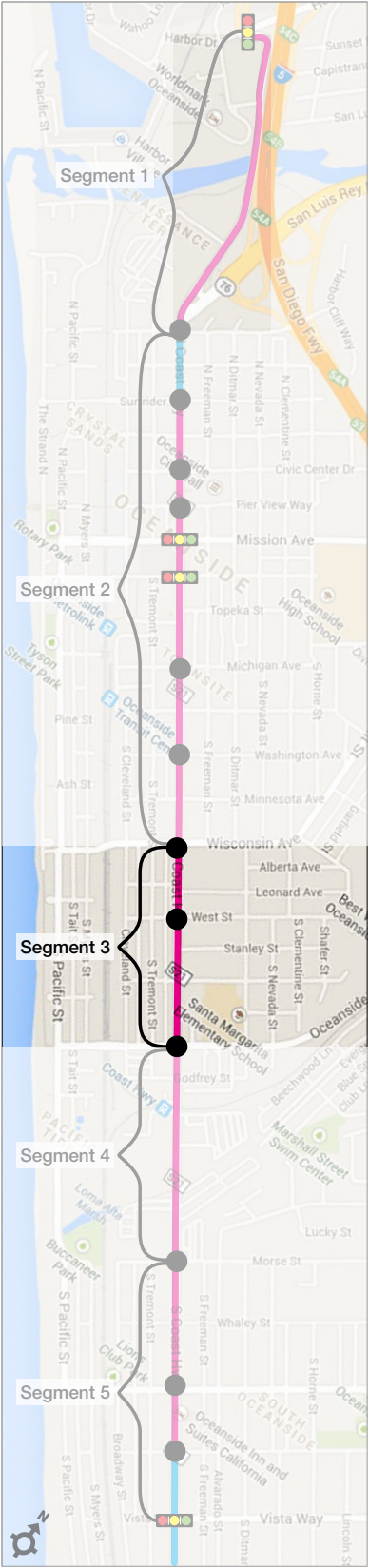


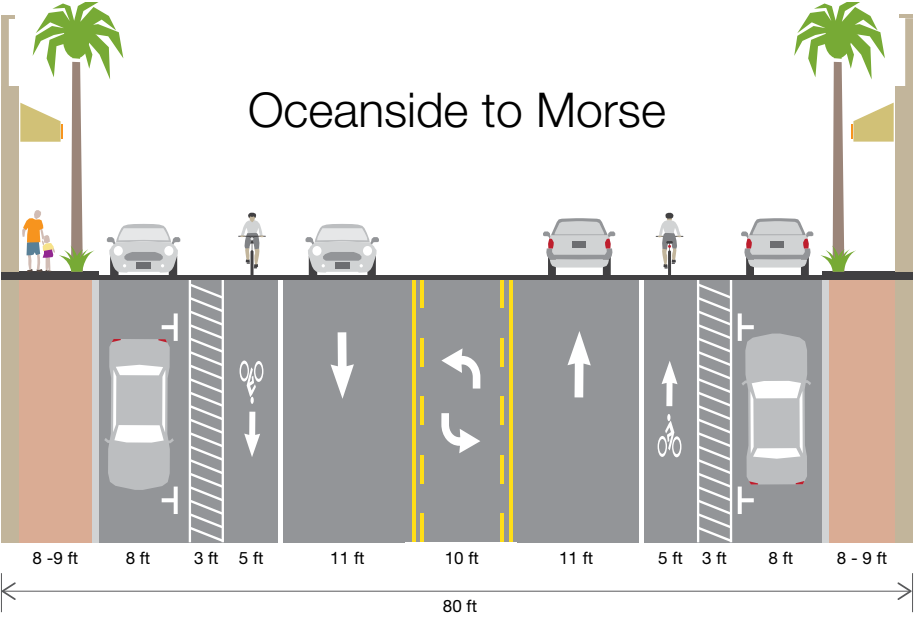
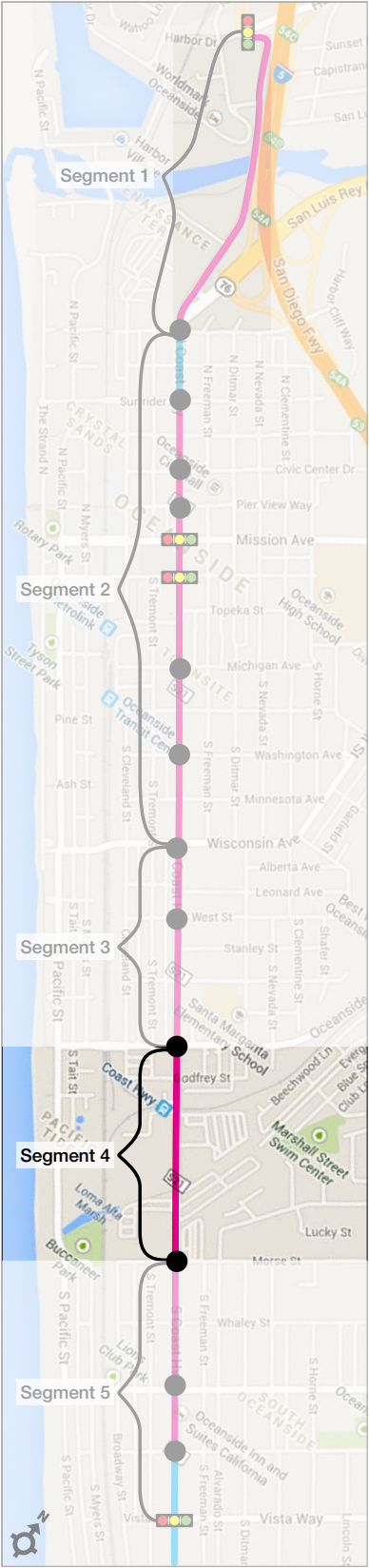
Figure 2-4 Segment 3 – Project Cross Sections



Legend

- Traffic Signal
- Roundabout
- 2 Lanes
- 2 Southbound Lanes

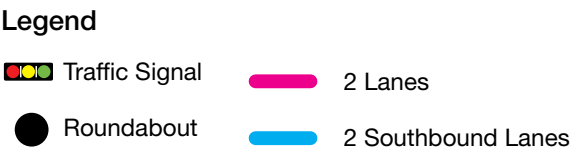
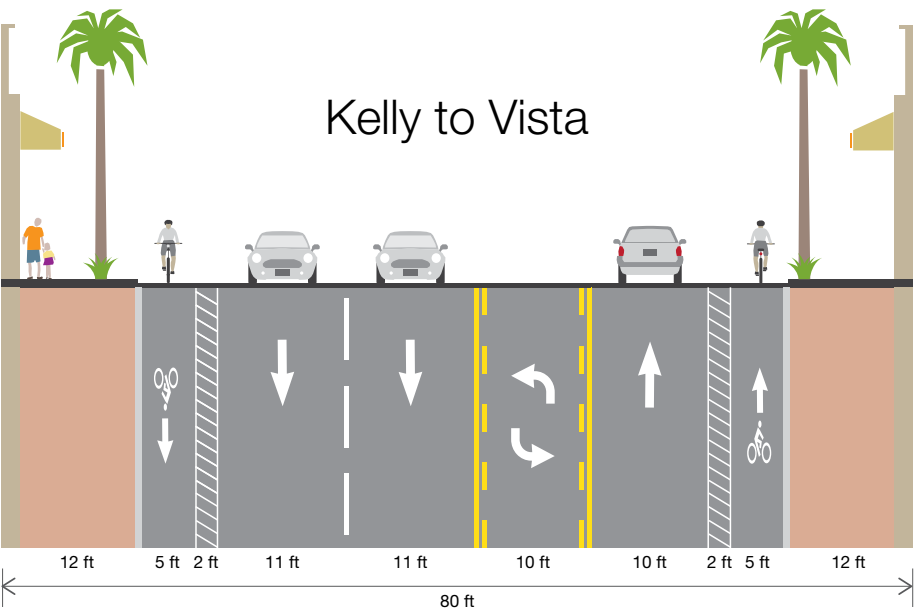
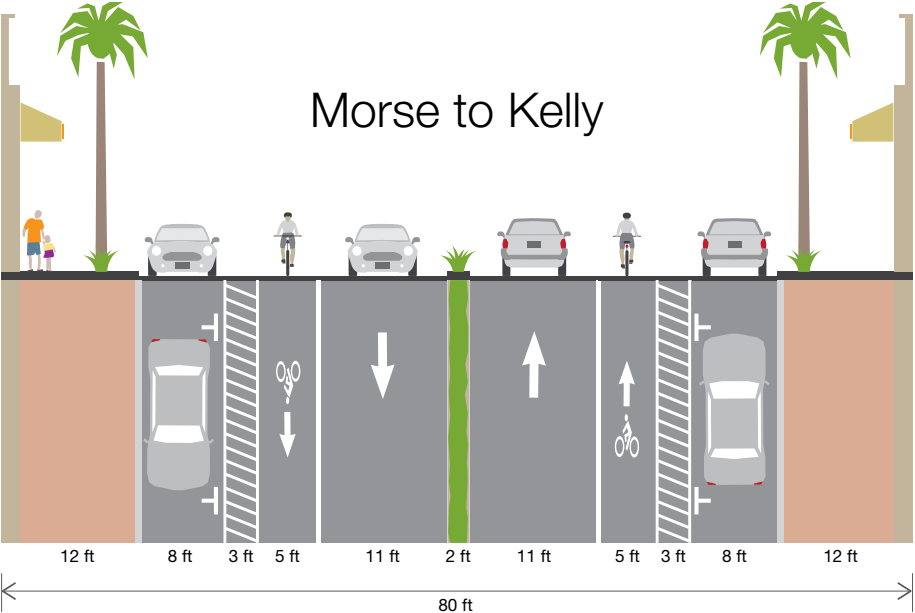
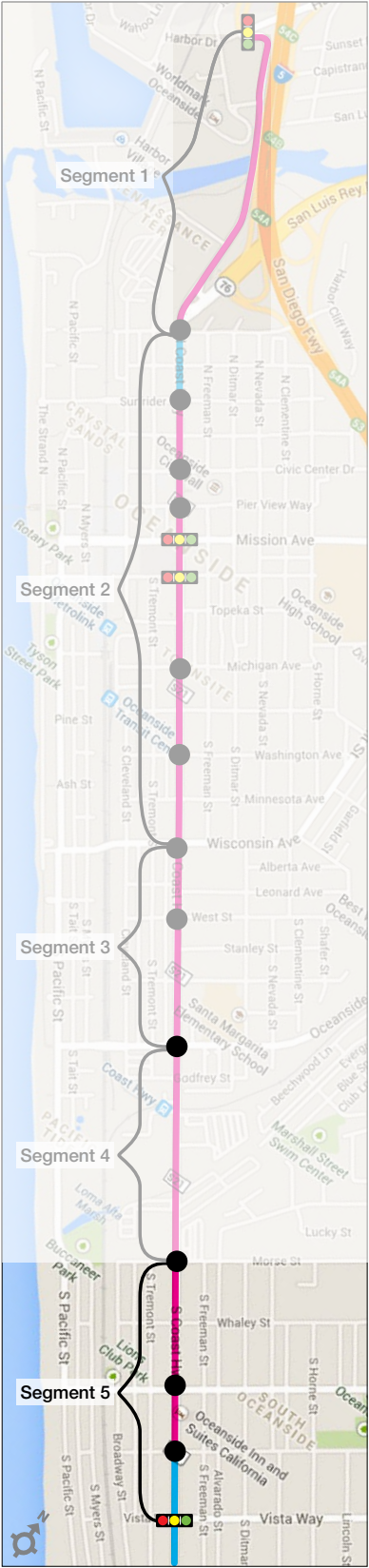
Figure 2-5 Segment 4 – Project Cross Sections



Legend

-  Traffic Signal
-  Roundabout
-  2 Lanes
-  2 Southbound Lanes

Figure 2-6 Segment 5 – Project Cross Sections



3 Analysis Methodology

The purpose of this TIA is to analyze the potential circulation impacts associated with the Coast Highway Corridor Study. The traffic analysis examines the following scenarios:

- Existing 2013 Conditions No Project
- Existing 2013 Conditions with Project
- Existing 2013 Conditions with Project Alternative 1 (four traffic lanes between Oceanside Blvd and Vista Way)
- Existing 2013 Conditions with Project Alternatives 2 (four traffic lanes between Morse St and Vista Way)
- Existing 2013 Conditions with Project Alternative 3 (four traffic lanes between Morse Street and Vista Way)
- Future 2035 Conditions No Project – General Plan Land Use
- Future 2035 Conditions with Project – Modified Vision Plan Land Use
- Future 2035 Conditions with Project Alternative 1 (four traffic lanes between Oceanside Blvd and Vista Way) – Modified Vision Plan Land Use
- Future 2035 Conditions with Project Alternative 2 (four traffic lanes between Morse St and Vista Way) – Modified Vision Plan Land Use
- Future 2035 Conditions with Project Alternative 3 (four traffic lanes between Morse Street and Vista Way) – Modified Vision Plan Land Use north of Morse St and General Plan Land use South of Morse St

The existing condition scenario analysis sets the existing condition baseline. The second, third, fourth, and fifth scenarios (project, project alternative 1, project alternative 2, and project alternative 3) allow for the analysis of existing traffic conditions with the proposed project and three project alternative lane configurations. The future baseline analysis evaluates future year 2035 under general plan condition. The future with project and with project alternative analyses evaluate future year 2035 under a modified Vision Plan land use condition with project and the three project alternative lane configurations.

Traffic operations at study intersections are evaluated for the AM and PM peak hours for each of the scenarios identified above. The peak hours are defined by the hour with the highest traffic volumes over a two hour period, typically between 7AM and 9AM in the morning and between 4PM and 6PM in the evening.

A detailed description of the methodology utilized in this TIA is presented below.

3.1 Traffic Count Data

Existing peak hour intersection count data and 48-hour roadway segment volumes were collected at the selected intersections and roadway segments in the study area during the summer (August) of 2013. Intersections 46 and 47 was not part of the original 2013 counts. In order to provide a more consistent and complete analysis, intersections 46 and 47 was added to

the study in 2016. Therefore, existing turning movement counts are not available for those two study intersections. The 2013 traffic counts are not anticipated to be considerably different compared to 2016 conditions as traffic is typically the highest during the summer months and thus captures a conservative representation of 2013 traffic conditions. Further, new private development along Coast Highway in the three years between the 2013 counts and 2016 has primarily been limited to adaptive reuse of existing buildings with some new construction of restaurants and breweries. These uses do not typically generate their peak number of automobile trips with the peak hour of adjacent street traffic, reducing the potential impact of these new developments on existing peak hour traffic volumes. It is important to note future Year 2035 traffic conditions (see below) utilize the San Diego Association of Government (SANDAG) forecast model and are independent from existing traffic volumes.

The existing intersection turning movement counts for the Caltrans interchanges were taken manually on Tuesday, March 13, 2018 during the morning peak period (7:00 AM to 9:00 AM) and the afternoon peak period (4:00 PM to 6:00 PM). The detailed traffic count data for the study area intersections and interchanges can be found in Appendix C.

3.2 Traffic Forecasting

Roadway segment volumes for 2035 conditions were provided by the San Diego Association of Governments (SANDAG) forecast model runs using the general plan and modified vision plan land uses. The SANDAG Series 12 model version was utilized to develop the future forecast traffic volumes.

The turning movement volumes at study intersections are based on existing turning movements and projected Average Daily Traffic (ADT) volumes along each approach.⁴ Each turning movement was derived using an iterative method that balanced the inflows and outflows for each approach. A more detailed description of the methodology used to forecast turning movement volume is contained in the National Cooperative Highway Research Program (NCHRP) 255 Highway Traffic Data for Urbanized Area Project Planning and Design, Chapter 8.

3.3 Trip Generation

Based on existing land uses and the SANDAG forecast model runs, existing and future trips were estimated for study area.⁵ Trip rates were based on the ITE Trip Generation Manual (9th Edition) and applied to existing and future land uses. The results of this comparison are found in Appendix B. A comparison of the two scenarios provides an estimate of trips generated between existing and future scenarios.

3.4 Vehicle Miles Traveled

Senate Bill (SB) 743 was passed by the State Legislature and signed by Governor Brown in 2013. This bill created a process to change the manner in which transportation impacts are analyzed under the California Environmental Quality Act (CEQA). Since the passage of SB 743, the State Office of Planning and Research has been working to identify the preferred approach going forward to analyze transportation impacts. The current proposal involves the use of Vehicle Miles Traveled (VMT) as the primary metric for determining transportation impact across the state. Further, the proposal states that land use development near transit or in VMT-efficient areas should be presumed to cause a less than significant transportation impact and that transit,

⁴ Existing turning movement was not available for intersections 46 and 47; assumed a 1-2-1 turning movement split to calculate future movements. A 1-2-1 split provides a base allocation of turning movement volumes for the development of future forecast turning movements. In this case, the first 1 represents left turns, the 2 would be through movements, and the second 1 would be right turns. This is rule-of-thumb industry guideline for use at intersections with no available turning movement counts.

⁵ Existing land uses are based on the Coast Highway Land Use Review (May 2015)

active transportation and rehabilitation projects that do not add motor vehicle capacity should also be presumed to cause a less than significant impact.

Vehicle Miles Traveled (VMT) is derived from travel patterns extracted from the SANDAG forecast model. This analysis was completed by SANDAG for the future year 2035 under general plan land use conditions (no project) and future year 2035 under a modified vision plan land use conditions (with project). VMT was extracted from SANDAG's model to provide a consistent platform for comparison between the modified vision plan (project scenario) and the general plan (no project scenario) land uses. The VMT analysis was conducted for all trips within, beginning, or ending within the project study area. The results of the VMT analysis are presented in Section 6. VMT data is presented both in terms of total VMT and VMT per capita for the study area west of Interstate 5.

3.5 Level of Service Analysis and Criteria

This section presents the methodology used to perform the traffic analysis, consistent with the City of Oceanside General Plan Circulation Element. The methodology used to assess the operation of signalized and unsignalized intersections is the Highway Capacity Manual (HCM) methodology. HCM methodology presents level of service (LOS) in terms of control delay in seconds per vehicle, which is defined as the average delay experienced at the traffic intersection. The minimum acceptable level of service established by the Circulation Element of the City of Oceanside General Plan is defined as LOS D for intersections during peak hour operations. Intersections that are maintained and operated by Caltrans were analyzed using the HCM 2010 methodology and the analysis was conducted consistent with Caltrans traffic study guidelines. Caltrans traffic study guidelines establish the transition between LOS C and D as the minimum acceptable LOS for Caltrans facilities.

3.5.1 Roadway Segment Operations

Roadway segment performance is based on the capacity of the facility (as determined by the functional classification, roadway geometrics, and number of through lanes) and the ADT volumes. The City of Oceanside General Plan Circulation Element evaluates roadway segment performance in terms of Level of Service (LOS), where the thresholds for each LOS grade are based on daily volume-to-capacity (v/c) ratios. LOS designations are based on a volume-to-capacity ratio, and range from "A" to "F" with LOS A representing the lowest level of congestion and LOS F representing extremely congested and restricted operations. The goal is to provide the right balance of paved roadway to serve the surrounding uses with an acceptable amount of peak period delay. The maximum average daily volumes for each street classification and lane configuration and the corresponding LOS are summarized in Table 3-1.

It should be noted the County of San Diego Public Road Standards were used to evaluate roadway capacities for the corridor along Coast Highway. These standards were used to supplement the existing City standards for the corridor roadways as the standards provide a more accurate assessment of daily roadway capacity based on the proposed project elements with a two-lane divided roadway and roundabouts. Given this proposed roadway condition and the capacity benefits provided by the raised median and roundabouts, the existing City standards for a two-lane collector roadway were deemed to be too conservative. A collector roadway with a raised median is included as a roadway type and follows the LOS thresholds outlined in Table 3-1.

Table 3-1: Roadway Classification Level of Service (LOS) & Capacity

Class	Lanes	Capacity (Daily Vehicles)				
		LOS A	LOS B	LOS C	LOS D	LOS E
Expressway	6	30,000	42,000	60,000	70,000	80,000
Expressway	4	25,000	35,000	50,000	55,000	60,000
Prime Arterial	6	25,000	35,000	50,000	55,000	60,000
6-Lane Major Arterial	6	20,000	28,000	40,000	45,000	50,000
5-Lane Major Arterial	5	17,500	24,500	35,000	40,000	45,000
4-Lane Major Arterial	4	15,000	21,000	30,000	35,000	40,000
Secondary Collector (4 lanes with 2-way left turn lane)	4	10,000	14,000	20,000	25,000	30,000
Secondary Collector (4 lanes without 2-way left-turn lane, with left turn pockets)	4	9,000	13,000	18,000	22,000	25,000
Collector (commercial fronting, 2-lanes with 2-way left turn lane) ¹	2	5,000	7,000	10,000	13,000	15,000
Collector (residential streets in the Circulation Element or industrial fronting)	2	4,000	5,500	7,500	9,000	10,000
Local Street (residential streets NOT in the Circulation Element)	2	—	—	2,200	—	—
Community Collector (w/ Raised Median) ²	2	10,000	11,700	13,400	15,000	19,000

1. This capacity will also be assumed for two-lane one-way collectors.

2. Source: County of San Diego Public Road Standards, March 2012

A roadway segment analysis, consistent with the City of Oceanside's Traffic Study Guidelines, is provided in the Appendix A of this traffic impact analysis report. The roadway segment analysis was completed for each study alternative and includes analysis of existing and forecast Average Daily Traffic (ADT) traffic volumes for various road segments located throughout the traffic study area. A peak hour roadway segment level of service (LOS) analysis was also completed for the same roadway segment locations. The city's Circulation Element requires that if a roadway is calculated to operate at LOS E on an average daily basis, then an arterial peak hour analysis should be performed following the (most recent version of) the Highway Capacity Manual (HCM) methodology. The peak hour roadway segment analysis, together with the daily analysis was completed to satisfy this requirement.

The roadway segment analysis did identify segments of Coast Highway that are forecast to operate at LOS E or F on an average daily basis in the Future With Project conditions. In these cases, the City of Oceanside requires that projects implement mitigation measures intended to enhance traffic operations and progression through the corridor during the peak traffic hours. These measures typically include installation of roundabouts, traffic signal timing or coordination enhancements, and minimizing conflicting traffic movements, etc. These measures are all part of the base Coast Highway Corridor project, which includes the installation of roundabouts throughout the corridor, specifically to enhance traffic flow, as well as elimination of traffic signals and the construction of a raised median in several sections of the roadway. These project elements are consistent with the City of Oceanside's Circulation Element levels of service (LOS) analysis methodology used to improve peak hour traffic flows along roadway segments. With the implementation of these project elements, level of service is projected to be acceptable on all study road segments and project alternatives in the peak hour.

3.5.2 Intersection Operations Analysis

3.5.2.1 Signalized Intersections

The HCM 2000 methodology defines LOS as a qualitative measure that describes operational conditions within a traffic stream, generally in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The criteria used to evaluate LOS conditions vary based on the type of roadway and whether the traffic flow is considered interrupted or uninterrupted. The six qualitative categories of LOS and corresponding average delay that have been defined are presented below:

Table 3-2: Level of Service for Signalized Intersections

LOS	Description	Delay (sec)
A	No approach phase is fully utilized by traffic, and no vehicle waits longer than one red indication. Typically, the approach appears quite open, turns are made easily, and nearly all drivers find freedom of operation.	0.0 -10.0
B	This service level represents stable operation, where an occasional approach phase is fully utilized, and a substantial number are nearing full use. Many drivers begin to feel restricted within platoons of vehicles.	10.1 – 20.0
C	This level still represents stable operating conditions. Occasionally, drivers may have to wait through more than one red signal indication, and backups may develop behind turning vehicles. Most drivers feel somewhat restricted, but not objectionably so.	20.1 – 35.0
D	This level encompasses a zone of increasing restriction approaching instability at the intersection. Delays to approaching vehicles may be substantial during short peaks within the peak period; however, enough cycles with lower demand occur to permit periodic clearance of developing queues, thus preventing excessive backups.	35.1 – 55.0
E	Capacity occurs at the upper end of this service level. It represents the most vehicles that any particular intersection approach can accommodate. Full utilization of every signal cycle is attained no matter how great the demand.	55.1 – 80.0
F	This level describes forced flow operations at low speeds, where volumes exceed capacity. These conditions usually result from queues of vehicles backing up from a restriction downstream. Speeds are reduced substantially, and stoppages may occur for short or long periods of time due to the congestion. In the extreme case, speed can drop to zero.	80.1 or more

Source: Highway Capacity Manual (2010)

3.5.2.2 Unsignalized Intersections

The two types of unsignalized intersections include side-street stop controlled (SSSC) and all-way stop-controlled (AWSC). The delay range for unsignalized intersections is different from those of signalized intersections primarily due to driver expectation. The expectation is that signalized intersections are designed to carry higher volumes of traffic and therefore higher levels of delay are acceptable. The HCM 2000 methodology estimates the delay based on the worse approach at unsignalized intersections. The table below includes the LOS ranges for both unsignalized intersection types.

Table 3-3: Level of Service for Unsignalized Intersections

Level of Service	Description	Control Delay (sec/veh)
A	Little or no delays	0.0 – 10.0
B	Short traffic delays	10.1 – 15.0
C	Average traffic delays	15.1 – 25.0
D	Long traffic delays	25.1 – 35.0
E	Very long traffic delays	35.1 – 50.0
F	Extreme traffic delays with intersection capacity exceeded	50.1 or more

Source: Highway Capacity Manual (2010)

3.5.2.3 Roundabouts and Interchanges

Roundabouts were evaluated using the HCM 2010 methodology utilizing the Highway Capacity Software 2010 (HCS 2010). HCM 2010 methodology evaluates LOS based on vehicle delay. LOS designations at roundabouts will follow the same criteria as designations for unsignalized intersections.

Caltrans assesses facility performance and impacts utilizing the HCM 2010 method. Facilities evaluated with this method include freeway terminals (intersections), on-ramps, and off-ramps (queues). The Synchro 9 software was used to implement this method. Standard settings were utilized. Caltrans traffic impact analysis guidelines do not explicitly define a significant impact in terms of existing level of service and change in that level of service; therefore, a significant impact is considered to occur when:

- The addition of project trips causes a change from LOS C or better to LOS D; or
- The addition of project trips causes a change from LOS D or worse to degrade to a lower LOS.
- If the intersection is operating at LOS F in the baseline condition, any increase in vehicle delay is taken to be an impact; LOS should be returned to, at least, the pre-project conditions.

LOS designations at ramp interchanges will follow the same criteria as designations for signalized intersections. The HCM methodology was used to analyze the study ramp intersections under Caltrans' jurisdiction. The intersection at Mission Avenue and the I-5 on-ramp is an uncontrolled intersection and was, therefore, not included in the analysis.

3.6 Roadway System

The circulation network considered for analysis consists of streets in the vicinity of the Coast Highway Corridor Study. This network includes the following roadways:

- Coast Highway
- Pacific Street
- Cleveland Street
- Broadway Street
- Tremont Street
- Freeman Street
- Ditmar Street
- Stewart Street
- State Route 76 (SR-76)
- Surfrider Way
- Civic Center Drive
- Pier View Way
- Mission Avenue
- Seagaze Street
- Missouri Avenue
- Washington Avenue
- Wisconsin Avenue
- Oceanside Boulevard

- o Morse Street
- o Cassidy Street
- Vista Way

Coast Highway – Runs north/south through Oceanside's downtown area, and has two typical sections within the City. The first section is a collector two-lane roadway with a continuous two-way left turn lane that spans from Harbor Drive to the intersection with SR-76. No on-street parking is allowed on most of the segment except for a small stretch just south of Harbor Drive. South of the SR-76, Coast Highway becomes a secondary collector and is generally built to secondary collector standards (as a four-lane undivided roadway). Between SR-76 and Wisconsin Avenue, the posted speed limit is 25 miles per hour, and south of Wisconsin, the speed limit increases to 35 miles per hour. Parking is not allowed on Coast Highway between SR-76 and Surfrider Way, from Oceanside Boulevard to Morse Street, and south of Vista Way, but is allowed in some sections between Surfrider Way and Oceanside Boulevard, and between Morse Street and Vista Way. Between Oceanside Boulevard and Morse Street and south of Vista Way, there is a striped bike lane on each side of the roadway.

Pacific Street – A collector roadway located west of Coast Highway. This street runs parallel to Coast Highway between Harbor Drive and Eaton Street. Pacific Street is a two-lane undivided roadway with on-street parking permitted on all segments. It is also designated as a bike route and has bike sharrows⁶ marked throughout the corridor.

Cleveland Street – A collector roadway located east of Pacific Street. Cleveland Street is interrupted between Seagaze Street and Michigan Avenue in the area occupied by the Oceanside Transit Station. Cleveland Street continues south of Missouri Avenue ending at Godfrey Street. This street is a two-lane undivided roadway.

Broadway Street – A collector that runs from Morse Street to Eaton Street. Broadway Street is a two-lane undivided roadway located west of Coast Highway and permits parking. The Coastal Rail Trail runs adjacent to Broadway Street from Cassidy Street to Vista Way.

Tremont Street – A local street located between Coast Highway and Cleveland Street. This street is a two-lane undivided roadway with parking allowed on all segments of the street. Tremont Street is a designated bike route from Missouri Avenue to Wisconsin Avenue.

Freeman Street – A local street located east of Coast Highway. This street is a two-lane undivided roadway with on-street parking permitted on all segments. Freeman Street is interrupted between Civic Center Drive and Pier View Way (area occupied by Oceanside's Civic Center) and between Wisconsin Avenue and Morse Street (with one block between Oceanside Boulevard and Godfrey Street). The last segment of Freeman Street is from Morse Street to Eaton Street.

Ditmar Street – Designated as a collector roadway from Missouri Avenue to Eucalyptus Street and a local street north of Missouri Avenue and south of Eucalyptus Street. Ditmar Street is a two-lane undivided roadway located east of Freeman Street and permits parking. Ditmar Street is interrupted south of Oceanside Boulevard, restarts at Morse Street and ends at Eaton Street.

Stewart Street – A local street located east of Ditmar Street. This street is a two-lane undivided roadway. Stewart Street runs parallel to Coast Highway between Laguna Street and Vista Way.

State Route 76 (SR-76) – This is a State Highway located east of the study area, connecting to Coast Highway in the northern portion of the City. East of Coast Highway, SR-76 starts as a four-lane undivided roadway, becoming a four-lane divided roadway in the proximity of the interchange with Interstate 5.

Surfrider Way – A collector street located south of the intersection of Coast Highway and SR-76. East of Coast Highway, Surfrider Way is a two-lane undivided roadway. West of Coast Highway,

⁶ Bike Sharrows – Road marking used to indicate a shared lane environment for bicycle and automobiles

the street is two-lane roadway divided by a landscaped median from Coast Highway to the rail tracks, and a two-lane undivided roadway from the rail tracks to the beach. Parallel on-street parking is allowed on Surfrider Way, with the exception of the block closest to the beach.

Civic Center Drive – A collector street located south of Surfrider Way, running from Cleveland Street to beyond the eastern limit of the study area. This street is a two-lane undivided roadway. Parallel parking is allowed on all segments of the street within the study area limits, with the exception of the south side of Civic Center Drive east of Coast Highway. Diagonal on-street parking is provided in this section of the roadway.

Pier View Way – A local street located south of Civic Center Drive, and runs from Cleveland Street to Horne Street. This street is a two-lane undivided roadway. Parking is allowed on all segments of the street, and diagonal parking is allowed on the segment between Cleveland Street and Ditmar Street.

Mission Avenue – A collector roadway that connects the Coast Highway corridor and beach area with portions of the city located east of Interstate 5. Mission Avenue is part of a one-way couplet with Seagaze Street and includes bicycle sharrows.

Seagaze Street – A two-lane collector roadway located south of Mission Avenue. Parallel parking is allowed on most parts of the street, with diagonal parking allowed on a portion of the north side of the street between Cleveland Street and Coast Highway and on the south side of the street between Coast Highway and Freeman Street. Seagaze Street is part of a one-way couplet with Mission Avenue and includes a striped eastbound bicycle lane.

Missouri Avenue – A local street located south of Michigan Avenue. This street begins at Cleveland Street and crosses the study area, ending at Vine Street. This street is a two-lane undivided roadway with parking permitted.

Washington Avenue – A local street located south of Missouri Avenue. This street begins at Cleveland Street and crosses the majority of the study area, ending at Grant Street. This street is a two-lane undivided roadway. Parking is allowed.

Wisconsin Avenue – A collector street located south of Washington Avenue. This street begins at The Strand and crosses the majority of the study area, ending at Weitzel Street. This street is a two-lane undivided roadway. On-street parking is allowed east of Pacific Street.

Oceanside Boulevard – A collector street located south of Wisconsin Avenue. It begins at Pacific Street, crosses the study area and continues east outside the study area boundaries. It provides access to industrial, residential, and retail/commercial uses. West of Coast Highway, Oceanside Boulevard is a two-lane undivided collector street, and parallel on-street parking is permitted. Between Coast Highway and I-5, Oceanside Boulevard is designated a secondary collector with four lanes, an undivided median and a striped bicycle lane.

Morse Street – A two-lane undivided collector street located south of Oceanside Boulevard and south of the Sprinter rail corridor. This street begins at Broadway Street and crosses the study area, ending at Griffin Street. On-street parking is allowed.

Cassidy Street – A collector street that begins at Broadway Street and crosses the study area from west to east, and continues east outside the study area boundaries. It is a two-lane undivided roadway. Parking is allowed on selected segments of the street. Bicycle sharrows are installed between Broadway and Ditmar Street.

Vista Way – Designated as a collector street. From Broadway Street to Coast Highway, it is a two-lane undivided roadway with parallel parking permitted. East of Coast Highway, Vista Way is a two-lane roadway with a continuous two-way center left turn lane. Parking is permitted from Broadway Street to the SR-78 ramps.

3.6.1 No Project Network

The no project network maintains existing roadway configurations and is the baseline for the Existing and Future analysis scenarios. These scenarios include a four lane Coast Highway corridor with two lanes of travel in each direction. The existing (no project) roadway configurations and intersection controls are shown in Figure 3-1.

3.6.2 Project Network

The project network includes full build out of the project and contains a two lane Coast Highway corridor with one lane of travel in each direction. A median divides the corridor throughout with roundabouts at twelve (12) intersections (listed below). The project roadway configurations and intersection controls are shown in Figure 3-2.

- Coast Hwy & SR-76
- Coast Hwy & Surfrider Way
- Coast Hwy & Civic Center Drive
- Coast Hwy & Pier View Way
- Coast Hwy & Michigan Ave
- Coast Hwy & Washington Ave
- Coast Hwy & Wisconsin Ave
- Coast Hwy & West St
- Coast Hwy & Oceanside Blvd
- Coast Hwy & Morse St
- Coast Hwy & Cassidy St
- Coast Hwy & Kelly St

3.6.3 Project Alternative 1 Network

The project alternative 1 network includes build out of the project from Harbor Drive to Oceanside Boulevard with a median divided two lane Coast Highway corridor with one lane of travel in each direction; roundabouts are located at seven (7) intersections (listed below). From Oceanside Boulevard to the southern city limits, Coast Highway corridor remains a four lane corridor with two lanes of travel in each direction. The project alternative 1 roadway configurations and intersection controls are shown in Figure 3-3.

- Coast Hwy & SR-76
- Coast Hwy & Civic Center Drive
- Coast Hwy & Pier View Way
- Coast Hwy & Michigan Ave
- Coast Hwy & Washington Ave
- Coast Hwy & Wisconsin Ave
- Coast Hwy & West St

3.6.4 Project Alternative 2 Network

The project alternative 2 network includes build out of the project from Harbor Drive to Morse Street with a median divided two lane Coast Highway corridor with one lane of travel in each direction; roundabouts are located at seven (7) intersections (listed below). From Morse Street to the southern city limits, Coast Highway corridor remains a four lane corridor with two lanes of travel in each direction. The project alternative 2 roadway configurations and intersection controls are shown in Figure 3-4.

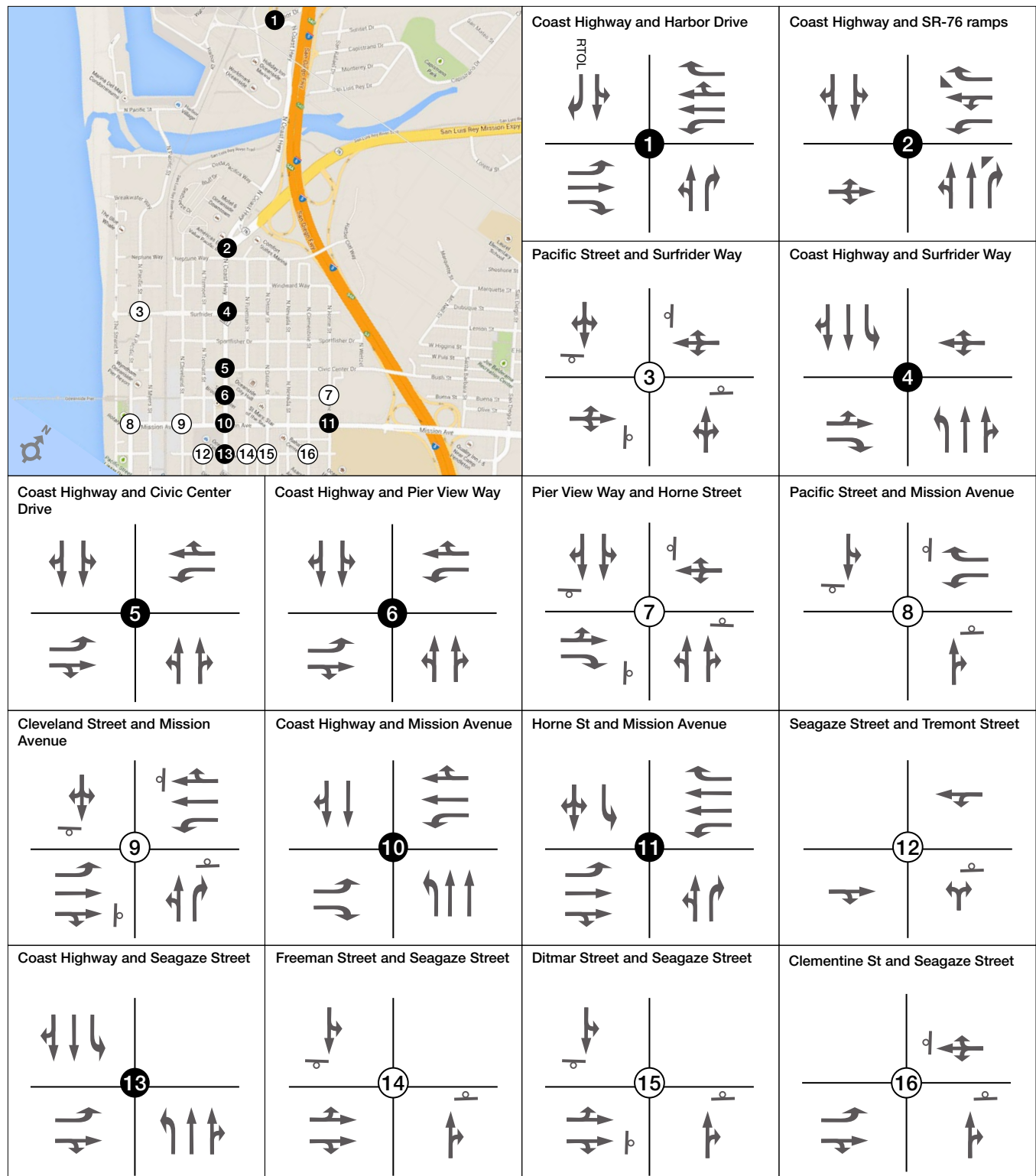
- Coast Hwy & SR-76
- Coast Hwy & Civic Center Drive
- Coast Hwy & Pier View Way
- Coast Hwy & Michigan Ave
- Coast Hwy & Washington Ave
- Coast Hwy & Wisconsin Ave
- Coast Hwy & West St

3.6.5 Project Alternative 3 Network

The project alternative 3 network includes build out of the project from Harbor Drive to Morse Street with a median divided two lane Coast Highway corridor with one lane of travel in each direction; roundabouts are located at seven (7) intersections (listed below). From Morse Street to the southern city limits, Alternative 3 assumes that Coast Highway would remain as a four lane roadway with two lanes of travel in each direction. Further, this alternative assumes that the Incentive Overlay district would stop at Morse Street and future land uses south of Morse Street would be consistent with the SANDAG regional growth forecasts. The project alternative 3 roadway configurations and intersection controls are shown in Figure 3-5.

- Coast Hwy & SR-76
- Coast Hwy & Civic Center Drive
- Coast Hwy & Pier View Way
- Coast Hwy & Michigan Ave
- Coast Hwy & Washington Ave
- Coast Hwy & Wisconsin Ave
- Coast Hwy & West St

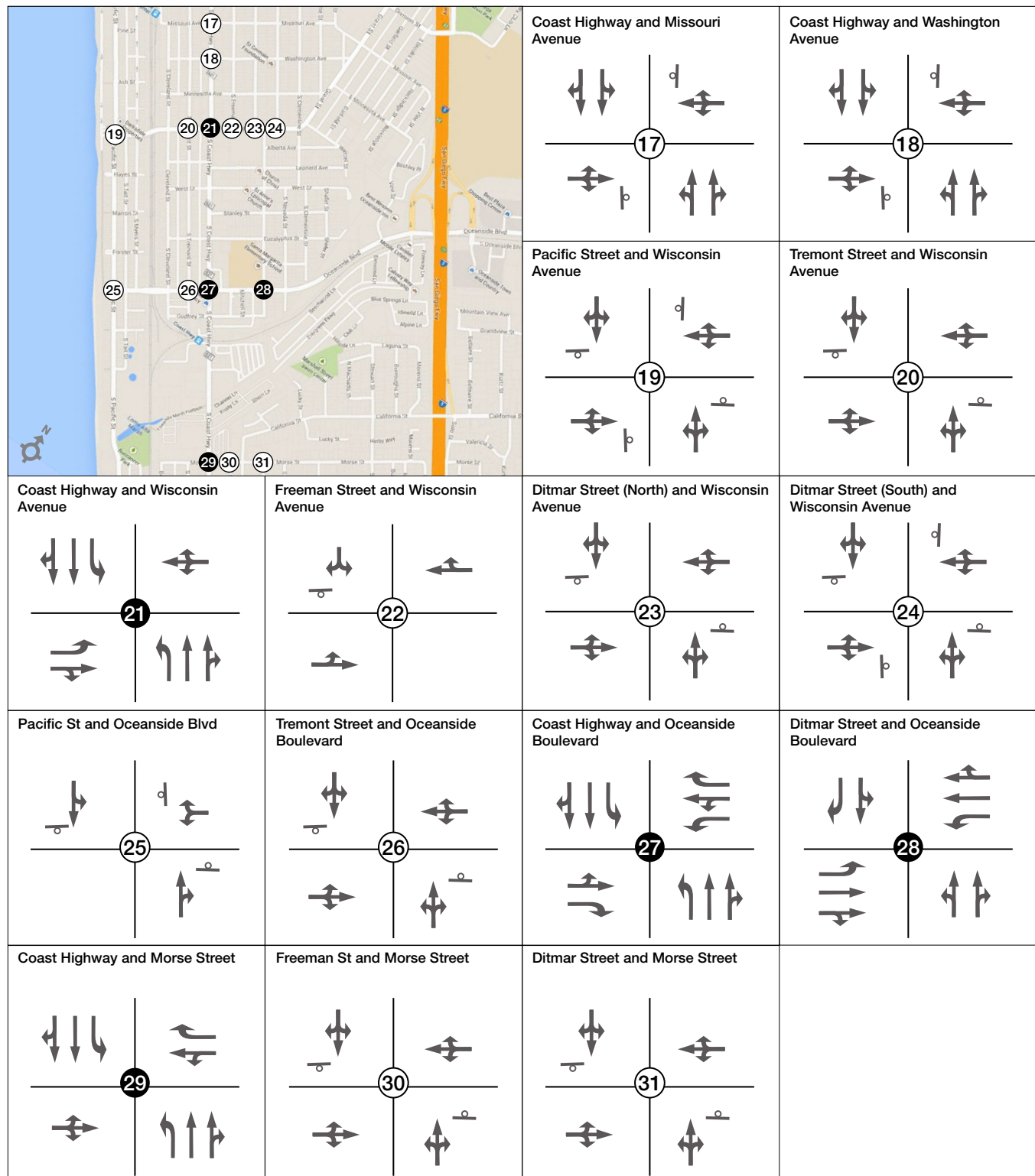
Figure 3-1a Existing (No Project) Roadway Configurations + Control



Legend

● Signalized Intersections ○ Unsignalized Intersections ➡ Free Right Turn Lane ⏸ Stop Sign Control

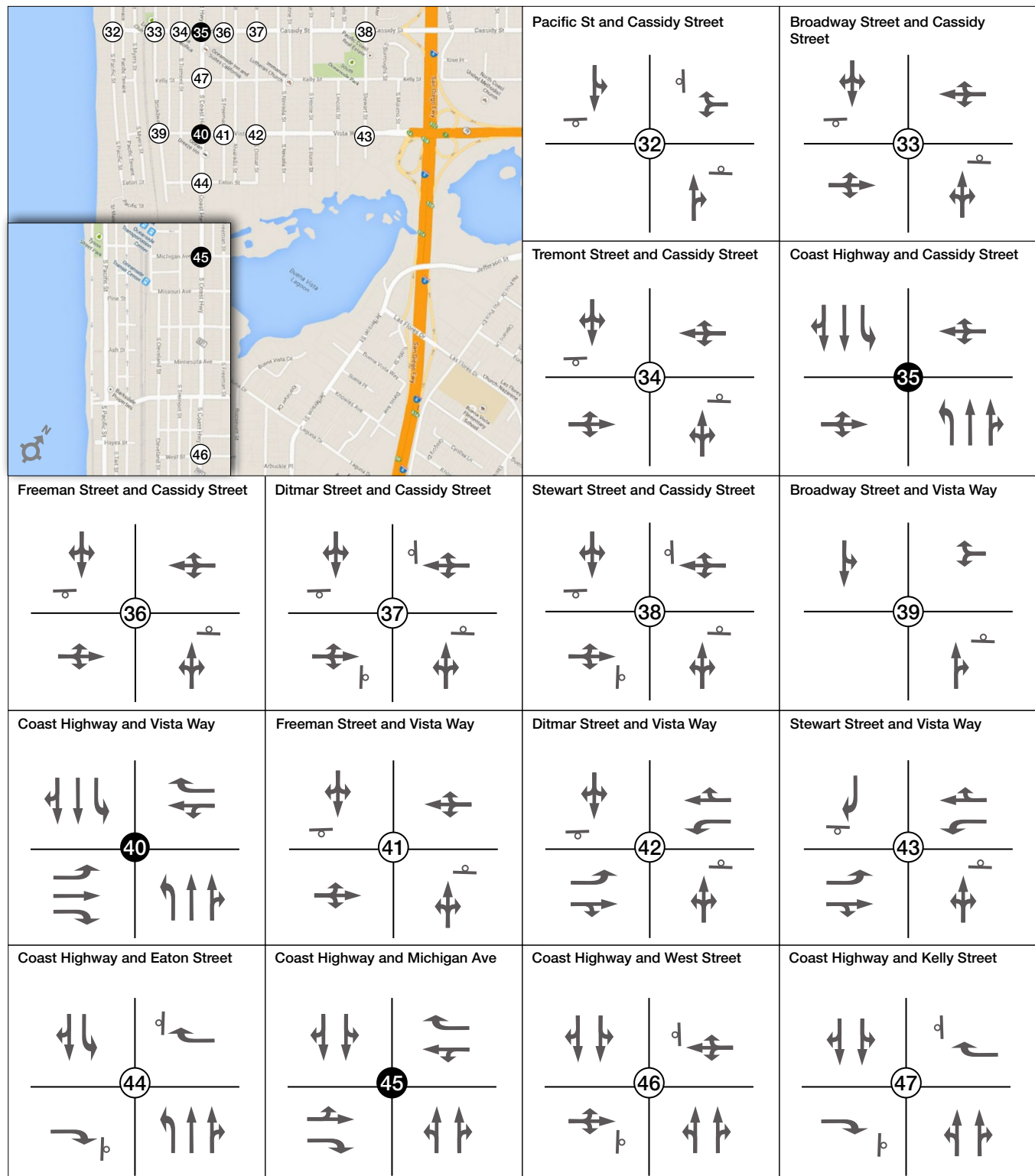
Figure 3-1b Existing (No Project) Roadway Configurations + Control



Legend

Signalized Intersections
 Unsignalized Intersections
 Free Right Turn Lane
 Stop Sign Control

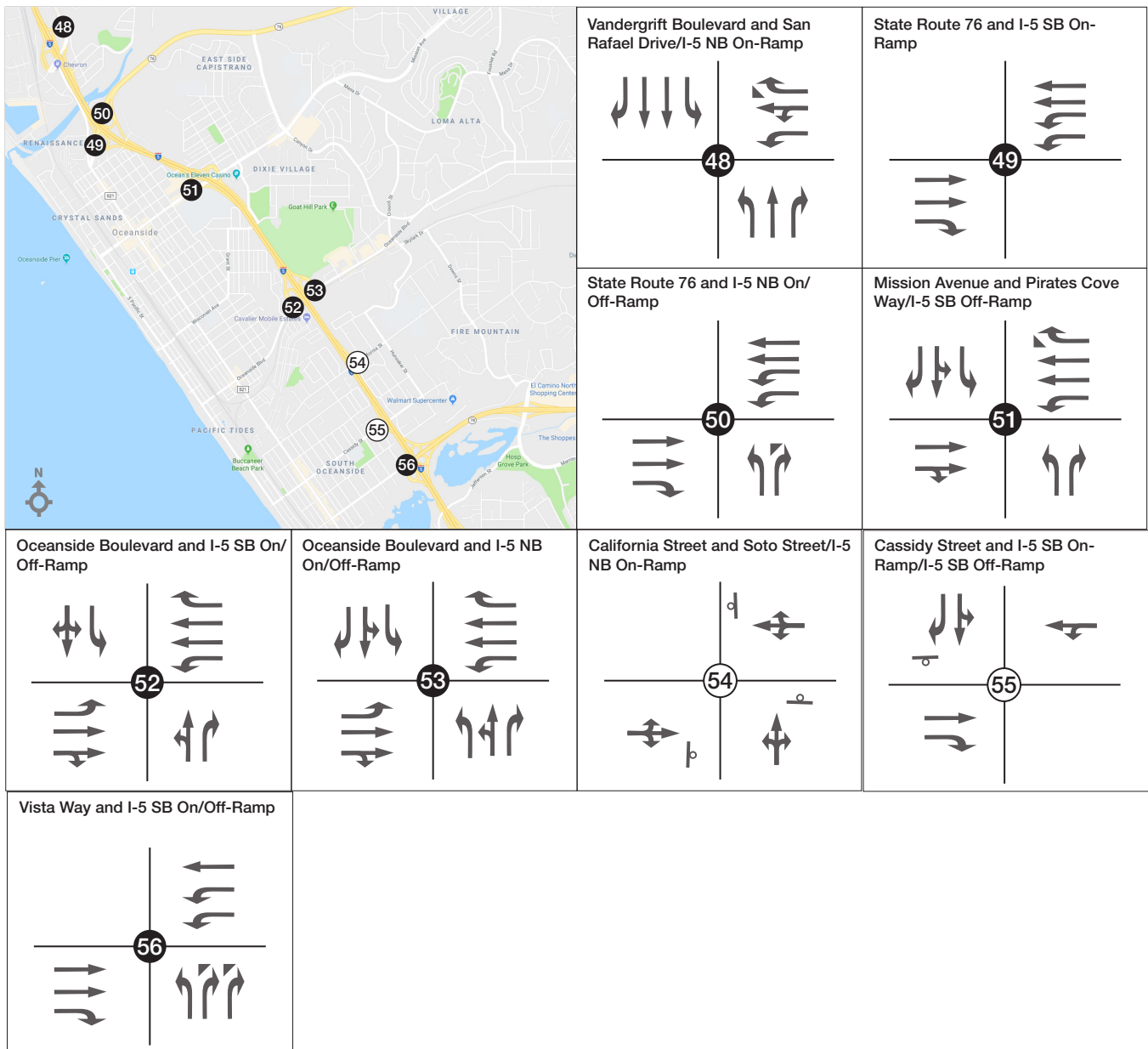
Figure 3-1c Existing (No Project) Roadway Configurations + Control



Legend

● Signalized Intersections ○ Unsignalized Intersections ➡ Free Right Turn Lane ⊥ Stop Sign Control

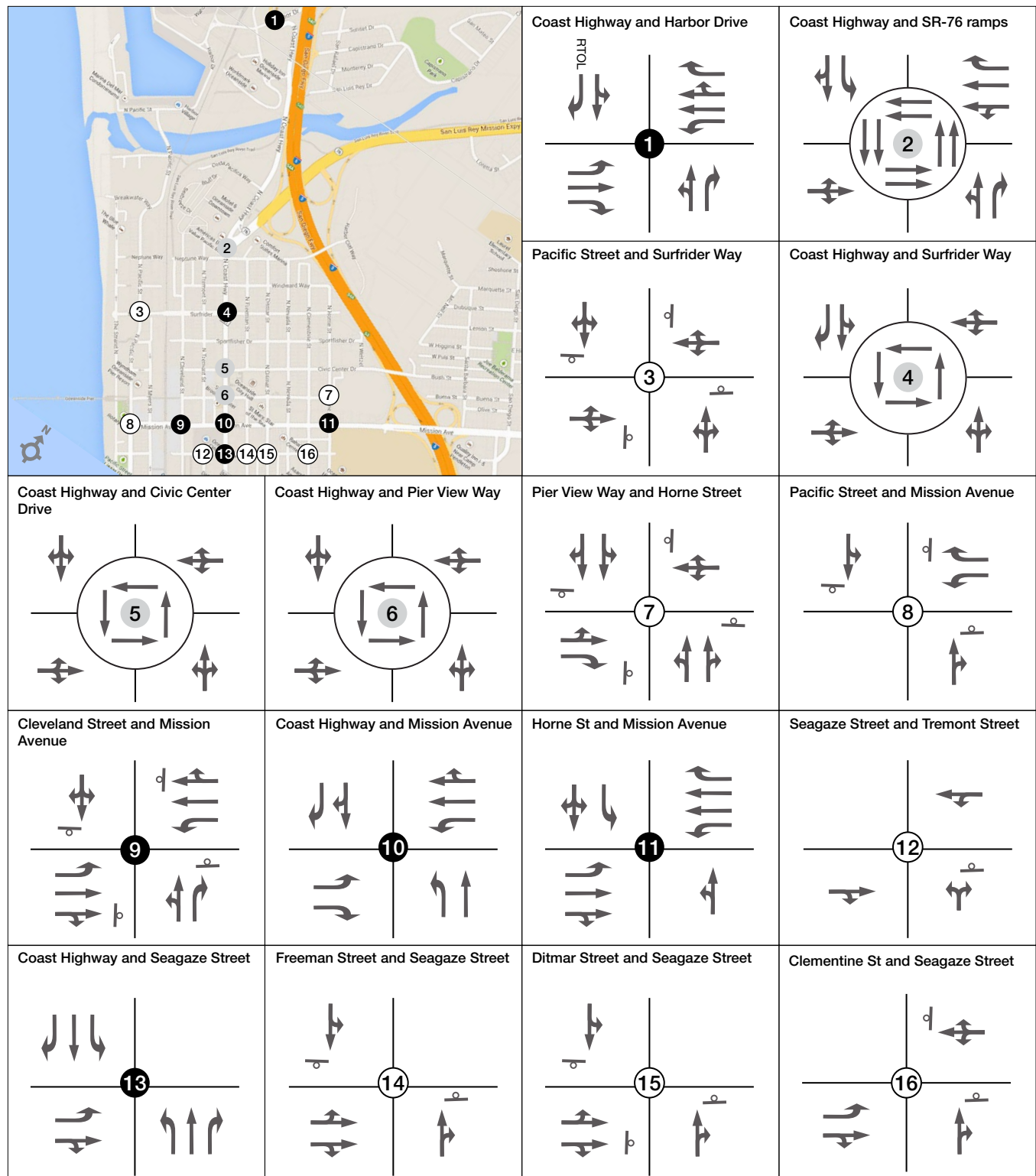
Figure 3-1d Existing (No Project) Roadway Configurations + Control



Legend

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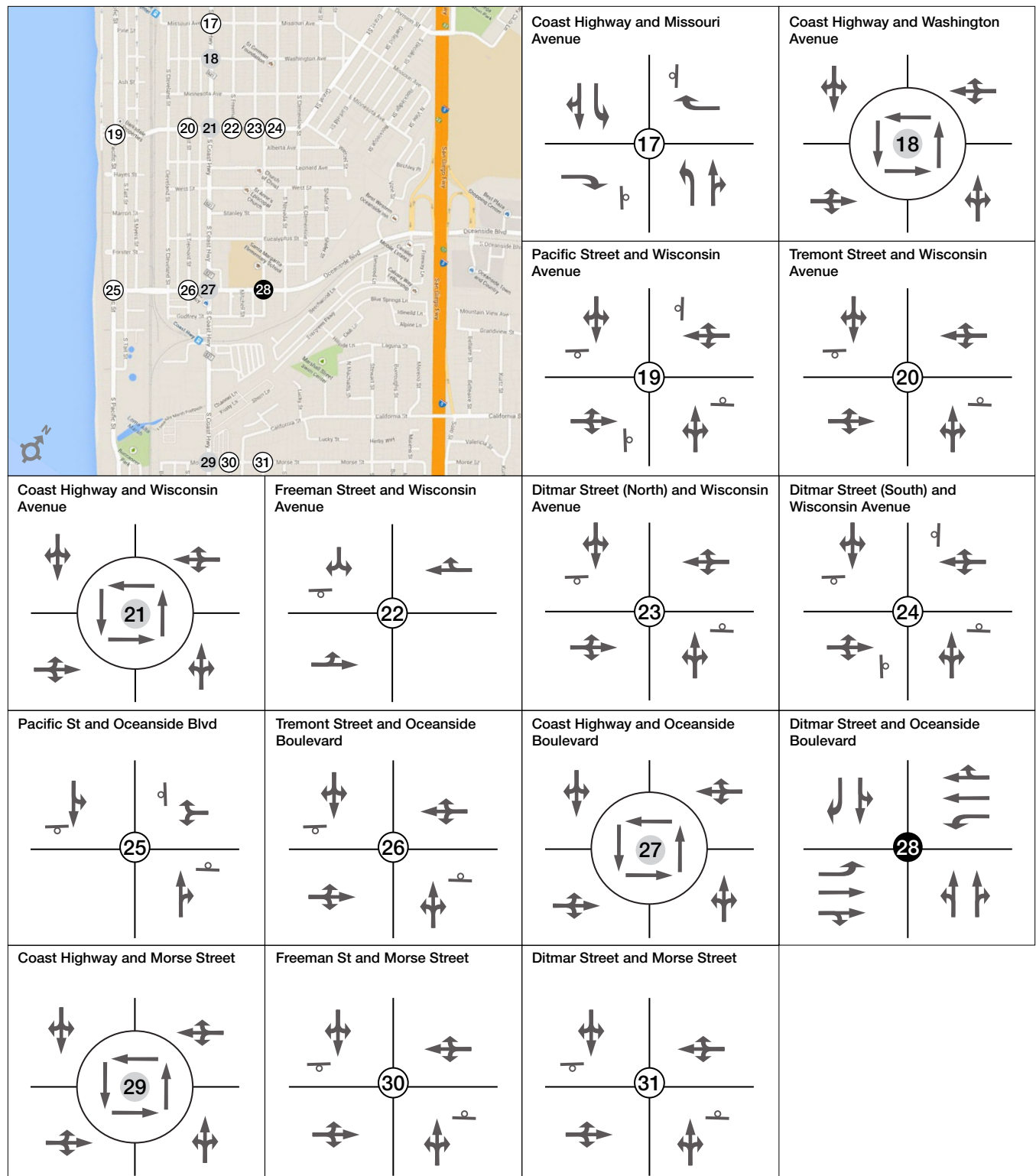
Figure 3-2a Project Roadway Configurations + Control



Legend

Signalized Intersections
 Unsignalized Intersections
 Roundabout Intersections
 Free Right Turn Lane
 Stop Sign Control

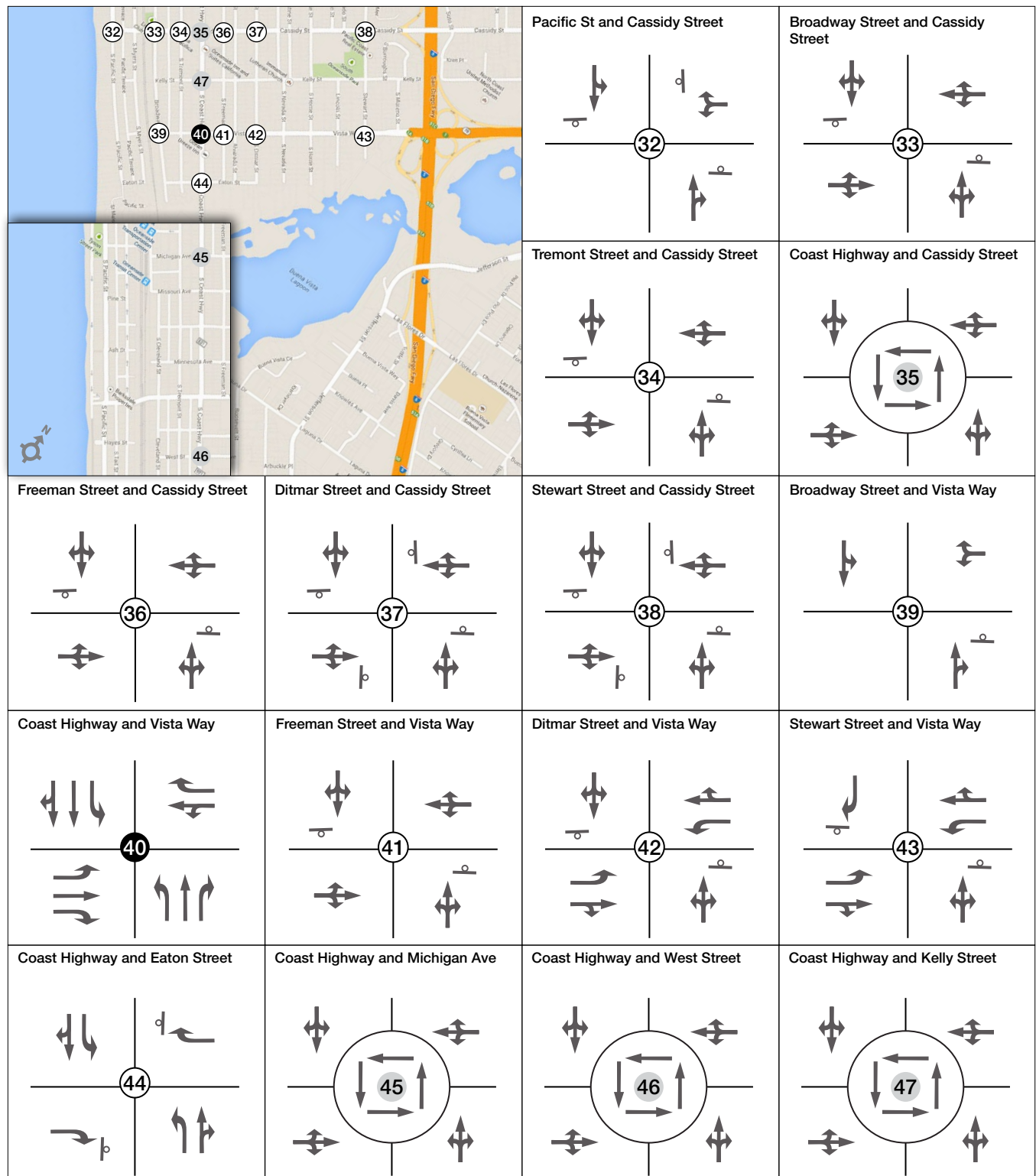
Figure 3-2b Project Roadway Configurations + Control



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ➡ Free Right Turn Lane ⏸ Stop Sign Control

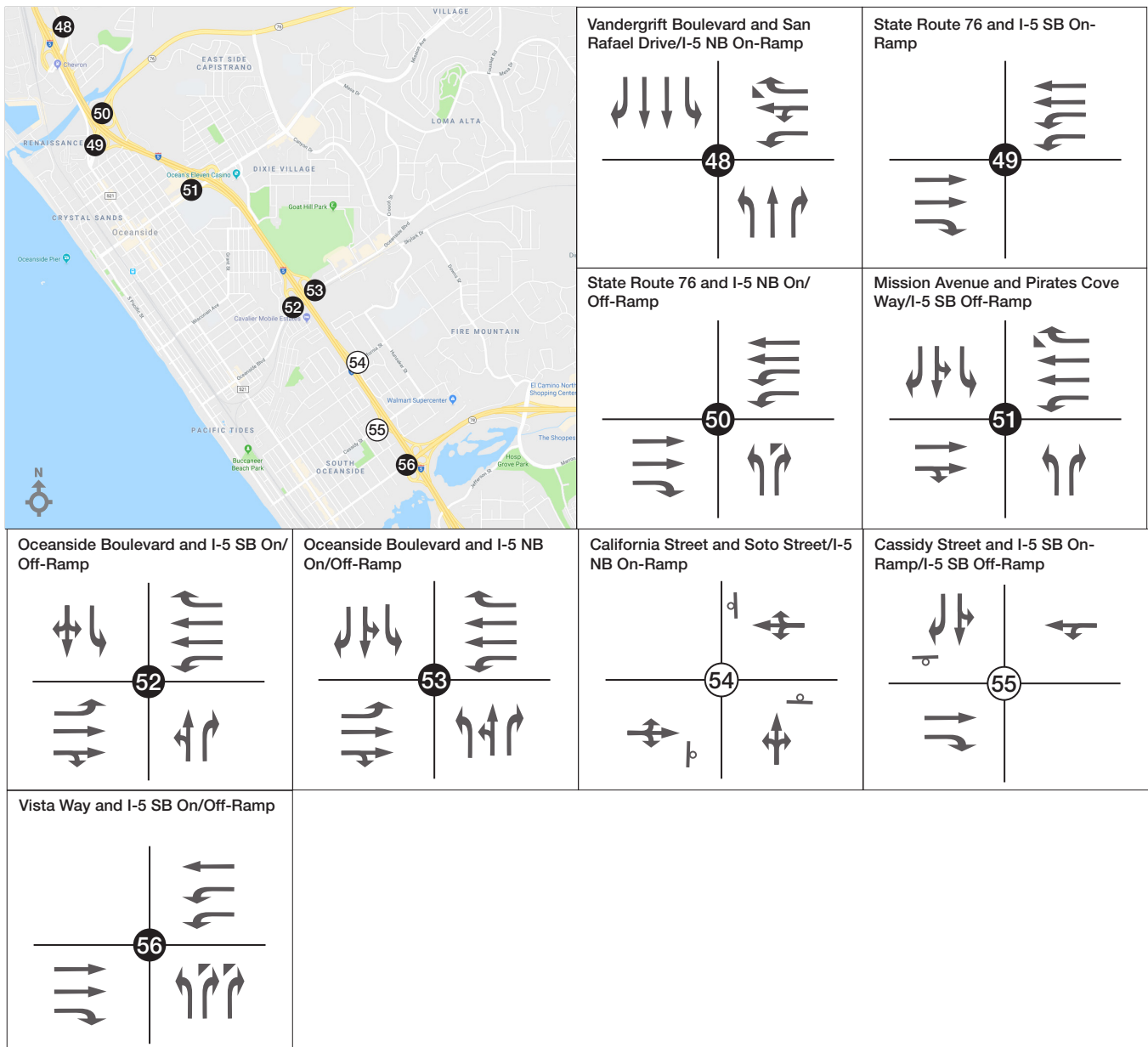
Figure 3-2c Project Roadway Configurations + Control



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ➡ Free Right Turn Lane ⏸ Stop Sign Control

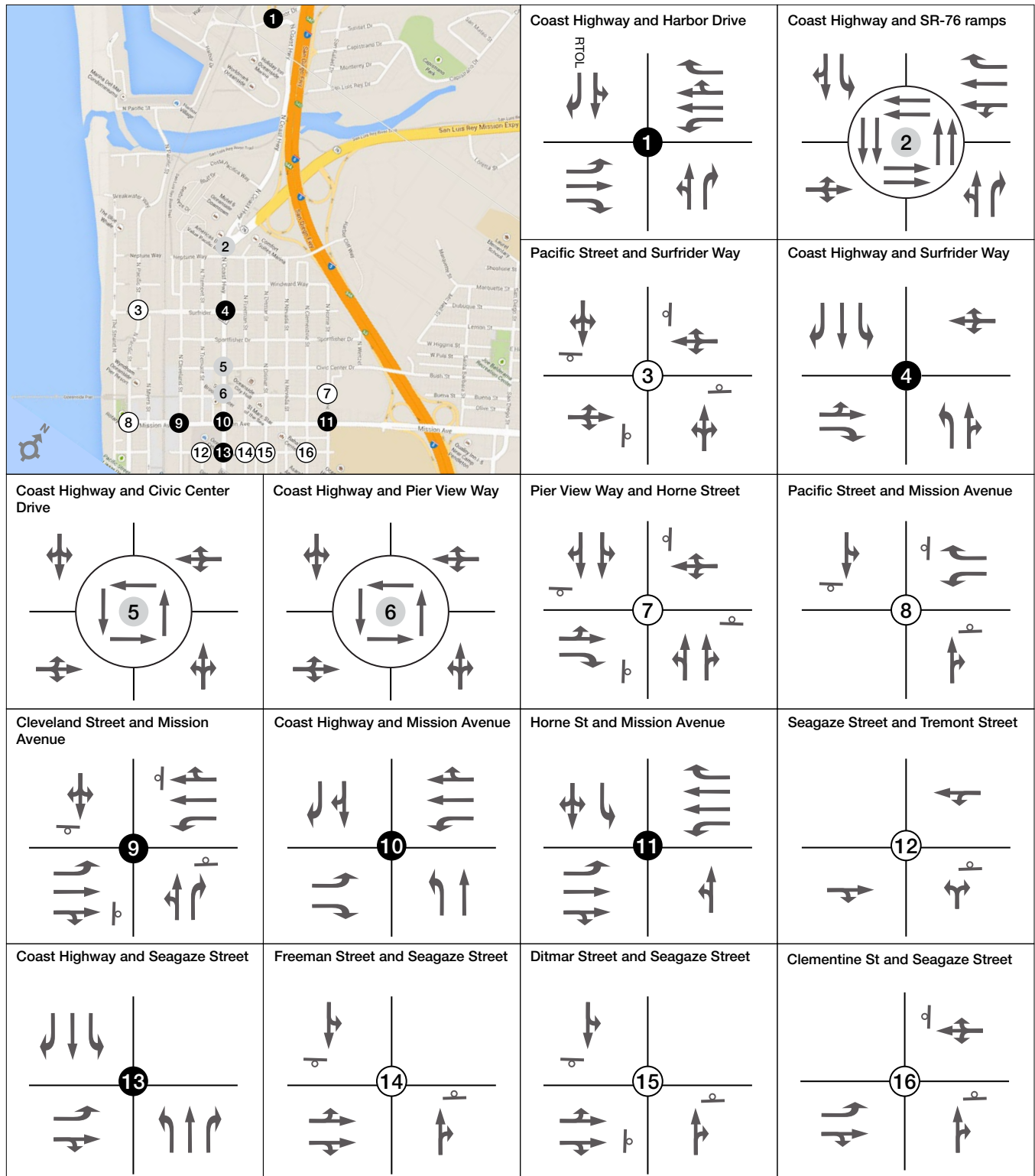
Figure 3-2d Project Roadway Configurations + Control



Legend

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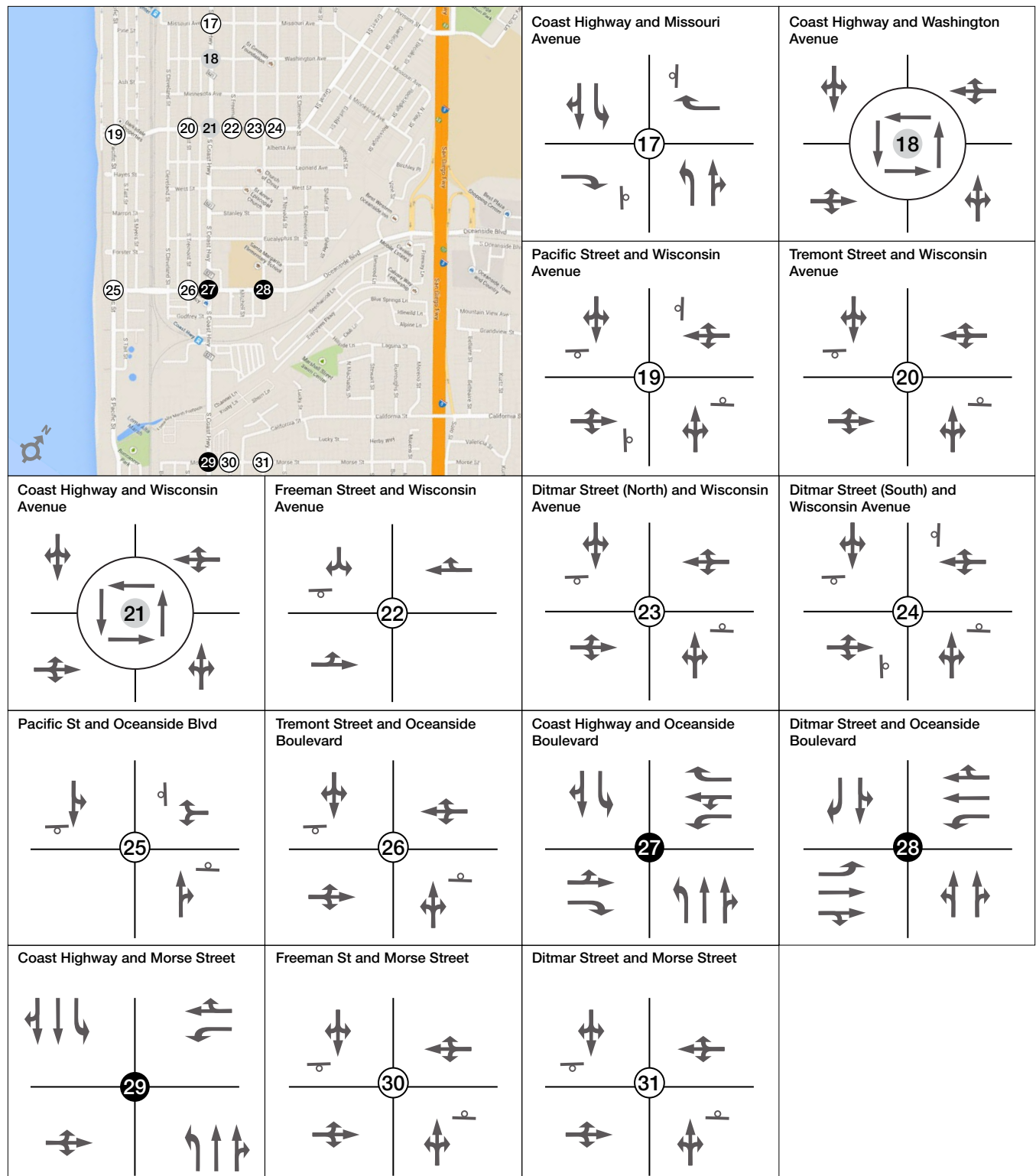
Figure 3-3a Project Alternative 1 Roadway Configurations + Control



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections → Free Right Turn Lane — Stop Sign Control

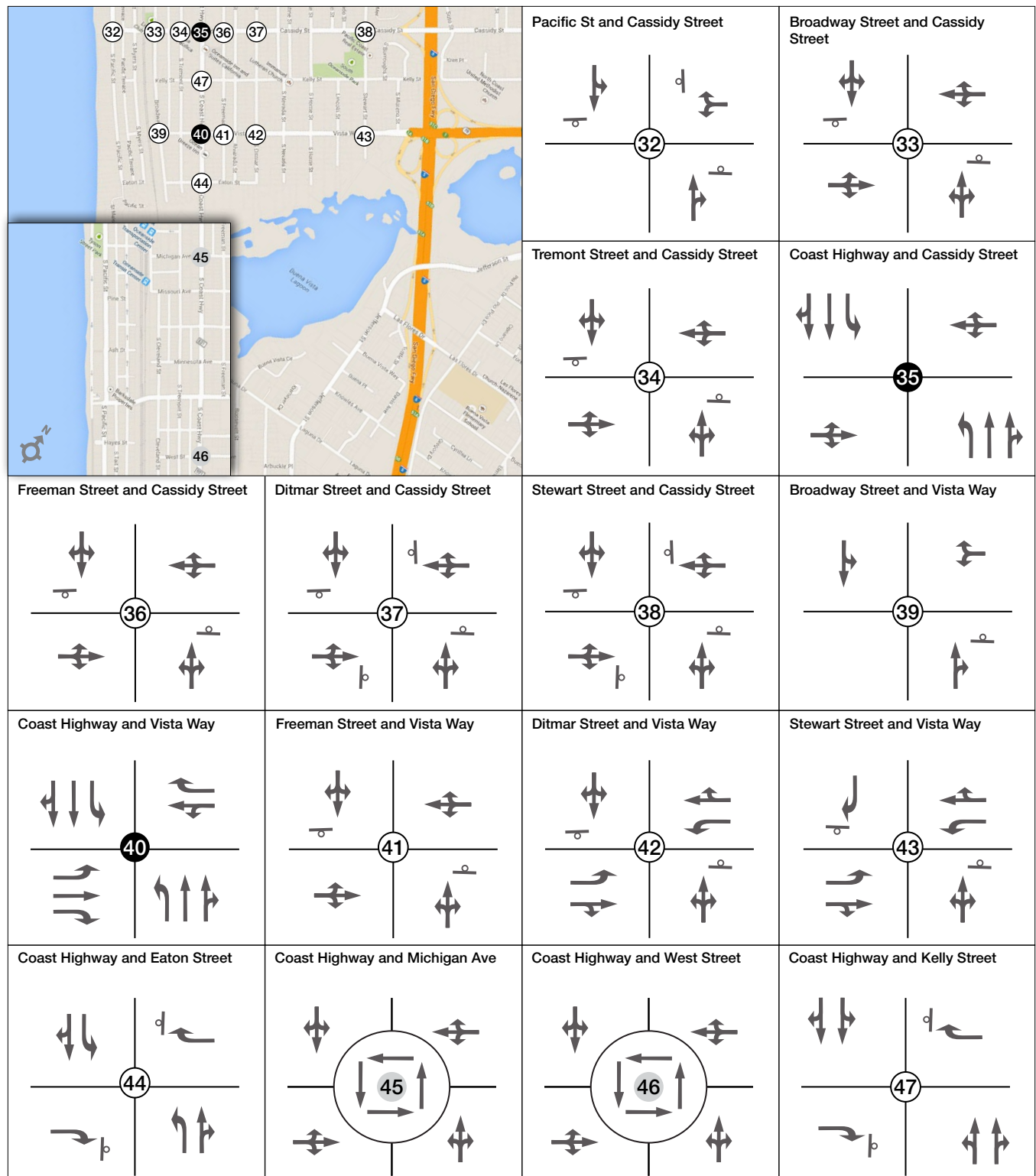
Figure 3-3b Project Alternative 1 Roadway Configurations + Control



Legend

Signalized Intersections
 Unsignalized Intersections
 Roundabout Intersections
 Free Right Turn Lane
 Stop Sign Control

Figure 3-3c Project Alternative 1 Roadway Configurations + Control



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections → Free Right Turn Lane — Stop Sign Control

Figure 3-3d Project Option with Pier View Way Closure Roadway Configurations + Control

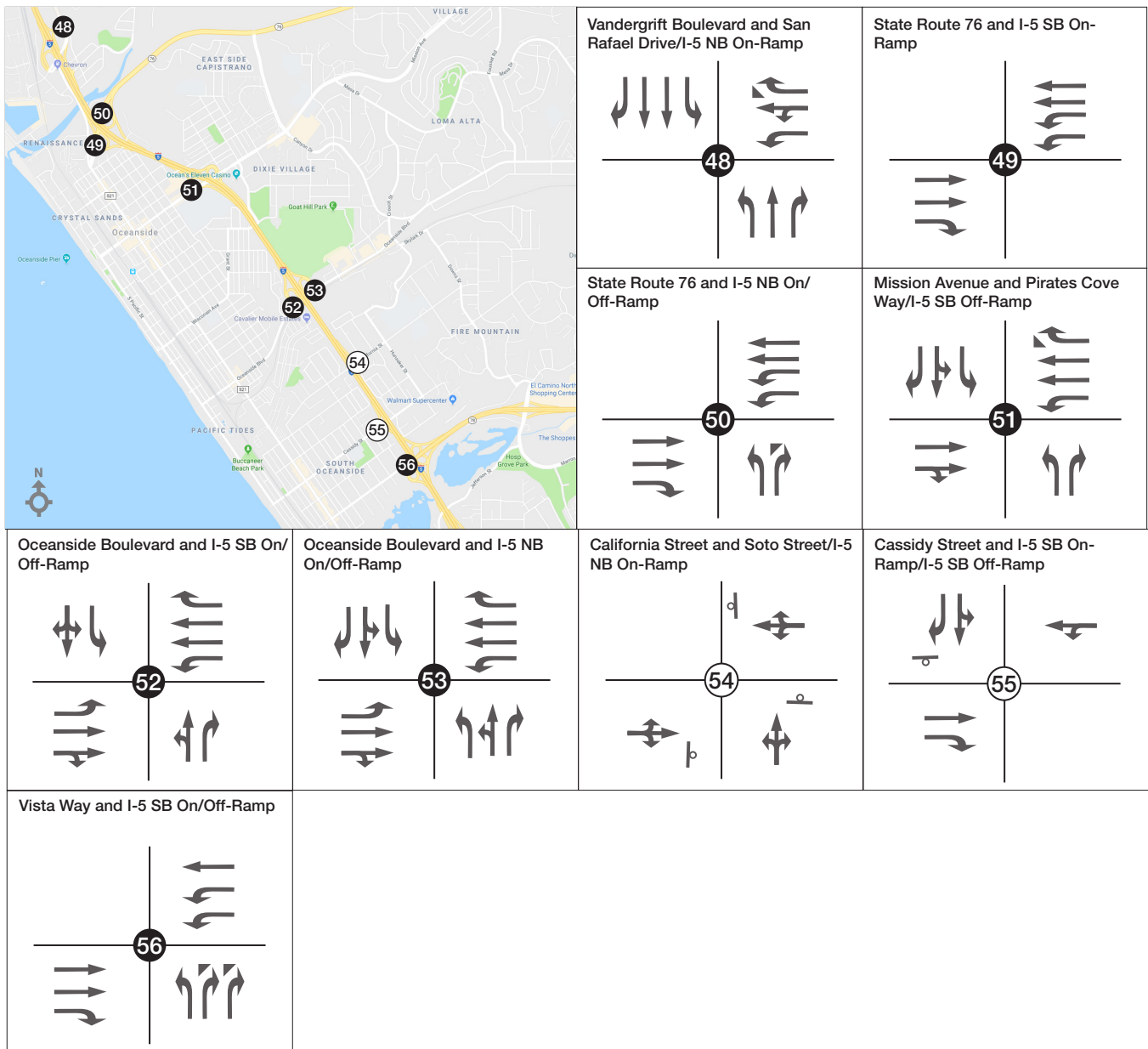
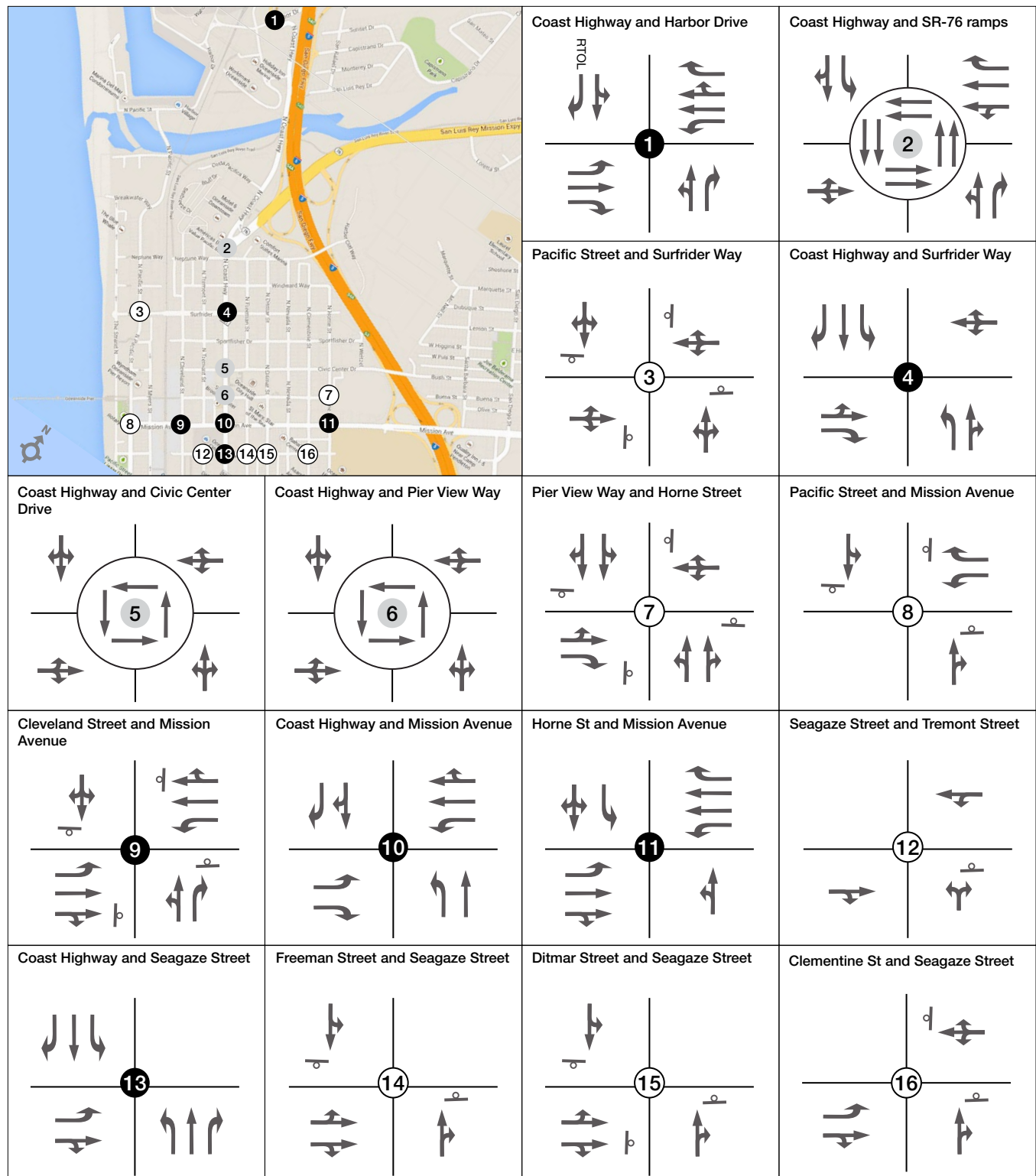


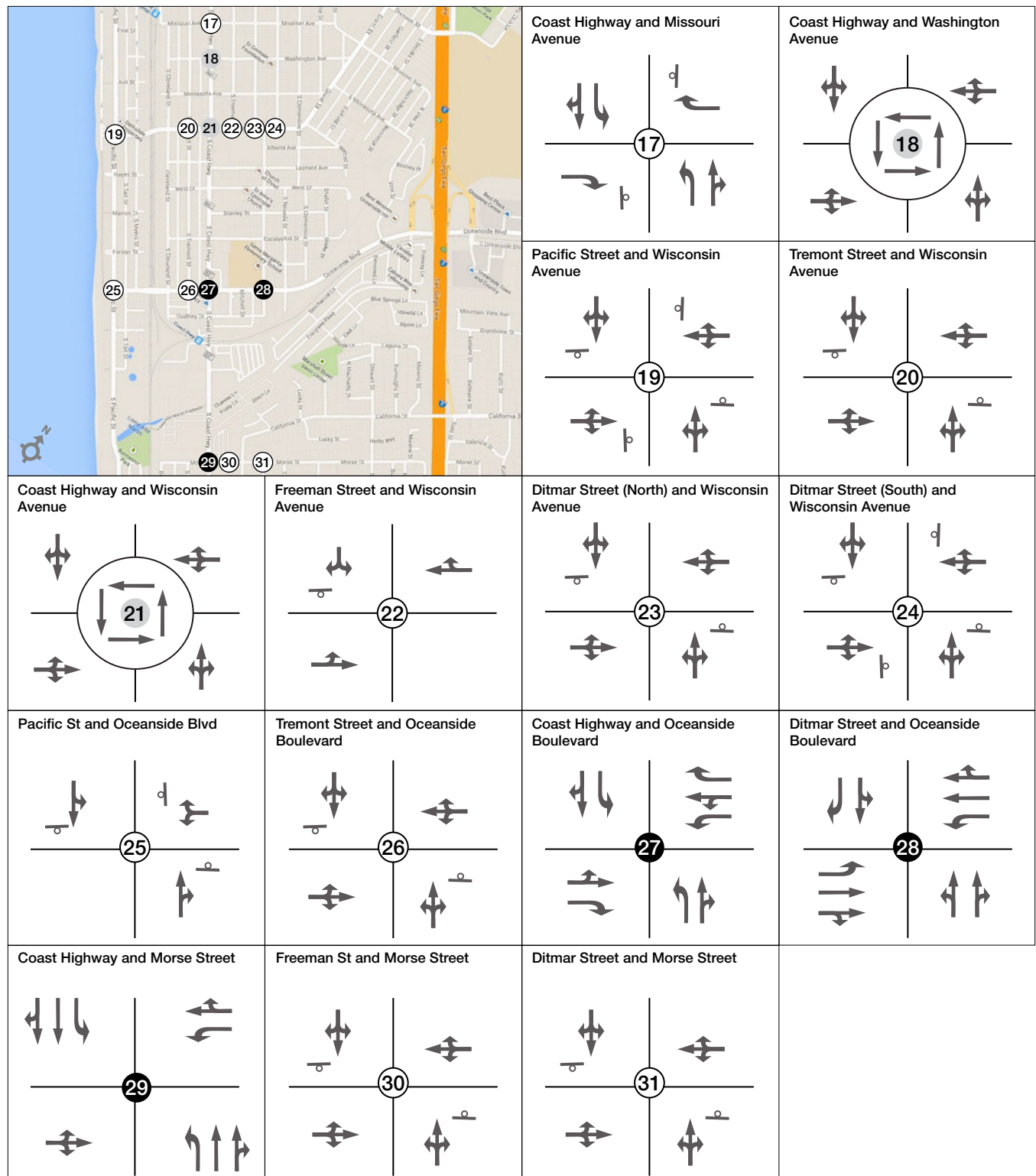
Figure 3-4a Project Alternative 2 Roadway Configurations + Control



Legend

Signalized Intersections
 Unsignalized Intersections
 Roundabout Intersections
 Free Right Turn Lane
 Stop Sign Control

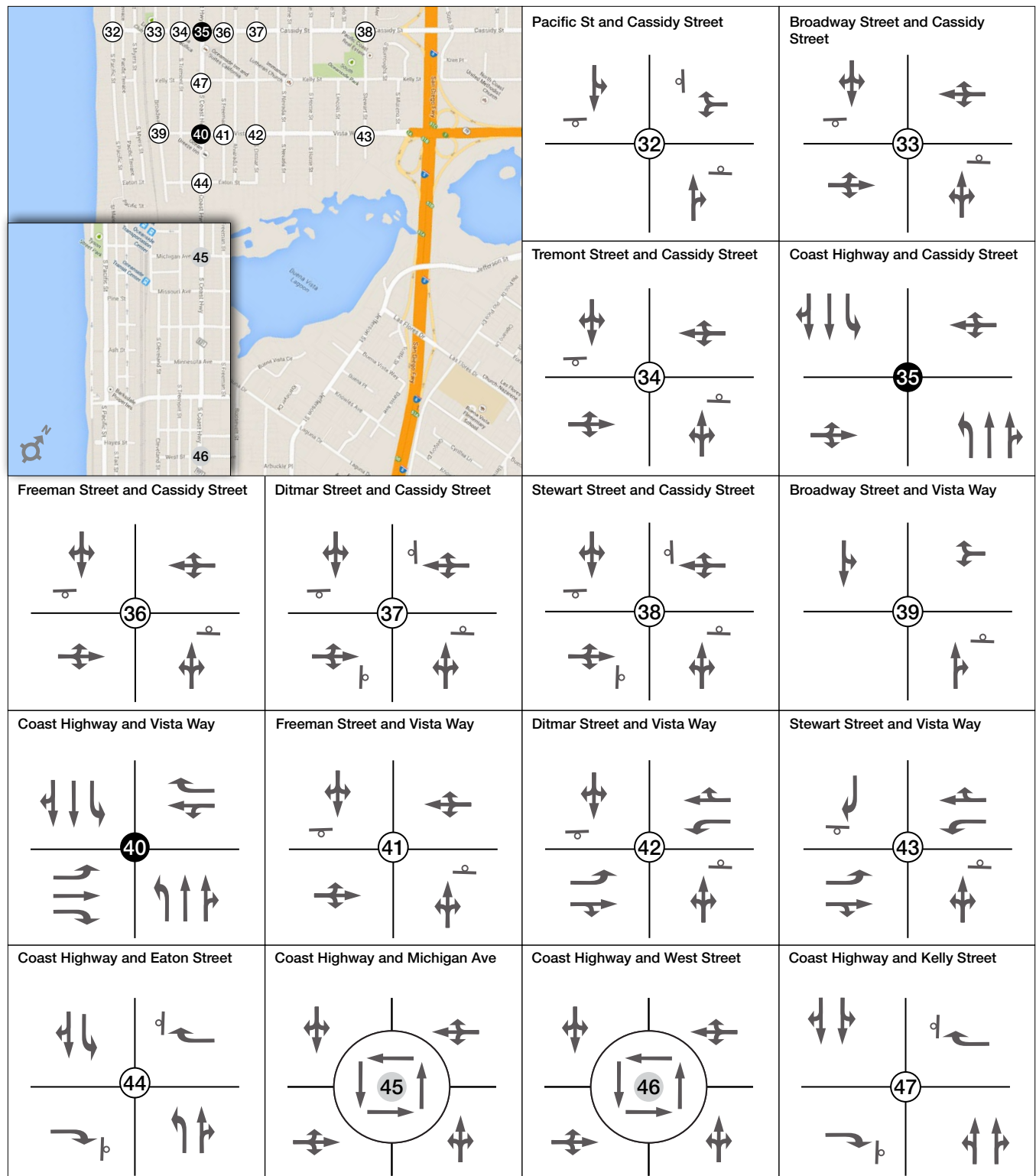
Figure 3-4b Project Alternative 2 Roadway Configurations + Control



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ➡ Free Right Turn Lane — Stop Sign Control

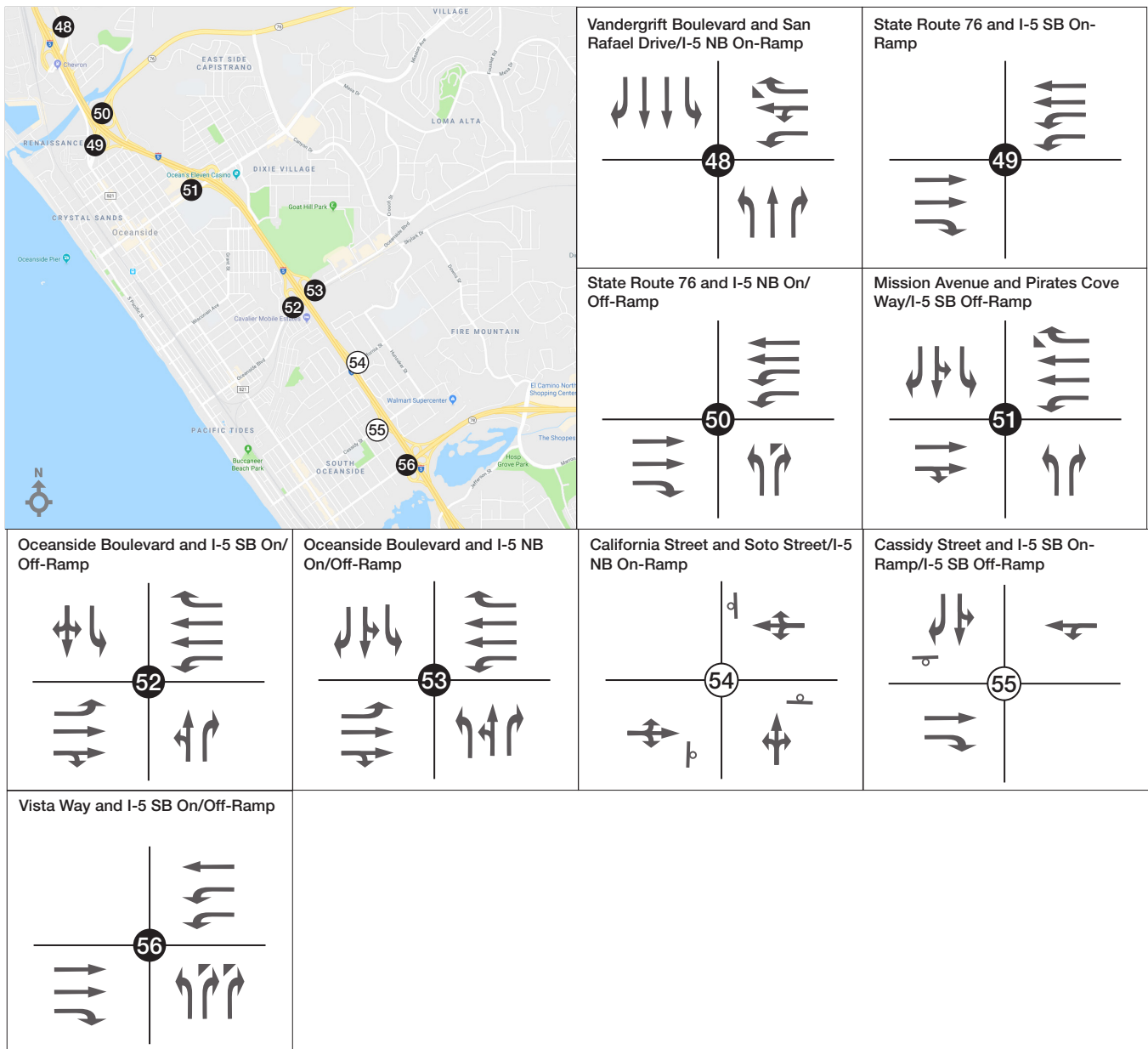
Figure 3-4c Project Alternative 2 Roadway Configurations + Control



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ➡ Free Right Turn Lane ⏸ Stop Sign Control

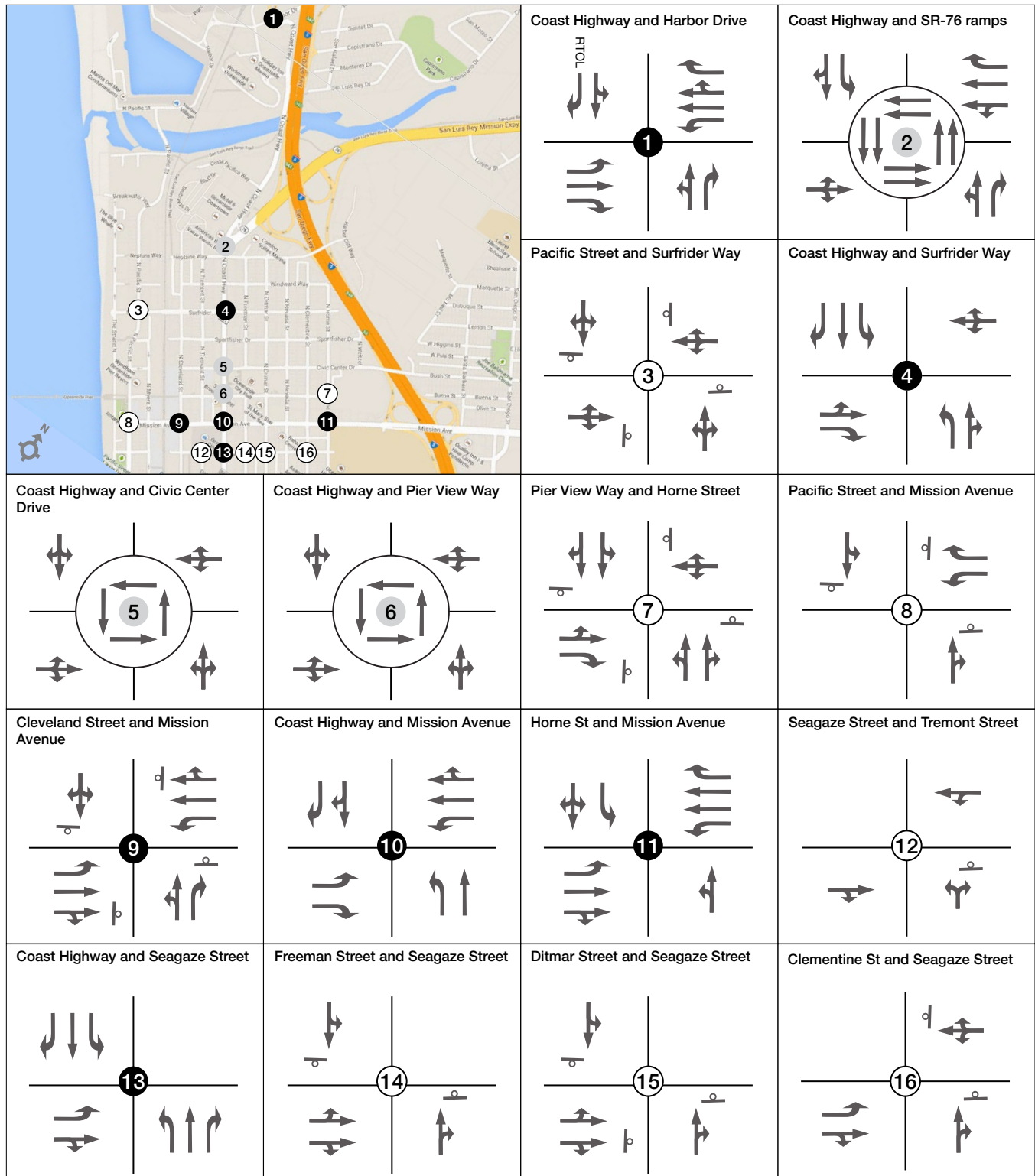
Figure 3-4d Project Alternative 1 Roadway Configurations + Control



Legend

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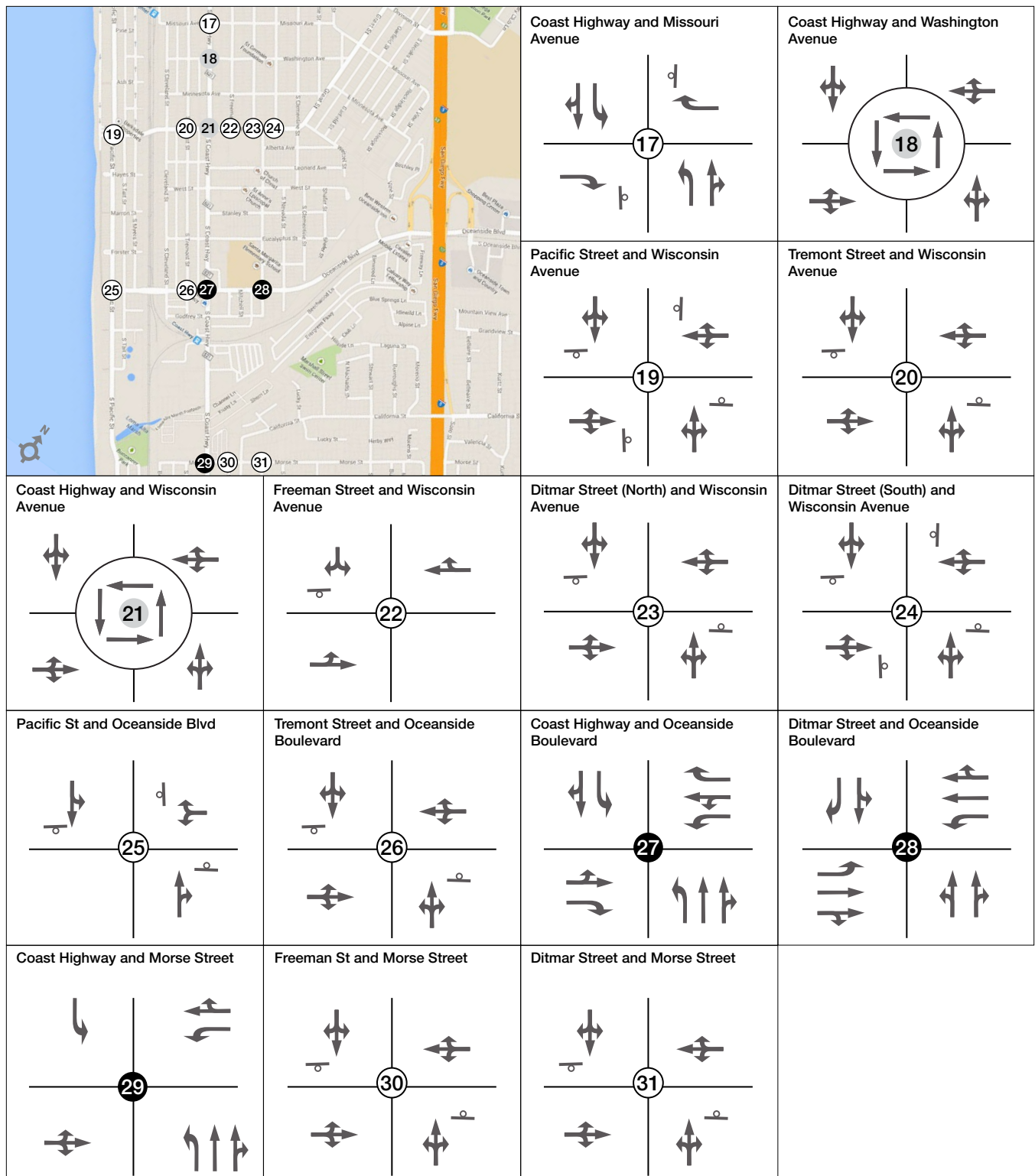
Figure 3-5a Project Alternative 3 Roadway Configurations + Control



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ➡ Free Right Turn Lane ⏸ Stop Sign Control

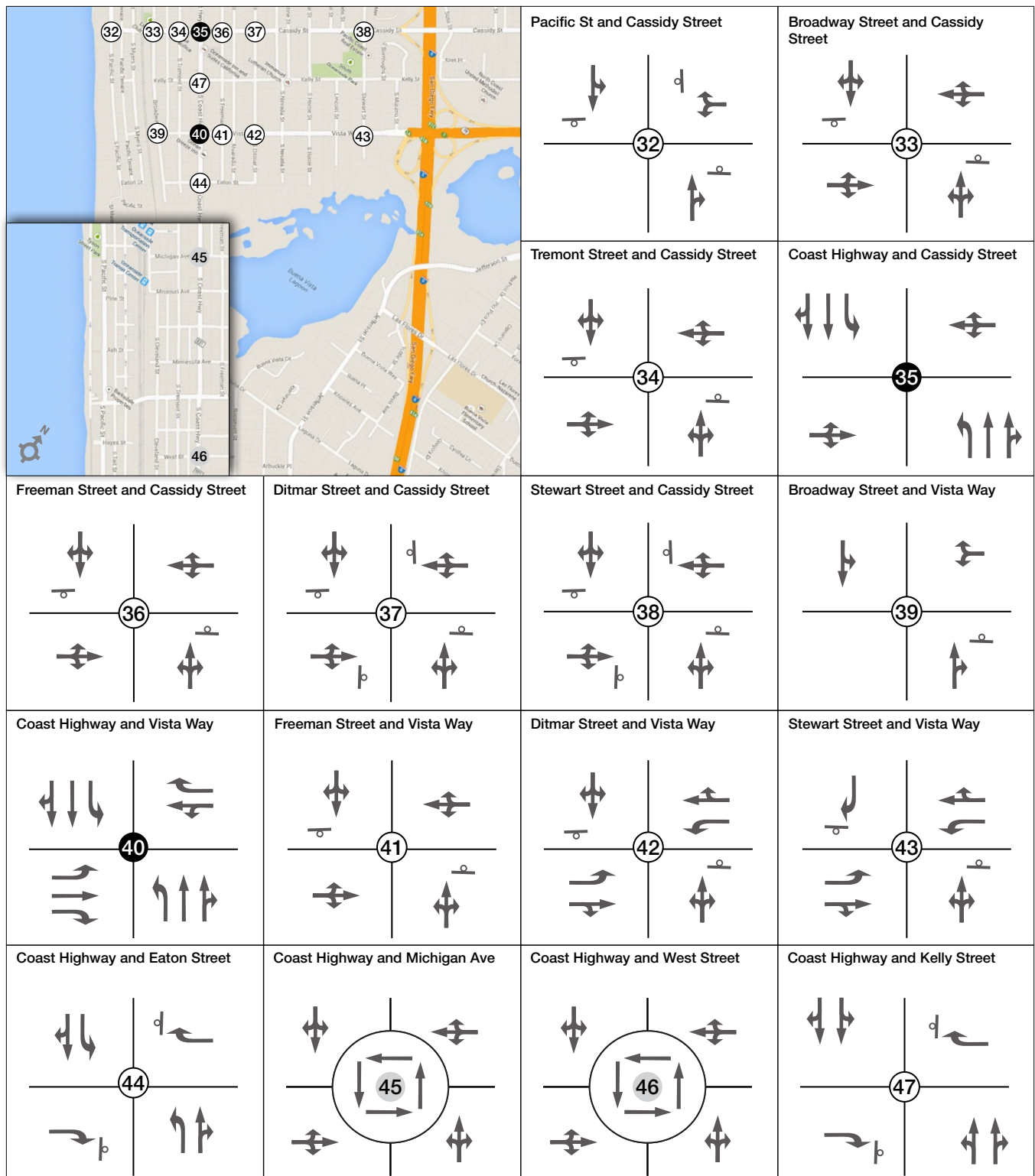
Figure 3-5b Project Alternative 3 Roadway Configurations + Control



Legend

Signalized Intersections
 Unsignalized Intersections
 Roundabout Intersections
 Free Right Turn Lane
 Stop Sign Control

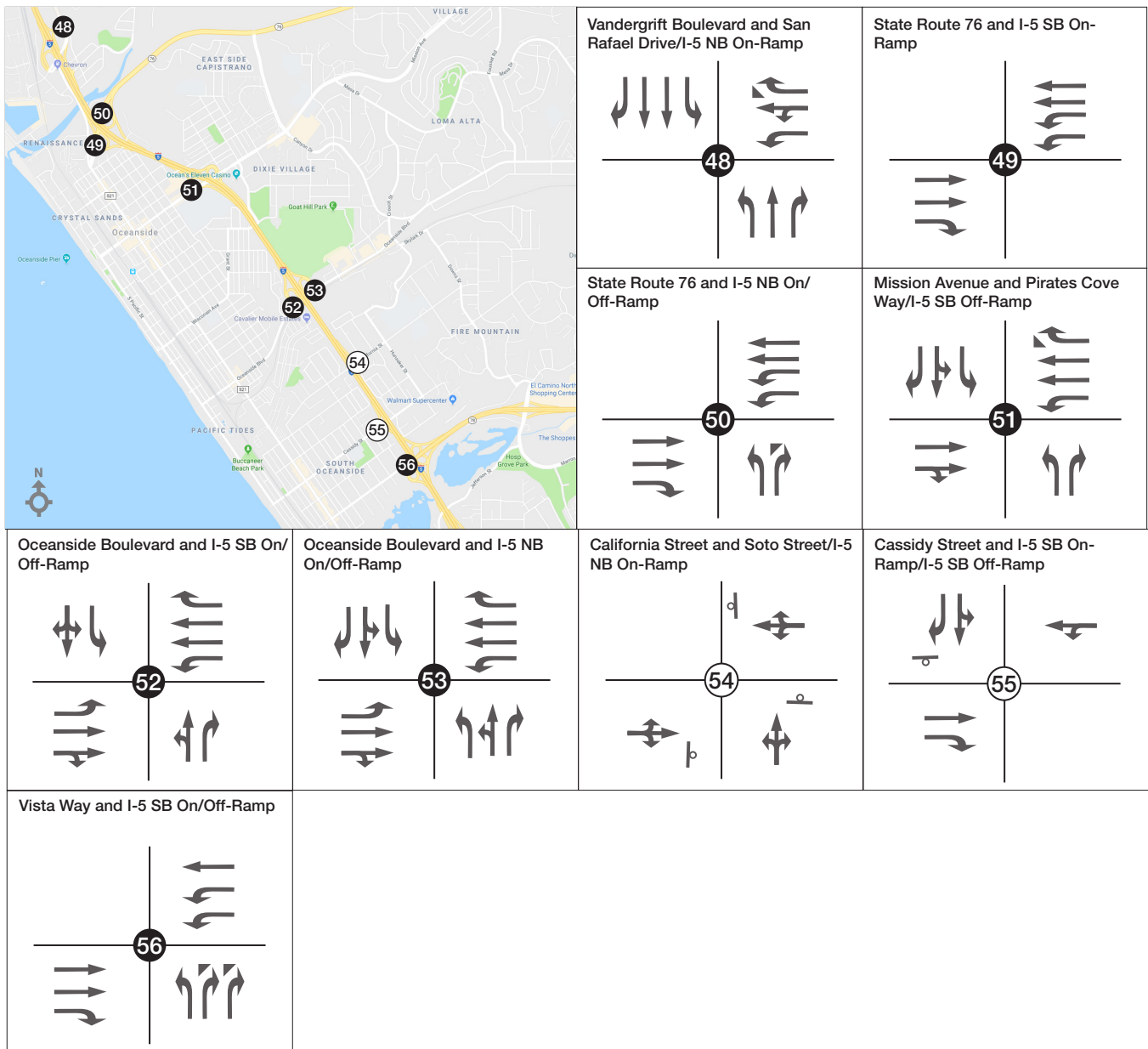
Figure 3-5c Project Alternative 3 Roadway Configurations + Control



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections → Free Right Turn Lane — Stop Sign Control

Figure 3-5d Project Alternative 2 Roadway Configurations + Control



Legend

● Signalized Intersections ○ Unsignalized Intersections ➡ Free Right Turn Lane ⏸ Stop Sign Control

4 Existing 2013 Conditions

This section provides a review of the existing roadway system in the study area, the traffic volumes for the study intersections and key road segments, and presents the level of service analyses for the existing (2013) conditions scenario.

As discussed in Section 2, the proposed project would transform Coast Highway into a complete street that accommodates all modes of travel in a safe and efficient manner. The key elements of the proposed project include a continuous Class II striped bicycle lane from Harbor Drive to the South City Limit, additional mid-block crosswalks, roundabouts in place of traffic signals, and other enhancements to landscaping and/or the roadway.

Existing peak hour intersection count data and 48-hour roadway segment volumes were collected at the selected intersections and roadway segments in the study area during the summer (August) of 2013. The 2013 traffic counts are not anticipated to be considerably different compared to 2016 conditions as traffic is typically the highest during the summer months and thus captures a conservative representation of 2013 traffic conditions. It is important to note the existing condition scenarios do not include the modified vision plan land uses; existing condition scenarios are based on actual volume counts. This approach was used as the project is not proposing new development, rather, it is in support of the vision plan goals. Future traffic conditions utilize the San Diego Association of Government (SANDAG) forecast model and are derived independently from existing traffic volumes. The detailed traffic count data can be found in Appendix C.

This section covers the following scenarios:

- Existing Baseline (No Project) Conditions – Year 2013 analysis without project including:
 - o Four-lane roadway throughout Coast Highway corridor
 - o General Plan land uses
- Existing Conditions with Project – Year 2013 analysis with project including:
 - o Two-lane roadway throughout Coast Highway corridor with roundabouts
 - o Modified Vision Plan land uses
- Existing Conditions with Project Alternative 1 – Year 2013 analysis with project including:
 - o Two-lane roadway with roundabouts from Harbor Blvd to Oceanside Blvd and four-lane roadway south of Oceanside Blvd
 - o Modified Vision Plan land uses
- Existing Conditions with Project Alternative 2 – Year 2013 analysis with project including:
 - o Two-lane roadway with roundabouts from Harbor Blvd to Morse St and four-lane roadway south of Morse St
 - o Modified Vision Plan land uses
- Existing Conditions with Project Alternative 3 – Year 2013 analysis with project including:
 - o Two-lane roadway with roundabouts from Harbor Blvd to Morse Street and four-lane roadway south of Morse Street
 - o Modified Vision Plan land uses north of Morse Street
 - o General Plan land uses south of Morse St

4.1 Existing Baseline (No Project)

4.1.1 Road Segment Volumes

Road segment volumes have been included in Appendix A for use in noise modeling purposes. Existing road segment volumes are extracted from 24-hour counts. The 24-hour count sheets are contained in Appendix C. In addition to a review of daily ADT volumes, peak hour roadway volumes are also provided for reference in Appendix A. Peak hour roadway volumes can provide a more appropriate depiction of traffic conditions compared with daily roadway capacity.

4.1.2 Intersection Level of Service

The intersection operations analysis for the existing condition without project was performed consistent with the methodology outlined in Section 3. Of the 56 intersections analyzed in the study area, all intersections, but one are operating at a LOS of D or better. Table 4-1 presents the results for the existing conditions traffic analysis without the proposed project. Figure 4-1 contains the traffic volumes used for the existing condition analysis. Appendix C contains the original count data.

Table 4-1: LOS Analysis – Existing Conditions without Project

	INTERSECTION	TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
			Delay (s)	LOS	Delay (s)	LOS
1	Coast Highway - I-5 Ramps / Harbor Drive	Signalized	28.0	C	51.3	D
2	Coast Highway - SR-76 Ramps	Signalized	13.7	B	37.1	D
3	Surfrider Way - Pacific Street	AWSC	8.5	A	11.2	B
4	Coast Highway - Surfrider Way	Signalized	10.4	B	14.4	B
5	Coast Highway - Civic Center Drive	Signalized	13.7	B	15.1	B
6	Coast Highway - Pier View Way	Signalized	16.8	B	16.6	B
7	Pier View Way - Horne Street	AWSC	8.7	A	11.9	B
8	Mission Avenue - Pacific Street	AWSC	7.9	A	10.1	B
9	Mission Avenue - Cleveland Street	AWSC	8.1	A	10.6	B
10	Coast Highway - Mission Avenue	Signalized	13.1	B	13.8	B
11	Mission Avenue - Horne Street	Signalized	7.4	A	18.9	B
12	Seagaze Street - Tremont Street	SSSC	3.3	A	11.5	B
13	Coast Highway - Seagaze Street	Signalized	14.7	B	23.9	C
14	Seagaze Street - Freeman Street	SSSC	10.3	A	15.6	C
15	Seagaze Street - Ditmar Street	AWSC	7.9	A	12.5	B
16	Seagaze Street - Clementine Street	SSSC	7.9	A	13.1	B
17	Coast Highway - Missouri Avenue	SSSC	12.0	B	23.9	C
18	Coast Highway - Washington Avenue	SSSC	11.3	B	22.0	C
19	Wisconsin Avenue - Pacific Street	AWSC	8.1	A	9.8	A
20	Wisconsin Avenue - Tremont Street	SSSC	10.6	B	14.0	B
21	Coast Highway - Wisconsin Avenue	Signalized	8.9	A	12.2	B
22	Wisconsin Avenue - Freeman Street	SSSC	9.1	A	9.7	A
23	Wisconsin Avenue - Ditmar Street (North)	SSSC	9.7	A	10.1	B
24	Wisconsin Avenue - Ditmar Street (South)	AWSC	7.5	A	7.9	A
25	Oceanside Boulevard - Pacific Street	AWSC	8.0	A	9.0	A
26	Oceanside Boulevard - Tremont Street	SSSC	10.9	B	14.7	B
27	Coast Highway - Oceanside Boulevard	Signalized	29.7	C	39.7	D

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	INTERSECTION	TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
			Delay (s)	LOS	Delay (s)	LOS
28	Oceanside Boulevard - Ditmar Street	Signalized	5.7	A	6.8	A
29	Coast Highway - Morse Street	Signalized	9.0	A	9.8	A
30	Morse Street - Freeman Street	SSSC	9.0	A	10.0	B
31	Morse Street - Ditmar Street	SSSC	8.8	A	9.2	A
32	Cassidy Street - Pacific Street	AWSC	7.7	A	9.3	A
33	Cassidy Street - Broadway Street	SSSC	10.3	B	14.5	B
34	Cassidy Street - Tremont Street	SSSC	9.9	A	12.4	B
35	Coast Highway - Cassidy Street	Signalized	9.1	A	14.0	B
36	Cassidy Street - Freeman Street	SSSC	10.2	B	12.7	B
37	Cassidy Street - Ditmar Street	AWSC	8.1	A	9.5	A
38	Cassidy Street - Stewart Street	AWSC	9.3	A	13.2	B
39	Vista Way - Broadway Street	SSSC	7.4	A	7.6	A
40	Coast Highway - Vista Way	Signalized	22.7	C	37.0	D
41	Vista Way - Freeman Street	SSSC	12.2	B	15.3	C
42	Vista Way - Ditmar Street	SSSC	13.0	B	18.7	C
43	Vista Way - Stewart Street	SSSC	12.3	B	17.4	C
44	Coast Highway - Eaton Street	SSSC	12.8	B	14.3	B
45	Coast Highway - Michigan Avenue	Signalized	7.3	A	9.0	A
46 ⁷	Coast Highway - West Street	SSSC	--	--	--	--
47 ⁸	Coast Highway - Kelly Street	SSSC	--	--	--	--
48	Harbor/Vandegrift Blvd - I-5 NB On-Ramp/San Rafael Drive	Signalized	17.6	B	22.7	C
49	SR-76 - I-5 SB On-Ramp	Signalized	8.9	A	7.0	A
50	SR-76 - I-5 NB On/Off-Ramp	Signalized	22.4	C	25.9	C
51	Mission - I-5 SB Off-Ramp	Signalized	14.7	B	20.7	C
52	Oceanside - I-5 SB On/Off-Ramp	Signalized	39.3	D	65.3	E
53	Oceanside - I-5 NB On/Off-Ramp	Signalized	38.3	D	52.4	D
54	California - I-5 NB On-Ramp	AWSC	9.2	A	8.5	A
55	Cassidy - I-5 SB On/Off-Ramp	SSSC	8.9	A	8.7	A
56	Vista Way - I-5 SB On/Off-Ramp	Signalized	11.0	B	11.2	B

Notes:

A. Delay is expressed as an average seconds of delay per vehicle

B. LOS – Level of Service

C. AWSC – All-way stop control intersection

D. SSSC – Side-street stop control intersection

E. OWSC – One-way stop control intersection

F. The minimum acceptable LOS is "D" for intersections 1-47

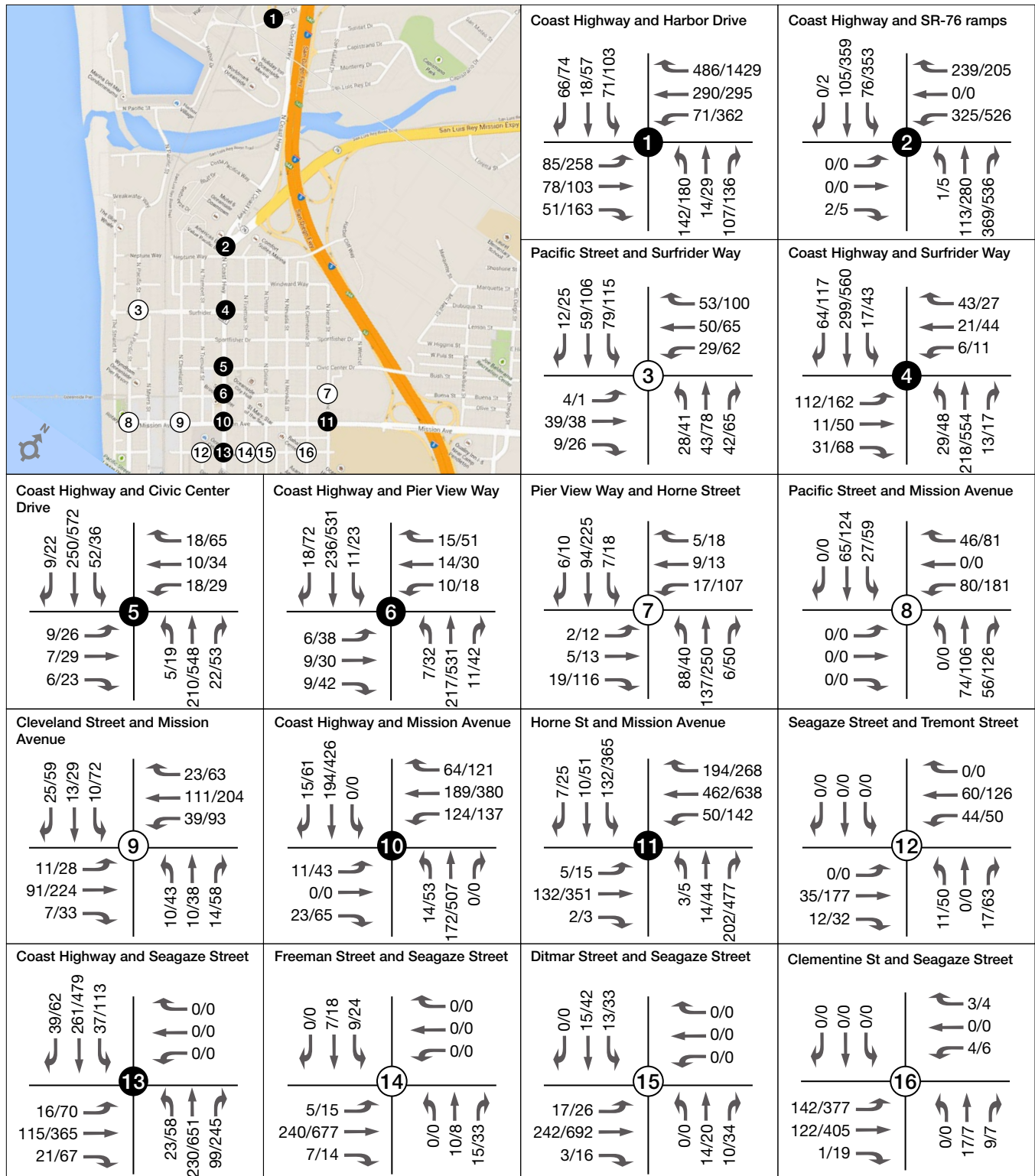
G. The minimum acceptable LOS is "D"; a change from C or D to a lower LOS will cause an impact for intersections 48-56

H. Existing turning movement volumes not available for Int 46 and Int 47

⁷ Not part of the original 2013 counts. In order to provide a more consistent and complete analysis, intersections 46 was added to the study in 2016. Therefore, existing turning movement counts are not available for the study intersection.

⁸ Not part of the original 2013 counts. In order to provide a more consistent and complete analysis, intersections 47 was added to the study in 2016. Therefore, existing turning movement counts are not available for the study intersection.

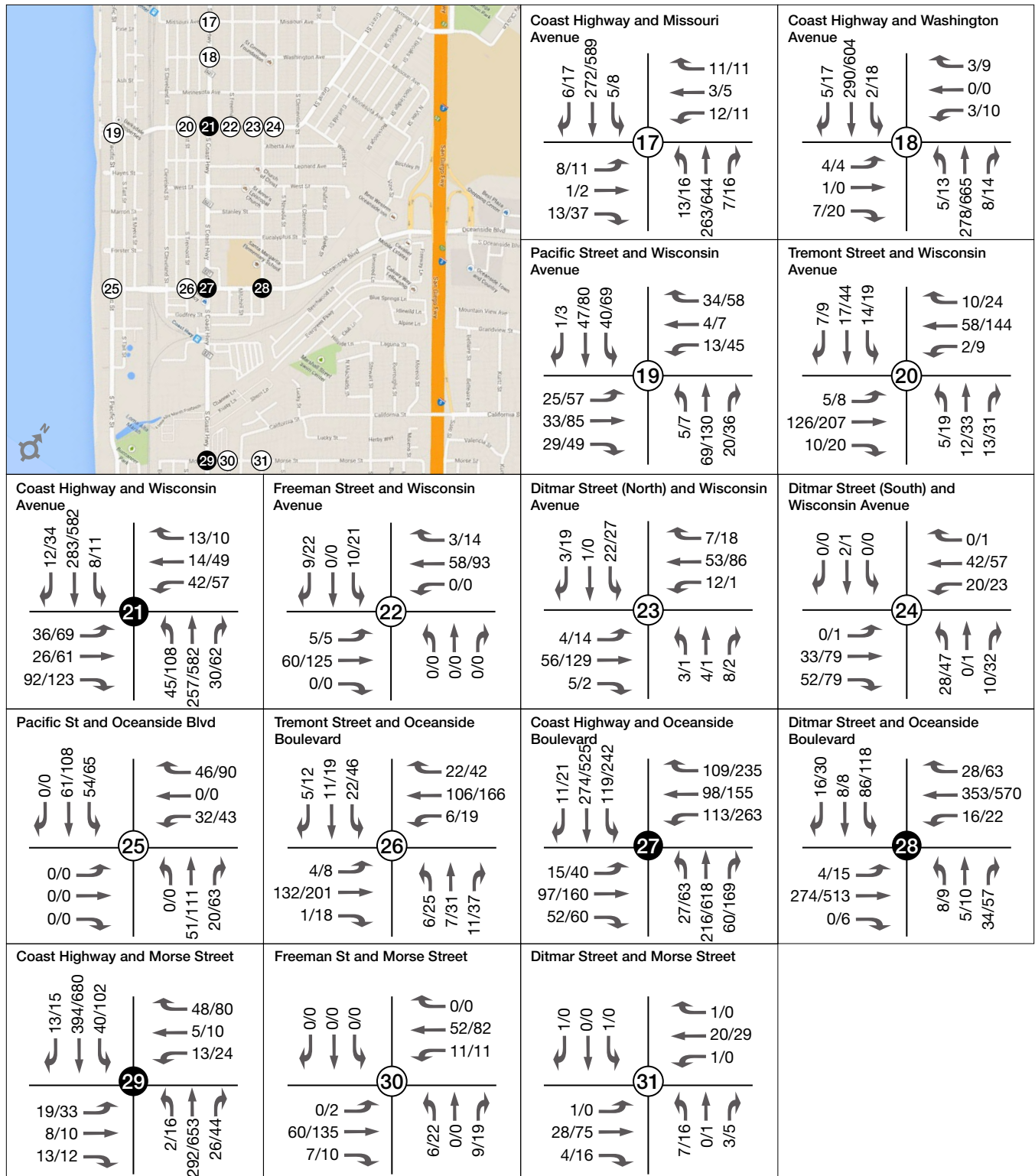
Figure 4-1a Existing (No Project) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ###/### AM/PM Turning Movement Volume

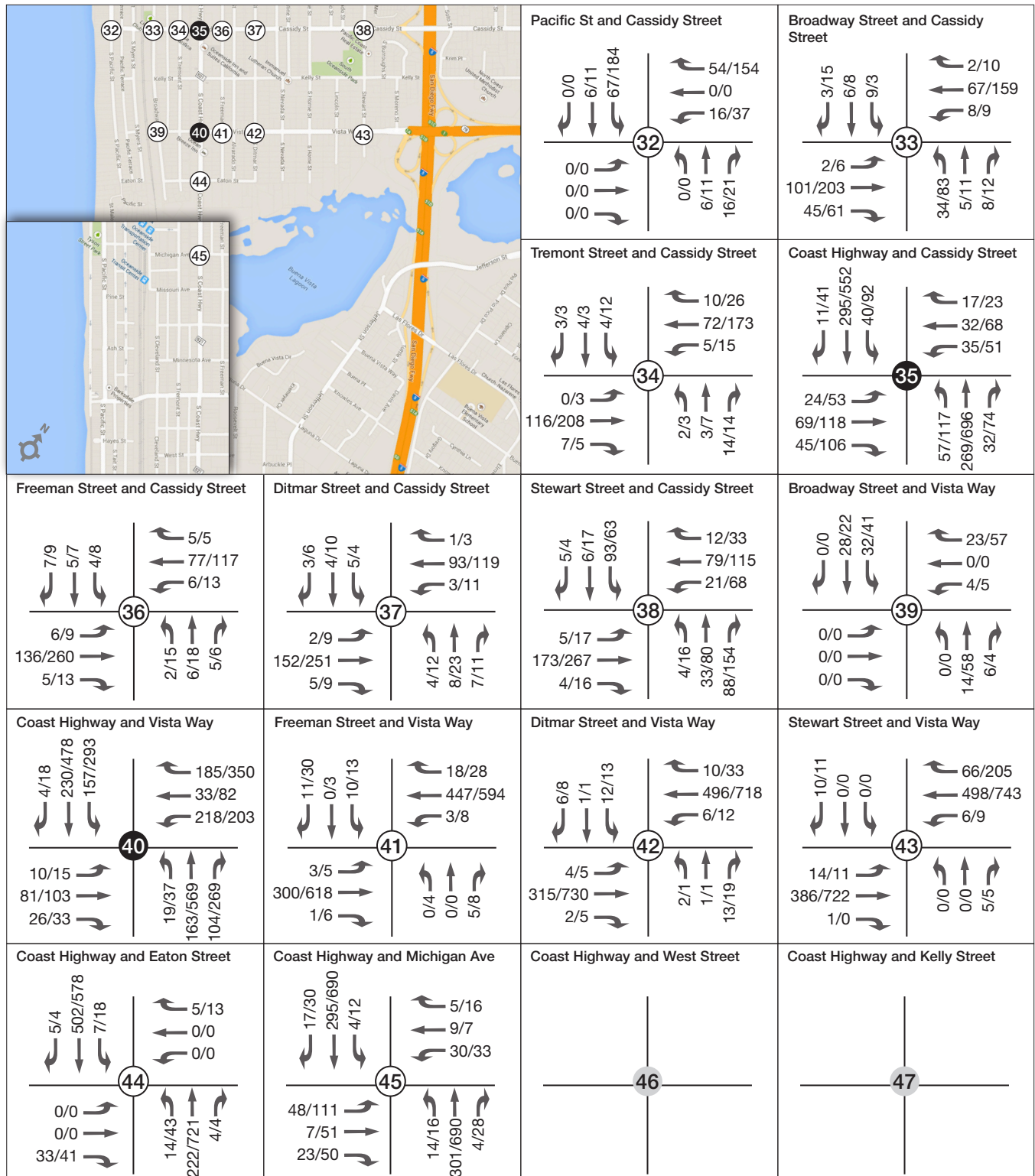
Figure 4-1b Existing (No Project) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ###/### AM/PM Turning Movement Volume

Figure 4-1c Existing (No Project) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ###/### AM/PM Turning Movement Volume

Note: Existing turning movement volumes not available for Intersections 46 and 47

Oceanside Boulevard and I-5 SB On/Off-Ramp

80/103 5/19 197/417	506/426 517/857 22/69
325/252 393/584 13/23	24/21 29/7 48/37

Oceanside Boulevard and I-5 NB On/Off-Ramp

223/449 155/136 316/612	257/259 748/735 43/45
86/70 378/834 143/139	127/177 74/56 41/72

California Street and Soto Street/I-5 NB On-Ramp

0/0 0/0 0/0	165/39 70/93 62/27
43/40 93/85 13/12	3/7 84/86 22/32

Cassidy Street and I-5 SB On-Ramp/I-5 SB Off-Ramp

133/110 0/0 40/65	0/0 83/49 163/102
0/0 207/273 267/214	0/0 0/0 0/0

Vista Way and I-5 SB On/Off-Ramp

0/0 0/0 0/0	0/0 698/927 1739/1598
0/0 294/537 119/81	10/33 0/0 1652/2440

 Signalized Intersections
 Unsignalized Intersections
 ###/### AM/PM Turning Movement Volume

4.2 Existing Conditions with Project (Two-Lane Coast Highway)

This section examines traffic conditions with the Coast Highway Corridor Project which proposes 2 lanes throughout the corridor with 12 new roundabouts as described in section 3.6.2. The analysis was conducted for the existing conditions.

4.2.1 Road Segment Volumes

Road segment volumes have been included in Appendix A for use in noise modeling purposes. In addition to a review of daily ADT volumes, peak hour roadway volumes are also provided for reference in Appendix A. Peak hour roadway volumes can provide a more appropriate depiction of traffic conditions compared with daily roadway capacity.

4.2.2 Intersection Level of Service

The intersection operations analysis for the existing condition with project was performed consistent with the methodology outlined in Section 3. Table 4-2 presents the results for the existing conditions traffic analysis with project. A comparison between the existing condition without and with project is also provided. Figure 4-2 contains the traffic volumes used for the existing conditions with project analysis.

Table 4-2: LOS Analysis – Existing Conditions with Project

INTERSECTION		EXISTING WITHOUT PROJECT				EXISTING WITH PROJECT				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
1	Coast Highway - I-5 Ramps / Harbor Drive	Signalized	AM	28.0	C	Signalized	AM	31.1	C	No
			PM	51.3	D		PM	51.3	D	No
2	Coast Highway - SR-76 Ramps	Signalized	AM	13.7	B	RBT	AM	3.1	A	No
			PM	37.1	D		PM	8.6	A	No
3	Surfrider Way - Pacific Street	AWSC	AM	8.5	A	AWSC	AM	8.5	A	No
			PM	11.2	B		PM	10.5	B	No
4	Coast Highway - Surfrider Way	Signalized	AM	10.4	B	RBT	AM	6.6	A	No
			PM	14.4	B		PM	17.0	C	No
5	Coast Highway - Civic Center Drive	Signalized	AM	13.7	B	RBT	AM	6.1	A	No
			PM	15.1	B		PM	13.3	B	No
6	Coast Highway - Pier View Way	Signalized	AM	16.8	B	RBT	AM	5.6	A	No
			PM	16.6	B		PM	12.9	B	No
7	Pier View Way - Horne Street	AWSC	AM	8.7	A	AWSC	AM	8.7	A	No
			PM	11.9	B		PM	11.9	B	No
8	Mission Avenue - Pacific Street	AWSC	AM	7.9	A	AWSC	AM	7.9	A	No
			PM	10.1	B		PM	10.0	A	No
9	Mission Avenue - Cleveland Street	AWSC	AM	8.1	A	AWSC	AM	8.1	A	No
			PM	10.6	B		PM	10.6	B	No
10	Coast Highway - Mission Avenue	Signalized	AM	13.1	B	Signalized	AM	8.0	A	No
			PM	13.8	B		PM	12.2	B	No
11	Mission Avenue - Horne Street	Signalized	AM	7.4	A	Signalized	AM	6.7	A	No
			PM	18.9	B		PM	17.1	B	No
12	Seagaze Street - Tremont Street	SSSC	AM	3.3	A	SSSC	AM	9.1	A	No
			PM	11.5	B		PM	11.5	B	No

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INTERSECTION		EXISTING WITHOUT PROJECT				EXISTING WITH PROJECT				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
13	Coast Highway - Seagaze Street	Signalized	AM	14.7	B	Signalized	AM	16.1	B	No
			PM	23.9	C		PM	27.3	C	No
14	Seagaze Street - Freeman Street	SSSC	AM	10.3	A	SSSC	AM	10.3	B	No
			PM	15.6	C		PM	15.6	C	No
15	Seagaze Street - Ditmar Street	AWSC	AM	7.9	A	AWSC	AM	7.6	A	No
			PM	12.5	B		PM	12.0	B	No
16	Seagaze Street - Clementine Street	SSSC	AM	7.9	A	SSSC	AM	7.9	A	No
			PM	13.1	B		PM	8.3	A	No
17	Coast Highway - Missouri Avenue	SSSC	AM	12.0	B	SSSC	AM	10.0	A	No
			PM	23.9	C		PM	13.5	B	No
18	Coast Highway - Washington Avenue	SSSC	AM	11.3	B	RBT	AM	6.4	A	No
			PM	22.0	C		PM	13.2	B	No
19	Wisconsin Avenue - Pacific Street	AWSC	AM	8.1	A	AWSC	AM	7.8	A	No
			PM	9.8	A		PM	9.5	A	No
20	Wisconsin Avenue - Tremont Street	SSSC	AM	10.6	B	SSSC	AM	10.6	B	No
			PM	14.0	B		PM	14.0	B	No
21	Coast Highway - Wisconsin Avenue	Signalized	AM	8.9	A	RBT	AM	7.0	A	No
			PM	12.2	B		PM	22.0	C	No
22	Wisconsin Avenue - Freeman Street	SSSC	AM	9.1	A	SSSC	AM	9.1	A	No
			PM	9.7	A		PM	9.7	A	No
23	Wisconsin Avenue - Ditmar Street (North)	SSSC	AM	9.7	A	SSSC	AM	9.7	A	No
			PM	10.1	B		PM	10.1	B	No
24	Wisconsin Avenue - Ditmar Street (South)	AWSC	AM	7.5	A	AWSC	AM	7.3	A	No
			PM	7.9	A		PM	7.9	A	No
25	Oceanside Boulevard - Pacific Street	AWSC	AM	8.0	A	AWSC	AM	7.7	A	No
			PM	9.0	A		PM	8.7	A	No
26	Oceanside Boulevard - Tremont Street	SSSC	AM	10.9	B	SSSC	AM	10.9	B	No
			PM	14.7	B		PM	14.6	B	No
27	Coast Highway - Oceanside Boulevard	Signalized	AM	29.7	C	RBT	AM	9.9	A	No
			PM	39.7	D		PM	52.1	F	Yes
28	Oceanside Boulevard - Ditmar Street	Signalized	AM	5.7	A	Signalized	AM	5.4	A	No
			PM	6.8	A		PM	5.9	A	No
29	Coast Highway - Morse Street	Signalized	AM	9.0	A	RBT	AM	7.5	A	No
			PM	9.8	A		PM	20.9	C	No
30	Morse Street - Freeman Street	SSSC	AM	9.0	A	SSSC	AM	9.0	A	No
			PM	10.0	B		PM	10.0	B	No
31	Morse Street - Ditmar Street	SSSC	AM	8.8	A	SSSC	AM	8.8	A	No
			PM	9.2	A		PM	9.2	A	No
32	Cassidy Street - Pacific Street	AWSC	AM	7.7	A	AWSC	AM	7.3	A	No
			PM	9.3	A		PM	8.7	A	No
33	Cassidy Street - Broadway Street	SSSC	AM	10.3	B	SSSC	AM	10.3	B	No
			PM	14.5	B		PM	14.5	B	No
34	Cassidy Street - Tremont Street	SSSC	AM	9.9	A	SSSC	AM	9.9	A	No
			PM	12.4	B		PM	12.4	B	No

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INTERSECTION		EXISTING WITHOUT PROJECT				EXISTING WITH PROJECT				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
35	Coast Highway - Cassidy Street	Signalized	AM	9.1	A	RBT	AM	7.8	A	No
			PM	14.0	B		PM	61.9	F	Yes
36	Cassidy Street - Freeman Street	SSSC	AM	10.2	B	SSSC	AM	10.2	B	No
			PM	12.7	B		PM	12.7	B	No
37	Cassidy Street - Ditmar Street	AWSC	AM	8.1	A	AWSC	AM	7.9	A	No
			PM	9.5	A		PM	9.0	A	No
38	Cassidy Street - Stewart Street	AWSC	AM	9.3	A	AWSC	AM	8.9	A	No
			PM	13.2	B		PM	12.0	B	No
39	Vista Way - Broadway Street	SSSC	AM	7.4	A	SSSC	AM	7.4	A	No
			PM	7.6	A		PM	7.6	A	No
40	Coast Highway - Vista Way	Signalized	AM	22.7	C	Signalized	AM	24.2	C	No
			PM	37.0	D		PM	46.4	D	No
41	Vista Way - Freeman Street	SSSC	AM	12.2	B	SSSC	AM	12.2	B	No
			PM	15.3	C		PM	15.3	C	No
42	Vista Way - Ditmar Street	SSSC	AM	13.0	B	SSSC	AM	13.0	B	No
			PM	18.7	C		PM	18.7	C	No
43	Vista Way - Stewart Street	SSSC	AM	12.3	B	SSSC	AM	12.3	B	No
			PM	17.4	C		PM	17.4	C	No
44	Coast Highway - Eaton Street	SSSC	AM	12.8	B	SSSC	AM	12.0	B	No
			PM	14.3	B		PM	16.5	C	No
45	Coast Highway - Michigan Avenue	Signalized	AM	7.3	A	RBT	AM	6.7	A	No
			PM	9.0	A		PM	22.5	C	No
46	Coast Highway - West Street	SSSC	AM	--	--	RBT	AM	--	--	--
			PM	--	--		PM	--	--	--
47	Coast Highway - Kelly Street	SSSC	AM	--	--	RBT	AM	--	--	--
			PM	--	--		PM	--	--	--
48	Harbor/Vandergrift Blvd - I-5 NB On-Ramp/San Rafael Drive	Signalized	AM	17.6	B	Signalized	AM	17.6	B	No
			PM	22.7	C		PM	22.7	C	No
49	SR-76 - I-5 SB On-Ramp	Signalized	AM	8.9	A	Signalized	AM	8.9	A	No
			PM	7.0	A		PM	7.0	A	No
50	SR-76 - I-5 NB On/Off-Ramp	Signalized	AM	22.4	C	Signalized	AM	22.4	C	No
			PM	25.9	C		PM	25.9	C	No
51	Mission - I-5 SB Off-Ramp	Signalized	AM	14.7	B	Signalized	AM	14.7	B	No
			PM	20.7	C		PM	17.6	B	No
52	Oceanside - I-5 SB On/Off-Ramp	Signalized	AM	39.3	D	Signalized	AM	39.3	D	No
			PM	65.3	E		PM	51.6	D	No
53	Oceanside - I-5 NB On/Off-Ramp	Signalized	AM	38.3	D	Signalized	AM	38.3	D	No
			PM	52.4	D		PM	47.4	D	No
54	California - I-5 NB On-Ramp	AWSC	AM	9.2	A	AWSC	AM	9.2	A	No
			PM	8.7	A		PM	8.5	A	No
55	Cassidy - I-5 SB On/Off-Ramp	SSSC	AM	8.9	A	SSSC	AM	8.9	A	No
			PM	8.7	A		PM	8.7	A	No
56	Vista Way - I-5 SB On/Off Ramp	Signalized	AM	11.0	B	Signalized	AM	11.0	B	No
			PM	11.2	B		PM	11.2	B	No

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Notes:

A. Delay is expressed as an average seconds of delay per vehicle

B. LOS – Level of Service

C. AWSC – All-way stop control intersection

D. SSSC – Side-street stop control intersection

E. RBT – Roundabout

F. The minimum acceptable LOS is "D" for intersections 1-47

G. The minimum acceptable LOS is "D"; a change from C or D to a lower LOS will cause an impact for intersections 48-56

H. Existing volumes not available for Int 46 and Int 47

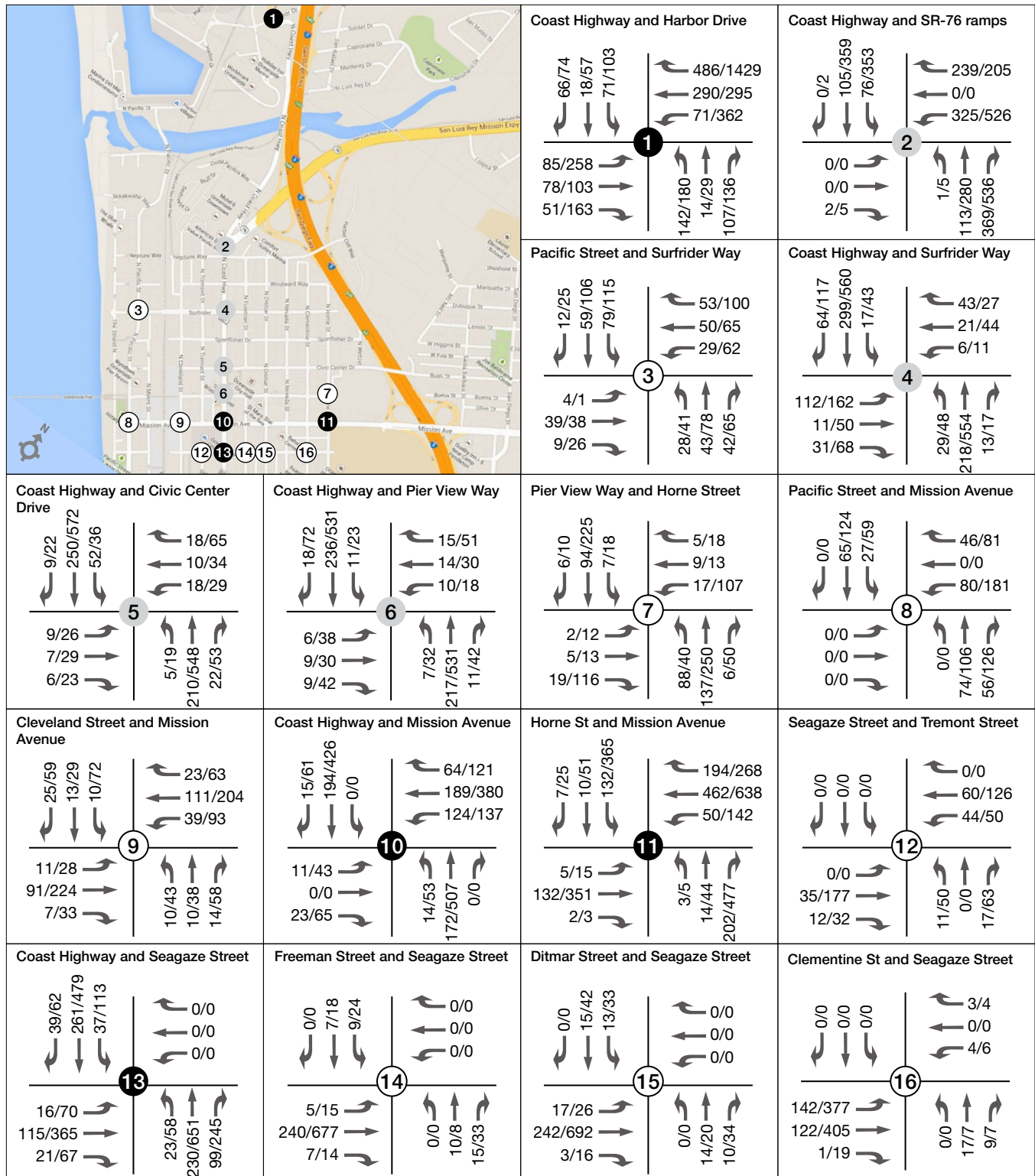
It is worth mentioning that delay and LOS does not change for several study intersections since project changes are mainly along Coast Highway. Therefore, intersections outside of Coast Highway will not be affected. The following intersections are identified to generate significant impacts in the PM peak hour in the existing with project conditions:

- Coast Highway and Oceanside Boulevard (#27)
- Coast Highway and Cassidy Street (#35)

All other intersections are not impacted by the proposed project.

Mitigation measures are discussed in Section 7.

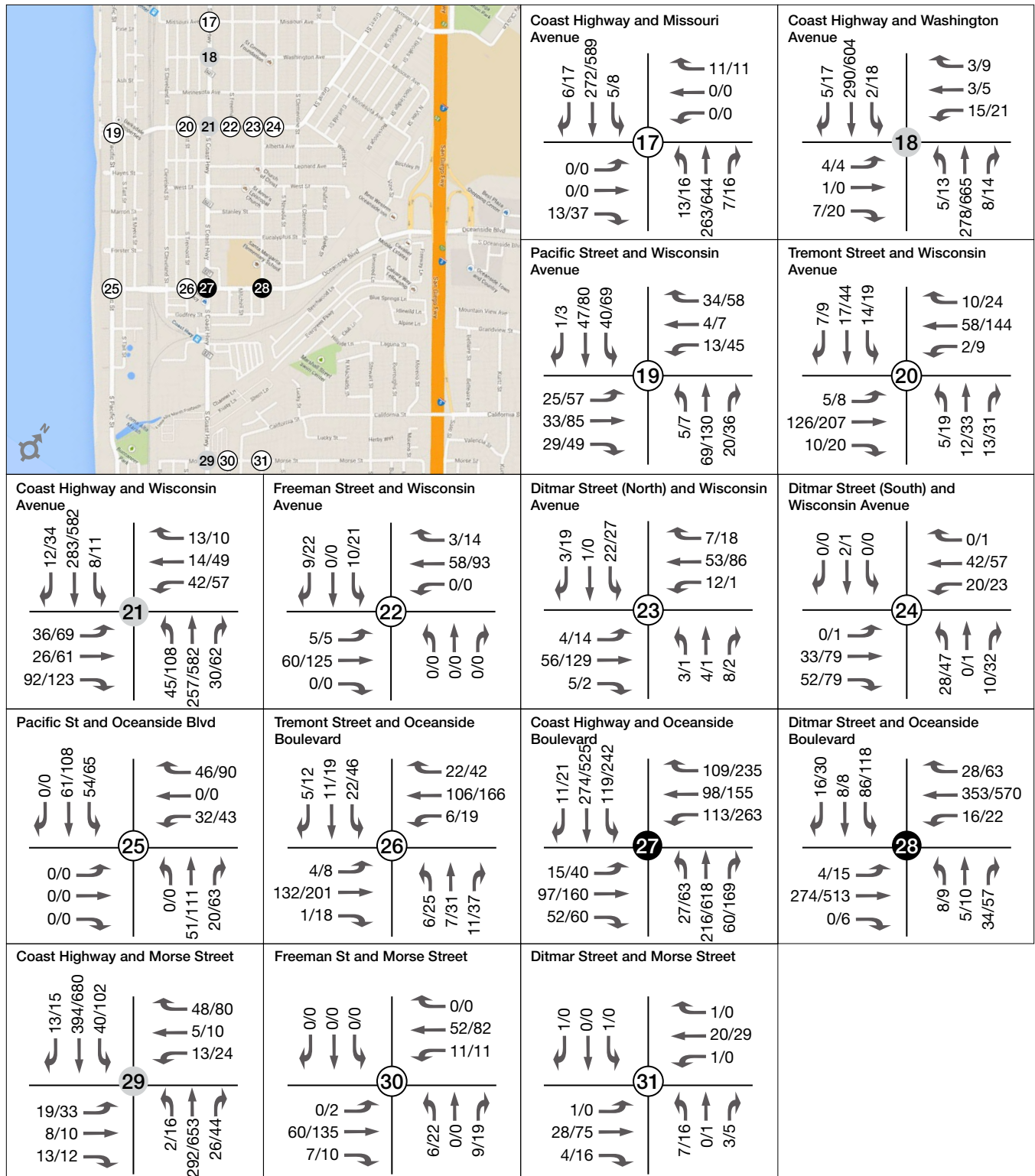
Figure 4-2a Existing with Project Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

Figure 4-2b Existing with Project Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

Figure 4-2c Existing with Project Peak Hour Volumes - AM & PM

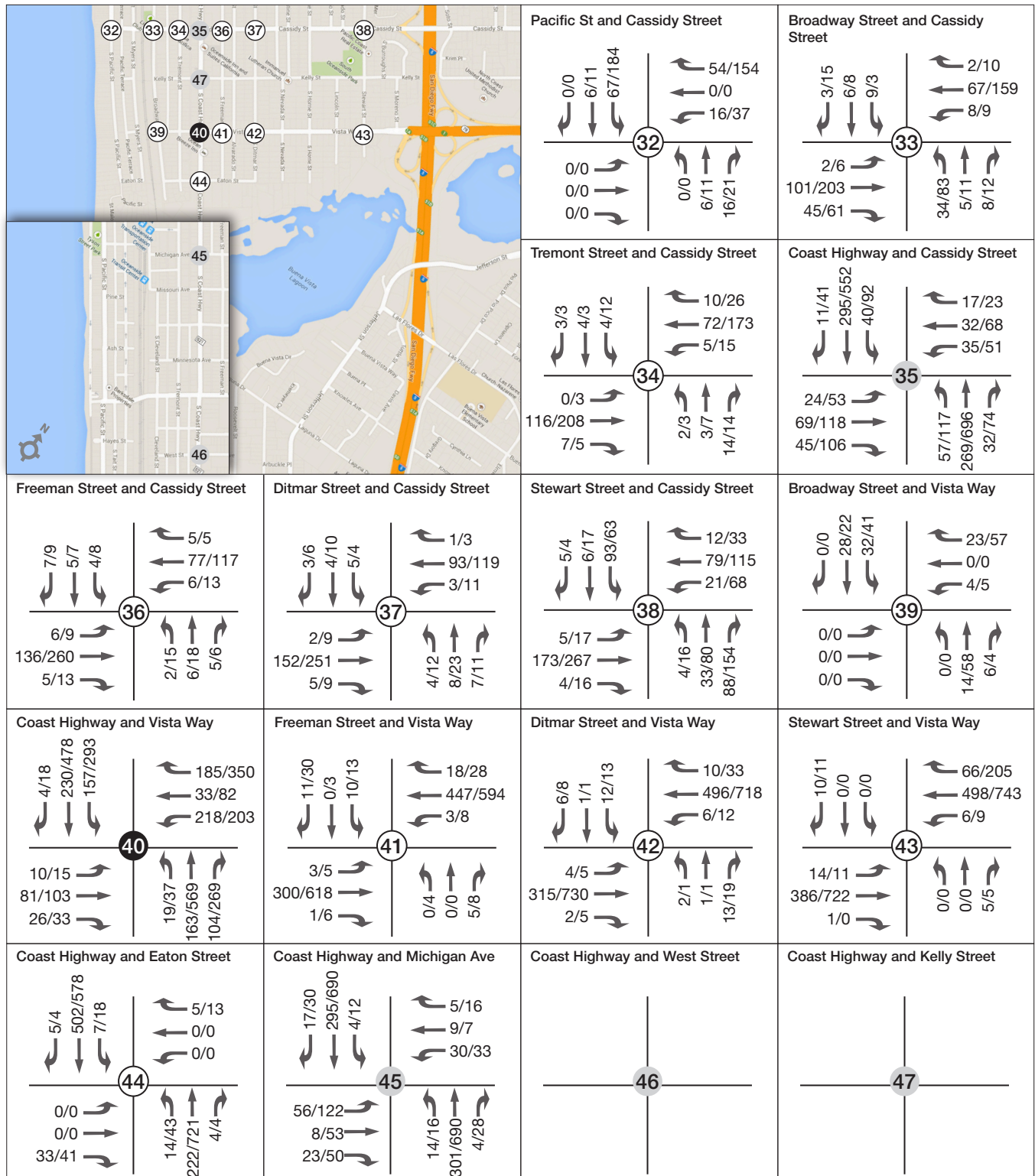
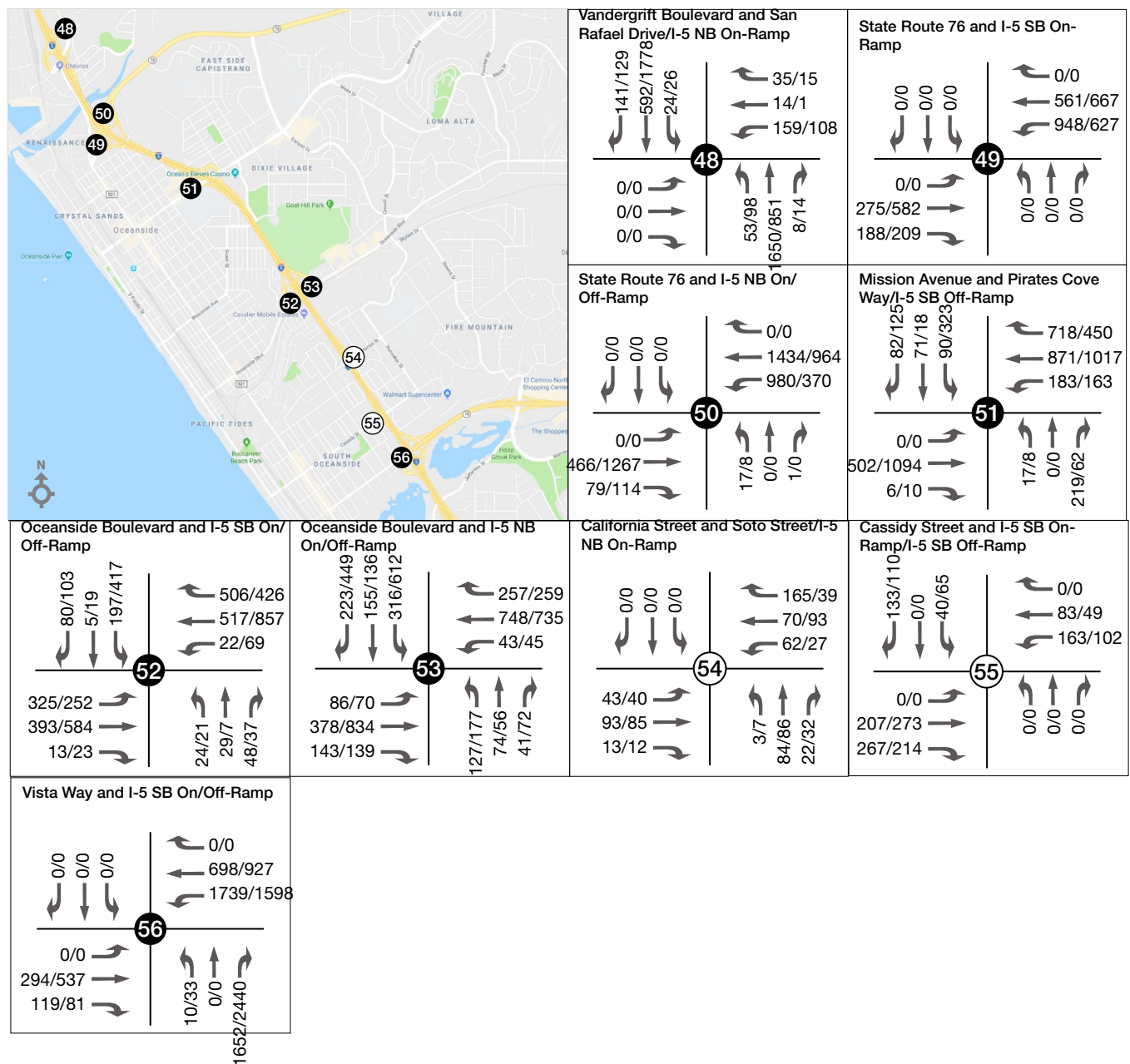


Figure 4-2d Existing with Project Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ##/## ➔ AM/PM Turning Movement Volume

4.3 Existing Conditions with Project Alternative 1 (Four-Lanes between Oceanside Blvd and Vista Way)

This section examines traffic conditions with the Coast Highway Corridor Project alternative 1 which proposes 2 lanes from Harbor Drive to Oceanside Blvd and four lanes between Oceanside Blvd and Vista Way with seven new roundabouts as described in Section 3.6.3. The analysis was conducted for the existing conditions.

4.3.1 Road Segment Volumes

Road segment volumes have been included in Appendix A for use in noise modeling purposes. In addition to a review of daily ADT volumes, peak hour roadway volumes are also provided for reference in Appendix A. Peak hour roadway volumes can provide a more appropriate depiction of traffic conditions compared with daily roadway capacity.

4.3.2 Intersection Level of Service

This section examines traffic conditions with and without the Coast Highway Corridor Study alternative 1. The analysis was conducted for the existing conditions.

The intersection operations analysis for the existing condition with project alternative 1 was performed consistent with the methodology outlined in Section 3. Table 4-3 presents the results for the existing conditions traffic analysis with project alternative 1. A comparison between the existing condition without and with project alternative 1 is also provided. Figure 4-3 contains the traffic volumes used for the existing conditions with project alternative 1 analysis.

Table 4-3: LOS Analysis – Existing Conditions with Project Alternative 1

INTERSECTION		EXISTING WITHOUT PROJECT				EXISTING WITH PROJECT ALTERNATIVE 1				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
1	Coast Highway - I-5 Ramps / Harbor Drive	Signalized	AM	28.0	C	Signalized	AM	31.1	C	No
			PM	51.3	D		PM	51.3	D	No
2	Coast Highway - SR-76 Ramps	Signalized	AM	13.7	B	RBT	AM	3.1	A	No
			PM	37.1	D		PM	8.6	A	No
3	Surfrider Way - Pacific Street	AWSC	AM	8.5	A	AWSC	AM	8.5	A	No
			PM	11.2	B		PM	10.5	B	No
4	Coast Highway - Surfrider Way	Signalized	AM	10.4	B	Signalized	AM	11.4	B	No
			PM	14.4	B		PM	19.1	B	No
5	Coast Highway - Civic Center Drive	Signalized	AM	13.7	B	RBT	AM	6.1	A	No
			PM	15.1	B		PM	13.3	B	No
6	Coast Highway - Pier View Way	Signalized	AM	16.8	B	RBT	AM	5.6	A	No
			PM	16.6	B		PM	12.9	B	No
7	Pier View Way - Horne Street	AWSC	AM	8.7	A	AWSC	AM	8.7	A	No
			PM	11.9	B		PM	11.9	B	No
8	Mission Avenue - Pacific Street	AWSC	AM	7.9	A	AWSC	AM	7.9	A	No
			PM	10.1	B		PM	10.0	A	No
9	Mission Avenue - Cleveland Street	AWSC	AM	8.1	A	AWSC	AM	8.1	A	No
			PM	10.6	B		PM	10.6	B	No
10	Coast Highway - Mission Avenue	Signalized	AM	13.1	B	Signalized	AM	8.0	A	No
			PM	13.8	B		PM	12.2	B	No

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INTERSECTION		EXISTING WITHOUT PROJECT				EXISTING WITH PROJECT ALTERNATIVE 1				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
11	Mission Avenue - Horne Street	Signalized	AM	7.4	A	Signalized	AM	6.7	A	No
			PM	18.9	B		PM	17.1	B	No
12	Seagaze Street - Tremont Street	SSSC	AM	3.3	A	SSSC	AM	9.1	A	No
			PM	11.5	B		PM	11.5	B	No
13	Coast Highway - Seagaze Street	Signalized	AM	14.7	B	Signalized	AM	16.1	B	No
			PM	23.9	C		PM	27.3	C	No
14	Seagaze Street - Freeman Street	SSSC	AM	10.3	A	SSSC	AM	10.3	B	No
			PM	15.6	C		PM	15.6	C	No
15	Seagaze Street - Ditmar Street	AWSC	AM	7.9	A	AWSC	AM	7.6	A	No
			PM	12.5	B		PM	12.0	B	No
16	Seagaze Street - Clementine Street	SSSC	AM	7.9	A	SSSC	AM	7.5	A	No
			PM	13.1	B		PM	8.3	A	No
17	Coast Highway - Missouri Avenue	SSSC	AM	12.0	B	SSSC	AM	10.0	A	No
			PM	23.9	C		PM	13.5	B	No
18	Coast Highway - Washington Avenue	SSSC	AM	11.3	B	RBT	AM	6.1	A	No
			PM	22.0	C		PM	13.2	B	No
19	Wisconsin Avenue - Pacific Street	AWSC	AM	8.1	A	AWSC	AM	7.8	A	No
			PM	9.8	A		PM	9.5	A	No
20	Wisconsin Avenue - Tremont Street	SSSC	AM	10.6	B	SSSC	AM	10.6	B	No
			PM	14.0	B		PM	14.0	B	No
21	Coast Highway - Wisconsin Avenue	Signalized	AM	8.9	A	RBT	AM	7.0	A	No
			PM	12.2	B		PM	22.0	C	No
22	Wisconsin Avenue - Freeman Street	SSSC	AM	9.1	A	SSSC	AM	9.1	A	No
			PM	9.7	A		PM	9.7	A	No
23	Wisconsin Avenue - Ditmar Street (North)	SSSC	AM	9.7	A	SSSC	AM	9.7	A	No
			PM	10.1	B		PM	10.1	B	No
24	Wisconsin Avenue - Ditmar Street (South)	AWSC	AM	7.5	A	AWSC	AM	7.3	A	No
			PM	7.9	A		PM	7.9	A	No
25	Oceanside Boulevard - Pacific Street	AWSC	AM	8.0	A	AWSC	AM	7.7	A	No
			PM	9.0	A		PM	8.7	A	No
26	Oceanside Boulevard - Tremont Street	SSSC	AM	10.9	B	SSSC	AM	11.0	B	No
			PM	14.7	B		PM	14.8	B	No
27	Coast Highway - Oceanside Boulevard	Signalized	AM	29.7	C	Signalized	AM	30.1	C	No
			PM	39.7	D		PM	41.2	D	No
28	Oceanside Boulevard - Ditmar Street	Signalized	AM	5.7	A	Signalized	AM	5.4	A	No
			PM	6.8	A		PM	5.9	A	No
29	Coast Highway - Morse Street	Signalized	AM	9.0	A	Signalized	AM	21.0	C	No
			PM	9.8	A		PM	10.1	A	No
30	Morse Street - Freeman Street	SSSC	AM	9.0	A	SSSC	AM	9.0	A	No
			PM	10.0	B		PM	10.0	B	No
31	Morse Street - Ditmar Street	SSSC	AM	8.8	A	SSSC	AM	8.8	A	No
			PM	9.2	A		PM	9.2	A	No
32	Cassidy Street - Pacific Street	AWSC	AM	7.7	A	AWSC	AM	7.3	A	No
			PM	9.3	A		PM	8.7	A	No

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		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
33	Cassidy Street - Broadway Street	SSSC	AM	10.3	B	SSSC	AM	10.3	B	No
			PM	14.5	B		PM	14.5	B	No
34	Cassidy Street - Tremont Street	SSSC	AM	9.9	A	SSSC	AM	9.9	A	No
			PM	12.4	B		PM	12.4	B	No
35	Coast Highway - Cassidy Street	Signalized	AM	9.1	A	Signalized	AM	8.9	A	No
			PM	14.0	B		PM	13.2	B	No
36	Cassidy Street - Freeman Street	SSSC	AM	10.2	B	SSSC	AM	10.2	B	No
			PM	12.7	B		PM	12.7	B	No
37	Cassidy Street - Ditmar Street	AWSC	AM	8.1	A	AWSC	AM	7.9	A	No
			PM	9.5	A		PM	9.0	A	No
38	Cassidy Street - Stewart Street	AWSC	AM	9.3	A	AWSC	AM	8.9	A	No
			PM	13.2	B		PM	12.0	B	No
39	Vista Way - Broadway Street	SSSC	AM	7.4	A	SSSC	AM	7.4	A	No
			PM	7.6	A		PM	7.6	A	No
40	Coast Highway - Vista Way	Signalized	AM	22.7	C	Signalized	AM	23.4	C	No
			PM	37.0	D		PM	39.5	D	No
41	Vista Way - Freeman Street	SSSC	AM	12.2	B	SSSC	AM	12.2	B	No
			PM	15.3	C		PM	15.3	C	No
42	Vista Way - Ditmar Street	SSSC	AM	13.0	B	SSSC	AM	13.0	B	No
			PM	18.7	C		PM	18.7	C	No
43	Vista Way - Stewart Street	SSSC	AM	12.3	B	SSSC	AM	12.3	B	No
			PM	17.4	C		PM	17.4	C	No
44	Coast Highway - Eaton Street	SSSC	AM	12.8	B	SSSC	AM	13.1	B	No
			PM	14.3	B		PM	14.5	B	No
45	Coast Highway - Michigan Avenue	Signalized	AM	7.3	A	RBT	AM	6.7	A	No
			PM	9.0	A		PM	22.5	C	No
46	Coast Highway - West Street	SSSC	AM	--	--	RBT	AM	--	--	--
			PM	--	--		PM	--	--	--
47	Coast Highway - Kelly Street	SSSC	AM	--	--	SSSC	AM	--	--	--
			PM	--	--		PM	--	--	--
48	Harbor/Vandergrift Blvd - I-5 NB On-Ramp/San Rafael Drive	Signalized	AM	17.6	B	Signalized	AM	17.6	B	No
			PM	22.7	C		PM	22.7	C	No
49	SR-76 - I-5 SB On- Ramp	Signalized	AM	8.9	A	Signalized	AM	8.9	A	No
			PM	7.0	A		PM	7.0	A	No
50	SR-76 - I-5 NB On/Off- Ramp	Signalized	AM	22.4	C	Signalized	AM	22.4	C	No
			PM	25.9	C		PM	25.9	C	No
51	Mission - I-5 SB Off- Ramp	Signalized	AM	14.7	B	Signalized	AM	14.7	B	No
			PM	20.7	C		PM	17.6	B	No
52	Oceanside - I-5 SB On/Off-Ramp	Signalized	AM	39.3	D	Signalized	AM	39.3	D	No
			PM	65.3	E		PM	53.1	D	No
53	Oceanside - I-5 NB On/Off-Ramp	Signalized	AM	38.3	D	Signalized	AM	38.3	D	No
			PM	52.4	D		PM	52.4	D	No
54	California - I-5 NB On- Ramp	AWSC	AM	9.2	A	AWSC	AM	9.2	A	No
			PM	8.5	A		PM	8.5	A	No

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INTERSECTION		EXISTING WITHOUT PROJECT				EXISTING WITH PROJECT ALTERNATIVE 1				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
55	Cassidy - I-5 SB On/Off-Ramp	SSSC	AM	8.9	A	SSSC	AM	8.9	A	No
			PM	8.7	A		PM	8.7	A	No
56	Vista Way - I-5 SB On/Off Ramp	Signalized	AM	11.0	B	Signalized	AM	11.0	B	No
			PM	11.2	B		PM	11.2	B	No

Notes:

A. Delay is expressed as an average seconds of delay per vehicle

B. LOS – Level of Service

C. AWSC – All-way stop control intersection

D. SSSC – Side-street stop control intersection

E. RBT – Roundabout

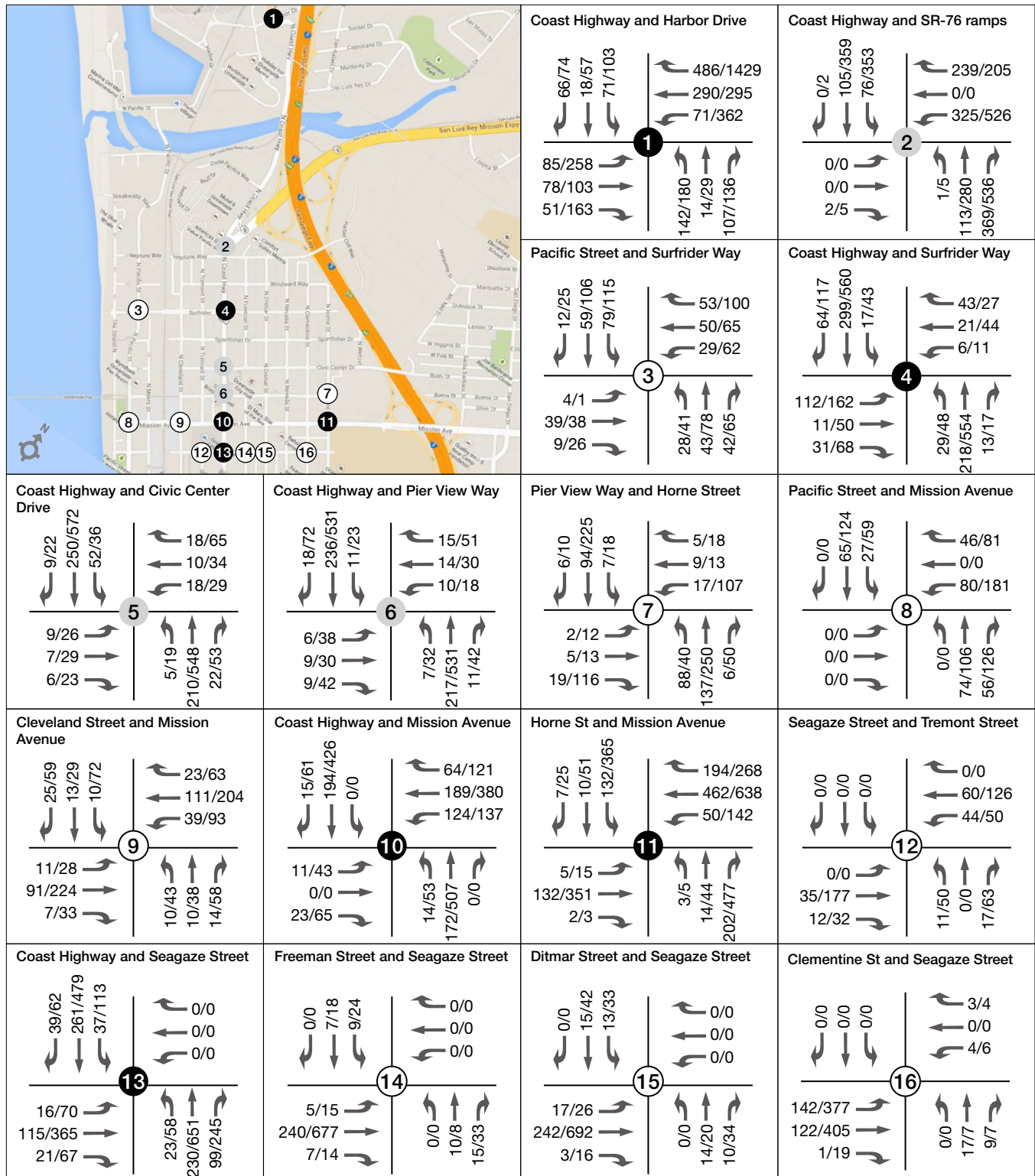
F. The minimum acceptable LOS is "D" for intersections 1-47

G. The minimum acceptable LOS is "D"; a change from C or D to a lower LOS will cause an impact for intersections 48-56

H. Existing volumes not available for Int 46 and Int 47

It is worth mentioning that delay and LOS does not change for several study intersections since project changes are mainly along Coast Highway. Therefore, intersections outside of Coast Highway will not be affected. All intersections are not impacted by the proposed project alternative 1.

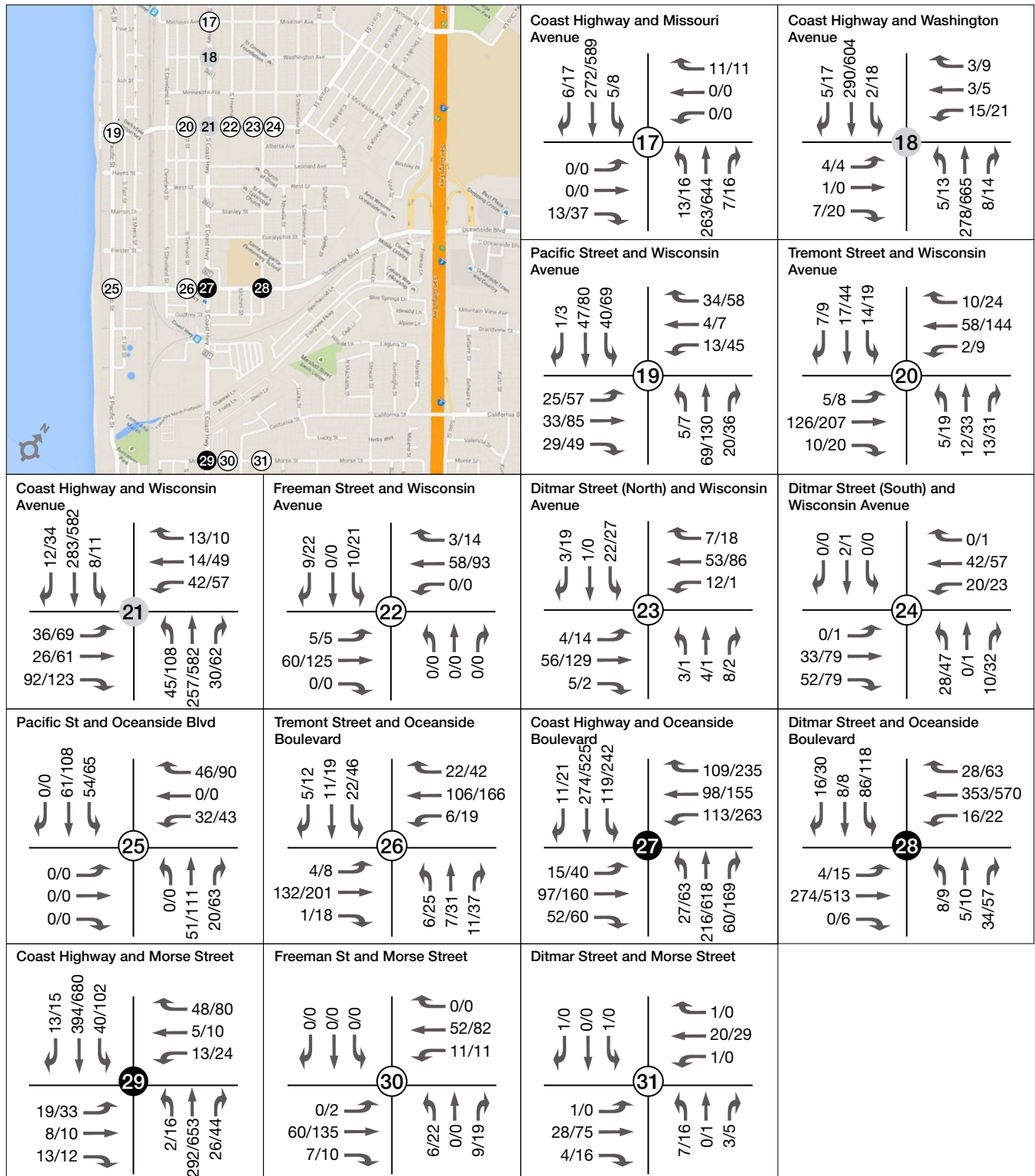
Figure 4-3a Existing with Project Alternative 1 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

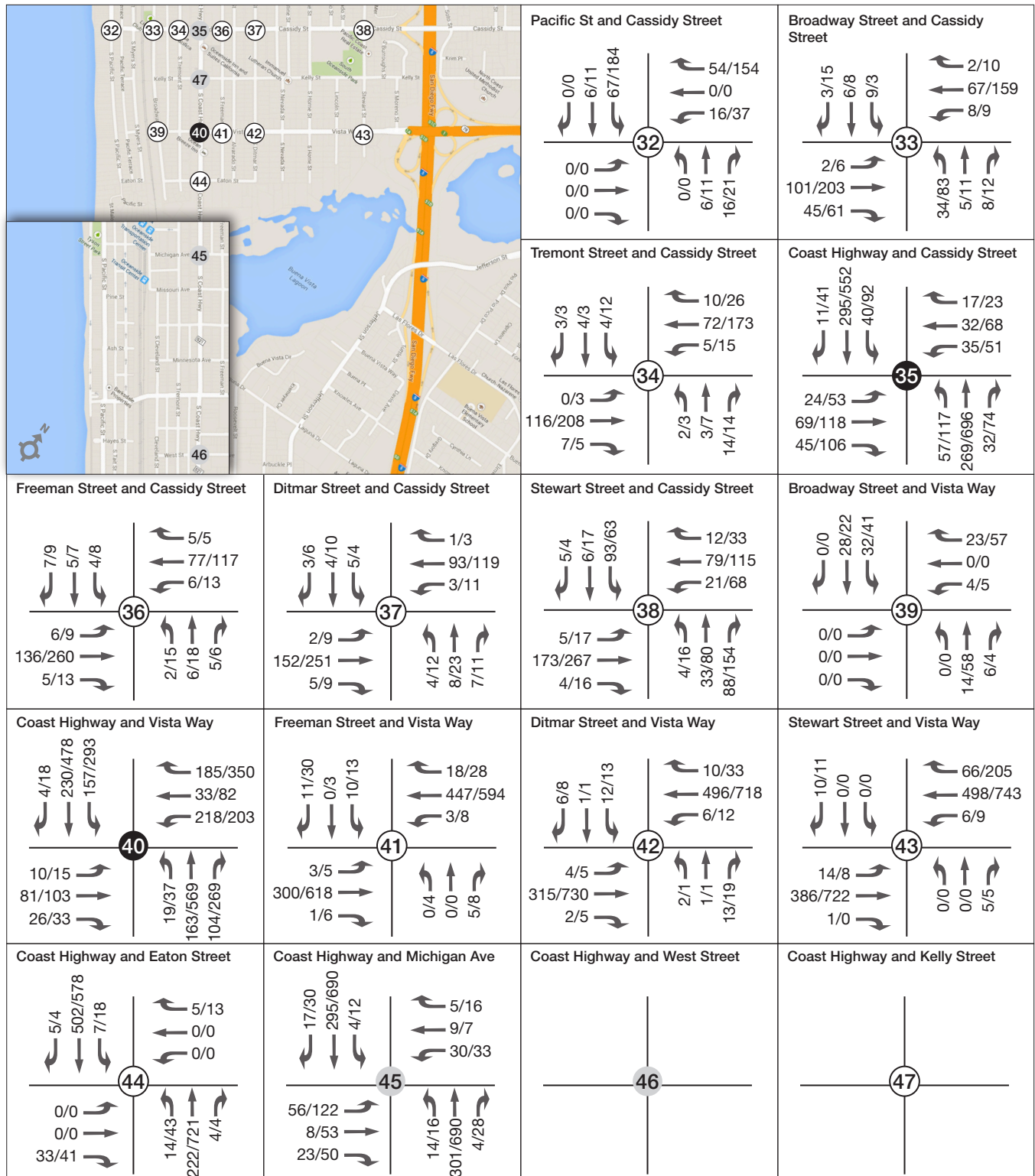
Figure 4-3b Existing with Project Alternative 1 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

Figure 4-3c Existing with Project Alternative 1 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

Map of Oceanside, CA

The map displays the following features:

- Highways:** 5, 52, 53, 54, 55, 56, 163, 94, and 905.
- Local Streets:** Vista Way, Oceanside Boulevard, California Street, Cassidy Street, Mission Avenue, and others.
- Interchanges:** 48, 49, 50, 51, 52, 53, 54, 55, 56.
- Landmarks:** Loma Alta, Fire Mountain, Pacific Tides, South Oceanside, and others.
- North Arrow:** Located in the bottom left corner.

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### ↩ AM/PM Turning Movement Volume

4.4 Existing Conditions with Project Alternative 2 (Four-Lanes between Morse St and Vista Way)

This section examines traffic conditions with the Coast Highway Corridor Project alternative 2 which proposes 2 lanes between Harbor Drive and Morse Street and four lanes between Morse St and Vista Way with seven new roundabouts as described in Section 3.6.4. The analysis was conducted for the existing conditions.

4.4.1 Road Segment Volumes

Road segment volumes have been included in Appendix A for use in noise modeling purposes. In addition to a review of daily ADT volumes, peak hour roadway volumes are also provided for reference in Appendix A. Peak hour roadway volumes can provide a more appropriate depiction of traffic conditions compared with daily roadway capacity.

4.4.2 Intersection Level of Service

This section examines traffic conditions with and without the Coast Highway Corridor Study alternative 2. The analysis was conducted for the existing conditions.

The intersection operations analysis for the existing condition with project alternative 2 was performed consistent with the methodology outlined in Section 3. Table 4-4 presents the results for the existing conditions traffic analysis with project alternative 2. A comparison between the existing condition without and with project alternative 2 is also provided. Figure 4-4 contains the traffic volumes used for the existing conditions with project alternative 2 analysis.

Table 4-4: LOS Analysis – Existing Conditions with Project Alternative 2

INTERSECTION		EXISTING WITHOUT PROJECT				EXISTING WITH PROJECT ALTERNATIVE 2				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
1	Coast Highway - I-5 Ramps / Harbor Drive	Signalized	AM	28.0	C	Signalized	AM	31.1	C	No
			PM	51.3	D		PM	51.3	D	No
2	Coast Highway - SR-76 Ramps	Signalized	AM	13.7	B	RBT	AM	3.1	A	No
			PM	37.1	D		PM	8.6	A	No
3	Surfrider Way - Pacific Street	AWSC	AM	8.5	A	AWSC	AM	8.5	A	No
			PM	11.2	B		PM	10.5	B	No
4	Coast Highway - Surfrider Way	Signalized	AM	10.4	B	Signalized	AM	11.4	B	No
			PM	14.4	B		PM	19.1	B	No
5	Coast Highway - Civic Center Drive	Signalized	AM	13.7	B	RBT	AM	6.1	A	No
			PM	15.1	B		PM	13.3	B	No
6	Coast Highway - Pier View Way	Signalized	AM	16.8	B	RBT	AM	5.6	A	No
			PM	16.6	B		PM	12.9	B	No
7	Pier View Way - Horne Street	AWSC	AM	8.7	A	AWSC	AM	8.7	A	No
			PM	11.9	B		PM	11.9	B	No
8	Mission Avenue - Pacific Street	AWSC	AM	7.9	A	AWSC	AM	7.9	A	No
			PM	10.1	B		PM	10.0	A	No
9	Mission Avenue - Cleveland Street	AWSC	AM	8.1	A	AWSC	AM	8.1	A	No
			PM	10.6	B		PM	10.6	B	No
10	Coast Highway - Mission Avenue	Signalized	AM	13.1	B	Signalized	AM	8.0	A	No
			PM	13.8	B		PM	12.2	B	No

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INTERSECTION		EXISTING WITHOUT PROJECT				EXISTING WITH PROJECT ALTERNATIVE 2				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
11	Mission Avenue - Horne Street	Signalized	AM	7.4	A	Signalized	AM	6.7	A	No
			PM	18.9	B		PM	17.1	B	No
12	Seagaze Street - Tremont Street	SSSC	AM	3.3	A	SSSC	AM	9.1	A	No
			PM	11.5	B		PM	11.5	B	No
13	Coast Highway - Seagaze Street	Signalized	AM	14.7	B	Signalized	AM	16.1	B	No
			PM	23.9	C		PM	27.3	C	No
14	Seagaze Street - Freeman Street	SSSC	AM	10.3	A	SSSC	AM	10.3	B	No
			PM	15.6	C		PM	15.6	C	No
15	Seagaze Street - Ditmar Street	AWSC	AM	7.9	A	AWSC	AM	7.6	A	No
			PM	12.5	B		PM	12.0	B	No
16	Seagaze Street - Clementine Street	SSSC	AM	7.9	A	SSSC	AM	7.5	A	No
			PM	13.1	B		PM	8.3	A	No
17	Coast Highway - Missouri Avenue	SSSC	AM	12.0	B	SSSC	AM	10.0	A	No
			PM	23.9	C		PM	13.5	B	No
18	Coast Highway - Washington Avenue	SSSC	AM	11.3	B	RBT	AM	6.1	A	No
			PM	22.0	C		PM	13.2	B	No
19	Wisconsin Avenue - Pacific Street	AWSC	AM	8.1	A	AWSC	AM	7.8	A	No
			PM	9.8	A		PM	9.5	A	No
20	Wisconsin Avenue - Tremont Street	SSSC	AM	10.6	B	SSSC	AM	10.6	B	No
			PM	14.0	B		PM	14.0	B	No
21	Coast Highway - Wisconsin Avenue	Signalized	AM	8.9	A	RBT	AM	7.0	A	No
			PM	12.2	B		PM	22.0	C	No
22	Wisconsin Avenue - Freeman Street	SSSC	AM	9.1	A	SSSC	AM	9.1	A	No
			PM	9.7	A		PM	9.7	A	No
23	Wisconsin Avenue - Ditmar Street (North)	SSSC	AM	9.7	A	SSSC	AM	9.7	A	No
			PM	10.1	B		PM	10.1	B	No
24	Wisconsin Avenue - Ditmar Street (South)	AWSC	AM	7.5	A	AWSC	AM	7.3	A	No
			PM	7.9	A		PM	7.9	A	No
25	Oceanside Boulevard - Pacific Street	AWSC	AM	8.0	A	AWSC	AM	7.7	A	No
			PM	9.0	A		PM	8.7	A	No
26	Oceanside Boulevard - Tremont Street	SSSC	AM	10.9	B	SSSC	AM	11.0	B	No
			PM	14.7	B		PM	14.8	B	No
27	Coast Highway - Oceanside Boulevard	Signalized	AM	29.7	C	Signalized	AM	30.1	C	No
			PM	39.7	D		PM	41.2	D	No
28	Oceanside Boulevard - Ditmar Street	Signalized	AM	5.7	A	Signalized	AM	5.4	A	No
			PM	6.8	A		PM	5.9	A	No
29	Coast Highway - Morse Street	Signalized	AM	9.0	A	Signalized	AM	21.0	C	No
			PM	9.8	A		PM	10.1	A	No
30	Morse Street - Freeman Street	SSSC	AM	9.0	A	SSSC	AM	9.0	A	No
			PM	10.0	B		PM	10.0	B	No
31	Morse Street - Ditmar Street	SSSC	AM	8.8	A	SSSC	AM	8.8	A	No
			PM	9.2	A		PM	9.2	A	No
32	Cassidy Street - Pacific Street	AWSC	AM	7.7	A	AWSC	AM	7.3	A	No
			PM	9.3	A		PM	8.7	A	No

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INTERSECTION		EXISTING WITHOUT PROJECT				EXISTING WITH PROJECT ALTERNATIVE 2				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
33	Cassidy Street - Broadway Street	SSSC	AM	10.3	B	SSSC	AM	10.3	B	No
			PM	14.5	B		PM	14.5	B	No
34	Cassidy Street - Tremont Street	SSSC	AM	9.9	A	SSSC	AM	9.9	A	No
			PM	12.4	B		PM	12.4	B	No
35	Coast Highway - Cassidy Street	Signalized	AM	9.1	A	Signalized	AM	8.9	A	No
			PM	14.0	B		PM	13.2	B	No
36	Cassidy Street - Freeman Street	SSSC	AM	10.2	B	SSSC	AM	10.2	B	No
			PM	12.7	B		PM	12.7	B	No
37	Cassidy Street - Ditmar Street	AWSC	AM	8.1	A	AWSC	AM	7.9	A	No
			PM	9.5	A		PM	9.0	A	No
38	Cassidy Street - Stewart Street	AWSC	AM	9.3	A	AWSC	AM	8.9	A	No
			PM	13.2	B		PM	12.0	B	No
39	Vista Way - Broadway Street	SSSC	AM	7.4	A	SSSC	AM	7.4	A	No
			PM	7.6	A		PM	7.6	A	No
40	Coast Highway - Vista Way	Signalized	AM	22.7	C	Signalized	AM	23.4	C	No
			PM	37.0	D		PM	39.5	D	No
41	Vista Way - Freeman Street	SSSC	AM	12.2	B	SSSC	AM	12.2	B	No
			PM	15.3	C		PM	15.3	C	No
42	Vista Way - Ditmar Street	SSSC	AM	13.0	B	SSSC	AM	13.0	B	No
			PM	18.7	C		PM	18.7	C	No
43	Vista Way - Stewart Street	SSSC	AM	12.3	B	SSSC	AM	12.3	B	No
			PM	17.4	C		PM	17.4	C	No
44	Coast Highway - Eaton Street	SSSC	AM	12.8	B	SSSC	AM	13.1	B	No
			PM	14.3	B		PM	14.5	B	No
45	Coast Highway - Michigan Avenue	Signalized	AM	7.3	A	RBT	AM	6.7	A	No
			PM	9.0	A		PM	22.5	C	No
46	Coast Highway - West Street	SSSC	AM	--	--	RBT	AM	--	--	--
			PM	--	--		PM	--	--	--
47	Coast Highway - Kelly Street	SSSC	AM	--	--	SSSC	AM	--	--	--
			PM	--	--		PM	--	--	--
48	Harbor/Vandergrift Blvd - I-5 NB On-Ramp/San Rafael Drive	Signalized	AM	17.6	B	Signalized	AM	17.6	B	No
			PM	22.7	C		PM	22.7	C	No
49	SR-76 - I-5 SB On- Ramp	Signalized	AM	8.9	A	Signalized	AM	8.9	A	No
			PM	7.0	A		PM	7.0	A	No
50	SR-76 - I-5 NB On/Off- Ramp	Signalized	AM	22.4	C	Signalized	AM	22.4	C	No
			PM	25.9	C		PM	25.9	C	No
51	Mission - I-5 SB Off- Ramp	Signalized	AM	14.7	B	Signalized	AM	14.7	B	No
			PM	20.7	C		PM	17.6	B	No
52	Oceanside - I-5 SB On/Off-Ramp	Signalized	AM	39.3	D	Signalized	AM	39.3	D	No
			PM	65.3	E		PM	51.6	D	No
53	Oceanside - I-5 NB On/Off-Ramp	Signalized	AM	38.3	D	Signalized	AM	38.3	D	No
			PM	52.4	D		PM	51.1	D	No
54	California - I-5 NB On- Ramp	AWSC	AM	9.2	A	AWSC	AM	9.2	A	No
			PM	8.5	A		PM	8.5	A	No

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INTERSECTION		EXISTING WITHOUT PROJECT				EXISTING WITH PROJECT ALTERNATIVE 2				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
55	Cassidy - I-5 SB On/Off-Ramp	SSSC	AM	8.9	A	SSSC	AM	8.9	A	No
			PM	8.7	A		PM	8.7	A	No
56	Vista Way - I-5 SB On/Off Ramp	Signalized	AM	11.0	B	Signalized	AM	11.0	B	No
			PM	11.2	B		PM	11.2	B	No

Notes:

A. Delay is expressed as an average seconds of delay per vehicle

B. LOS – Level of Service

C. AWSC – All-way stop control intersection

D. SSSC – Side-street stop control intersection

E. RBT – Roundabout

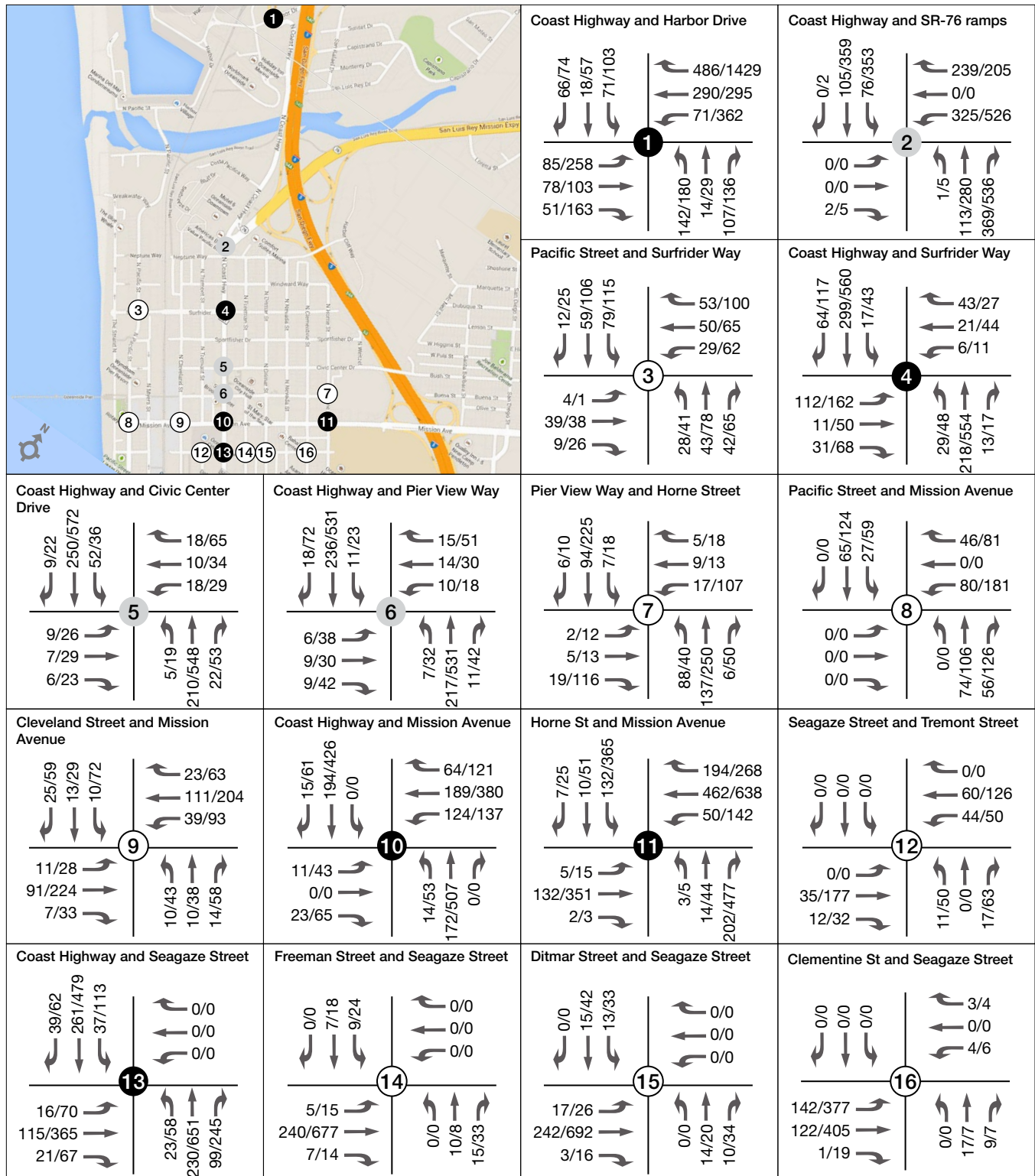
F. The minimum acceptable LOS is "D" for intersections 1-47

G. The minimum acceptable LOS is "D"; a change from C or D to a lower LOS will cause an impact for intersections 48-56

H. Existing volumes not available for Int 46 and Int 47

It is worth mentioning that delay and LOS does not change for several study intersections since project changes are mainly along Coast Highway. Therefore, intersections outside of Coast Highway will not be affected. All other intersections are not impacted by the proposed project alternative 2.

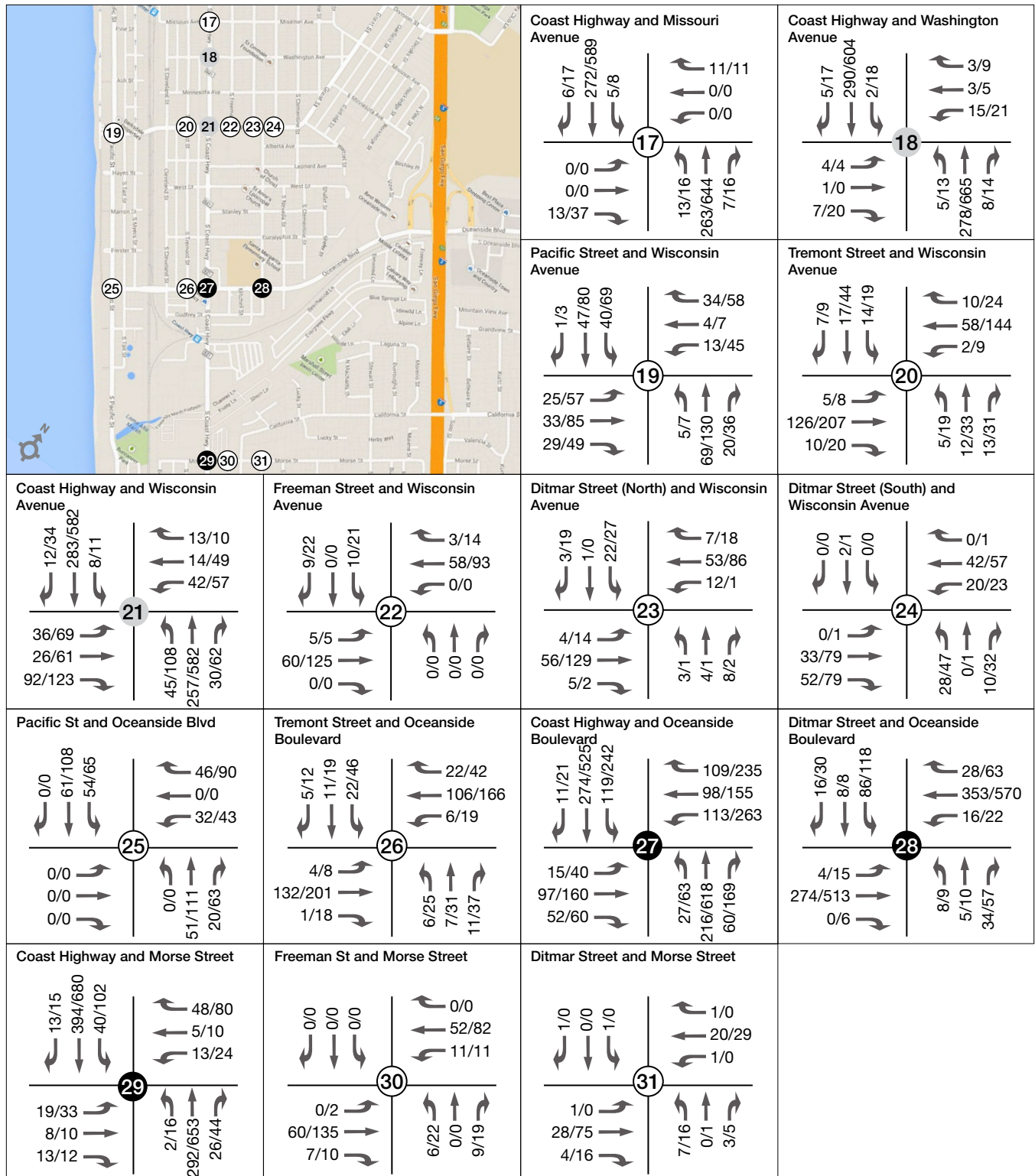
Figure 4-4a Existing with Project Alternative 2 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

Figure 4-4b Existing with Project Alternative 2 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

Figure 4-4c Existing with Project Alternative 1 Peak Hour Volumes - AM & PM

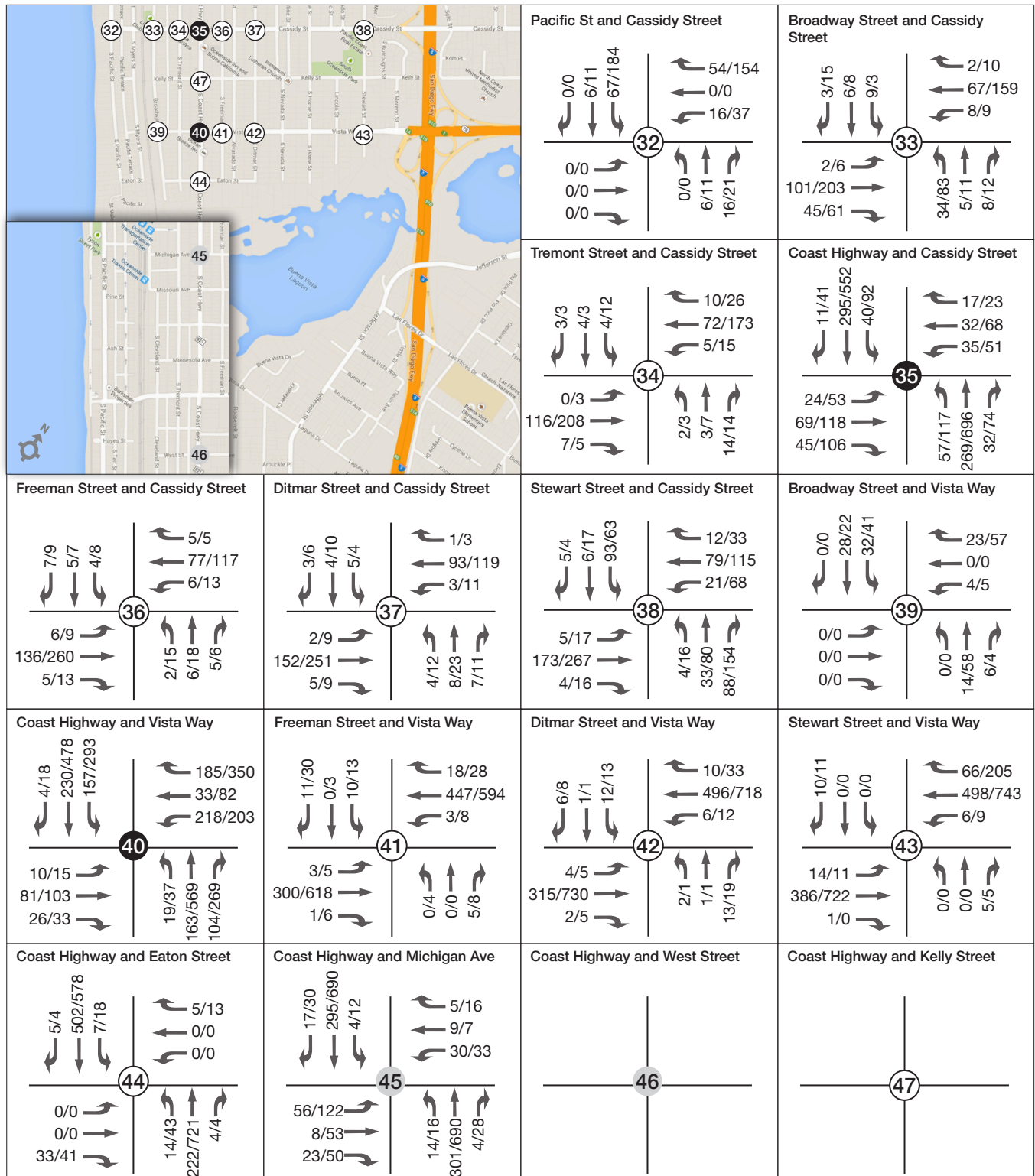
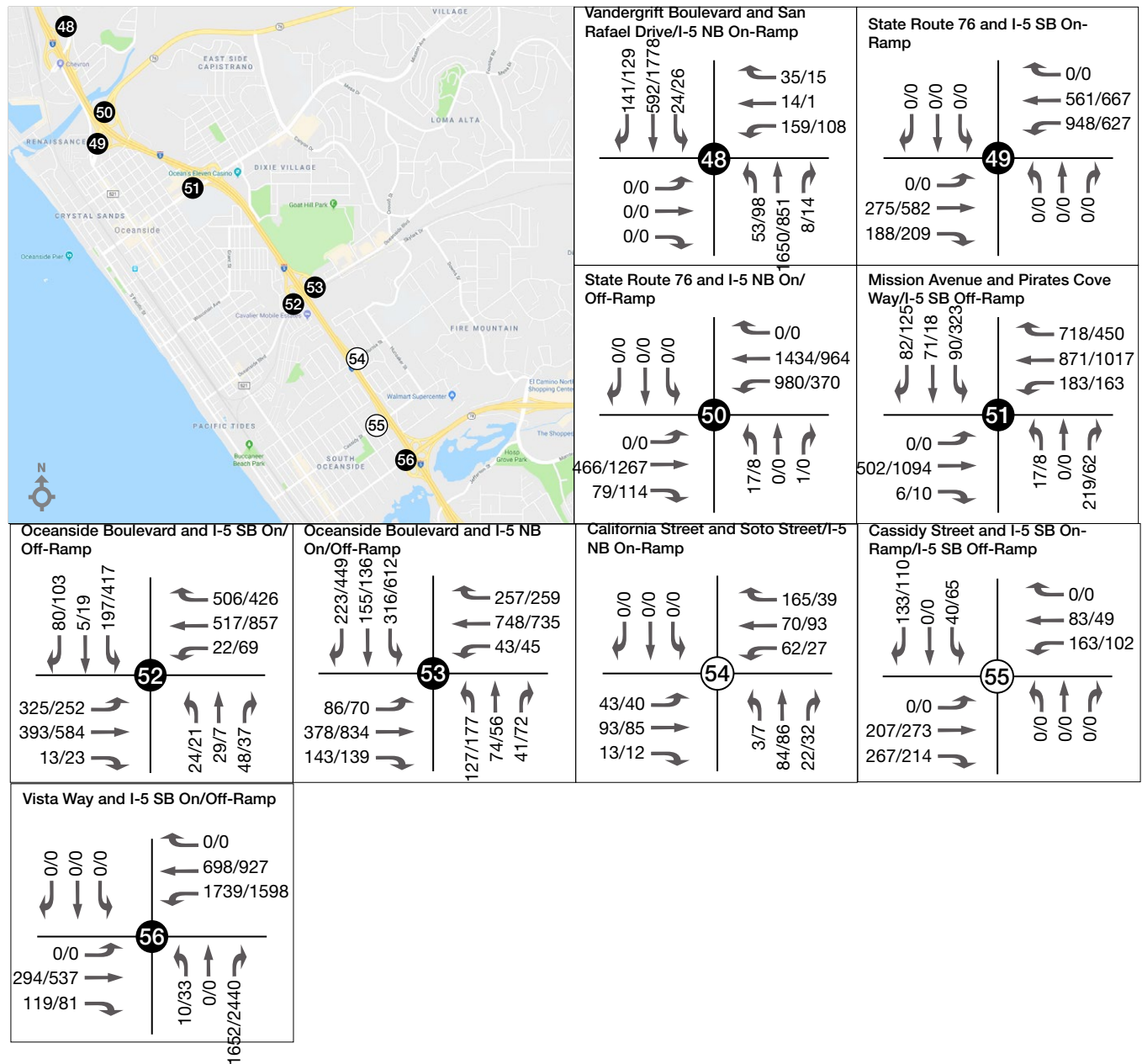


Figure 4-4d Existing with Project Alternative 2 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ##/## AM/PM Turning Movement Volume

4.5 Existing Conditions with Project Alternative 3 (Four-Lanes between Morse St and Vista Way)

This section examines traffic conditions with the Coast Highway Corridor Project alternative 3 which proposes 2 lanes from Harbor Drive to Morse Street and four lanes between Morse Street and Vista Way with seven new roundabouts as described in Section 3.6.3. The analysis was conducted for the existing conditions. The land use south of Morse Street and west of the I-5 was restored to the general plan land uses.

4.5.1 Road Segment Volumes

Road segment volumes have been included in Appendix A for use in noise modeling purposes. In addition to a review of daily ADT volumes, peak hour roadway volumes are also provided for reference in Appendix A. Peak hour roadway volumes can provide a more appropriate depiction of traffic conditions compared with daily roadway capacity.

4.5.2 Intersection Level of Service

This section examines traffic conditions with and without the Coast Highway Corridor Study alternative 3. The analysis was conducted for the existing conditions.

The intersection operations analysis for the existing condition with project alternative 3 was performed consistent with the methodology outlined in Section 3. Table 4-5 presents the results for the existing conditions traffic analysis with project alternative 3. A comparison between the existing condition without and with project alternative 3 is also provided. Figure 4-5 contains the traffic volumes used for the existing conditions with project alternative 3 analysis.

Table 4-5: LOS Analysis – Existing Conditions with Project Alternative 3

INTERSECTION		EXISTING WITHOUT PROJECT				EXISTING WITH PROJECT ALTERNATIVE 3				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
1	Coast Highway - I-5 Ramps / Harbor Drive	Signalized	AM	28.0	C	Signalized	AM	31.1	C	No
			PM	51.3	D		PM	51.3	D	No
2	Coast Highway - SR-76 Ramps	Signalized	AM	13.7	B	RBT	AM	3.1	A	No
			PM	37.1	D		PM	8.6	A	No
3	Surfrider Way - Pacific Street	AWSC	AM	8.5	A	AWSC	AM	8.5	A	No
			PM	11.2	B		PM	10.5	B	No
4	Coast Highway - Surfrider Way	Signalized	AM	10.4	B	Signalized	AM	11.4	B	No
			PM	14.4	B		PM	19.1	B	No
5	Coast Highway - Civic Center Drive	Signalized	AM	13.7	B	RBT	AM	6.1	A	No
			PM	15.1	B		PM	13.3	B	No
6	Coast Highway - Pier View Way	Signalized	AM	16.8	B	RBT	AM	5.6	A	No
			PM	16.6	B		PM	12.9	B	No
7	Pier View Way - Horne Street	AWSC	AM	8.7	A	AWSC	AM	8.7	A	No
			PM	11.9	B		PM	11.9	B	No
8	Mission Avenue - Pacific Street	AWSC	AM	7.9	A	AWSC	AM	7.9	A	No
			PM	10.1	B		PM	10	A	No
9	Mission Avenue - Cleveland Street	AWSC	AM	8.1	A	AWSC	AM	8.1	A	No
			PM	10.6	B		PM	10.6	B	No
10		Signalized	AM	13.1	B	Signalized	AM	8	A	No

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		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
	Coast Highway - Mission Avenue		PM	13.8	B		PM	12.2	B	No
11	Mission Avenue - Horne Street	Signalized	AM	7.4	A	Signalized	AM	6.7	A	No
			PM	18.9	B		PM	17.1	B	No
12	Seagaze Street - Tremont Street	SSSC	AM	3.3	A	SSSC	AM	9.1	A	No
			PM	11.5	B		PM	11.5	B	No
13	Coast Highway - Seagaze Street	Signalized	AM	14.7	B	Signalized	AM	16.1	B	No
			PM	23.9	C		PM	27.3	C	No
14	Seagaze Street - Freeman Street	SSSC	AM	10.3	A	SSSC	AM	10.3	B	No
			PM	15.6	C		PM	15.6	C	No
15	Seagaze Street - Ditmar Street	AWSC	AM	7.9	A	AWSC	AM	7.6	A	No
			PM	12.5	B		PM	12	B	No
16	Seagaze Street - Clementine Street	SSSC	AM	7.9	A	SSSC	AM	7.5	A	No
			PM	13.1	B		PM	8.3	A	No
17	Coast Highway - Missouri Avenue	SSSC	AM	12.0	B	SSSC	AM	10	A	No
			PM	23.9	C		PM	13.5	B	No
18	Coast Highway - Washington Avenue	SSSC	AM	11.3	B	RBT	AM	6.1	A	No
			PM	22.0	C		PM	13.2	B	No
19	Wisconsin Avenue - Pacific Street	AWSC	AM	8.1	A	AWSC	AM	7.8	A	No
			PM	9.8	A		PM	9.5	A	No
20	Wisconsin Avenue - Tremont Street	SSSC	AM	10.6	B	SSSC	AM	10.6	B	No
			PM	14.0	B		PM	14	B	No
21	Coast Highway - Wisconsin Avenue	Signalized	AM	8.9	A	RBT	AM	7	A	No
			PM	12.2	B		PM	22	C	No
22	Wisconsin Avenue - Freeman Street	SSSC	AM	9.1	A	SSSC	AM	9.1	A	No
			PM	9.7	A		PM	9.7	A	No
23	Wisconsin Avenue - Ditmar Street (North)	SSSC	AM	9.7	A	SSSC	AM	9.7	A	No
			PM	10.1	B		PM	10.1	B	No
24	Wisconsin Avenue - Ditmar Street (South)	AWSC	AM	7.5	A	AWSC	AM	7.3	A	No
			PM	7.9	A		PM	7.9	A	No
25	Oceanside Boulevard - Pacific Street	AWSC	AM	8.0	A	AWSC	AM	7.7	A	No
			PM	9.0	A		PM	8.7	A	No
26	Oceanside Boulevard - Tremont Street	SSSC	AM	10.9	B	SSSC	AM	11	B	No
			PM	14.7	B		PM	14.8	B	No
27	Coast Highway - Oceanside Boulevard	Signalized	AM	29.7	C	Signalized	AM	30.1	C	No
			PM	39.7	D		PM	41.2	D	No
28	Oceanside Boulevard - Ditmar Street	Signalized	AM	5.7	A	Signalized	AM	5.4	A	No
			PM	6.8	A		PM	5.9	A	No
29	Coast Highway - Morse Street	Signalized	AM	9.0	A	Signalized	AM	21	C	No
			PM	9.8	A		PM	10.1	A	No
30	Morse Street - Freeman Street	SSSC	AM	9.0	A	SSSC	AM	9	A	No
			PM	10.0	B		PM	10	B	No
31	Morse Street - Ditmar Street	SSSC	AM	8.8	A	SSSC	AM	8.8	A	No
			PM	9.2	A		PM	9.2	A	No

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INTERSECTION		EXISTING WITHOUT PROJECT				EXISTING WITH PROJECT ALTERNATIVE 3				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
32	Cassidy Street - Pacific Street	AWSC	AM	7.7	A	AWSC	AM	7.3	A	No
			PM	9.3	A		PM	8.7	A	No
33	Cassidy Street - Broadway Street	SSSC	AM	10.3	B	SSSC	AM	10.3	B	No
			PM	14.5	B		PM	14.5	B	No
34	Cassidy Street - Tremont Street	SSSC	AM	9.9	A	SSSC	AM	9.9	A	No
			PM	12.4	B		PM	12.4	B	No
35	Coast Highway - Cassidy Street	Signalized	AM	9.1	A	Signalized	AM	8.9	A	No
			PM	14.0	B		PM	13.2	B	No
36	Cassidy Street - Freeman Street	SSSC	AM	10.2	B	SSSC	AM	10.2	B	No
			PM	12.7	B		PM	12.7	B	No
37	Cassidy Street - Ditmar Street	AWSC	AM	8.1	A	AWSC	AM	7.9	A	No
			PM	9.5	A		PM	9	A	No
38	Cassidy Street - Stewart Street	AWSC	AM	9.3	A	AWSC	AM	8.9	A	No
			PM	13.2	B		PM	12	B	No
39	Vista Way - Broadway Street	SSSC	AM	7.4	A	SSSC	AM	7.4	A	No
			PM	7.6	A		PM	7.6	A	No
40	Coast Highway - Vista Way	Signalized	AM	22.7	C	Signalized	AM	23.4	C	No
			PM	37.0	D		PM	39.5	D	No
41	Vista Way - Freeman Street	SSSC	AM	12.2	B	SSSC	AM	12.2	B	No
			PM	15.3	C		PM	15.3	C	No
42	Vista Way - Ditmar Street	SSSC	AM	13.0	B	SSSC	AM	13	B	No
			PM	18.7	C		PM	18.7	C	No
43	Vista Way - Stewart Street	SSSC	AM	12.3	B	SSSC	AM	12.3	B	No
			PM	17.4	C		PM	17.4	C	No
44	Coast Highway - Eaton Street	SSSC	AM	12.8	B	SSSC	AM	13.1	B	No
			PM	14.3	B		PM	14.5	B	No
45	Coast Highway - Michigan Avenue	Signalized	AM	7.3	A	RBT	AM	6.7	A	No
			PM	9.0	A		PM	22.5	C	No
46	Coast Highway - West Street	SSSC	AM	--	--	RBT	AM	--	--	--
			PM	--	--		PM	--	--	--
47	Coast Highway - Kelly Street	SSSC	AM	--	--	SSSC	AM	--	--	--
			PM	--	--		PM	--	--	--
48	Harbor/Vandergrift Blvd - I-5 NB On-Ramp/San Rafael Drive	Signalized	AM	17.6	B	Signalized	AM	17.6	B	No
			PM	22.7	C		PM	22.7	C	No
49	SR-76 - I-5 SB On-Ramp	Signalized	AM	8.9	A	Signalized	AM	8.5	A	No
			PM	7.0	A		PM	6.8	A	No
50	SR-76 - I-5 NB On/Off-Ramp	Signalized	AM	22.4	C	Signalized	AM	37.4	D	Yes
			PM	25.9	C		PM	22.5	C	No
51	Mission - I-5 SB Off-Ramp	Signalized	AM	14.7	B	Signalized	AM	14.2	B	No
			PM	20.7	C		PM	17.7	B	No
52	Oceanside - I-5 SB On/Off-Ramp	Signalized	AM	39.3	D	Signalized	AM	36.4	D	No
			PM	65.3	E		PM	56.3	D	No
53	Oceanside - I-5 NB On/Off-Ramp	Signalized	AM	38.3	D	Signalized	AM	34.5	C	No
			PM	52.4	D		PM	58.7	E	Yes

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INTERSECTION		EXISTING WITHOUT PROJECT				EXISTING WITH PROJECT ALTERNATIVE 3				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
54	California - I-5 NB On-Ramp	AWSC	AM	9.2	A	AWSC	AM	9.5	A	No
			PM	8.5	A		PM	8.5	A	No
55	Cassidy - I-5 SB On/Off-Ramp	SSSC	AM	8.9	A	SSSC	AM	8.9	A	No
			PM	8.7	A		PM	8.7	A	No
56	Vista Way - I-5 SB On/Off Ramp	Signalized	AM	11.0	B	Signalized	AM	11.0	B	No
			PM	11.2	B		PM	11.2	B	No

Notes:

A. Delay is expressed as an average seconds of delay per vehicle

B. LOS – Level of Service

C. AWSC – All-way stop control intersection

D. SSSC – Side-street stop control intersection

E. RBT – Roundabout

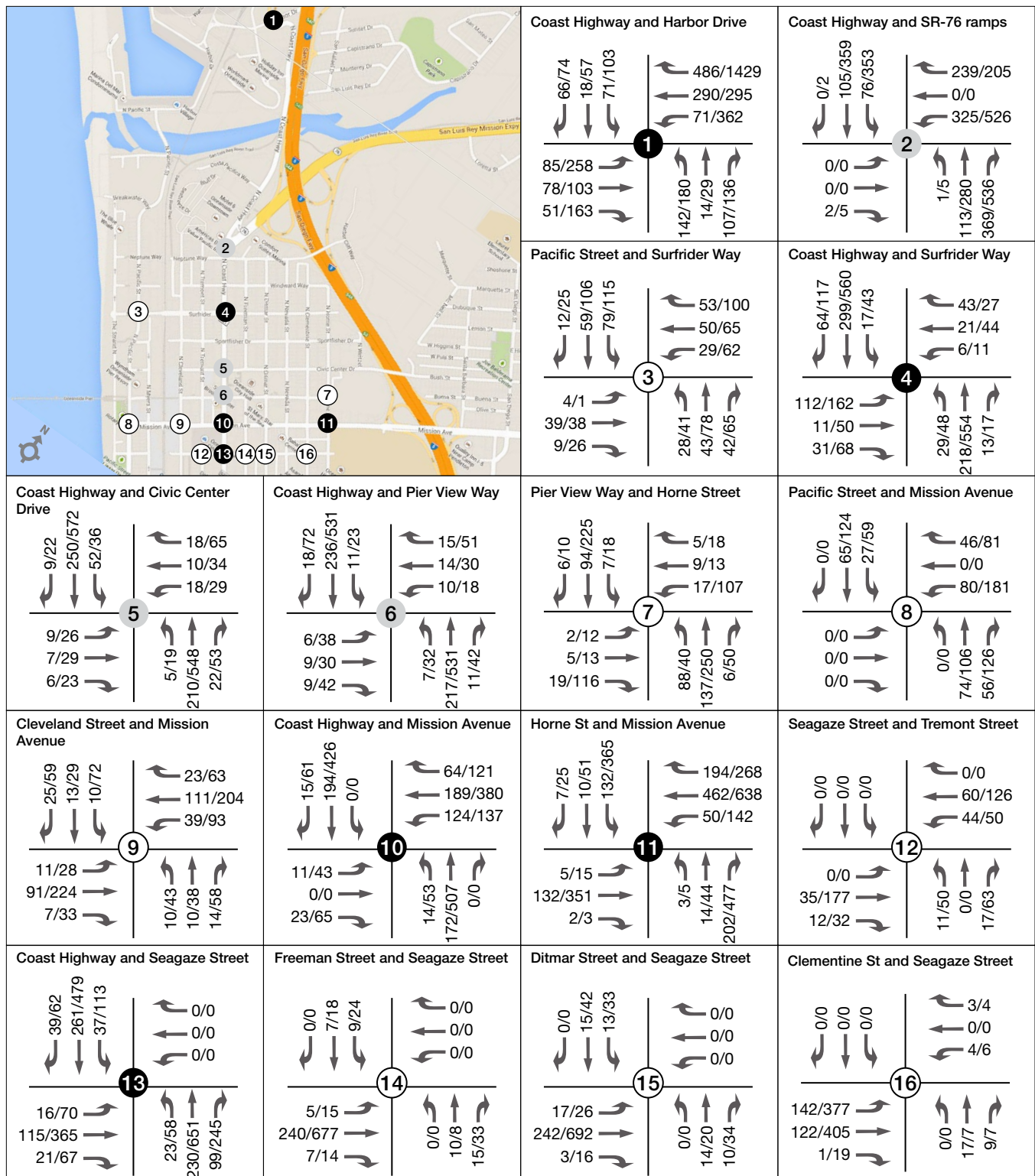
F. The minimum acceptable LOS is "D" for intersections 1-47

G. The minimum acceptable LOS is "D"; a change from C or D to a lower LOS will cause an impact for intersections 48-56

H. Existing volumes not available for Int 46 and Int 47

It is worth mentioning that delay and LOS does not change for several study intersections since project changes are mainly along Coast Highway. Therefore, intersections outside of Coast Highway will not be affected. All other intersections are not impacted by the proposed project alternative 3.

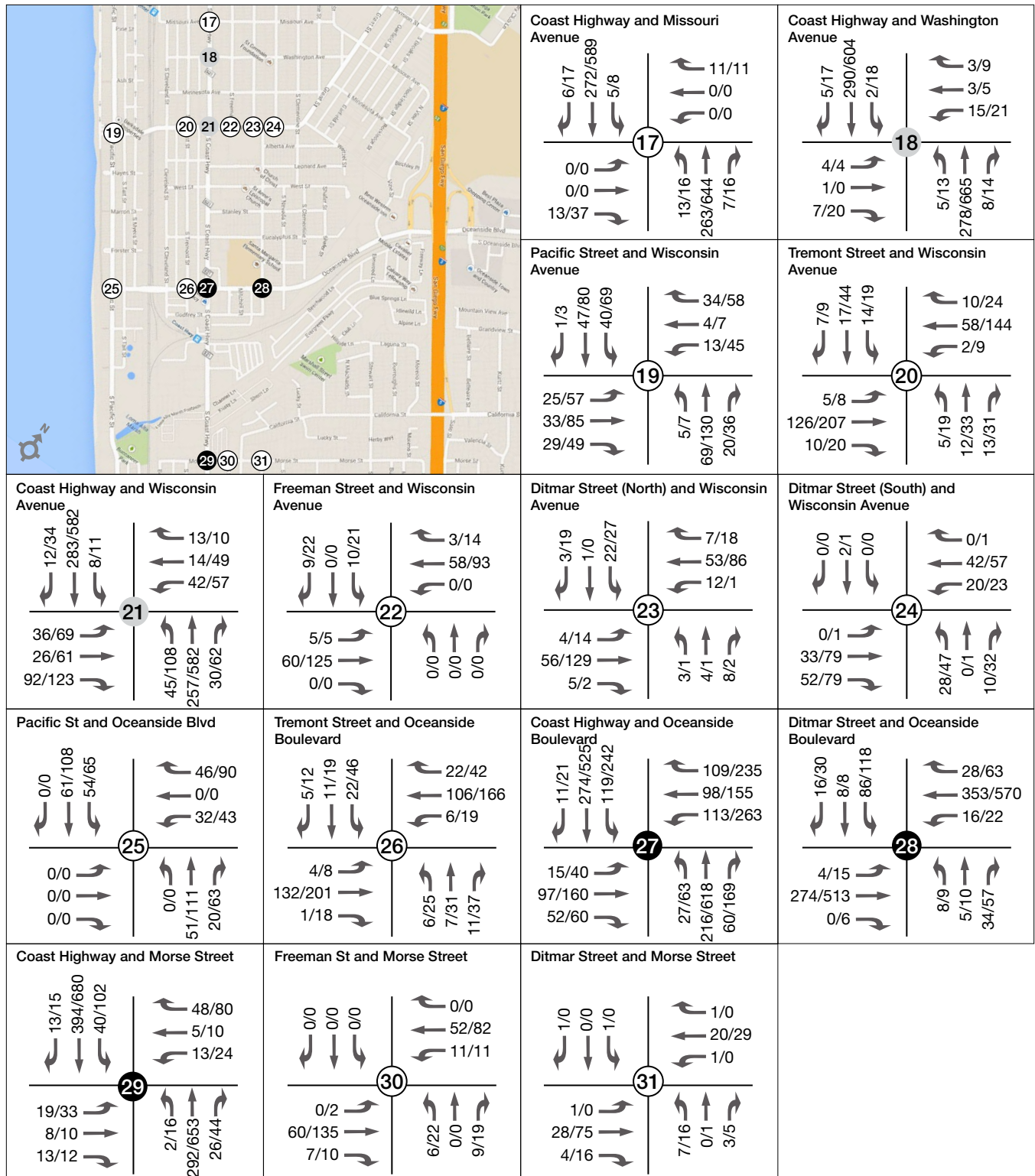
Figure 4-5a Existing with Project Alternative 3 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

Figure 4-5b Existing with Project Alternative 3 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

Figure 4-5c Existing with Project Alternative 2 Peak Hour Volumes - AM & PM

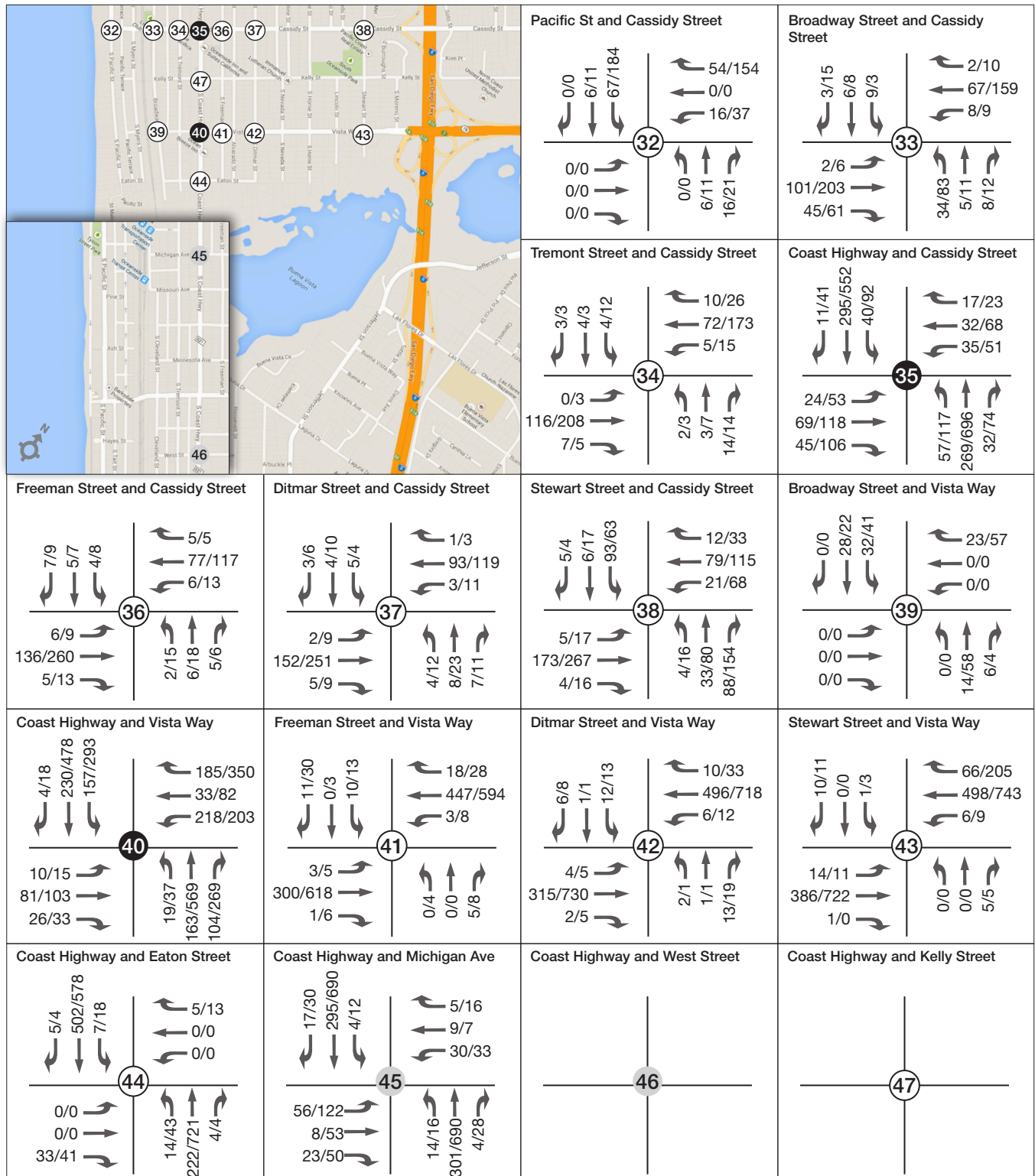
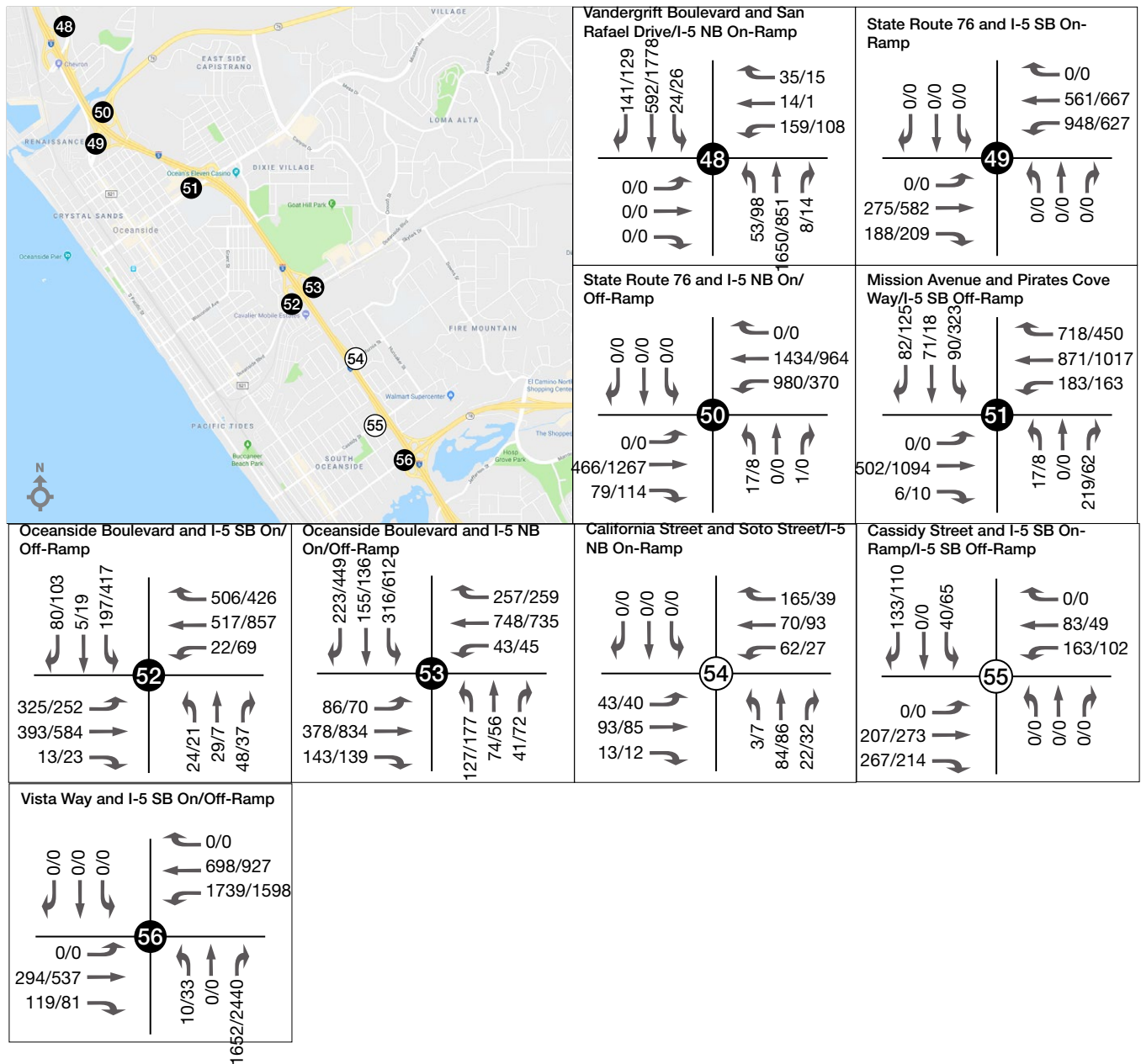


Figure 4-5d Existing with Project Alternative 3 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ##/## AM/PM Turning Movement Volume

5 Future 2035 Conditions

This section provides a review of the future (2035) roadway system in the study area, the traffic volumes for the study intersections and key road segments, and presents the level of service analyses for the future (2035) conditions scenario.

As discussed in Section 2, the proposed project would transform Coast Highway into a complete street that accommodates all modes of travel in a safe and efficient manner. The key elements of the proposed project include a continuous Class II striped bicycle lane from Harbor Drive to the South City Limit, additional mid-block crosswalks, roundabouts in place of traffic signals, and other enhancements to landscaping and/or the roadway.

It is important to note, the future (2035) roadway system assumes buildout of the Vista Way/SR-78 & I-5 Interchange project which includes HOV lanes and ramps. To provide a complete and comprehensive approach, analyses were also conducted without the buildout of the Vista Way/SR-78 & I-5 Interchange project which does not include HOV lanes and ramps (existing configuration) for each of the analysis scenarios (No Project, With Project, Alternative 1, Alternative 2, and Alternative 3). The buildout and existing Vista Way/SR-78 & I-5 Interchange configurations are listed below:

- Existing Vista Way/SR-78 & I-5 Interchange
 - o I-5 on/off-ramps and general lanes
 - I-5 HOV lanes terminate just north of SR-78 interchange
 - o SR-78 general lanes
 - o I-5 NB and SR-78 ramps
- Buildout Vista Way/SR-78 & I-5 Interchange
 - o I-5 on/off-ramps and general lanes/HOV lanes
 - I-5 HOV lanes throughout City of Oceanside
 - o SR-78 general lanes/HOV lanes
 - o I-5 NB and SR-78 ramps/HOV ramps

This section covers the following scenarios:

- Future Baseline (No Project) Conditions – Year 2035 analysis without project including:
 - o Four-lane roadway throughout the Coast Highway corridor
 - o General Plan land uses consistent with SANDAG's 2035 growth forecast
- Future Conditions with Project – Year 2035 analysis with project including:
 - o Two-lane roadway throughout the Coast Highway corridor with roundabouts
 - o Modified Vision Plan land uses
- Future Conditions with Project Alternative 1 – Year 2035 analysis with project including:
 - o Two-lane roadway with roundabouts from Harbor Blvd to Oceanside Blvd and four-lane roadway with traffic signals south of Oceanside Blvd
 - o Modified Vision Plan land uses
- Future Conditions with Project Alternative 2 – Year 2035 analysis with project including:

- o Two-lane roadway with roundabouts from Harbor Blvd to Morse St and four-lane roadway with traffic signals south of Morse St
- o Modified Vision Plan land uses
- Future Conditions with Project Alternative 3 – Year 2035 analysis with project including:
 - o Two-lane roadway with roundabouts from Harbor Blvd to Morse Street and four-lane roadway with traffic signals south of Morse Street
 - o Modified Vision Plan land uses north of Morse Street
 - o General Plan land uses south of Morse St

5.1 Year 2035 Future Baseline (No Project) – General Plan

This section examines traffic conditions without the Coast Highway Corridor Project and includes 4 lanes throughout the corridor. The analysis was conducted for Future (2035) under the adopted General Plan conditions.

5.1.1 Road Segment Volumes

Road segment volumes have been included in Appendix A for use in noise modeling purposes. Future road segment volumes are extracted from SANDAG's regional model. In addition to a review of daily ADT volumes, peak hour roadway volumes are also provided for reference in Appendix A. Peak hour roadway volumes can provide a more appropriate depiction of traffic conditions compared with daily roadway capacity.

5.1.2 Intersection Level of Service

The intersection operations analysis for the future condition without project was performed consistent with the methodology outlined in Section 3. Of the 56 intersections analyzed in the study area, two intersections are projected to operate at a LOS of E or F. Table 5-1 presents the results for the future conditions traffic analysis without the proposed project. Figure 5-1 contains the traffic volumes used for the future condition analysis.

Table 5-1: LOS Analysis – Future Conditions without Project

INTERSECTION		TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
			Delay (s)	LOS	Delay (s)	LOS
1	Coast Highway - I-5 Ramps / Harbor Drive	Signalized	30.4	C	65.3	E
2	Coast Highway - SR-76 Ramps	Signalized	13.3	B	27.7	C
3	Surfrider Way - Pacific Street	AWSC	9.7	A	14.5	B
4	Coast Highway - Surfrider Way	Signalized	12.8	B	15.6	B
5	Coast Highway - Civic Center Drive	Signalized	26.8	C	14.6	B
6	Coast Highway - Pier View Way	Signalized	13.6	B	12.5	B
7	Pier View Way - Horne Street	AWSC	9.2	A	15.6	C
8	Mission Avenue - Pacific Street	AWSC	9.2	A	17.3	C
9	Mission Avenue - Cleveland Street	Signalized	30.4	C	18.5	B
10	Coast Highway - Mission Avenue	Signalized	10.6	B	14.0	B
11	Mission Avenue - Horne Street	Signalized	7.1	A	12.1	B
12	Seagaze Street - Tremont Street	SSSC	10.1	B	22.2	C
13	Coast Highway - Seagaze Street	Signalized	18.7	B	23.9	C
14	Seagaze Street - Freeman Street	SSSC	10.0	B	14.4	B
15	Seagaze Street - Ditmar Street	AWSC	8.5	A	33.3	D

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	INTERSECTION	TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
			Delay (s)	LOS	Delay (s)	LOS
16	Seagaze Street - Clementine Street	SSSC	8.1	A	14.1	B
17	Coast Highway - Missouri Avenue	SSSC	13.1	B	33.7	D
18	Coast Highway - Washington Avenue	SSSC	12.4	B	31.9	D
19	Wisconsin Avenue - Pacific Street	AWSC	9.7	A	28.7	D
20	Wisconsin Avenue - Tremont Street	SSSC	11.5	B	18.4	C
21	Coast Highway - Wisconsin Avenue	Signalized	10.6	B	19.3	B
22	Wisconsin Avenue - Freeman Street	SSSC	9.0	A	9.5	A
23	Wisconsin Avenue - Ditmar Street (North)	SSSC	9.6	A	9.8	A
24	Wisconsin Avenue - Ditmar Street (South)	AWSC	7.5	A	7.8	A
25	Oceanside Boulevard - Pacific Street	AWSC	8.4	A	9.8	A
26	Oceanside Boulevard - Tremont Street	SSSC	12.4	B	24.6	C
27	Coast Highway - Oceanside Boulevard	Signalized	16.4	B	58.5	E
28	Oceanside Boulevard - Ditmar Street	Signalized	19.1	B	8.1	A
29	Coast Highway - Morse Street	Signalized	16.4	B	15.5	B
30	Morse Street - Freeman Street	SSSC	9.8	A	13.1	B
31	Morse Street - Ditmar Street	SSSC	9.1	A	10.0	B
32	Cassidy Street - Pacific Street	AWSC	8.1	A	11.1	B
33	Cassidy Street - Broadway Street	SSSC	11.5	B	23.8	C
34	Cassidy Street - Tremont Street	SSSC	10.1	B	13.1	B
35	Coast Highway - Cassidy Street	Signalized	15.5	B	19.6	B
36	Cassidy Street - Freeman Street	SSSC	11.7	B	21.2	C
37	Cassidy Street - Ditmar Street	AWSC	8.7	A	11.6	B
38	Cassidy Street - Stewart Street	AWSC	11.0	B	24.5	C
39	Vista Way - Broadway Street	SSSC	7.8	A	8.2	A
40	Coast Highway - Vista Way	Signalized	25.0	C	45.1	D
41	Vista Way - Freeman Street	SSSC	13.5	B	20.0	C
42	Vista Way - Ditmar Street	SSSC	14.8	B	25.0	D
43	Vista Way - Stewart Street	SSSC	13.2	B	20.2	C
44	Coast Highway - Eaton Street	SSSC	14.4	B	16.2	C
45	Coast Highway - Michigan Avenue	Signalized	7.5	A	6.6	A
46	Coast Highway - West Street	SSSC	11.4	B	18.0	C
47	Coast Highway - Kelly Street	SSSC	10.2	B	13.9	B
48	Harbor/Vandegrift Blvd - I-5 NB On-Ramp/San Rafael Drive	Signalized	15	B	36.6	D
49	SR-76 - I-5 SB On-Ramp	Signalized	4.8	A	4.5	A
50	SR-76 - I-5 NB On/Off-Ramp	Signalized	21.5	C	22.4	C
51	Mission - I-5 SB Off-Ramp	Signalized	1.5	B	13.5	B
52	Oceanside - I-5 SB On/Off-Ramp	Signalized	43.5	D	42.4	D
53	Oceanside - I-5 NB On/Off-Ramp	Signalized	39.8	D	65.3	E
54	California - I-5 NB On-Ramp	AWSC	7.6	A	7.5	A
55	Cassidy - I-5 SB On/Off-Ramp	SSSC	9.2	A	9.3	A
56	Vista Way - I-5 SB On/Off-Ramp	Signalized	20.4	C	25.7	C

Notes:

A. Delay is expressed as an average seconds of delay per vehicle

B. LOS – Level of Service

C. AWSC – All-way stop control intersection

D. SSSC – Side-street stop control intersection

E. The minimum acceptable LOS is "D" for intersections 1-47

F. The minimum acceptable LOS is "D"; a change from C or D to a lower LOS will cause an impact for intersections 48-56

Two intersections were identified to operate below the minimum acceptable LOS D during the PM peak hour in the future baseline condition. The following intersections each would operate worse than LOS D for the PM period.

- Coast Highway and Harbor Drive / I-5 Ramps (#1)
- Coast Highway and Oceanside Boulevard (#27)
- Oceanside Boulevard and I-5 NB On-/Off-Ramp (#53)

All other intersections would operate at LOS D or better during both peak hours.

5.1.3 Vista Way/SR-78 & I-5 Existing Configuration

This section examines traffic conditions with the Coast Highway Corridor Project which includes 4 lanes throughout the corridor and assumes existing network conditions for the Vista Way/SR-78 and I-5 Interchange. The analysis was conducted for future (2035) conditions.

5.1.3.1 Road Segment Volumes

Road segment volumes have been included in Appendix A for use in noise modeling purposes. Future road segment volumes are extracted from SANDAG's regional model. In addition to a review of daily ADT volumes, peak hour roadway volumes are also provided for reference in Appendix A. Peak hour roadway volumes can provide a more appropriate depiction of traffic conditions compared with daily roadway capacity.

5.1.3.2 Intersection Level of Service

The intersection operations analysis for the future condition without project was performed consistent with the methodology outlined in Section 3. Table 5-2 presents the results for the future conditions traffic analysis without the proposed project under existing Vista Way/SR-78 & I-5 Interchange configuration. Figure 5-2 contains the traffic volumes used for the future condition analysis.

Table 5-2 presents the results for the future conditions traffic analysis without the proposed project. Figure 5-2 contains the traffic volumes used for the future condition analysis.

Table 5-2: LOS Analysis – Future Conditions without Project (Existing SR-78)

INTERSECTION		TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
			Delay (s)	LOS	Delay (s)	LOS
1	Coast Highway - I-5 Ramps / Harbor Drive	Signalized	31.1	C	68.9	E
2	Coast Highway - SR-76 Ramps	Signalized	12.7	B	25.6	C
3	Surfrider Way - Pacific Street	AWSC	10.4	B	19.5	C
4	Coast Highway - Surfrider Way	Signalized	16.4	B	17.1	B
5	Coast Highway - Civic Center Drive	Signalized	13.2	B	15.6	B
6	Coast Highway - Pier View Way	Signalized	19.2	B	8.7	A
7	Pier View Way - Horne Street	AWSC	9.4	A	17.6	C
8	Mission Avenue - Pacific Street	AWSC	9.5	A	19.4	C
9	Mission Avenue - Cleveland Street	Signalized	18.8	B	17.7	B
10	Coast Highway - Mission Avenue	Signalized	12	B	12.8	B
11	Mission Avenue - Horne Street	Signalized	6.9	A	10.7	B
12	Seagaze Street - Tremont Street	SSSC	9.8	A	17.1	C
13	Coast Highway - Seagaze Street	Signalized	15.8	B	22.7	C
14	Seagaze Street - Freeman Street	SSSC	10.1	B	15	B
15	Seagaze Street - Ditmar Street	AWSC	8.6	A	30.2	D
16	Seagaze Street - Clementine Street	SSSC	8.3	A	17.7	C
17	Coast Highway - Missouri Avenue	SSSC	10.8	B	15.7	C
18	Coast Highway - Washington Avenue	SSSC	9.9	A	13.8	B
19	Wisconsin Avenue - Pacific Street	AWSC	10.1	B	51.3	F
20	Wisconsin Avenue - Tremont Street	SSSC	10.8	B	14.9	B
21	Coast Highway - Wisconsin Avenue	Signalized	14.5	B	24.5	C
22	Wisconsin Avenue - Freeman Street	SSSC	11.5	B	19.4	C
23	Wisconsin Avenue - Ditmar Street (North)	SSSC	13.2	B	17.9	C

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	INTERSECTION	TRAFFIC CONTROL	AM PEAK HOUR		PM PEAK HOUR	
			Delay (s)	LOS	Delay (s)	LOS
24	Wisconsin Avenue - Ditmar Street (South)	AWSC	9.5	A	23.7	C
25	Oceanside Boulevard - Pacific Street	AWSC	9.1	A	12.1	B
26	Oceanside Boulevard - Tremont Street	SSSC	14.3	B	91	F
27	Coast Highway - Oceanside Boulevard	Signalized	26.2	C	32.1	C
28	Oceanside Boulevard - Ditmar Street	Signalized	14.9	B	15.3	B
29	Coast Highway - Morse Street	Signalized	19.6	B	22.9	C
30	Morse Street - Freeman Street	SSSC	12.9	B	112.9	F
31	Morse Street - Ditmar Street	SSSC	9.5	A	11.5	B
32	Cassidy Street - Pacific Street	AWSC	8.6	A	16.8	C
33	Cassidy Street - Broadway Street	SSSC	16	C	397.4	F
34	Cassidy Street - Tremont Street	SSSC	10.1	B	13.1	B
35	Coast Highway - Cassidy Street	Signalized	18.5	B	20	C
36	Cassidy Street - Freeman Street	SSSC	21.4	C	OVF	F
37	Cassidy Street - Ditmar Street	AWSC	7.6	A	8.6	A
38	Cassidy Street - Stewart Street	AWSC	9.2	A	13.8	B
39	Vista Way - Broadway Street	SSSC	8.5	A	9.4	A
40	Coast Highway - Vista Way	Signalized	32.8	C	78.9	E
41	Vista Way - Freeman Street	SSSC	34	D	OVF	F
42	Vista Way - Ditmar Street	SSSC	26.2	D	294.2	F
43	Vista Way - Stewart Street	SSSC	22	C	69.1	F
44	Coast Highway - Eaton Street	SSSC	14.9	B	17.4	C
45	Coast Highway - Michigan Avenue	Signalized	4.7	A	5.4	A
46	Coast Highway - West Street	SSSC	9.6	A	11.2	B
47	Coast Highway - Kelly Street	SSSC	10	B	12.7	B
48	Harbor/Vandegrift Blvd - I-5 NB On-Ramp/San Rafael Drive	Signalized	15	B	37.4	D
49	SR-76 - I-5 SB On-Ramp	Signalized	4.9	A	4.5	A
50	SR-76 - I-5 NB On/Off-Ramp	Signalized	25.4	C	27.8	C
51	Mission - I-5 SB Off-Ramp	Signalized	11.6	B	13.8	BC
52	Oceanside - I-5 SB On/Off-Ramp	Signalized	50.2	D	42.6	D
53	Oceanside - I-5 NB On/Off-Ramp	Signalized	37.7	D	65.7	E
54	California - I-5 NB On-Ramp	AWSC	7.6	A	7.6	A
55	Cassidy - I-5 SB On/Off-Ramp	SSSC	9.3	A	9.5	A
56	Vista Way - I-5 SB On/Off-Ramp	Signalized	25.8	C	88	F

Notes:

A. Delay is expressed as an average seconds of delay per vehicle

B. LOS – Level of Service

C. AWSC – All-way stop control intersection

D. SSSC – Side-street stop control intersection

E. OVF – Overflow, Synchro is unable to calculate a level of delay

F. RBT – Roundabout

G. The minimum acceptable LOS is "D" for intersections 1-47

H. The minimum acceptable LOS is "D"; a change from C or D to a lower LOS will cause an impact for intersections 48-56

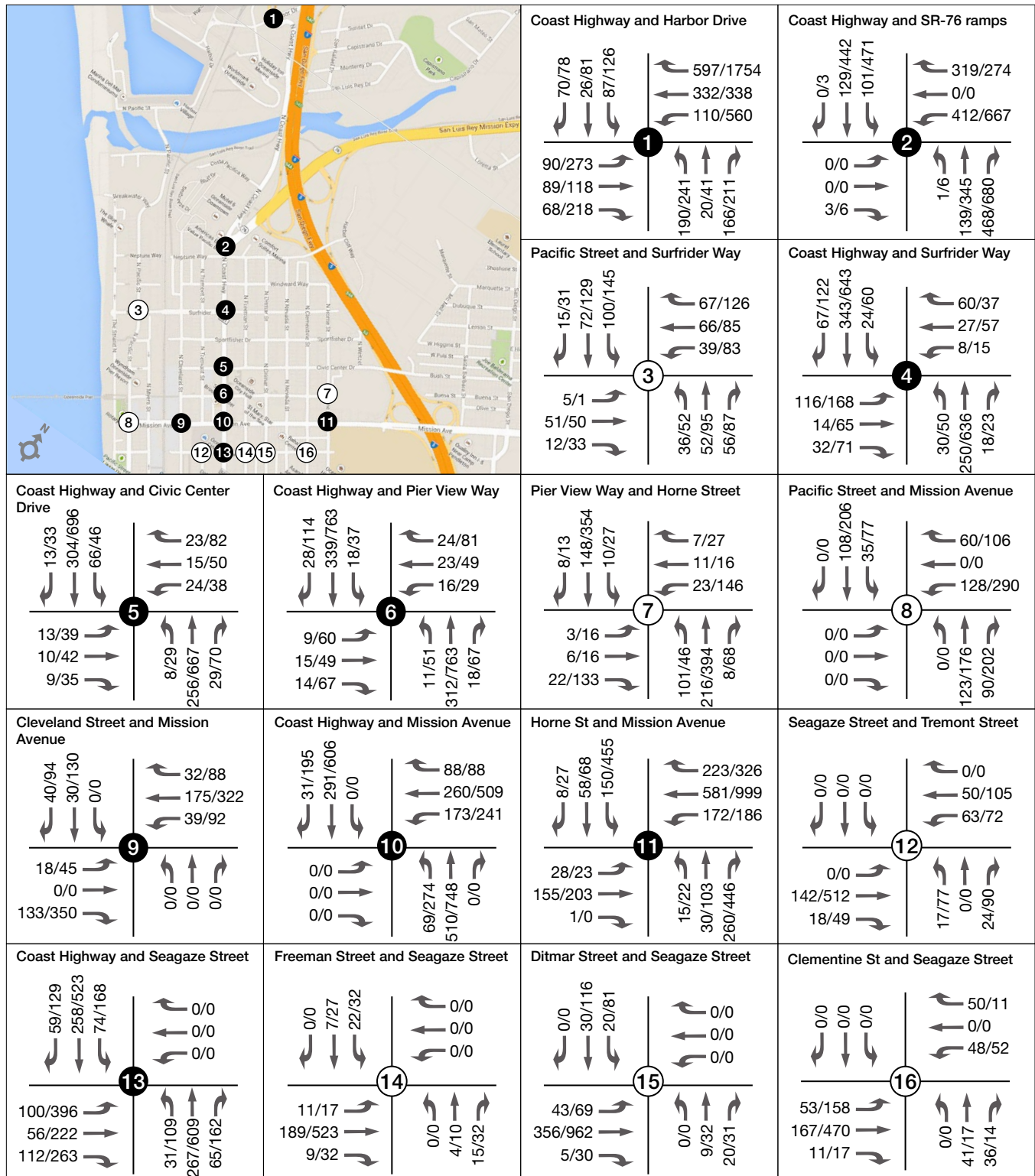
Eleven intersections were identified to operate below the minimum acceptable LOS D during the PM peak hour in the future baseline condition. The following intersections each would operate worse than LOS D for the PM period.

- Coast Highway and Harbor Drive / I-5 Ramps (#1)
- Wisconsin Avenue and Pacific Street (#19)

- Oceanside Boulevard and Tremont Street (#26)
- Morse Street and Freeman Street (#30)
- Cassidy Street and Broadway Street (#33)
- Cassidy Street - Freeman Street (#36)
- Coast Highway and Vista Way (#40)
- Vista Way and Freeman Street (#41)
- Vista Way and Ditmar Street (#42)
- Vista Way and Stewart Street (#43)
- Oceanside Boulevard and I-5 NB On-/Off-Ramp (#53)
- Vista Way and I-5 SB On/Off-Ramp (#56)

All other intersections would operate at LOS D or better during both peak hours.

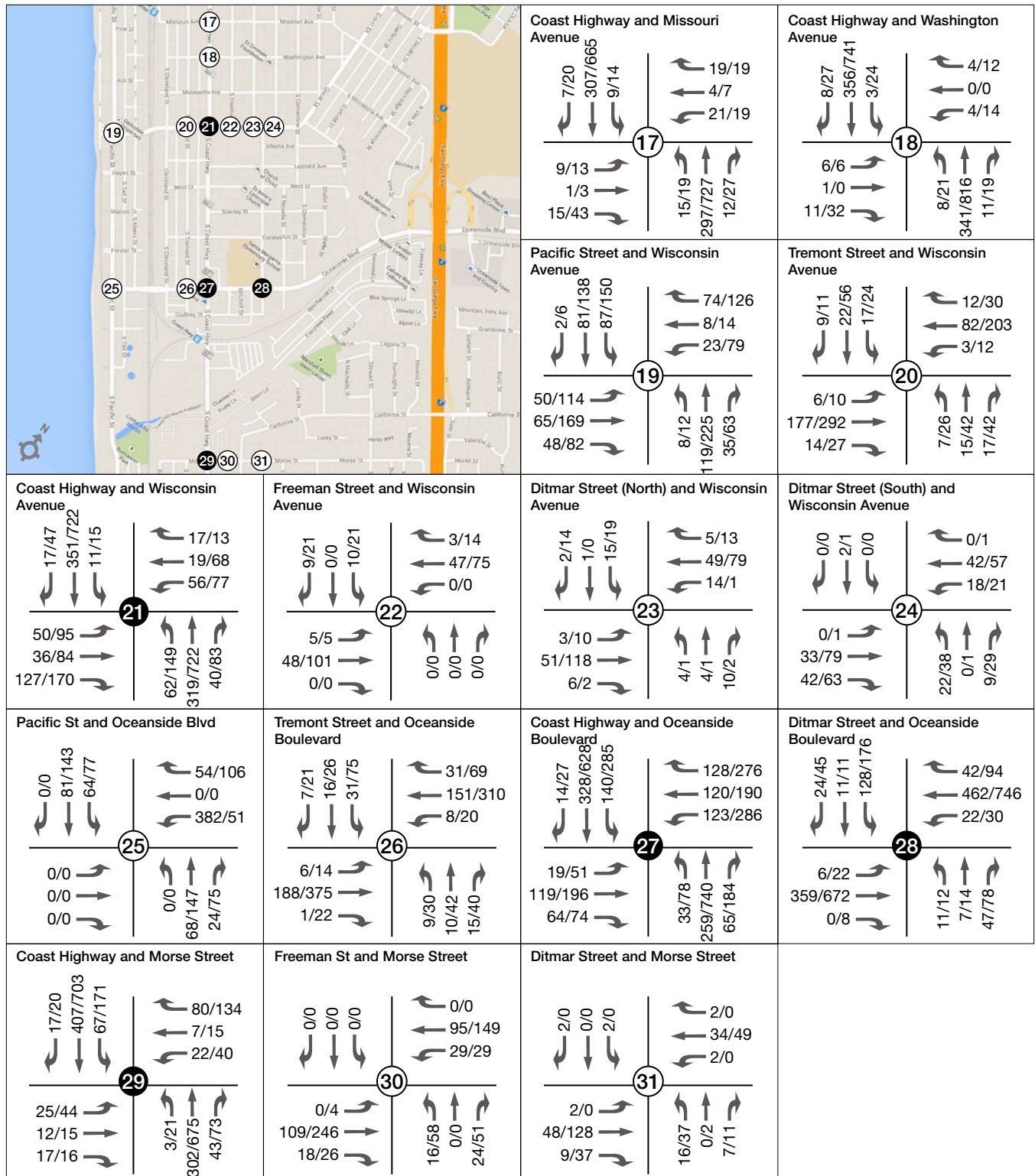
Figure 5-1a Future (No Project) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ###/### AM/PM Turning Movement Volume

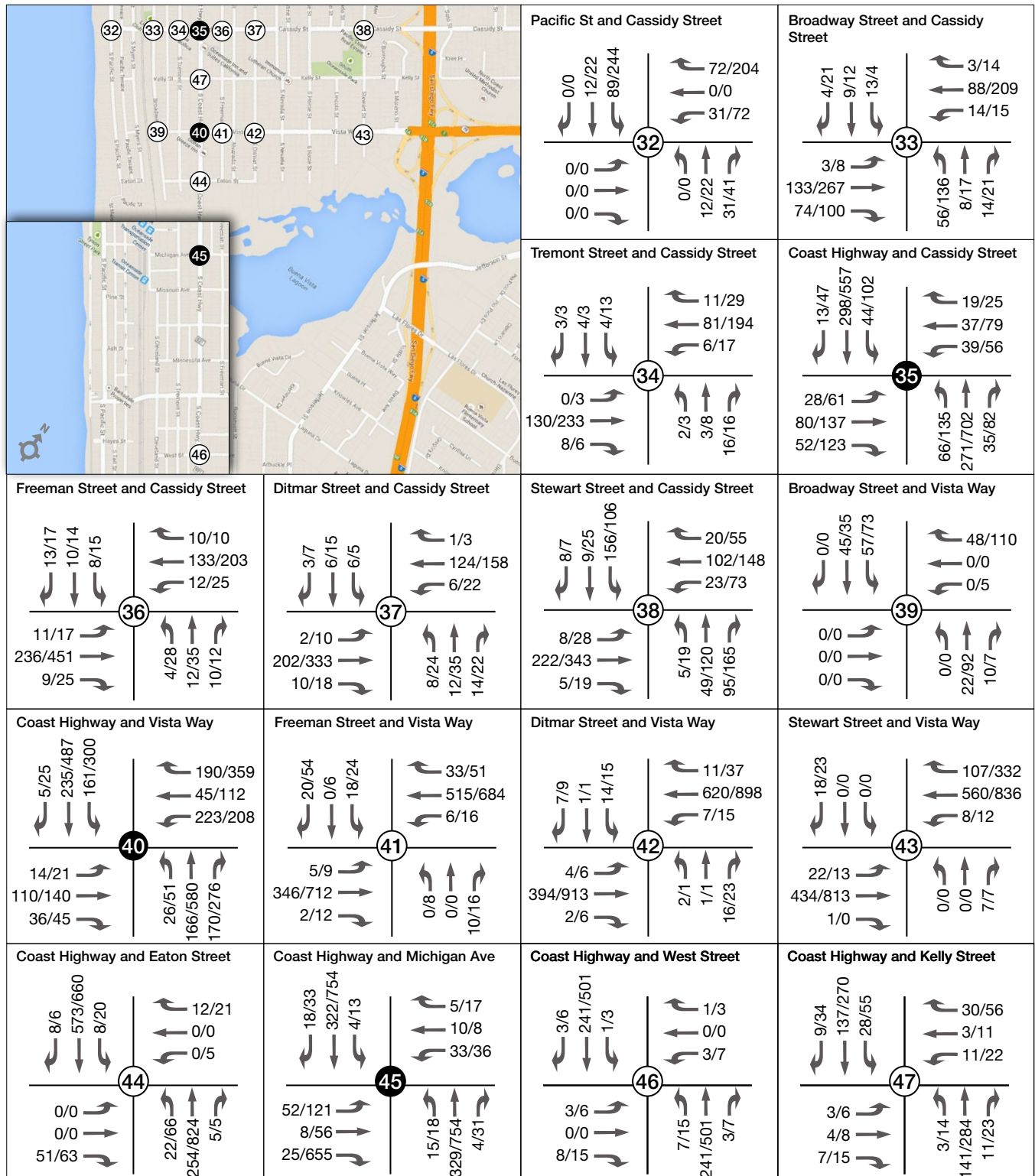
Figure 5-1b Future (No Project) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ###/### AM/PM Turning Movement Volume

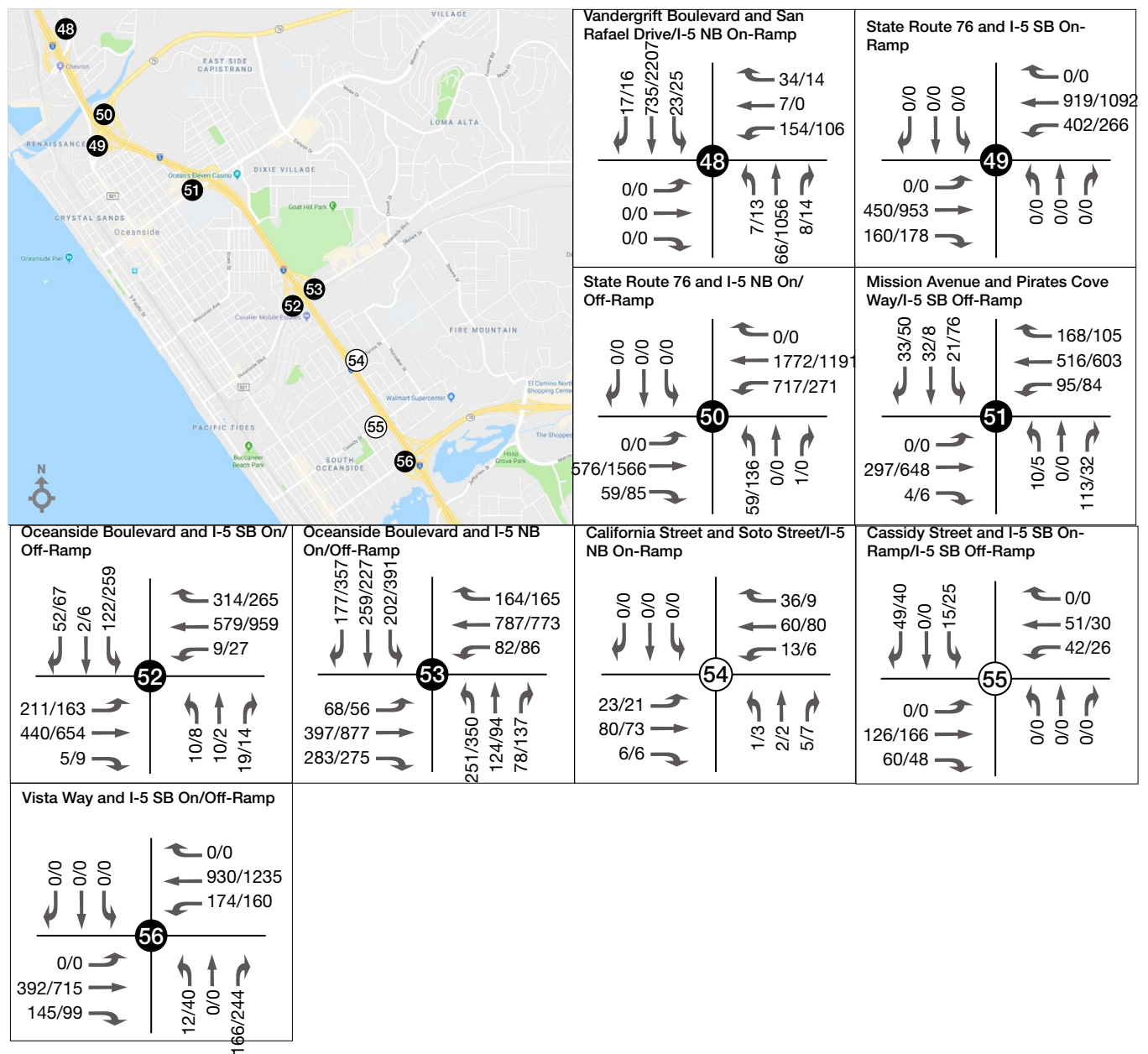
Figure 5-1c Future (No Project) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ###/### AM/PM Turning Movement Volume

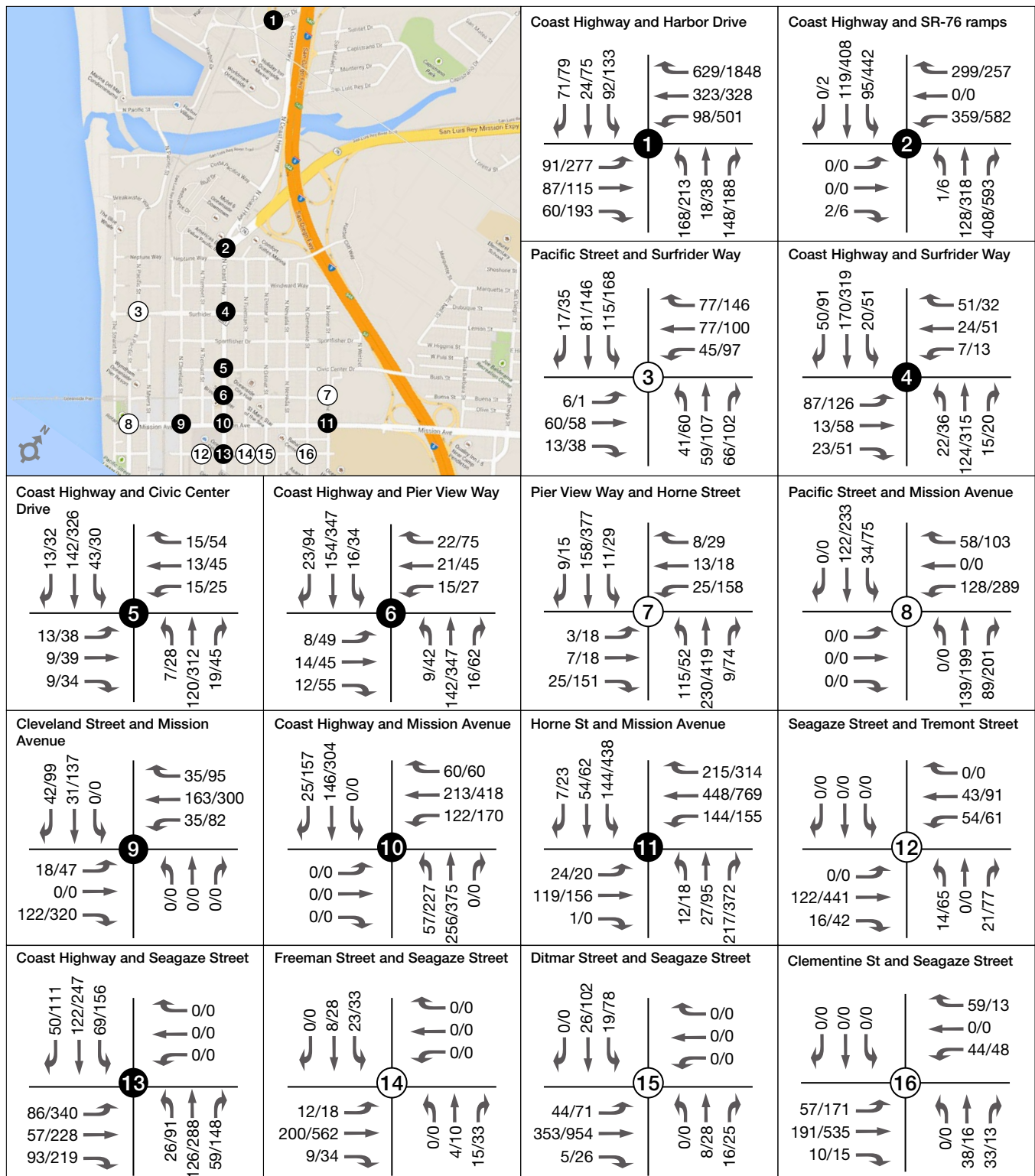
Figure 5-1d Future (No Project) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ###/### AM/PM Turning Movement Volume

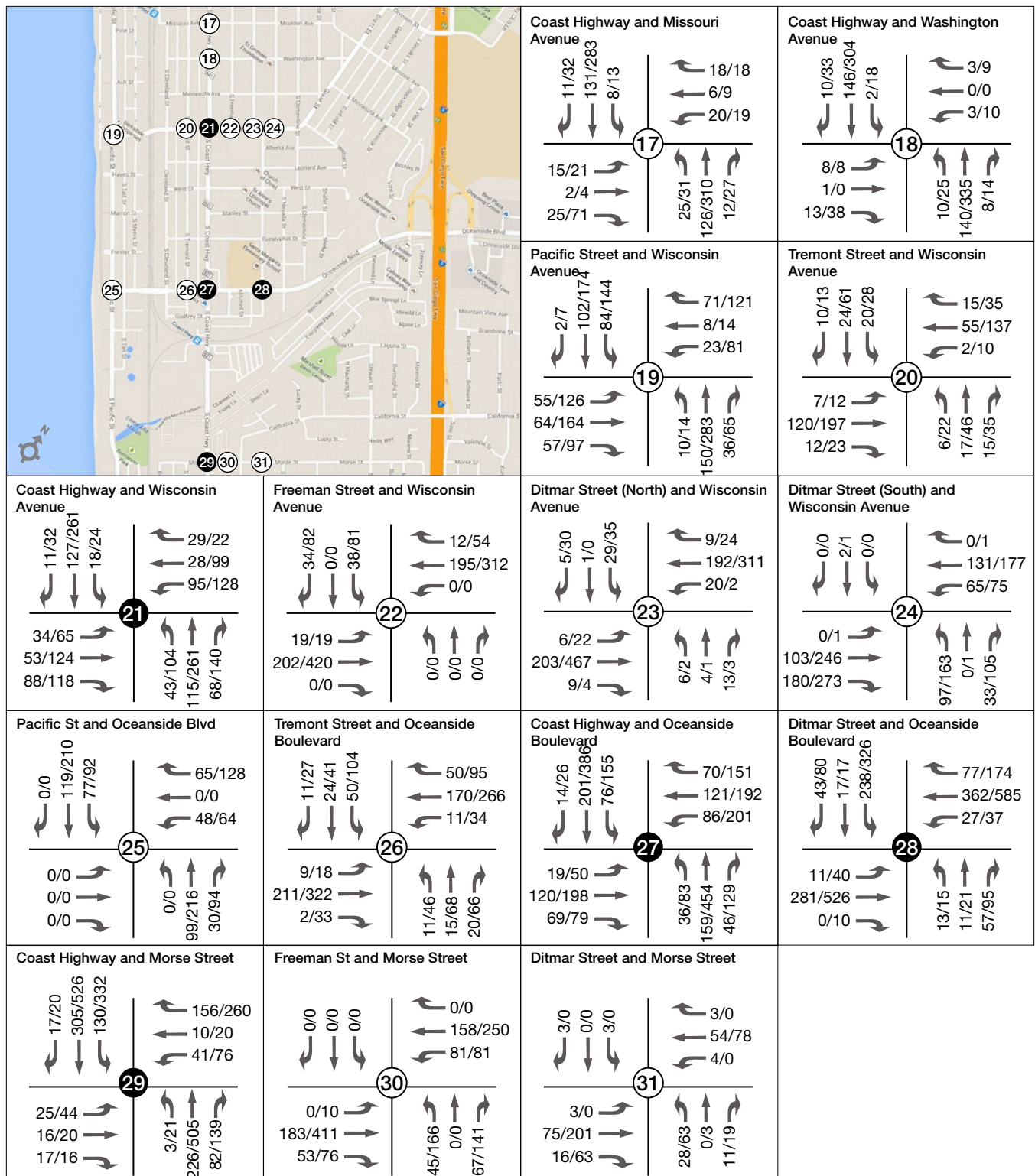
Figure 5-2a Future (No Project) Existing SR-78 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ###/### AM/PM Turning Movement Volume

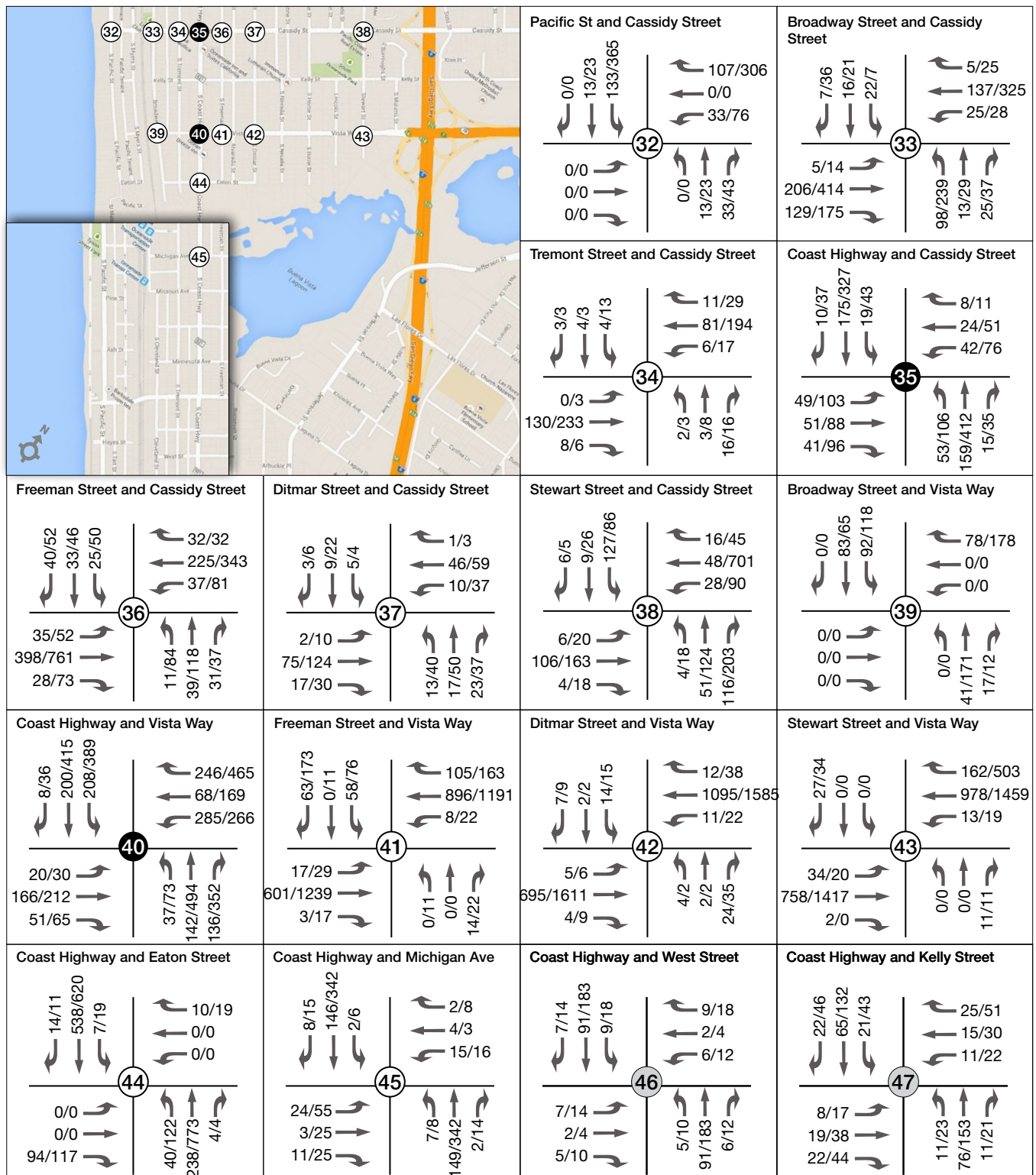
Figure 5-2b Future (No Project) Existing SR-78 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ###/### AM/PM Turning Movement Volume

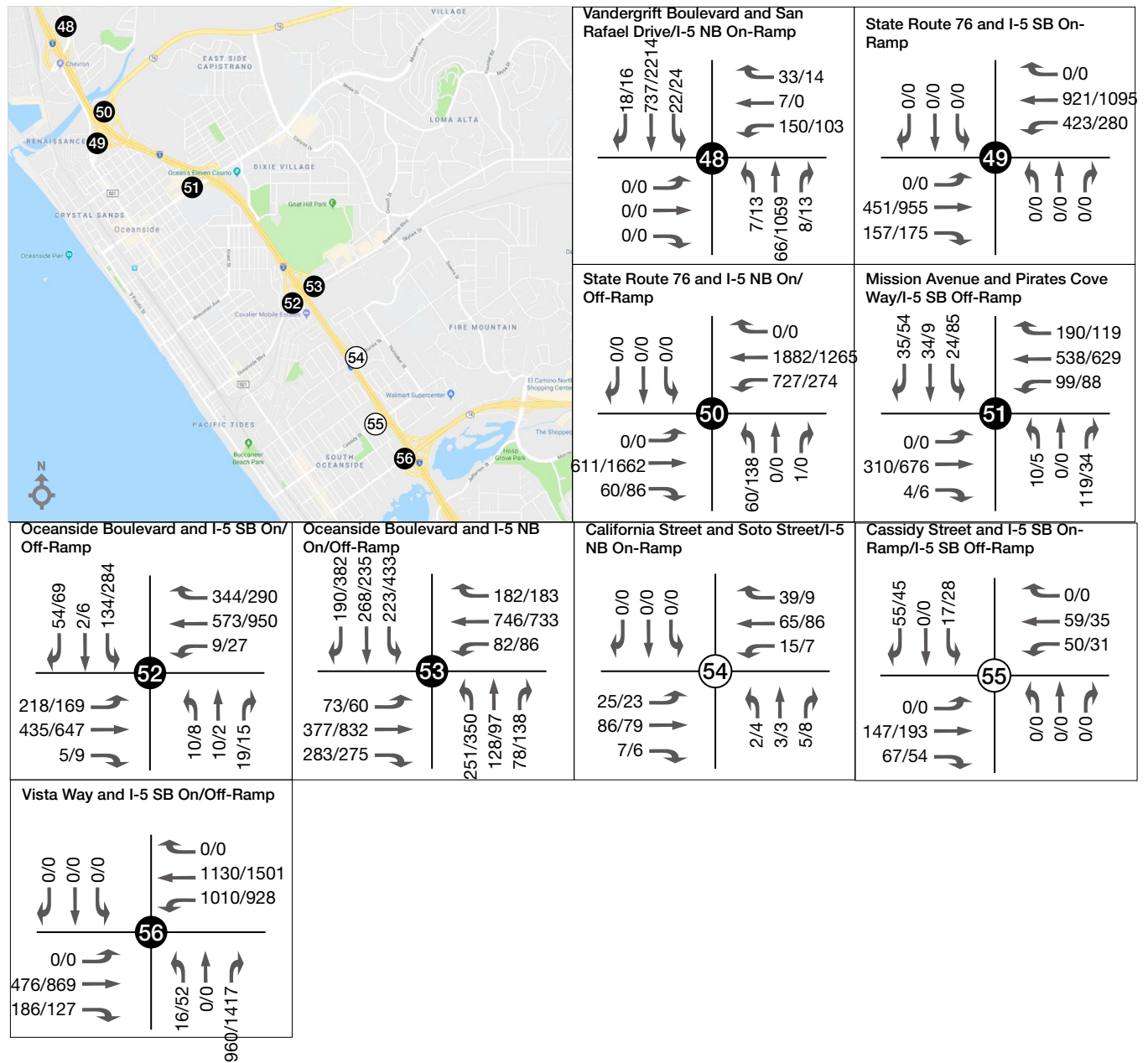
Figure 5-2c Future (No Project) Existing SR-78 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ###/### AM/PM Turning Movement Volume

Figure 5-2d Future (No Project) Existing SR-78 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ###/### AM/PM Turning Movement Volume

5.2 Year 2035 Future Conditions with Project (Two-Lane Coast Highway) – Modified Vision Plan

This section examines traffic conditions with the Coast Highway Corridor Project which proposes 2 lanes throughout the corridor with 12 new roundabouts as described in section 3.6.2. The analysis was conducted for Future (2035) under the Modified Vision Plan conditions.

5.2.1 Road Segment Volumes

Road segment volumes have been included for noise modeling purposes. Future road segment volumes with project are found in Appendix A. In addition to a review of daily ADT volumes, peak hour roadway volumes are also provided for reference in Appendix A. Peak hour roadway volumes can provide a more appropriate depiction of traffic conditions compared with daily roadway capacity.

5.2.2 Intersection Level of Service

This section examines traffic conditions with and without the Coast Highway Corridor project. The analysis was conducted for the future conditions.

The intersection operations analysis for the future condition with project was performed consistent with the methodology outlined in Section 3. Table 5-3 presents the results for the future conditions traffic analysis with project. A comparison between the future condition without and with project is also provided. Figure 5-3 contains the traffic volumes used for the future conditions with project analysis.

Table 5-3: LOS Analysis – Future Conditions with Project

INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
1	Coast Highway - I-5 Ramps / Harbor Drive	Signalized	AM	30.4	C	Signalized	AM	29.8	C	No
			PM	65.3	E		PM	46.8	D	No
2	Coast Highway - SR-76 Ramps	Signalized	AM	13.3	B	RBT	AM	3.9	A	No
			PM	27.7	C		PM	26.7	D	No
3	Surfrider Way - Pacific Street	AWSC	AM	9.7	A	AWSC	AM	9	A	No
			PM	14.5	B		PM	12.8	B	No
4	Coast Highway - Surfrider Way	Signalized	AM	12.8	B	RBT	AM	8.8	A	No
			PM	15.6	B		PM	83.4	F	Yes
5	Coast Highway - Civic Center Drive	Signalized	AM	26.8	C	RBT	AM	7.4	A	No
			PM	14.6	B		PM	32	D	No
6	Coast Highway - Pier View Way	Signalized	AM	13.6	B	RBT	AM	6.6	A	No
			PM	12.5	B		PM	29.1	D	No
7	Pier View Way - Horne Street	AWSC	AM	9.2	A	AWSC	AM	8.8	A	No
			PM	15.6	C		PM	11.5	B	No
8	Mission Avenue - Pacific Street	AWSC	AM	9.2	A	AWSC	AM	9	A	No
			PM	17.3	C		PM	16.8	C	No
9	Mission Avenue - Cleveland Street	Signalized	AM	30.4	C	Signalized	AM	14.8	B	No
			PM	18.5	B		PM	12.4	B	No
10	Coast Highway - Mission Avenue	Signalized	AM	10.6	B	Signalized	AM	16.4	B	No
			PM	14	B		PM	26.6	C	No

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
11	Mission Avenue - Horne Street	Signalized	AM	7.1	A	Signalized	AM	14.7	B	No
			PM	12.1	B		PM	13.5	B	No
12	Seagaze Street - Tremont Street	SSSC	AM	10.1	B	SSSC	AM	9.2	A	No
			PM	22.2	C		PM	11.6	B	No
13	Coast Highway - Seagaze Street	Signalized	AM	18.7	B	Signalized	AM	12.5	B	No
			PM	23.9	C		PM	18	B	No
14	Seagaze Street - Freeman Street	SSSC	AM	10	B	SSSC	AM	10.1	B	No
			PM	14.4	B		PM	15.2	C	No
15	Seagaze Street - Ditmar Street	AWSC	AM	8.5	A	AWSC	AM	9	A	No
			PM	33.3	D		PM	55.5	F	Yes
16	Seagaze Street - Clementine Street	SSSC	AM	8.1	A	SSSC	AM	8.4	A	No
			PM	14.1	B		PM	16.6	C	No
17	Coast Highway - Missouri Avenue	SSSC	AM	13.1	B	SSSC	AM	10.1	B	No
			PM	33.7	D		PM	13.7	B	No
18	Coast Highway - Washington Avenue	SSSC	AM	12.4	B	RBT	AM	5.9	A	No
			PM	31.9	D		PM	12.1	B	No
19	Wisconsin Avenue - Pacific Street	AWSC	AM	9.7	A	AWSC	AM	9	A	No
			PM	28.7	D		PM	15.7	C	No
20	Wisconsin Avenue - Tremont Street	SSSC	AM	11.5	B	SSSC	AM	12.5	B	No
			PM	18.4	C		PM	26.6	D	No
21	Coast Highway - Wisconsin Avenue	Signalized	AM	10.6	B	RBT	AM	8.3	A	No
			PM	19.3	B		PM	49.2	E	Yes
22	Wisconsin Avenue - Freeman Street	SSSC	AM	9	A	SSSC	AM	11.2	B	No
			PM	9.5	A		PM	15.8	C	No
23	Wisconsin Avenue - Ditmar Street (North)	SSSC	AM	9.6	A	SSSC	AM	13.4	B	No
			PM	9.8	A		PM	19.6	C	No
24	Wisconsin Avenue - Ditmar Street (South)	AWSC	AM	7.5	A	AWSC	AM	9.8	A	No
			PM	7.8	A		PM	24.2	C	No
25	Oceanside Boulevard - Pacific Street	AWSC	AM	8.4	A	AWSC	AM	8.4	A	No
			PM	9.8	A		PM	10.8	B	No
26	Oceanside Boulevard - Tremont Street	SSSC	AM	12.4	B	SSSC	AM	14	B	No
			PM	24.6	C		PM	41.1	E	Yes
27	Coast Highway - Oceanside Boulevard	Signalized	AM	16.4	B	RBT	AM	10.5	B	No
			PM	58.5	E		PM	57.8	F	Yes
28	Oceanside Boulevard - Ditmar Street	Signalized	AM	19.1	B	Signalized	AM	15.8	B	No
			PM	8.1	A		PM	18	B	No
29	Coast Highway - Morse Street	Signalized	AM	16.4	B	RBT	AM	9.2	A	No
			PM	15.5	B		PM	71.1	F	Yes
30	Morse Street - Freeman Street	SSSC	AM	9.8	A	SSSC	AM	10.2	B	No
			PM	13.1	B		PM	14.9	B	No
31	Morse Street - Ditmar Street	SSSC	AM	9.1	A	SSSC	AM	9.2	A	No
			PM	10	B		PM	10.5	B	No
32	Cassidy Street - Pacific Street	AWSC	AM	8.1	A	AWSC	AM	7.9	A	No
			PM	11.1	B		PM	12	B	No

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		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
33	Cassidy Street - Broadway Street	SSSC	AM	11.5	B	SSSC	AM	10.9	B	No
			PM	23.8	C		PM	18.7	C	No
34	Cassidy Street - Tremont Street	SSSC	AM	10.1	B	SSSC	AM	9.8	A	No
			PM	13.1	B		PM	11.7	B	No
35	Coast Highway - Cassidy Street	Signalized	AM	15.5	B	RBT	AM	11.4	B	No
			PM	19.6	B		PM	249.9	F	Yes
36	Cassidy Street - Freeman Street	SSSC	AM	11.7	B	SSSC	AM	10.4	B	No
			PM	21.2	C		PM	17.1	C	No
37	Cassidy Street - Ditmar Street	AWSC	AM	8.7	A	AWSC	AM	7.2	A	No
			PM	11.6	B		PM	7.6	A	No
38	Cassidy Street - Stewart Street	AWSC	AM	11	B	AWSC	AM	8.5	A	No
			PM	24.5	C		PM	10.5	B	No
39	Vista Way - Broadway Street	SSSC	AM	7.8	A	SSSC	AM	7.8	A	No
			PM	8.2	A		PM	8.2	A	No
40	Coast Highway - Vista Way	Signalized	AM	25	C	Signalized	AM	31.1	C	No
			PM	45.1	D		PM	64.2	E	Yes
41	Vista Way - Freeman Street	SSSC	AM	13.5	B	SSSC	AM	14.7	B	No
			PM	20	C		PM	27.6	D	No
42	Vista Way - Ditmar Street	SSSC	AM	14.8	B	SSSC	AM	19.9	C	No
			PM	25	D		PM	585.5	F	Yes
43	Vista Way - Stewart Street	SSSC	AM	13.2	B	SSSC	AM	17.5	C	No
			PM	20.2	C		PM	35.3	E	Yes
44	Coast Highway - Eaton Street	SSSC	AM	14.4	B	SSSC	AM	14.4	B	No
			PM	16.2	C		PM	23.3	C	No
45	Coast Highway - Michigan Avenue	Signalized	AM	7.5	A	RBT	AM	6.5	A	No
			PM	6.6	A		PM	21.3	C	No
46	Coast Highway - West Street	SSSC	AM	11.4	B	RBT	AM	4.7	A	No
			PM	18	C		PM	6.9	A	No
47	Coast Highway - Kelly Street	SSSC	AM	10.2	B	RBT	AM	4.7	A	No
			PM	13.9	B		PM	8.6	A	No
48	Harbor/Vandergrift Blvd - I-5 NB On-Ramp/San Rafael Drive	Signalized	AM	15	B	Signalized	AM	16.6	B	No
			PM	36.6	D		PM	45.6	D	No
49	SR-76 - I-5 SB On-Ramp	Signalized	AM	4.8	A	Signalized	AM	5.0	A	No
			PM	4.5	A		PM	4.8	A	No
50	SR-76 - I-5 NB On/Off-Ramp	Signalized	AM	21.5	C	Signalized	AM	27.0	C	No
			PM	22.4	C		PM	31.6	C	No
51	Mission - I-5 SB Off-Ramp	Signalized	AM	11.5	B	Signalized	AM	11.3	B	No
			PM	13.5	B		PM	13.3	B	No
52	Oceanside - I-5 SB On/Off-Ramp	Signalized	AM	43.5	D	Signalized	AM	74.5	E	Yes
			PM	42.4	D		PM	51.1	D	Yes
53	Oceanside - I-5 NB On/Off-Ramp	Signalized	AM	39.8	D	Signalized	AM	38.7	D	No
			PM	65.3	E		PM	71.9	E	Yes
54	California - I-5 NB On-Ramp	AWSC	AM	7.6	A	AWSC	AM	7.7	A	No
			PM	7.5	A		PM	7.6	A	No

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
55	Cassidy - I-5 SB On/Off-Ramp	SSSC	AM	9.2	A	SSSC	AM	9.3	A	No
			PM	9.3	A		PM	9.5	A	No
56	Vista Way - I-5 SB On/Off Ramp	Signalized	AM	20.4	C	Signalized	AM	32.7	C	No
			PM	25.7	C		PM	89.9	F	Yes

Notes:

A. Delay is expressed as an average seconds of delay per vehicle

B. LOS – Level of Service

C. AWSC – All-way stop control intersection

D. SSSC – Side-street stop control intersection

E. OVF – Overflow, Synchro is unable to calculate a level of delay

F. RBT – Roundabout

G. The minimum acceptable LOS is "D" for intersections 1-47

H. The minimum acceptable LOS is "D"; a change from C or D to a lower LOS will cause an impact for intersections 48-56

The following intersections are identified to generate significant impacts in the future with project conditions:

- Coast Highway & Surfrider Way (#4)
- Seagaze Street & Ditmar Street (#15)
- Coast Highway & Wisconsin Boulevard (#21)
- Oceanside Boulevard & Tremont Street (#26)
- Coast Highway & Oceanside Boulevard (#27)
- Coast Highway & Morse Street (#29)
- Coast Highway & Cassidy Street (#35)
- Coast Highway & Vista Way (#40)
- Vista Way & Ditmar Street (#42)
- Vista Way & Stewart Street (#43)
- Oceanside Boulevard and I-5 SB On-/Off-Ramp (#52)
- Oceanside Boulevard and I-5 NB On-/Off-Ramp (#53)
- Vista Way & I-5 SB On/Off Ramp (#56)

All other intersections are not impacted by the proposed project.

Mitigation measures are discussed in Section 7.

5.2.3 Vista Way/SR-78 & I-5 Existing Configuration

This section examines traffic conditions with the Coast Highway Corridor project which includes 2 lanes throughout the corridor and assumes existing network conditions for the Vista Way/SR-78 and I-5 Interchange. The analysis was conducted for future (2035) conditions.

5.2.3.1 Road Segment Volumes

Road segment volumes have been included in Appendix A for use in noise modeling purposes. Future road segment volumes are extracted from SANDAG's regional model. In addition to a review of daily ADT volumes, peak hour roadway volumes are also provided for reference in Appendix A. Peak hour roadway volumes can provide a more appropriate depiction of traffic conditions compared with daily roadway capacity.

5.2.3.2 Intersection Level of Service

The intersection operations analysis for the future condition without project was performed consistent with the methodology outlined in Section 3. Table 5-4 presents the results for the future conditions traffic analysis with the proposed project under existing Vista Way/SR-78 & I-5 Interchange configuration. Figure 5-4 contains the traffic volumes used for the future condition analysis.

Table 5-4: LOS Analysis – Future Conditions with Project (Existing SR-78)

INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
1	Coast Highway - I-5 Ramps / Harbor Drive	Signalized	AM	31.1	C	Signalized	AM	29.8	C	No
			PM	68.9	E		PM	53.7	D	No
2	Coast Highway - SR-76 Ramps	Signalized	AM	12.7	B	RBT	AM	3	A	No
			PM	25.6	C		PM	17.8	C	No
3	Surfrider Way - Pacific Street	AWSC	AM	10.4	B	AWSC	AM	9.7	A	No
			PM	19.5	C		PM	14.6	B	No
4	Coast Highway - Surfrider Way	Signalized	AM	16.4	B	RBT	AM	5.8	A	No
			PM	17.1	B		PM	71	F	Yes
5	Coast Highway - Civic Center Drive	Signalized	AM	13.2	B	RBT	AM	7.3	A	No
			PM	15.6	B		PM	30.6	D	No
6	Coast Highway - Pier View Way	Signalized	AM	19.2	B	RBT	AM	7.1	A	No
			PM	8.7	A		PM	46.4	E	Yes
7	Pier View Way - Horne Street	AWSC	AM	9.4	A	AWSC	AM	8.9	A	No
			PM	17.6	C		PM	11.9	B	No
8	Mission Avenue - Pacific Street	AWSC	AM	9.5	A	AWSC	AM	9.3	A	No
			PM	19.4	C		PM	17.6	C	No
9	Mission Avenue - Cleveland Street	Signalized	AM	18.8	B	Signalized	AM	13	B	No
			PM	17.7	B		PM	14.8	B	No
10	Coast Highway - Mission Avenue	Signalized	AM	12	B	Signalized	AM	15.2	B	No
			PM	12.8	B		PM	30.6	C	No
11	Mission Avenue - Horne Street	Signalized	AM	6.9	A	Signalized	AM	13.3	B	No
			PM	10.7	B		PM	12.8	B	No

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
12	Seagaze Street - Tremont Street	SSSC	AM	9.8	A	SSSC	AM	9.1	A	No
			PM	17.1	C		PM	11.2	B	No
13	Coast Highway - Seagaze Street	Signalized	AM	15.8	B	Signalized	AM	13.1	B	No
			PM	22.7	C		PM	16.7	B	No
14	Seagaze Street - Freeman Street	SSSC	AM	10.1	B	SSSC	AM	10	B	No
			PM	15	B		PM	14.4	B	No
15	Seagaze Street - Ditmar Street	AWSC	AM	8.6	A	AWSC	AM	8.7	A	No
			PM	30.2	D		PM	38	E	Yes
16	Seagaze Street - Clementine Street	SSSC	AM	8.3	A	SSSC	AM	8.2	A	No
			PM	17.7	C		PM	14.3	B	No
17	Coast Highway - Missouri Avenue	SSSC	AM	10.8	B	SSSC	AM	10	A	No
			PM	15.7	C		PM	13.3	B	No
18	Coast Highway - Washington Avenue	SSSC	AM	9.9	A	RBT	AM	5.9	A	No
			PM	13.8	B		PM	12.9	B	No
19	Wisconsin Avenue - Pacific Street	AWSC	AM	10.1	B	AWSC	AM	9.7	A	No
			PM	51.3	F		PM	20.4	C	No
20	Wisconsin Avenue - Tremont Street	SSSC	AM	10.8	B	SSSC	AM	12.7	B	No
			PM	14.9	B		PM	30.8	D	No
21	Coast Highway - Wisconsin Avenue	Signalized	AM	14.5	B	RBT	AM	8.5	A	No
			PM	24.5	C		PM	57.8	F	Yes
22	Wisconsin Avenue - Freeman Street	SSSC	AM	11.5	B	SSSC	AM	10.9	B	No
			PM	19.4	C		PM	14.9	B	No
23	Wisconsin Avenue - Ditmar Street (North)	SSSC	AM	13.2	B	SSSC	AM	13.1	B	No
			PM	17.9	C		PM	17.9	C	No
24	Wisconsin Avenue - Ditmar Street (South)	AWSC	AM	9.5	A	AWSC	AM	9.7	A	No
			PM	23.7	C		PM	26.5	D	No
25	Oceanside Boulevard - Pacific Street	AWSC	AM	9.1	A	AWSC	AM	9.2	A	No
			PM	12.1	B		PM	12.6	B	No
26	Oceanside Boulevard - Tremont Street	SSSC	AM	14.3	B	SSSC	AM	13.9	B	No
			PM	91	F		PM	42.1	E	No
27	Coast Highway - Oceanside Boulevard	Signalized	AM	26.2	C	RBT	AM	11.2	B	No
			PM	32.1	C		PM	254	F	Yes
28	Oceanside Boulevard - Ditmar Street	Signalized	AM	14.9	B	Signalized	AM	15.3	B	No
			PM	15.3	B		PM	16.5	B	No
29	Coast Highway - Morse Street	Signalized	AM	19.6	B	RBT	AM	10.8	B	No
			PM	22.9	C		PM	134.8	F	Yes
30	Morse Street - Freeman Street	SSSC	AM	12.9	B	SSSC	AM	10.5	B	No
			PM	112.9	F		PM	16.8	C	No
31	Morse Street - Ditmar Street	SSSC	AM	9.5	A	SSSC	AM	9.3	A	No
			PM	11.5	B		PM	10.9	B	No
32	Cassidy Street - Pacific Street	AWSC	AM	8.6	A	AWSC	AM	8.6	A	No
			PM	16.8	C		PM	17	C	No
33	Cassidy Street - Broadway Street	SSSC	AM	16	C	SSSC	AM	11.6	B	No
			PM	397.4	F		PM	26.5	D	No

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
34	Cassidy Street - Tremont Street	SSSC	AM	10.1	B	SSSC	AM	10.3	B	No
			PM	13.1	B		PM	12.7	B	No
35	Coast Highway - Cassidy Street	Signalized	AM	18.5	B	RBT	AM	9.4	A	No
			PM	20	C		PM	166.3	F	Yes
36	Cassidy Street - Freeman Street	SSSC	AM	21.4	C	SSSC	AM	11	B	No
			PM	OVF	F		PM	26.1	D	No
37	Cassidy Street - Ditmar Street	AWSC	AM	7.6	A	AWSC	AM	7.5	A	No
			PM	8.6	A		PM	8.5	A	No
38	Cassidy Street - Stewart Street	AWSC	AM	9.2	A	AWSC	AM	8.9	A	No
			PM	13.8	B		PM	12.4	B	No
39	Vista Way - Broadway Street	SSSC	AM	8.5	A	SSSC	AM	8	A	No
			PM	9.4	A		PM	8.4	A	No
40	Coast Highway - Vista Way	Signalized	AM	32.8	C	Signalized	AM	35.5	D	No
			PM	78.9	E		PM	66.3	E	No
41	Vista Way - Freeman Street	SSSC	AM	34	D	SSSC	AM	16.8	C	No
			PM	OVF	F		PM	49.4	E	No
42	Vista Way - Ditmar Street	SSSC	AM	26.2	D	SSSC	AM	25.2	D	No
			PM	294.2	F		PM	OVF	F	Yes
43	Vista Way - Stewart Street	SSSC	AM	22	C	SSSC	AM	22.1	C	No
			PM	69.1	F		PM	66.8	F	No
44	Coast Highway - Eaton Street	SSSC	AM	14.9	B	SSSC	AM	16.3	C	No
			PM	17.4	C		PM	33.5	D	No
45	Coast Highway - Michigan Avenue	Signalized	AM	4.7	A	RBT	AM	6.4	A	No
			PM	5.4	A		PM	19.4	C	No
46	Coast Highway - West Street	SSSC	AM	9.6	A	RBT	AM	4.9	A	No
			PM	11.2	B		PM	7.3	A	No
47	Coast Highway - Kelly Street	SSSC	AM	10	B	RBT	AM	5.6	A	No
			PM	12.7	B		PM	10.2	B	No
48	Harbor/Vandergrift Blvd - I-5 NB On-Ramp/San Rafael Drive	Signalized	AM	15	B	Signalized	AM	16.6	B	No
			PM	37.4	D		PM	45.6	D	No
49	SR-76 - I-5 SB On-Ramp	Signalized	AM	4.9	A	Signalized	AM	5	A	No
			PM	4.5	A		PM	4.8	A	No
50	SR-76 - I-5 NB On/Off-Ramp	Signalized	AM	25.4	C	Signalized	AM	27	C	No
			PM	27.8	C		PM	31.6	C	No
51	Mission - I-5 SB Off-Ramp	Signalized	AM	11.6	B	Signalized	AM	11.3	B	No
			PM	13.8	B		PM	13.3	B	No
52	Oceanside - I-5 SB On/Off-Ramp	Signalized	AM	50.2	D	Signalized	AM	74.5	E	Yes
			PM	42.6	D		PM	51.1	D	Yes
53	Oceanside - I-5 NB On/Off-Ramp	Signalized	AM	37.7	D	Signalized	AM	38.7	D	Yes
			PM	65.7	E		PM	71.9	E	Yes
54	California - I-5 NB On-Ramp	AWSC	AM	7.6	A	AWSC	AM	7.7	A	No
			PM	7.6	A		PM	7.6	A	No
55	Cassidy - I-5 SB On/Off-Ramp	SSSC	AM	9.3	A	SSSC	AM	9.3	A	No
			PM	9.5	A		PM	9.5	A	No

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
56	Vista Way - I-5 SB On/Off Ramp	Signalized	AM	25.8	C	Signalized	AM	32.7	C	No
			PM	88	F		PM	89.9	F	Yes

Notes:

A. Delay is expressed as an average seconds of delay per vehicle

B. LOS – Level of Service

C. AWSC – All-way stop control intersection

D. SSSC – Side-street stop control intersection

E. OVF – Overflow, Synchro is unable to calculate a level of delay

F. RBT – Roundabout

G. The minimum acceptable LOS is "D" for intersections 1-47

H. The minimum acceptable LOS is "D"; a change from C or D to a lower LOS will cause an impact for intersections 48-56

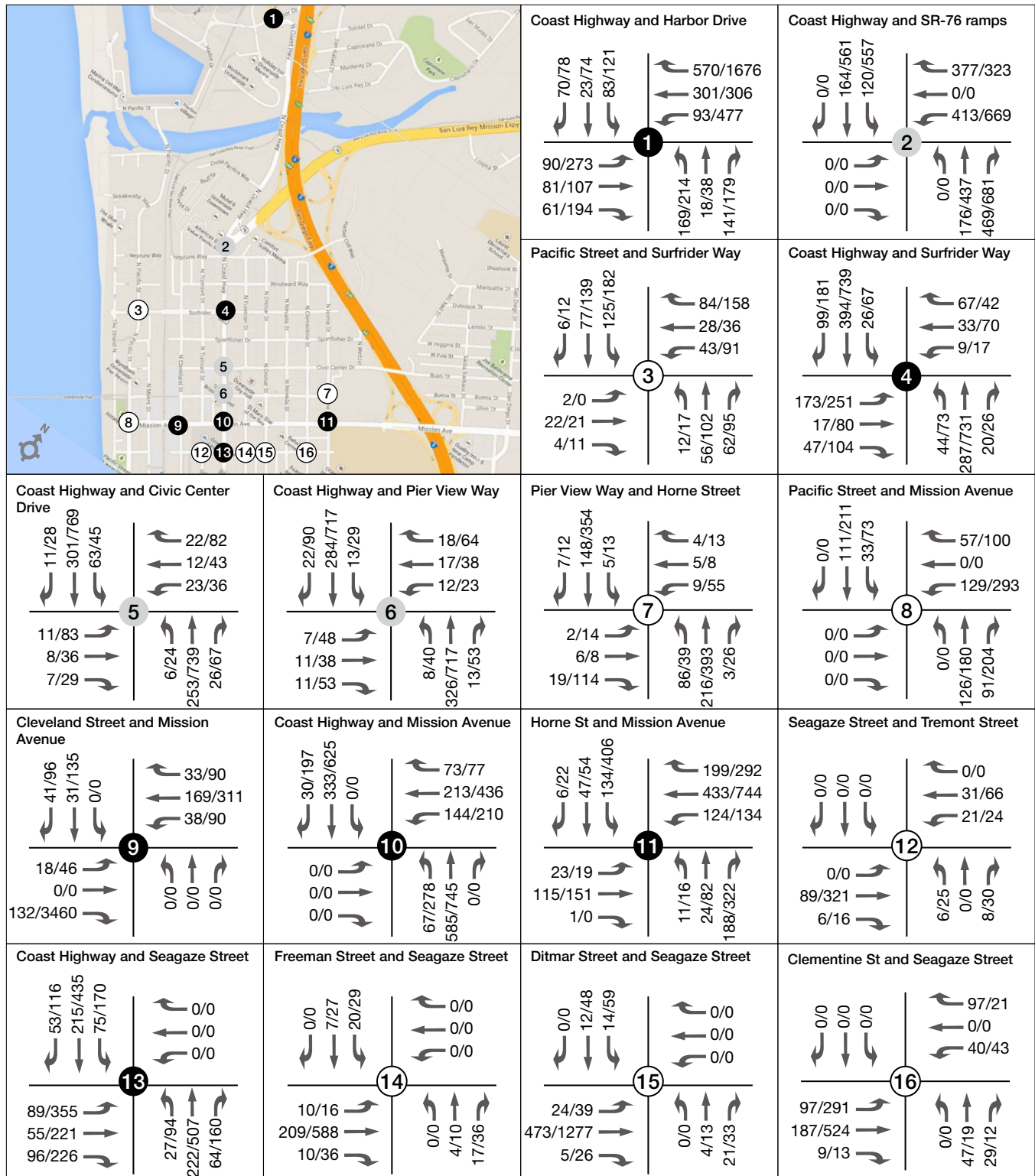
The following intersections are identified to generate significant impacts in the PM peak hour in the future with project conditions:

- Coast Highway & Surfrider Way (#4)
- Coast Highway & Pier View Way (#6)
- Seagaze Street & Ditmar Street (#15)
- Coast Highway & Wisconsin Boulevard (#21)
- Coast Highway & Oceanside Boulevard (#27)
- Coast Highway & Morse Street (#29)
- Coast Highway & Cassidy Street (#35)
- Vista Way & Ditmar Street (#42)
- Oceanside Boulevard & I-5 SB On/Off-Ramp (#52)
- Oceanside Boulevard & I-5 NB On/Off-Ramp (#53)
- Vista Way & I-5 SB On/Off Ramp (#56)

All other intersections are not impacted by the proposed project.

Mitigation measures are discussed in Section 7.

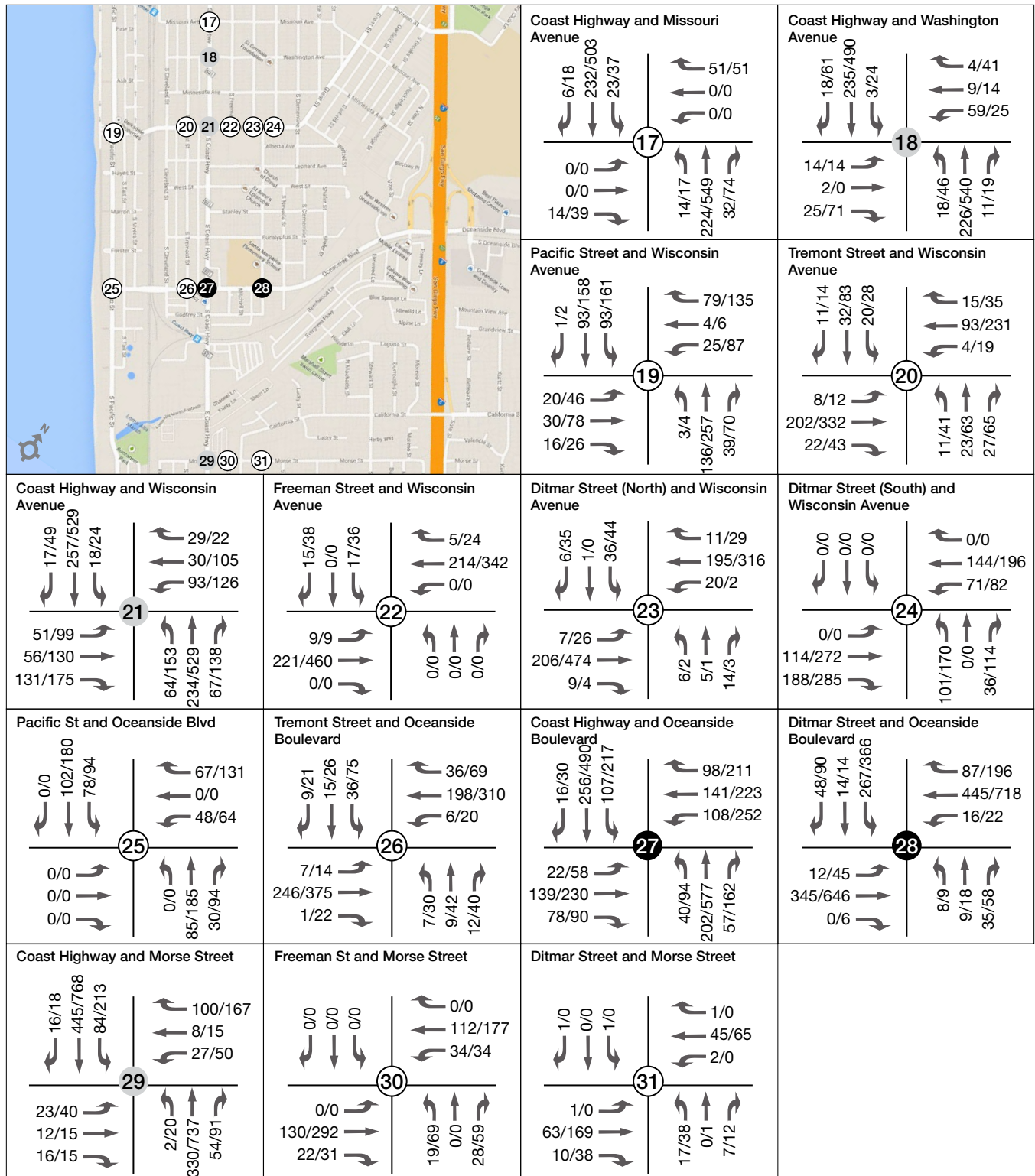
Figure 5-3a Future with Project Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

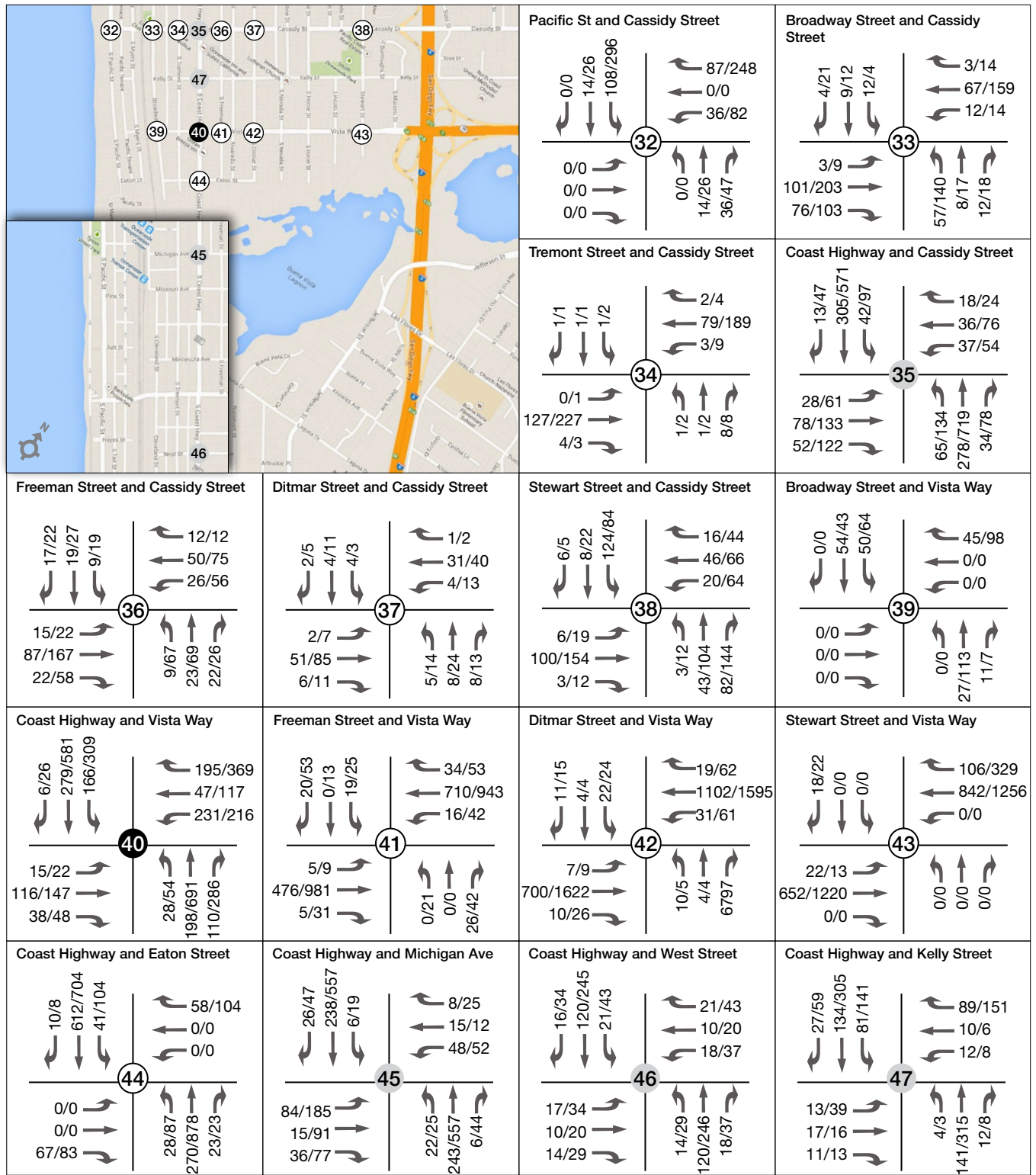
Figure 5-3b Future with Project Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

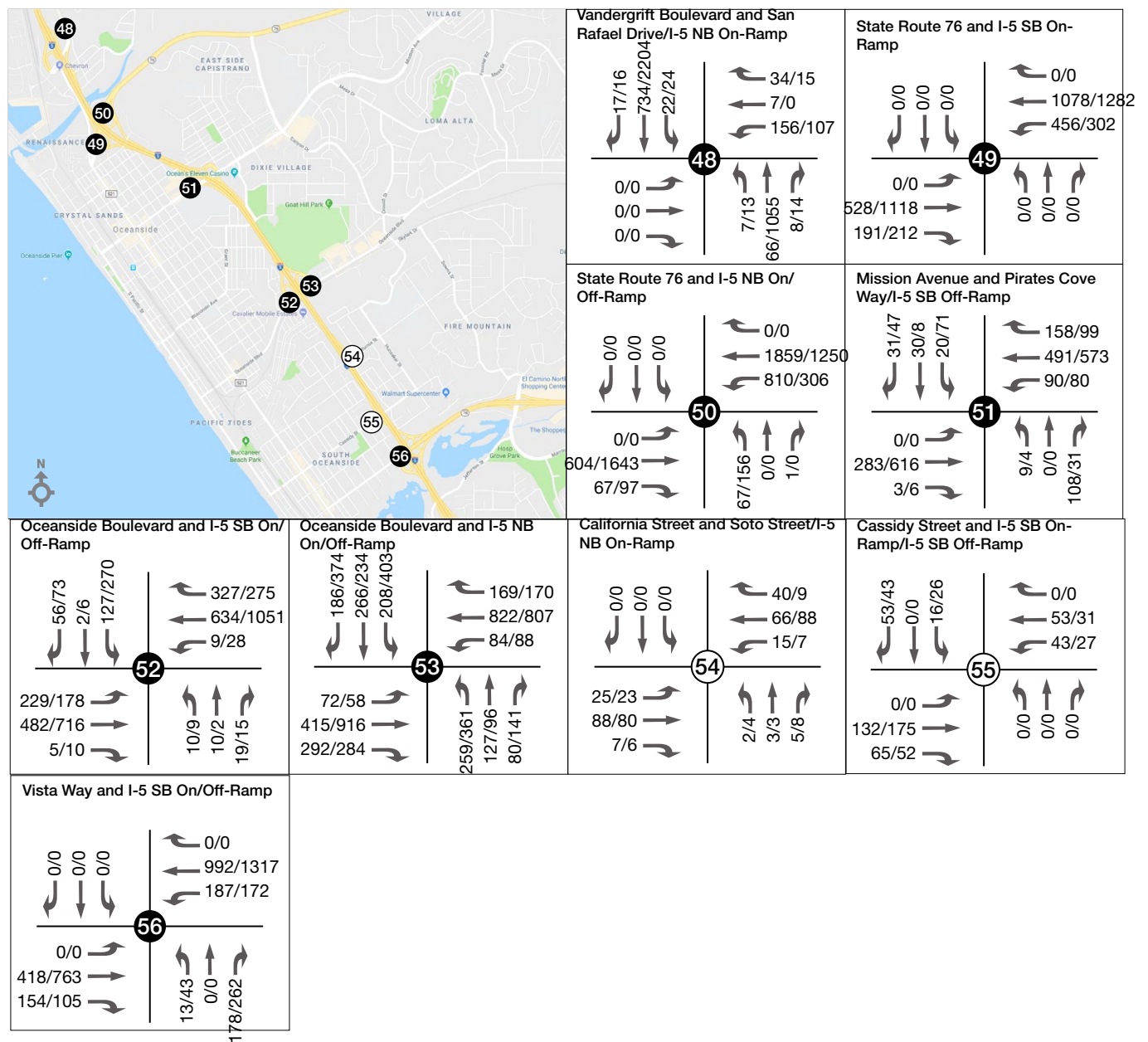
Figure 5-3c Future with Project Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

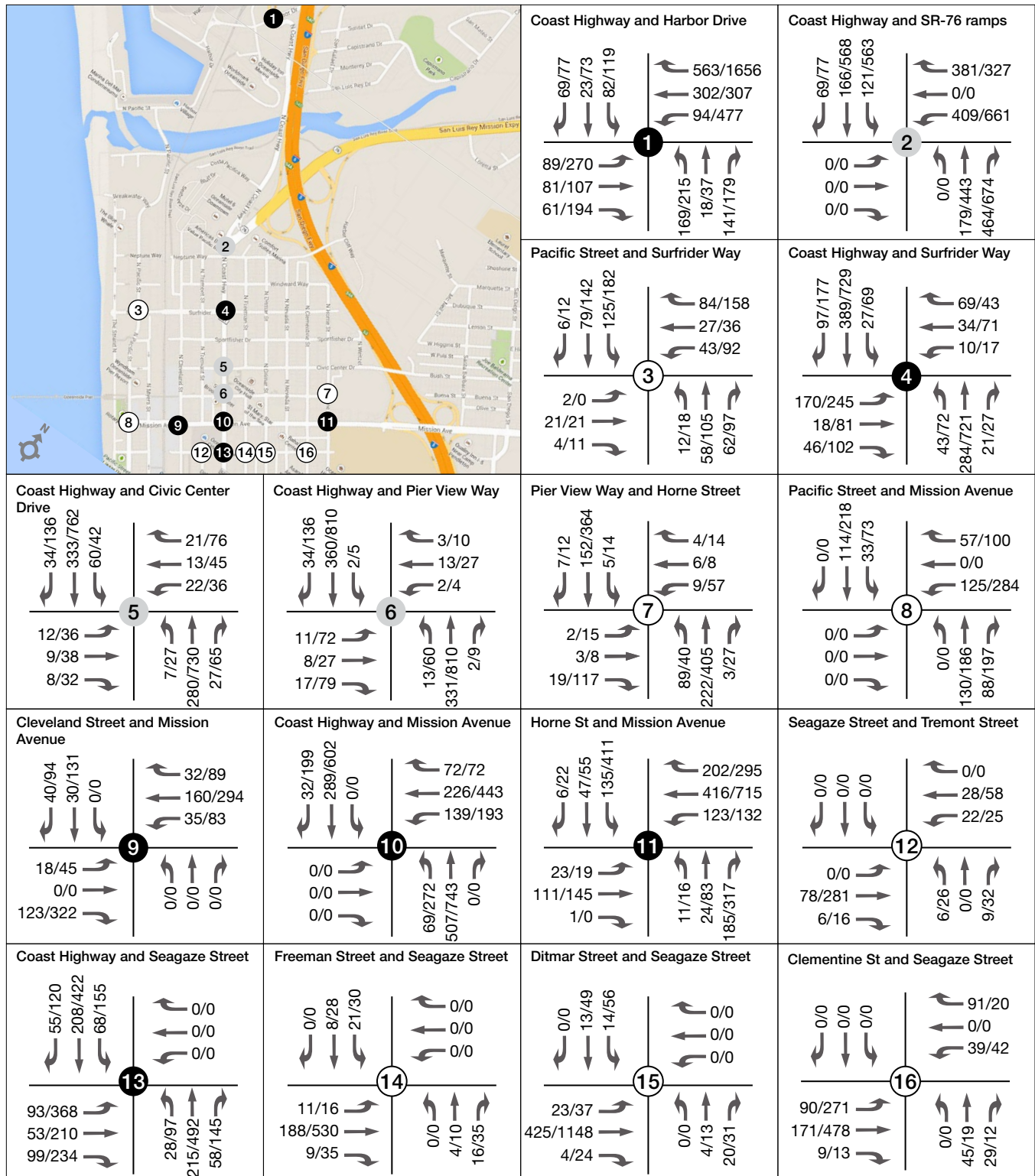
Figure 5-3d Future with Project Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

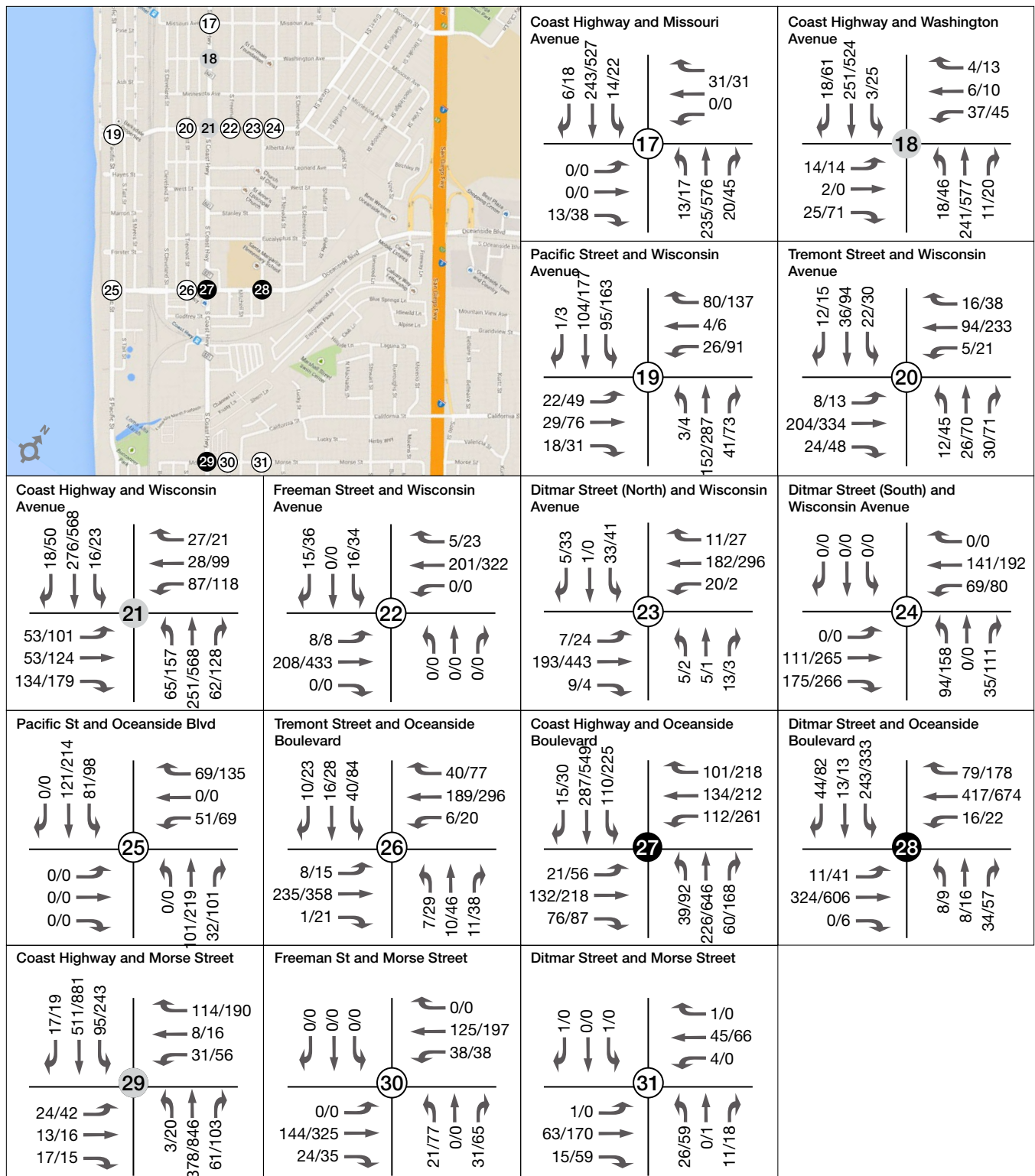
Figure 5-4a Future with Project (Existing SR-78) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

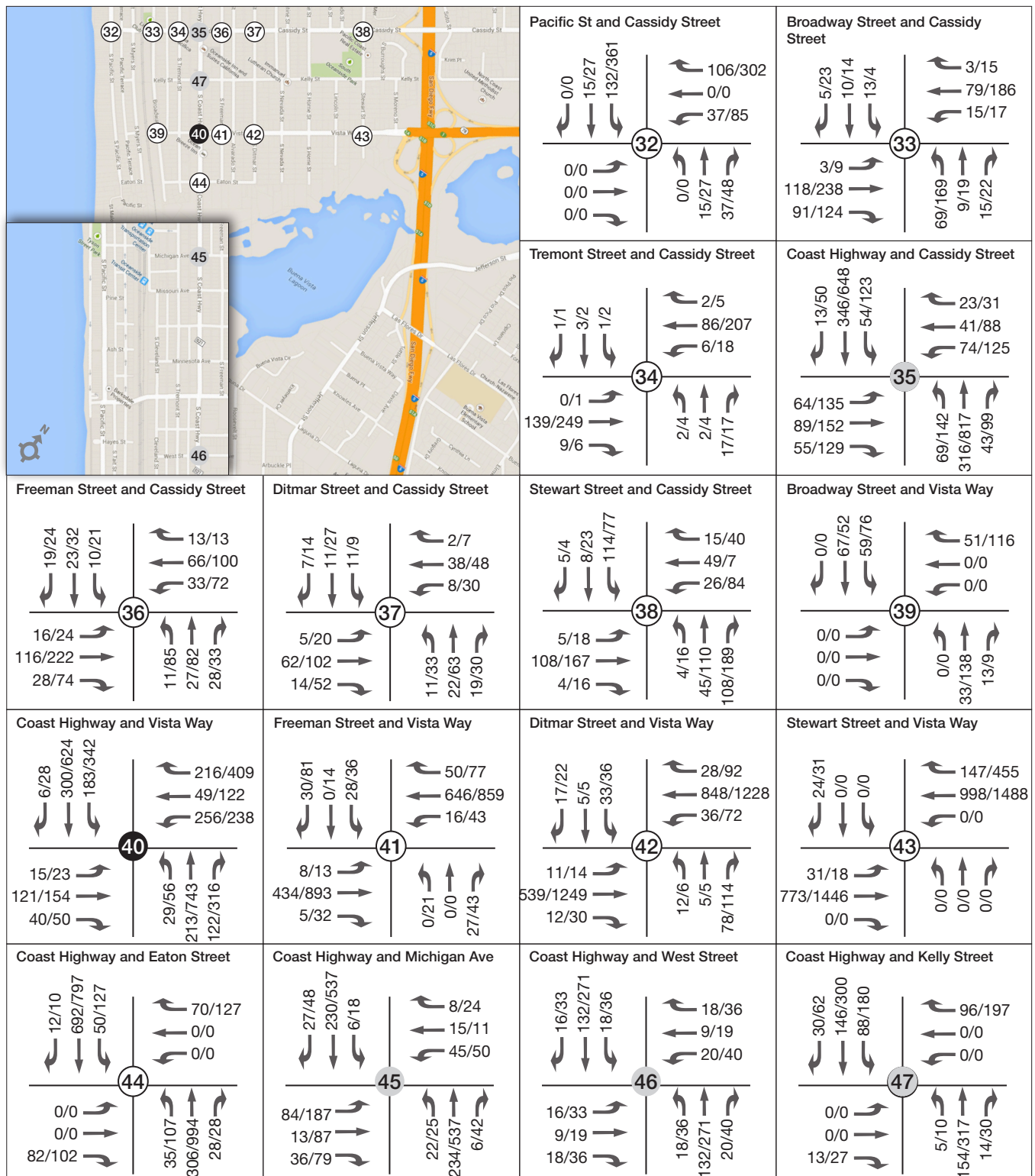
Figure 5-4b Future with Project (Existing SR-78) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

Figure 5-4c Future with Project (Existing SR-78) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

Intersection	Northbound	Southbound	Eastbound	Westbound
Oceanside Boulevard and I-5 SB On/Off-Ramp	57/73 2/7 138/292	355/229 612/1014 9/28	230/173 465/691 5/9	10/9 10/2 19/15
Oceanside Boulevard and I-5 NB On/Off-Ramp	194/390 273/240 226/437	183/185 778/765 84/88	75/61 393/868 291/283	258/360 130/99 80/141
California Street and Soto Street/I-5 NB On-Ramp	0/0 0/0 0/0	39/9 65/86 16/7	25/23 86/78 7/7	2/4 5/5 6/8
Cassidy Street and I-5 SB On-Ramp/I-5 SB Off-Ramp	55/46 0/0 17/28	0/0 59/35 50/31	0/0 148/195 69/55	0/0 0/0 0/0
Vista Way and I-5 SB On/Off-Ramp	0/0 0/0 0/0	0/0 1229/1632 1018/935	0/0 518/945 201/137	17/56 0/0 967/1428
Vandergrift Boulevard and San Rafael Drive/I-5 NB On-Ramp	18/16 737/2213 22/24	32/14 6/0 150/103	0/0 0/0 0/0	7/13 66/1059 8/13
State Route 76 and I-5 SB On-Ramp	0/0 0/0 0/0	0/0 1082/1287 479/317	0/0 531/1123 188/209	0/0 0/0 0/0
State Route 76 and I-5 NB On/Off-Ramp	0/0 0/0 0/0	0/0 1970/1324 807/305	0/0 640/1740 67/97	0/0 0/0 1/0
Mission Avenue and Pirates Cove Way/I-5 SB Off-Ramp	32/49 31/8 22/77	172/108 499/582 92/82	0/0 287/626 3/6	10/5 0/0 111/31

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### ↗ AM/PM Turning Movement Volume

5.3 Year 2035 Future Conditions with Project Alternative 1 (Four-Lanes between Oceanside Blvd and Vista Way) – Modified Vision Plan

This section examines traffic conditions with the Coast Highway Corridor project alternative 1 which proposes 2 lanes from Harbor Drive to Oceanside Blvd and four lanes between Oceanside Blvd and Vista Way with seven new roundabouts as described in section 3.6.3. The analysis was conducted for the future (2035) conditions.

5.3.1 Road Segment Volumes

Road segment volumes have been included for noise modeling purposes. Future road segment volumes with project alternative 1 are found in Appendix A. In addition to a review of daily ADT volumes, peak hour roadway volumes are also provided for reference in Appendix A. Peak hour roadway volumes can provide a more appropriate depiction of traffic conditions compared with daily roadway capacity.

5.3.2 Intersection Level of Service

This section examines traffic conditions with and without the Coast Highway Corridor Project Alternative 1. The analysis was conducted for the future conditions.

The intersection operations analysis for the future condition with project alternative 1 was performed consistent with the methodology outlined in Section 3. Table 5-5 presents the results for the future conditions traffic analysis with project alternative 1. A comparison between the future condition without and with project alternative 1 is also provided. Figure 5-5 contains the traffic volumes used for the future conditions with project alternative 1 analysis.

Table 5-5: LOS Analysis – Future Conditions with Project Alternative 1

INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 1				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
1	Coast Highway - I-5 Ramps / Harbor Drive	Signalized	AM	30.4	C	Signalized	AM	29.8	C	No
			PM	65.3	E		PM	46.8	D	No
2	Coast Highway - SR-76 Ramps	Signalized	AM	13.3	B	RBT	AM	3.9	A	No
			PM	27.7	C		PM	26.7	D	No
3	Surfrider Way - Pacific Street	AWSC	AM	9.7	A	AWSC	AM	9	A	No
			PM	14.5	B		PM	12.8	B	No
4	Coast Highway - Surfrider Way	Signalized	AM	12.8	B	Signalized	AM	12.9	B	No
			PM	15.6	B		PM	19.2	B	No
5	Coast Highway - Civic Center Drive	Signalized	AM	26.8	C	RBT	AM	7.4	A	No
			PM	14.6	B		PM	32	D	No
6	Coast Highway - Pier View Way	Signalized	AM	13.6	B	RBT	AM	6.6	A	No
			PM	12.5	B		PM	29.1	D	No
7	Pier View Way - Horne Street	AWSC	AM	9.2	A	AWSC	AM	8.8	A	No
			PM	15.6	C		PM	11.5	B	No
8	Mission Avenue - Pacific Street	AWSC	AM	9.2	A	AWSC	AM	9	A	No
			PM	17.3	C		PM	16.8	C	No
9	Mission Avenue - Cleveland Street	Signalized	AM	30.4	C	Signalized	AM	14.8	B	No
			PM	18.5	B		PM	12.4	B	No

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 1				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
10	Coast Highway - Mission Avenue	Signalized	AM	10.6	B	Signalized	AM	16.4	B	No
			PM	14	B		PM	26.6	C	No
11	Mission Avenue - Horne Street	Signalized	AM	7.1	A	Signalized	AM	14.7	B	No
			PM	12.1	B		PM	13.5	B	No
12	Seagaze Street - Tremont Street	SSSC	AM	10.1	B	SSSC	AM	9.2	A	No
			PM	22.2	C		PM	11.6	B	No
13	Coast Highway - Seagaze Street	Signalized	AM	18.7	B	Signalized	AM	12.5	B	No
			PM	23.9	C		PM	18	B	No
14	Seagaze Street - Freeman Street	SSSC	AM	10	B	SSSC	AM	10.1	B	No
			PM	14.4	B		PM	15.2	C	No
15	Seagaze Street - Ditmar Street	AWSC	AM	8.5	A	AWSC	AM	9	A	No
			PM	33.3	D		PM	55.5	F	Yes
16	Seagaze Street - Clementine Street	SSSC	AM	8.1	A	SSSC	AM	8.3	A	No
			PM	14.1	B		PM	16.6	C	No
17	Coast Highway - Missouri Avenue	SSSC	AM	13.1	B	SSSC	AM	10.1	B	No
			PM	33.7	D		PM	13.7	B	No
18	Coast Highway - Washington Avenue	SSSC	AM	12.4	B	RBT	AM	5.8	A	No
			PM	31.9	D		PM	11.7	B	No
19	Wisconsin Avenue - Pacific Street	AWSC	AM	9.7	A	AWSC	AM	9	A	No
			PM	28.7	D		PM	15.7	C	No
20	Wisconsin Avenue - Tremont Street	SSSC	AM	11.5	B	SSSC	AM	12.5	B	No
			PM	18.4	C		PM	26.6	D	No
21	Coast Highway - Wisconsin Avenue	Signalized	AM	10.6	B	RBT	AM	8.3	A	No
			PM	19.3	B		PM	49.2	E	Yes
22	Wisconsin Avenue - Freeman Street	SSSC	AM	9	A	SSSC	AM	11.2	B	No
			PM	9.5	A		PM	15.8	C	No
23	Wisconsin Avenue - Ditmar Street (North)	SSSC	AM	9.6	A	SSSC	AM	13.4	B	No
			PM	9.8	A		PM	19.6	C	No
24	Wisconsin Avenue - Ditmar Street (South)	AWSC	AM	7.5	A	AWSC	AM	9.8	A	No
			PM	7.8	A		PM	24.2	C	No
25	Oceanside Boulevard - Pacific Street	AWSC	AM	8.4	A	AWSC	AM	8.4	A	No
			PM	9.8	A		PM	10.8	B	No
26	Oceanside Boulevard - Tremont Street	SSSC	AM	12.4	B	SSSC	AM	14	B	No
			PM	24.6	C		PM	41.1	E	Yes
27	Coast Highway - Oceanside Boulevard	Signalized	AM	16.4	B	Signalized	AM	27	C	No
			PM	58.5	E		PM	45	D	No
28	Oceanside Boulevard - Ditmar Street	Signalized	AM	19.1	B	Signalized	AM	15.8	B	No
			PM	8.1	A		PM	18	B	No
29	Coast Highway - Morse Street	Signalized	AM	16.4	B	Signalized	AM	8.5	A	No
			PM	15.5	B		PM	14	B	No
30	Morse Street - Freeman Street	SSSC	AM	9.8	A	SSSC	AM	10.2	B	No
			PM	13.1	B		PM	14.9	B	No

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 1				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
31	Morse Street - Ditmar Street	SSSC	AM	9.1	A	SSSC	AM	9.2	A	No
			PM	10	B		PM	10.5	B	No
32	Cassidy Street - Pacific Street	AWSC	AM	8.1	A	AWSC	AM	7.9	A	No
			PM	11.1	B		PM	12	B	No
33	Cassidy Street - Broadway Street	SSSC	AM	11.5	B	SSSC	AM	10.9	B	No
			PM	23.8	C		PM	18.7	C	No
34	Cassidy Street - Tremont Street	SSSC	AM	10.1	B	SSSC	AM	9.8	A	No
			PM	13.1	B		PM	11.7	B	No
35	Coast Highway - Cassidy Street	Signalized	AM	15.5	B	Signalized	AM	14.2	B	No
			PM	19.6	B		PM	51.1	D	No
36	Cassidy Street - Freeman Street	SSSC	AM	11.7	B	SSSC	AM	10.4	B	No
			PM	21.2	C		PM	17.1	C	No
37	Cassidy Street - Ditmar Street	AWSC	AM	8.7	A	AWSC	AM	7.2	A	No
			PM	11.6	B		PM	7.6	A	No
38	Cassidy Street - Stewart Street	AWSC	AM	11	B	AWSC	AM	8.5	A	No
			PM	24.5	C		PM	10.5	B	No
39	Vista Way - Broadway Street	SSSC	AM	7.8	A	SSSC	AM	7.8	A	No
			PM	8.2	A		PM	8.2	A	No
40	Coast Highway - Vista Way	Signalized	AM	25	C	Signalized	AM	32	C	No
			PM	45.1	D		PM	50.7	D	No
41	Vista Way - Freeman Street	SSSC	AM	13.5	B	SSSC	AM	14.7	B	No
			PM	20	C		PM	27.5	D	No
42	Vista Way - Ditmar Street	SSSC	AM	14.8	B	SSSC	AM	19.9	C	No
			PM	25	D		PM	472.7	F	Yes
43	Vista Way - Stewart Street	SSSC	AM	13.2	B	SSSC	AM	17.5	C	No
			PM	20.2	C		PM	35.3	E	Yes
44	Coast Highway - Eaton Street	SSSC	AM	14.4	B	SSSC	AM	16	C	No
			PM	16.2	C		PM	19.2	C	No
45	Coast Highway - Michigan Avenue	Signalized	AM	7.5	A	RBT	AM	6.4	A	No
			PM	6.6	A		PM	20.1	C	No
46	Coast Highway - West Street	SSSC	AM	11.4	B	RBT	AM	4.7	A	No
			PM	18	C		PM	6.9	A	No
47	Coast Highway - Kelly Street	SSSC	AM	10.2	B	SSSC	AM	13.3	B	No
			PM	13.9	B		PM	33.9	D	No
48	Harbor/Vandergrift Blvd - I-5 NB On-Ramp/San Rafael Drive	Signalized	AM	15	B	Signalized	AM	16.6	B	No
			PM	36.6	D		PM	45.6	D	No
49	SR-76 - I-5 SB On-Ramp	Signalized	AM	4.8	A	Signalized	AM	5.0	A	No
			PM	4.5	A		PM	4.8	A	No
50	SR-76 - I-5 NB On/Off-Ramp	Signalized	AM	21.5	C	Signalized	AM	27.0	C	No
			PM	22.4	C		PM	31.6	C	No
51	Mission - I-5 SB Off-Ramp	Signalized	AM	11.5	B	Signalized	AM	11.3	B	No
			PM	13.5	B		PM	13.3	B	No
52		Signalized	AM	43.5	D	Signalized	AM	75.9	E	Yes

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 1				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
	Oceanside - I-5 SB On/Off-Ramp		PM	42.4	D		PM	51.1	D	Yes
53	Oceanside - I-5 NB On/Off-Ramp	Signalized	AM	39.8	D	Signalized	AM	40.0	D	Yes
			PM	65.3	E		PM	71.9	E	Yes
54	California - I-5 NB On- Ramp	AWSC	AM	7.6	A	AWSC	AM	7.7	A	No
			PM	7.5	A		PM	7.6	A	No
55	Cassidy - I-5 SB On/Off- Ramp	SSSC	AM	9.2	A	SSSC	AM	9.3	A	No
			PM	9.3	A		PM	9.5	A	No
56	Vista Way - I-5 SB On/Off Ramp	Signalized	AM	20.4	C	Signalized	AM	32.7	C	No
			PM	25.7	C		PM	89.9	F	Yes

Notes:

A. Delay is expressed as an average seconds of delay per vehicle

B. LOS – Level of Service

C. AWSC – All-way stop control intersection

D. SSSC – Side-street stop control intersection

E. OVF – Overflow, Synchro is unable to calculate a level of delay

F. RBT – Roundabout

G. The minimum acceptable LOS is "D" for intersections 1-47

H. The minimum acceptable LOS is "D"; a change from C or D to a lower LOS will cause an impact for intersections 48-56

The following intersections are identified to generate significant impacts in the PM peak hour in the future with project conditions:

- Seagaze Street & Ditmar Street (#15)
- Coast Highway & Wisconsin Boulevard (#21)
- Oceanside Boulevard & Tremont Street (#26)
- Vista Way & Ditmar Street (#42)
- Vista Way & Stewart Street (#43)
- Oceanside Boulevard & I-5 SB On/Off-Ramp (#52)
- Oceanside Boulevard & I-5 NB On/Off-Ramp (#53)
- Vista Way & I-5 SB On/Off Ramp (#56)

All other intersections are not impacted by the proposed project alternative 1.

Mitigation measures are discussed in Section 7.

5.3.3 Vista Way/SR-78 & I-5 Existing Configuration

This section examines traffic conditions with the Coast Highway Corridor project alternative 1 throughout the corridor and assumes existing network conditions for the Vista Way/SR-78 and I-5 Interchange. The analysis was conducted for future (2035) conditions.

5.3.3.1 Road Segment Volumes

Road segment volumes have been included in Appendix A for use in noise modeling purposes. Future road segment volumes are extracted from SANDAG's regional model. In addition to a review of daily ADT volumes, peak hour roadway volumes are also provided for reference in Appendix A. Peak hour roadway volumes can provide a more appropriate depiction of traffic conditions compared with daily roadway capacity.

5.3.3.2 Intersection Level of Service

The intersection operations analysis for the future condition without project was performed consistent with the methodology outlined in Section 3. Table 5-6 presents the results for the future conditions traffic analysis with the proposed project Alternative 1 under existing Vista Way/SR-78 & I-5 Interchange configuration. Figure 5-6 contains the traffic volumes used for the future condition analysis.

Table 5-6: LOS Analysis – Future Conditions with Project Alternative 1 (Existing SR-78)

INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 1				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
1	Coast Highway - I-5 Ramps / Harbor Drive	Signalized	AM	31.1	C	Signalized	AM	29.8	C	No
			PM	68.9	E		PM	53.7	D	No
2	Coast Highway - SR-76 Ramps	Signalized	AM	12.7	B	RBT	AM	3	A	No
			PM	25.6	C		PM	17.8	C	No
3	Surfrider Way - Pacific Street	AWSC	AM	10.4	B	AWSC	AM	9.7	A	No
			PM	19.5	C		PM	14.6	B	No
4	Coast Highway - Surfrider Way	Signalized	AM	16.4	B	Signalized	AM	9.8	A	No
			PM	17.1	B		PM	18	B	No
5	Coast Highway - Civic Center Drive	Signalized	AM	13.2	B	RBT	AM	7.3	A	No
			PM	15.6	B		PM	30.6	D	No
6	Coast Highway - Pier View Way	Signalized	AM	19.2	B	RBT	AM	7.1	A	No
			PM	8.7	A		PM	46.4	E	Yes
7	Pier View Way - Horne Street	AWSC	AM	9.4	A	AWSC	AM	8.9	A	No
			PM	17.6	C		PM	11.9	B	No
8	Mission Avenue - Pacific Street	AWSC	AM	9.5	A	AWSC	AM	9.3	A	No
			PM	19.4	C		PM	17.6	C	No
9	Mission Avenue - Cleveland Street	Signalized	AM	18.8	B	Signalized	AM	14.8	B	No
			PM	17.7	B		PM	16.8	B	No
10	Coast Highway - Mission Avenue	Signalized	AM	12	B	Signalized	AM	15.2	B	No
			PM	12.8	B		PM	30.6	C	No
11	Mission Avenue - Horne Street	Signalized	AM	6.9	A	Signalized	AM	13.3	B	No
			PM	10.7	B		PM	12.8	B	No

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 1				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
12	Seagaze Street - Tremont Street	SSSC	AM	9.8	A	SSSC	AM	9.1	A	No
			PM	17.1	C		PM	11.2	B	No
13	Coast Highway - Seagaze Street	Signalized	AM	15.8	B	Signalized	AM	13.1	B	No
			PM	22.7	C		PM	16.7	B	No
14	Seagaze Street - Freeman Street	SSSC	AM	10.1	B	SSSC	AM	10	B	No
			PM	15	B		PM	14.4	B	No
15	Seagaze Street - Ditmar Street	AWSC	AM	8.6	A	AWSC	AM	8.7	A	No
			PM	30.2	D		PM	38	E	Yes
16	Seagaze Street - Clementine Street	SSSC	AM	8.3	A	SSSC	AM	8.2	A	No
			PM	17.7	C		PM	14.3	B	No
17	Coast Highway - Missouri Avenue	SSSC	AM	10.8	B	SSSC	AM	10	A	No
			PM	15.7	C		PM	13.3	B	No
18	Coast Highway - Washington Avenue	SSSC	AM	9.9	A	RBT	AM	5.9	A	No
			PM	13.8	B		PM	12.9	B	No
19	Wisconsin Avenue - Pacific Street	AWSC	AM	10.1	B	AWSC	AM	9.7	A	No
			PM	51.3	F		PM	20.4	C	No
20	Wisconsin Avenue - Tremont Street	SSSC	AM	10.8	B	SSSC	AM	12.7	B	No
			PM	14.9	B		PM	30.8	D	No
21	Coast Highway - Wisconsin Avenue	Signalized	AM	14.5	B	RBT	AM	8.5	A	No
			PM	24.5	C		PM	57.8	F	Yes
22	Wisconsin Avenue - Freeman Street	SSSC	AM	11.5	B	SSSC	AM	10.9	B	No
			PM	19.4	C		PM	14.9	B	No
23	Wisconsin Avenue - Ditmar Street (North)	SSSC	AM	13.2	B	SSSC	AM	13.1	B	No
			PM	17.9	C		PM	17.9	C	No
24	Wisconsin Avenue - Ditmar Street (South)	AWSC	AM	9.5	A	AWSC	AM	9.7	A	No
			PM	23.7	C		PM	26.5	D	No
25	Oceanside Boulevard - Pacific Street	AWSC	AM	9.1	A	AWSC	AM	9.2	A	No
			PM	12.1	B		PM	12.6	B	No
26	Oceanside Boulevard - Tremont Street	SSSC	AM	14.3	B	SSSC	AM	13.8	B	No
			PM	91	F		PM	42	E	No
27	Coast Highway - Oceanside Boulevard	Signalized	AM	26.2	C	Signalized	AM	26.7	C	No
			PM	32.1	C		PM	47.4	D	No
28	Oceanside Boulevard - Ditmar Street	Signalized	AM	14.9	B	Signalized	AM	15.3	B	No
			PM	15.3	B		PM	15.6	B	No
29	Coast Highway - Morse Street	Signalized	AM	19.6	B	Signalized	AM	9.4	A	No
			PM	22.9	C		PM	15	B	No
30	Morse Street - Freeman Street	SSSC	AM	12.9	B	SSSC	AM	10.5	B	No
			PM	112.9	F		PM	16.8	C	No
31	Morse Street - Ditmar Street	SSSC	AM	9.5	A	SSSC	AM	9.3	A	No
			PM	11.5	B		PM	10.9	B	No
32	Cassidy Street - Pacific Street	AWSC	AM	8.6	A	AWSC	AM	8.6	A	No
			PM	16.8	C		PM	17	C	No
33	Cassidy Street - Broadway Street	SSSC	AM	16	C	SSSC	AM	11.6	B	No
			PM	397.4	F		PM	26.5	D	No

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 1				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
34	Cassidy Street - Tremont Street	SSSC	AM	10.1	B	SSSC	AM	10.3	B	No
			PM	13.1	B		PM	12.7	B	No
35	Coast Highway - Cassidy Street	Signalized	AM	18.5	B	Signalized	AM	12.8	B	No
			PM	20	C		PM	31.5	C	No
36	Cassidy Street - Freeman Street	SSSC	AM	21.4	C	SSSC	AM	11	B	No
			PM	OVF	F		PM	26.1	D	No
37	Cassidy Street - Ditmar Street	AWSC	AM	7.6	A	AWSC	AM	7.5	A	No
			PM	8.6	A		PM	8.5	A	No
38	Cassidy Street - Stewart Street	AWSC	AM	9.2	A	AWSC	AM	8.9	A	No
			PM	13.8	B		PM	12.4	B	No
39	Vista Way - Broadway Street	SSSC	AM	8.5	A	SSSC	AM	8	A	No
			PM	9.4	A		PM	8.4	A	No
40	Coast Highway - Vista Way	Signalized	AM	32.8	C	Signalized	AM	35.3	D	No
			PM	78.9	E		PM	54.9	D	No
41	Vista Way - Freeman Street	SSSC	AM	34	D	SSSC	AM	16.8	C	No
			PM	OVF	F		PM	49.4	E	No
42	Vista Way - Ditmar Street	SSSC	AM	26.2	D	SSSC	AM	25.2	D	No
			PM	294.2	F		PM	OVF	F	Yes
43	Vista Way - Stewart Street	SSSC	AM	22	C	SSSC	AM	22.1	C	No
			PM	69.1	F		PM	66.8	F	No
44	Coast Highway - Eaton Street	SSSC	AM	14.9	B	SSSC	AM	18.8	C	No
			PM	17.4	C		PM	24.5	C	No
45	Coast Highway - Michigan Avenue	Signalized	AM	4.7	A	RBT	AM	6.4	A	No
			PM	5.4	A		PM	19.4	C	No
46	Coast Highway - West Street	SSSC	AM	9.6	A	RBT	AM	4.9	A	No
			PM	11.2	B		PM	7.3	A	No
47	Coast Highway - Kelly Street	SSSC	AM	10	B	SSSC	AM	14.2	B	No
			PM	12.7	B		PM	69.4	F	Yes
48	Harbor/Vandergrift Blvd - I-5 NB On-Ramp/San Rafael Drive	Signalized	AM	15	B	Signalized	AM	16.6	B	No
			PM	37.4	D		PM	45.6	D	No
49	SR-76 - I-5 SB On-Ramp	Signalized	AM	4.9	A	Signalized	AM	5	A	No
			PM	4.5	A		PM	4.8	A	No
50	SR-76 - I-5 NB On/Off-Ramp	Signalized	AM	25.4	C	Signalized	AM	27	C	No
			PM	27.8	C		PM	31.6	C	No
51	Mission - I-5 SB Off-Ramp	Signalized	AM	11.6	B	Signalized	AM	11.3	B	No
			PM	13.8	B		PM	13.3	B	No
52	Oceanside - I-5 SB On/Off-Ramp	Signalized	AM	50.2	D	Signalized	AM	75.9	E	Yes
			PM	42.6	D		PM	51.1	D	Yes
53	Oceanside - I-5 NB On/Off-Ramp	Signalized	AM	37.7	D	Signalized	AM	40.0	D	Yes
			PM	65.7	E		PM	71.9	E	Yes
54	California - I-5 NB On-Ramp	AWSC	AM	7.6	A	AWSC	AM	7.7	A	No
			PM	7.6	A		PM	7.6	A	No
55	Cassidy - I-5 SB On/Off-Ramp	SSSC	AM	9.3	A	SSSC	AM	9.3	A	No
			PM	9.5	A		PM	9.5	A	No

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 1				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
56	Vista Way - I-5 SB On/Off Ramp	Signalized	AM	25.8	C	Signalized	AM	32.7	C	No
			PM	88	F		PM	89.9	F	Yes

Notes:

A. Delay is expressed as an average seconds of delay per vehicle

B. LOS – Level of Service

C. AWSC – All-way stop control intersection

D. SSSC – Side-street stop control intersection

E. OVF – Overflow, Synchro is unable to calculate a level of delay

F. RBT – Roundabout

G. The minimum acceptable LOS is "D" for intersections 1-47

H. The minimum acceptable LOS is "D"; a change from C or D to a lower LOS will cause an impact for intersections 48-56

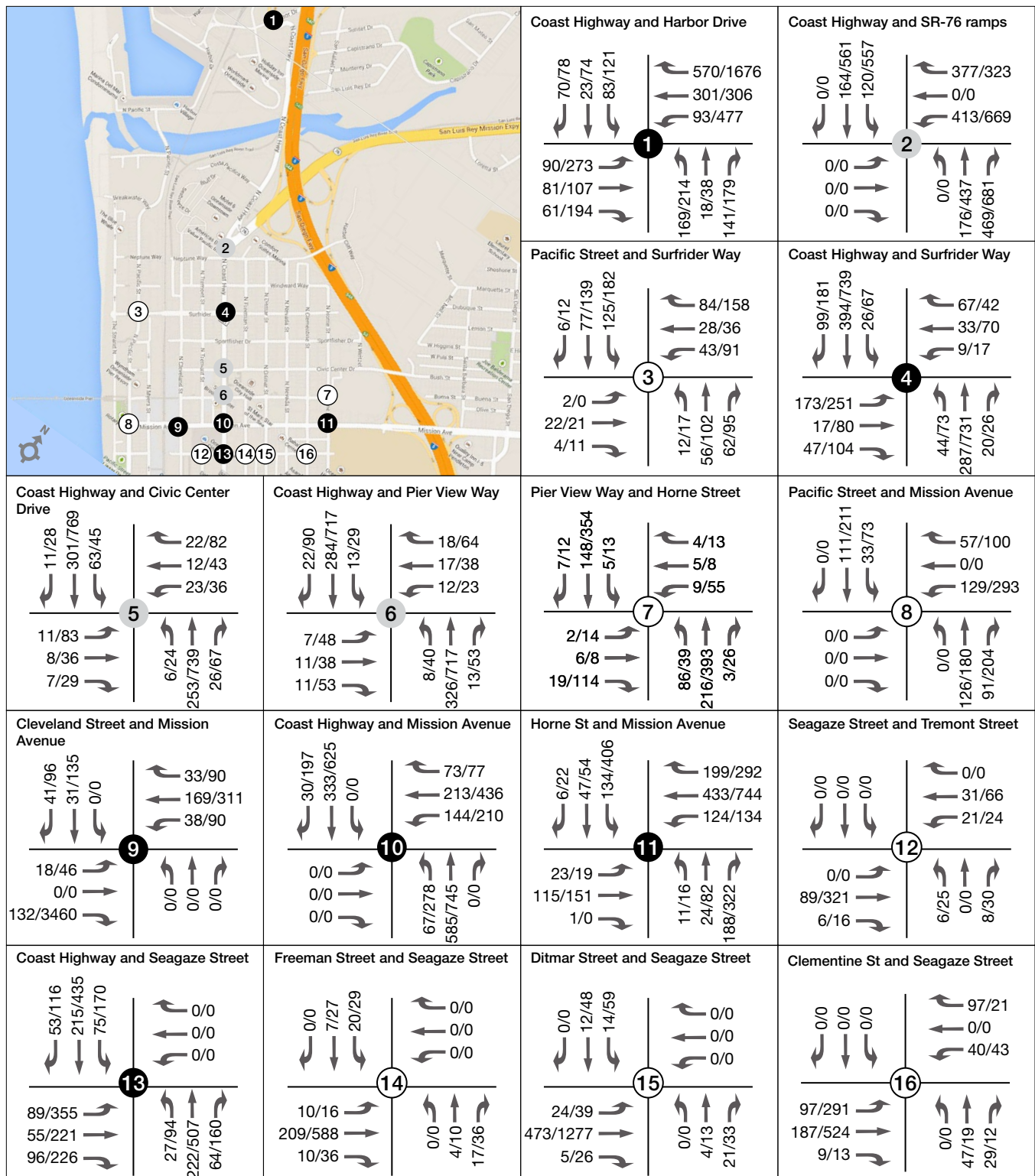
The following intersections are identified to generate significant impacts in the future with project conditions:

- Coast Highway & Pier View Way (#6)
- Seagaze Street & Ditmar Street (#15)
- Coast Highway & Wisconsin Boulevard (#21)
- Vista Way & Ditmar Street (#42)
- Coast Highway & Kelly Street (#47)
- Oceanside Boulevard & SB On/Off-Ramp (#52)
- Oceanside Boulevard & NB On/Off-Ramp (#53)
- Vista Way & I-5 SB On/Off Ramp (#56)

All other intersections are not impacted by the proposed project alternative 1.

Mitigation measures are discussed in Section 7.

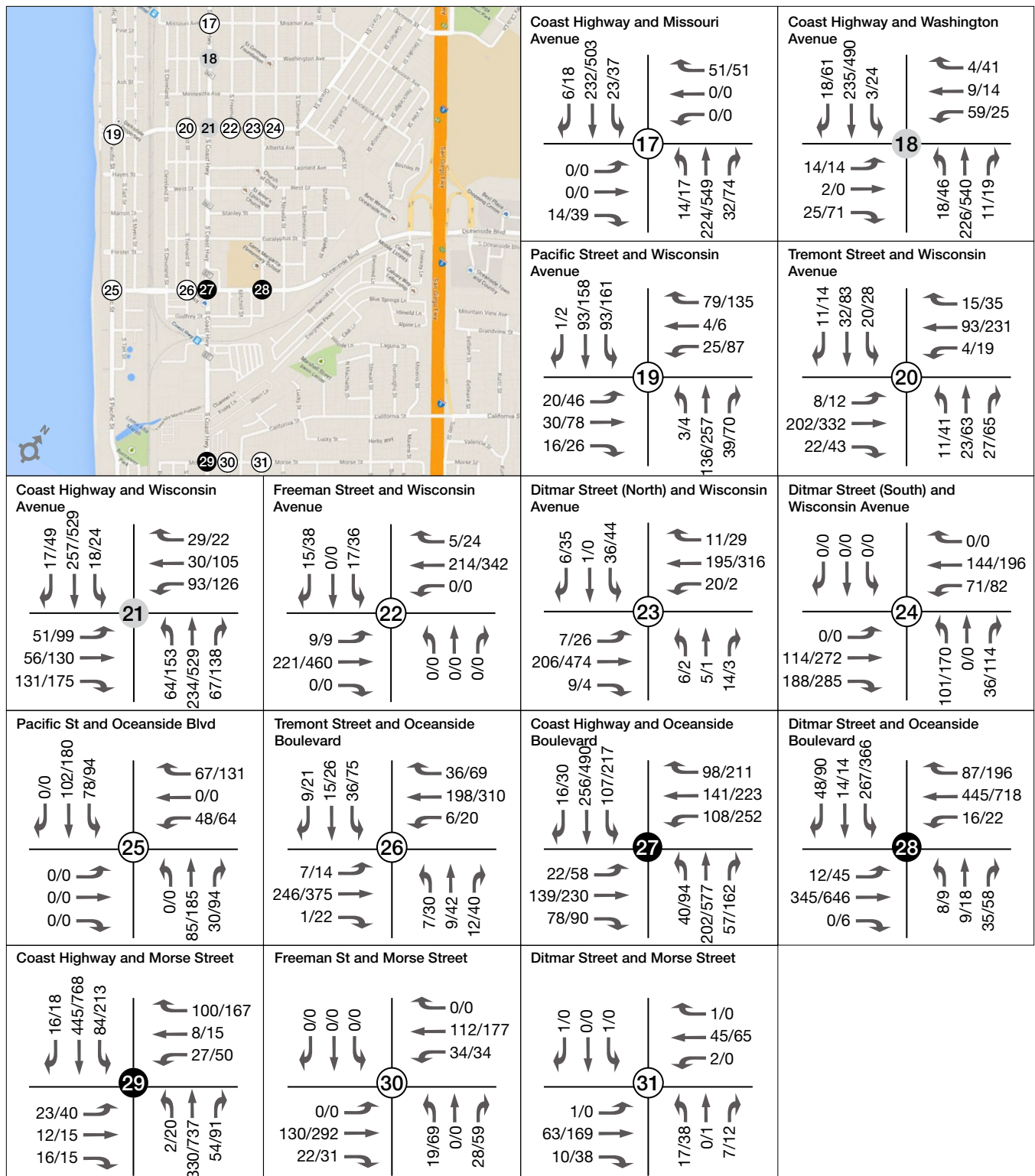
Figure 5-5a Future with Project Alternative 1 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

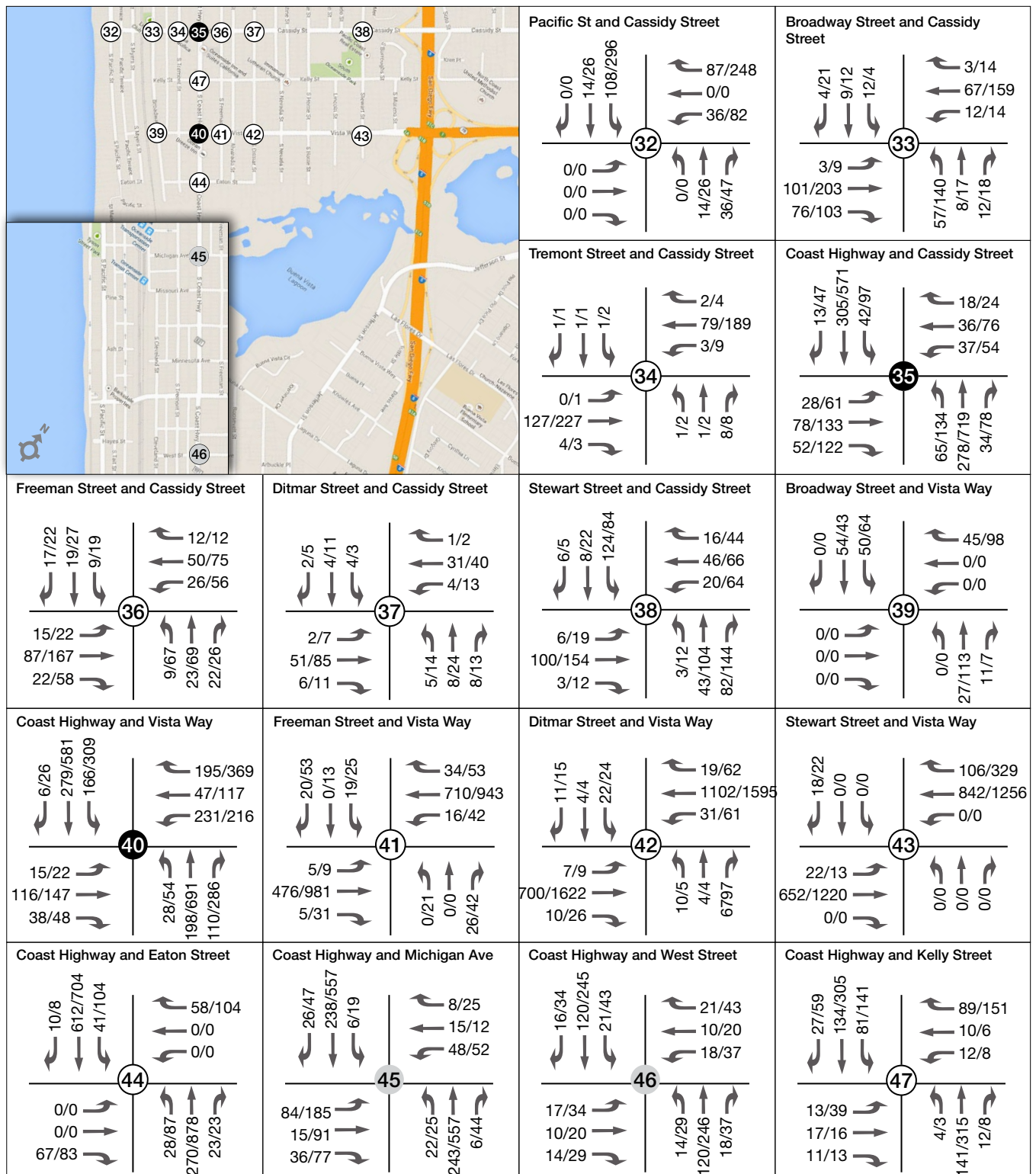
Figure 5-5b Future with Project Alternative 1 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

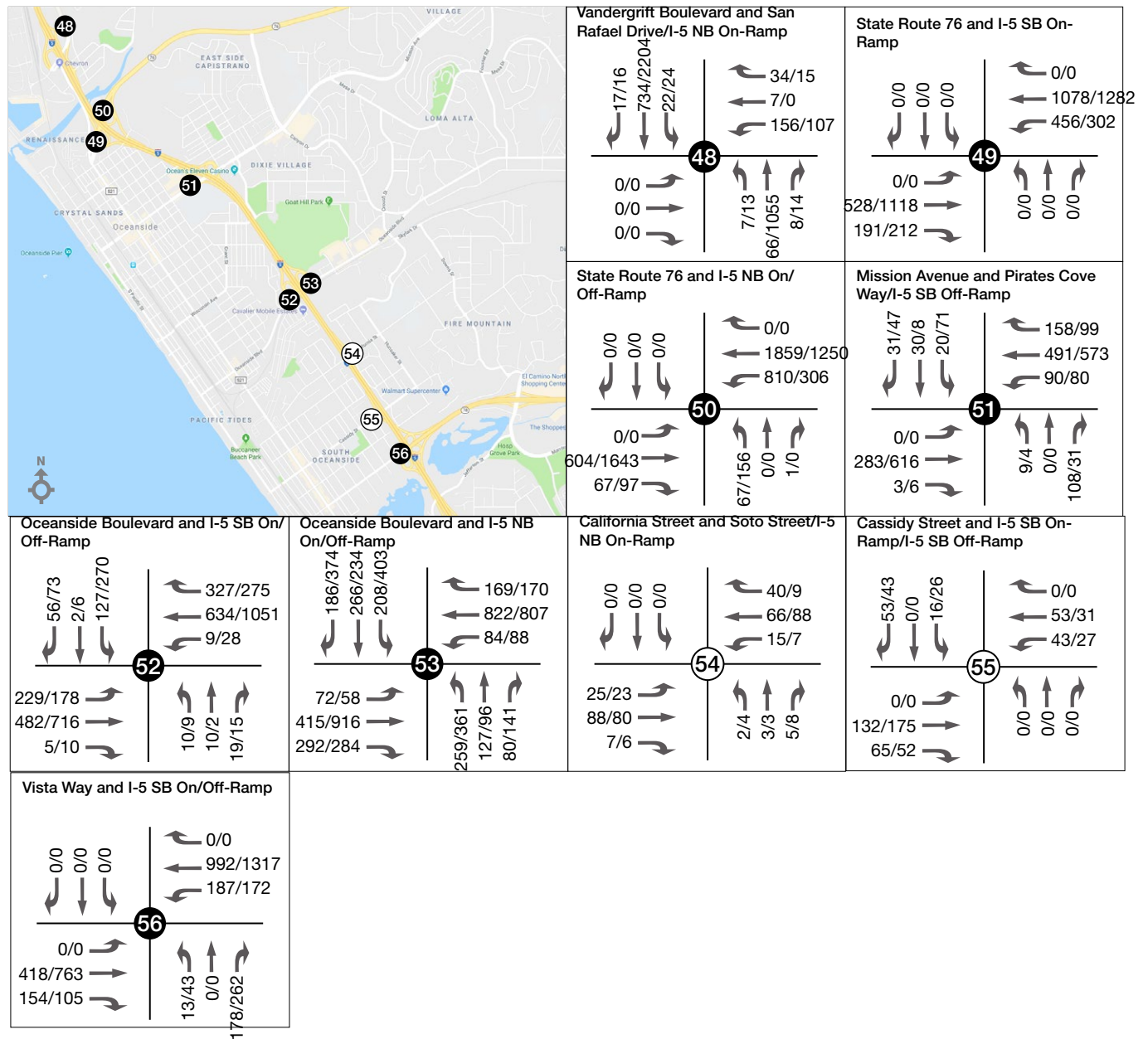
Figure 5-5c Future with Project Alternative 1 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

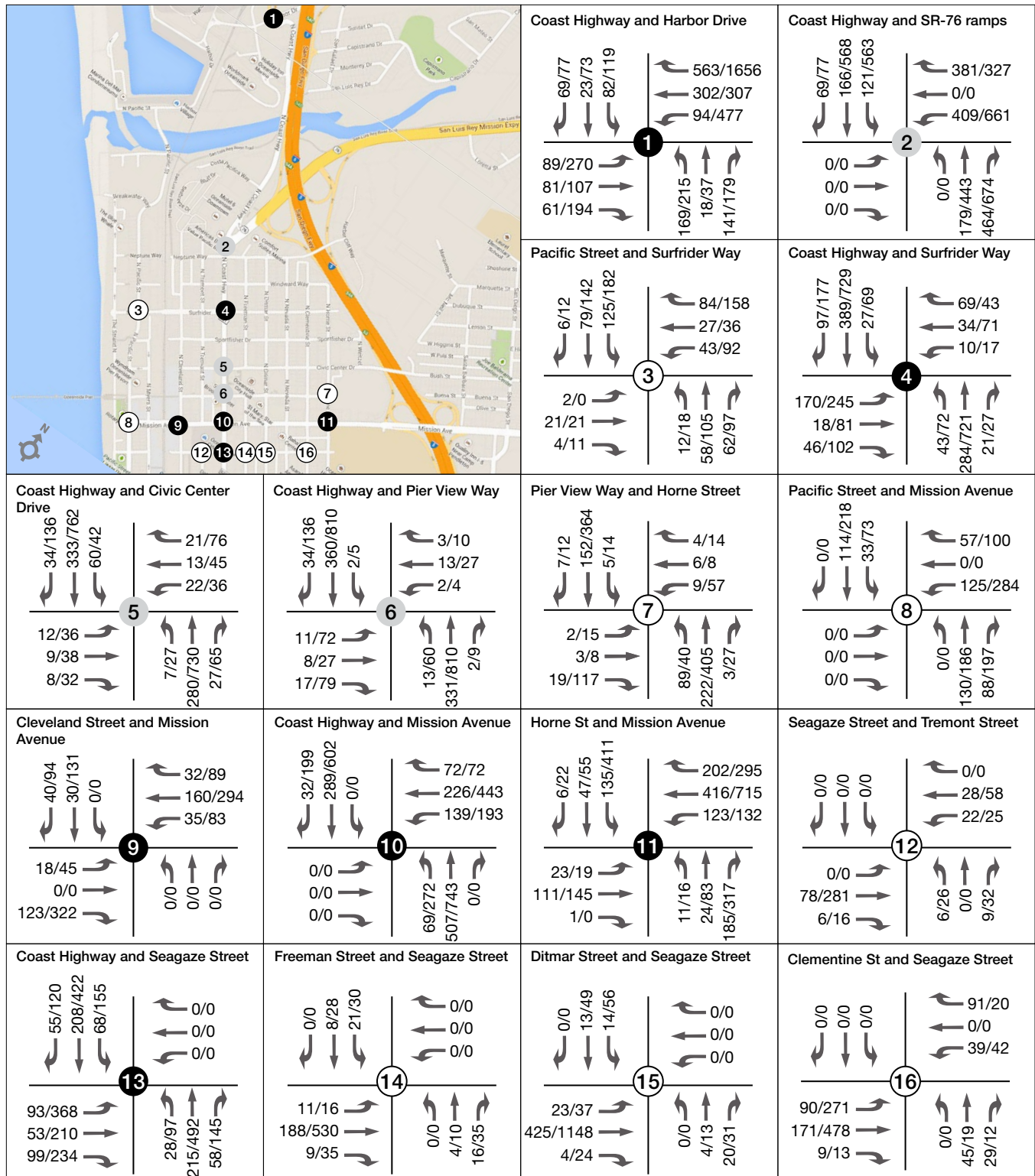
Figure 5-5d Future with Project Alternative 1 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ##/## AM/PM Turning Movement Volume

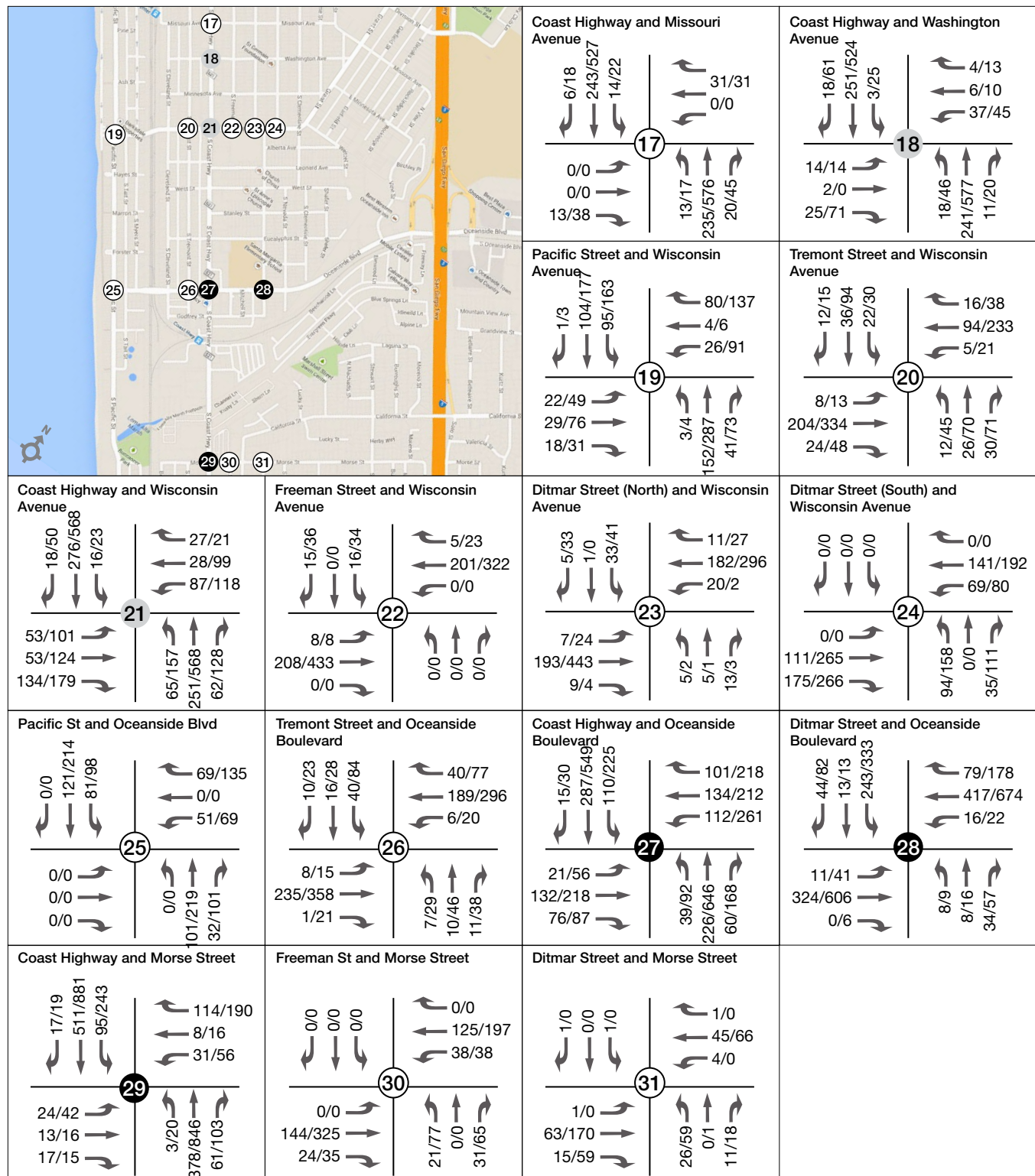
Figure 5-6a Future with Project Alternative 1 (Existing SR-78) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

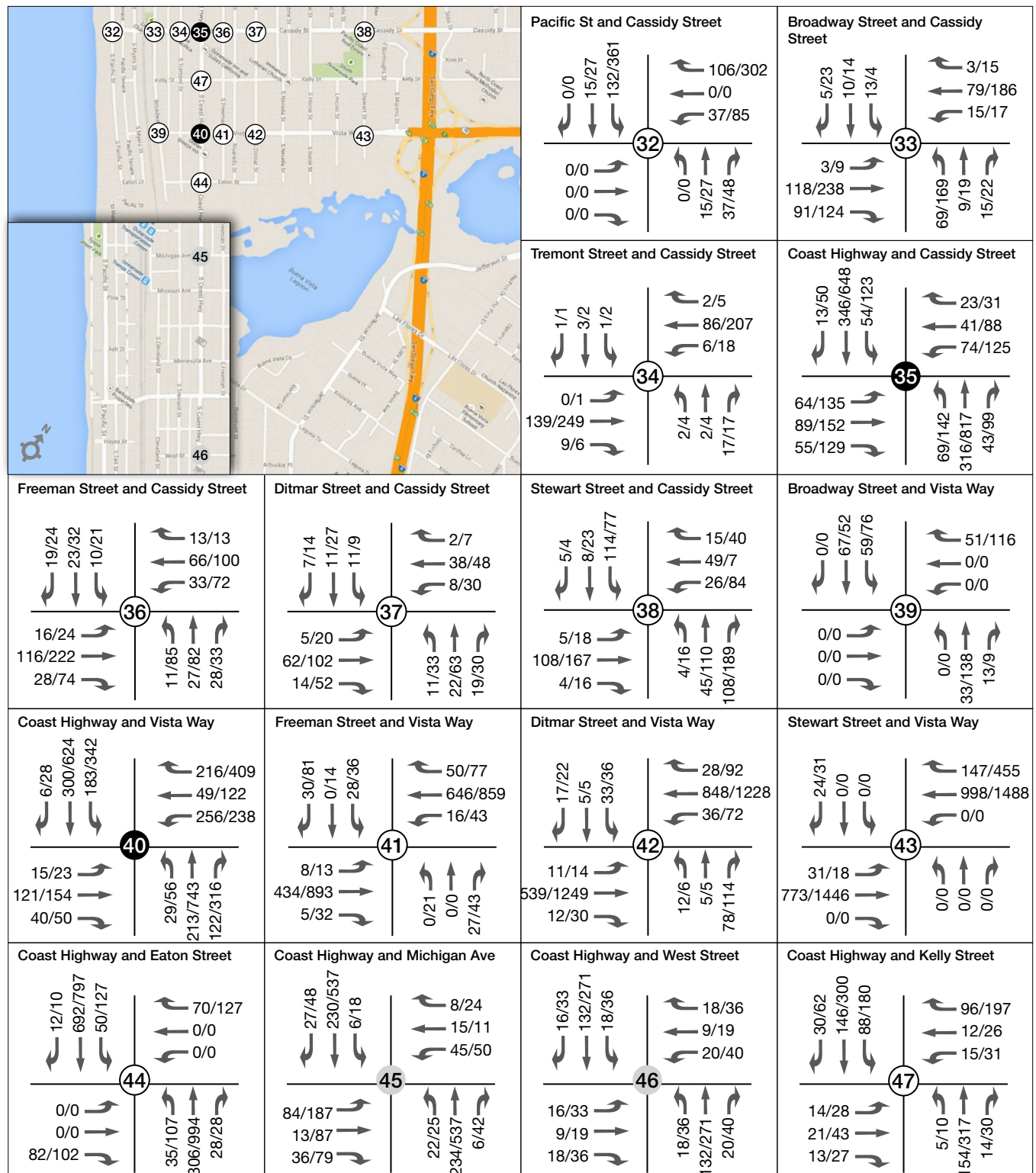
Figure 5-6b Future with Project Alternative 1 (Existing SR-78) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

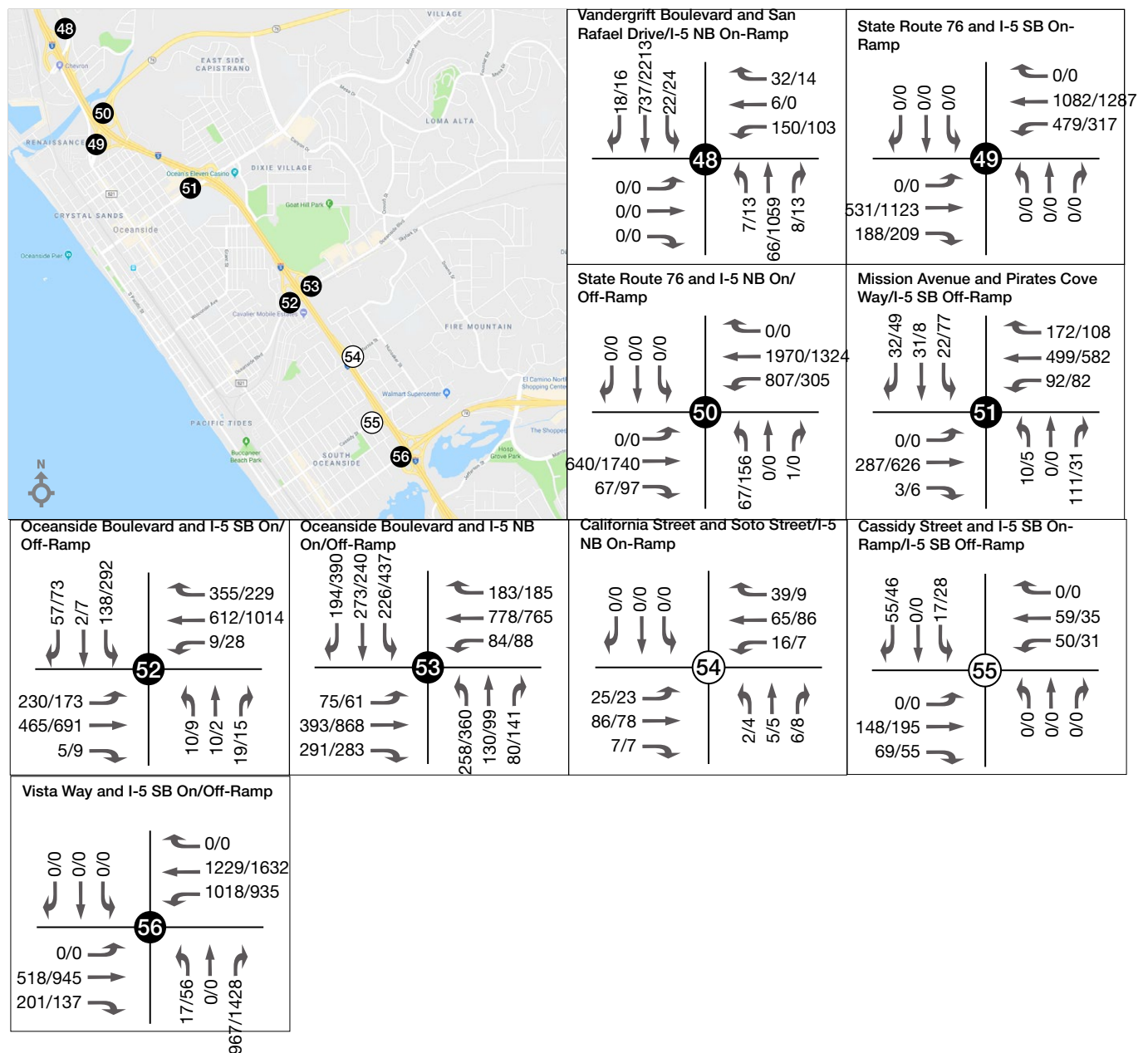
Figure 5-6c Future with Project Alternative 1 (Existing SR-78) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

Figure 5-6d Future with Project Alternative 1 (Existing SR-78) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

5.4 Year 2035 Future Conditions with Project Alternative 2 (Four-Lanes between Morse St and Vista Way) – Modified Vision Plan

This section examines traffic conditions with the Coast Highway Corridor project alternative 2 which proposes 2 lanes between Harbor Drive and Morse Street and four lanes between Morse St and Vista Way with seven new roundabouts as described in section 3.6.4. The analysis was conducted for the Future (2035) under the Modified Vision Plan conditions.

5.4.1 Road Segment Volumes

Road segment volumes have been included for noise modeling purposes. Future road segment volumes with project alternative 2 are found in Appendix A. In addition to a review of daily ADT volumes, peak hour roadway volumes are also provided for reference in Appendix A. Peak hour roadway volumes can provide a more appropriate depiction of traffic conditions compared with daily roadway capacity.

5.4.2 Intersection Level of Service

This section examines traffic conditions with and without the Coast Highway Corridor project alternative 2. The analysis was conducted for the future conditions.

The intersection operations analysis for the future condition with project alternative 2 was performed consistent with the methodology outlined in Section 3. Table 5-7 presents the results for the future conditions traffic analysis with project alternative 2. A comparison between the future condition without and with project alternative 2 is also provided. Figure 5-7 contains the traffic volumes used for the future conditions with project alternative 2 analysis.

Table 5-7: LOS Analysis – Future Conditions with Project Alternative 2

INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 2				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
1	Coast Highway - I-5 Ramps / Harbor Drive	Signalized	AM	30.4	C	Signalized	AM	29.8	C	No
			PM	65.3	E		PM	46.8	D	No
2	Coast Highway - SR-76 Ramps	Signalized	AM	13.3	B	RBT	AM	3.9	A	No
			PM	27.7	C		PM	26.7	D	No
3	Surfrider Way - Pacific Street	AWSC	AM	9.7	A	AWSC	AM	9	A	No
			PM	14.5	B		PM	12.8	B	No
4	Coast Highway - Surfrider Way	Signalized	AM	12.8	B	Signalized	AM	12.9	B	No
			PM	15.6	B		PM	19.2	B	No
5	Coast Highway - Civic Center Drive	Signalized	AM	26.8	C	RBT	AM	7.4	A	No
			PM	14.6	B		PM	32	D	No
6	Coast Highway - Pier View Way	Signalized	AM	13.6	B	RBT	AM	6.6	A	No
			PM	12.5	B		PM	29.1	D	No
7	Pier View Way - Horne Street	AWSC	AM	9.2	A	AWSC	AM	8.8	A	No
			PM	15.6	C		PM	11.5	B	No
8	Mission Avenue - Pacific Street	AWSC	AM	9.2	A	AWSC	AM	9	A	No
			PM	17.3	C		PM	16.8	C	No
9	Mission Avenue - Cleveland Street	Signalized	AM	30.4	C	Signalized	AM	14.8	B	No
			PM	18.5	B		PM	12.4	B	No

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 2				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
10	Coast Highway - Mission Avenue	Signalized	AM	10.6	B	Signalized	AM	16.4	B	No
			PM	14	B		PM	26.6	C	No
11	Mission Avenue - Horne Street	Signalized	AM	7.1	A	Signalized	AM	14.7	B	No
			PM	12.1	B		PM	13.5	B	No
12	Seagaze Street - Tremont Street	SSSC	AM	10.1	B	SSSC	AM	9.2	A	No
			PM	22.2	C		PM	11.6	B	No
13	Coast Highway - Seagaze Street	Signalized	AM	18.7	B	Signalized	AM	12.5	B	No
			PM	23.9	C		PM	18	B	No
14	Seagaze Street - Freeman Street	SSSC	AM	10	B	SSSC	AM	10.1	B	No
			PM	14.4	B		PM	15.2	C	No
15	Seagaze Street - Ditmar Street	AWSC	AM	8.5	A	AWSC	AM	9	A	No
			PM	33.3	D		PM	55.5	F	Yes
16	Seagaze Street - Clementine Street	SSSC	AM	8.1	A	SSSC	AM	8.3	A	No
			PM	14.1	B		PM	16.6	C	No
17	Coast Highway - Missouri Avenue	SSSC	AM	13.1	B	SSSC	AM	10.1	B	No
			PM	33.7	D		PM	13.7	B	No
18	Coast Highway - Washington Avenue	SSSC	AM	12.4	B	RBT	AM	5.8	A	No
			PM	31.9	D		PM	11.7	B	No
19	Wisconsin Avenue - Pacific Street	AWSC	AM	9.7	A	AWSC	AM	9	A	No
			PM	28.7	D		PM	15.7	C	No
20	Wisconsin Avenue - Tremont Street	SSSC	AM	11.5	B	SSSC	AM	12.5	B	No
			PM	18.4	C		PM	26.6	D	No
21	Coast Highway - Wisconsin Avenue	Signalized	AM	10.6	B	RBT	AM	8.3	A	No
			PM	19.3	B		PM	49.2	E	Yes
22	Wisconsin Avenue - Freeman Street	SSSC	AM	9	A	SSSC	AM	11.2	B	No
			PM	9.5	A		PM	15.8	C	No
23	Wisconsin Avenue - Ditmar Street (North)	SSSC	AM	9.6	A	SSSC	AM	13.4	B	No
			PM	9.8	A		PM	19.6	C	No
24	Wisconsin Avenue - Ditmar Street (South)	AWSC	AM	7.5	A	AWSC	AM	9.8	A	No
			PM	7.8	A		PM	24.2	C	No
25	Oceanside Boulevard - Pacific Street	AWSC	AM	8.4	A	AWSC	AM	8.4	A	No
			PM	9.8	A		PM	10.8	B	No
26	Oceanside Boulevard - Tremont Street	SSSC	AM	12.4	B	SSSC	AM	14	B	No
			PM	24.6	C		PM	41.1	E	Yes
27	Coast Highway - Oceanside Boulevard	Signalized	AM	16.4	B	Signalized	AM	27	C	No
			PM	58.5	E		PM	45	D	No
28	Oceanside Boulevard - Ditmar Street	Signalized	AM	19.1	B	Signalized	AM	15.8	B	No
			PM	8.1	A		PM	18	B	No
29	Coast Highway - Morse Street	Signalized	AM	16.4	B	Signalized	AM	8.5	A	No
			PM	15.5	B		PM	14	B	No
30	Morse Street - Freeman Street	SSSC	AM	9.8	A	SSSC	AM	10.2	B	No
			PM	13.1	B		PM	14.9	B	No

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 2				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
31	Morse Street - Ditmar Street	SSSC	AM	9.1	A	SSSC	AM	9.2	A	No
			PM	10	B		PM	10.5	B	No
32	Cassidy Street - Pacific Street	AWSC	AM	8.1	A	AWSC	AM	7.9	A	No
			PM	11.1	B		PM	12	B	No
33	Cassidy Street - Broadway Street	SSSC	AM	11.5	B	SSSC	AM	10.9	B	No
			PM	23.8	C		PM	18.7	C	No
34	Cassidy Street - Tremont Street	SSSC	AM	10.1	B	SSSC	AM	9.8	A	No
			PM	13.1	B		PM	11.7	B	No
35	Coast Highway - Cassidy Street	Signalized	AM	15.5	B	Signalized	AM	14.2	B	No
			PM	19.6	B		PM	51.1	D	No
36	Cassidy Street - Freeman Street	SSSC	AM	11.7	B	SSSC	AM	10.4	B	No
			PM	21.2	C		PM	17.1	C	No
37	Cassidy Street - Ditmar Street	AWSC	AM	8.7	A	AWSC	AM	7.2	A	No
			PM	11.6	B		PM	7.6	A	No
38	Cassidy Street - Stewart Street	AWSC	AM	11	B	AWSC	AM	8.5	A	No
			PM	24.5	C		PM	10.5	B	No
39	Vista Way - Broadway Street	SSSC	AM	7.8	A	SSSC	AM	7.8	A	No
			PM	8.2	A		PM	8.2	A	No
40	Coast Highway - Vista Way	Signalized	AM	25	C	Signalized	AM	32	C	No
			PM	45.1	D		PM	50.7	D	No
41	Vista Way - Freeman Street	SSSC	AM	13.5	B	SSSC	AM	14.7	B	No
			PM	20	C		PM	27.5	D	No
42	Vista Way - Ditmar Street	SSSC	AM	14.8	B	SSSC	AM	19.9	C	No
			PM	25	D		PM	472.7	F	Yes
43	Vista Way - Stewart Street	SSSC	AM	13.2	B	SSSC	AM	17.5	C	No
			PM	20.2	C		PM	35.3	E	Yes
44	Coast Highway - Eaton Street	SSSC	AM	14.4	B	SSSC	AM	16	C	No
			PM	16.2	C		PM	19.2	C	No
45	Coast Highway - Michigan Avenue	Signalized	AM	7.5	A	RBT	AM	6.4	A	No
			PM	6.6	A		PM	20.1	C	No
46	Coast Highway - West Street	SSSC	AM	11.4	B	RBT	AM	4.7	A	No
			PM	18	C		PM	6.9	A	No
47	Coast Highway - Kelly Street	SSSC	AM	10.2	B	SSSC	AM	13.3	B	No
			PM	13.9	B		PM	33.9	D	No
48	Harbor/Vandergrift Blvd - I-5 NB On-Ramp/San Rafael Drive	Signalized	AM	15	B	Signalized	AM	16.6	B	No
			PM	36.6	D		PM	45.6	D	No
49	SR-76 - I-5 SB On-Ramp	Signalized	AM	4.8	A	Signalized	AM	5.0	A	No
			PM	4.5	A		PM	4.8	A	No
50	SR-76 - I-5 NB On/Off-Ramp	Signalized	AM	21.5	C	Signalized	AM	27.0	C	No
			PM	22.4	C		PM	31.6	C	No
51	Mission - I-5 SB Off-Ramp	Signalized	AM	11.5	B	Signalized	AM	11.3	B	No
			PM	13.5	B		PM	13.3	B	No
52		Signalized	AM	43.5	D	Signalized	AM	75.9	E	Yes

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 2				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
	Oceanside - I-5 SB On/Off-Ramp		PM	42.4	D		PM	51.1	D	Yes
53	Oceanside - I-5 NB On/Off-Ramp	Signalized	AM	39.8	D	Signalized	AM	40.0	D	Yes
			PM	65.3	E		PM	71.9	E	Yes
54	California - I-5 NB On- Ramp	AWSC	AM	7.6	A	AWSC	AM	7.7	A	No
			PM	7.5	A		PM	7.6	A	No
55	Cassidy - I-5 SB On/Off- Ramp	SSSC	AM	9.2	A	SSSC	AM	9.3	A	No
			PM	9.3	A		PM	9.5	A	No
56	Vista Way - I-5 SB On/Off Ramp	Signalized	AM	20.4	C	Signalized	AM	32.7	C	No
			PM	25.7	C		PM	89.9	F	Yes

Notes:

A. Delay is expressed as an average seconds of delay per vehicle

B. LOS – Level of Service

C. AWSC – All-way stop control intersection

D. SSSC – Side-street stop control intersection

E. OVF – Overflow, Synchro is unable to calculate a level of delay

F. RBT – Roundabout

G. The minimum acceptable LOS is "D" for intersections 1-47

H. The minimum acceptable LOS is "D"; a change from C or D to a lower LOS will cause an impact for intersections 48-56

The following intersections are identified to generate significant impacts in the future with project conditions:

- Seagaze Street & Ditmar Street (#15)
- Coast Highway & Wisconsin Boulevard (#21)
- Oceanside Boulevard & Tremont Street (#26)
- Vista Way & Ditmar Street (#42)
- Vista Way & Stewart Street (#43)
- Oceanside Boulevard & SB On/Off-Ramp (#52)
- Oceanside Boulevard & NB On/Off-Ramp (#53)
- Vista Way & I-5 SB On/Off Ramp (#56)

All other intersections are not impacted by the proposed project alternative 2.

Mitigation measures are discussed in Section 7.

5.4.3 Vista Way/SR-78 & I-5 Existing Configuration

This section examines traffic conditions with the Coast Highway Corridor project alternative 2 throughout the corridor and assumes existing network conditions for the Vista Way/SR-78 and I-5 Interchange. The analysis was conducted for future (2035) conditions.

5.4.3.1 Road Segment Volumes

Road segment volumes have been included in Appendix A for use in noise modeling purposes. Future road segment volumes are extracted from SANDAG's regional model. In addition to a review of daily ADT volumes, peak hour roadway volumes are also provided for reference in Appendix A. Peak hour roadway volumes can provide a more appropriate depiction of traffic conditions compared with daily roadway capacity.

5.4.3.2 Intersection Level of Service

The intersection operations analysis for the future condition project alternative 2 was performed consistent with the methodology outlined in Section 3. Table 5-8 presents the results for the future conditions traffic analysis with the proposed project under existing Vista Way/SR-78 & I-5 Interchange configuration. Figure 5-8 contains the traffic volumes used for the future condition analysis.

Table 5-8: LOS Analysis – Future Conditions with Project Alternative 2 (Existing SR-78)

INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 2				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
1	Coast Highway - I-5 Ramps / Harbor Drive	Signalized	AM	31.1	C	Signalized	AM	29.8	C	No
			PM	68.9	E		PM	53.7	D	No
2	Coast Highway - SR-76 Ramps	Signalized	AM	12.7	B	RBT	AM	3	A	No
			PM	25.6	C		PM	17.8	C	No
3	Surfrider Way - Pacific Street	AWSC	AM	10.4	B	AWSC	AM	9.7	A	No
			PM	19.5	C		PM	14.6	B	No
4	Coast Highway - Surfrider Way	Signalized	AM	16.4	B	Signalized	AM	9.8	A	No
			PM	17.1	B		PM	18	B	No
5	Coast Highway - Civic Center Drive	Signalized	AM	13.2	B	RBT	AM	7.3	A	No
			PM	15.6	B		PM	30.6	D	No
6	Coast Highway - Pier View Way	Signalized	AM	19.2	B	RBT	AM	7.1	A	No
			PM	8.7	A		PM	46.4	E	Yes
7	Pier View Way - Horne Street	AWSC	AM	9.4	A	AWSC	AM	8.9	A	No
			PM	17.6	C		PM	11.9	B	No
8	Mission Avenue - Pacific Street	AWSC	AM	9.5	A	AWSC	AM	9.3	A	No
			PM	19.4	C		PM	17.6	C	No
9	Mission Avenue - Cleveland Street	Signalized	AM	18.8	B	Signalized	AM	14.8	B	No
			PM	17.7	B		PM	16.8	B	No
10	Coast Highway - Mission Avenue	Signalized	AM	12	B	Signalized	AM	15.2	B	No
			PM	12.8	B		PM	30.6	C	No
11	Mission Avenue - Horne Street	Signalized	AM	6.9	A	Signalized	AM	13.3	B	No
			PM	10.7	B		PM	12.8	B	No

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 2				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
12	Seagaze Street - Tremont Street	SSSC	AM	9.8	A	SSSC	AM	9.1	A	No
			PM	17.1	C		PM	11.2	B	No
13	Coast Highway - Seagaze Street	Signalized	AM	15.8	B	Signalized	AM	13.1	B	No
			PM	22.7	C		PM	16.7	B	No
14	Seagaze Street - Freeman Street	SSSC	AM	10.1	B	SSSC	AM	10	B	No
			PM	15	B		PM	14.4	B	No
15	Seagaze Street - Ditmar Street	AWSC	AM	8.6	A	AWSC	AM	8.7	A	No
			PM	30.2	D		PM	38	E	Yes
16	Seagaze Street - Clementine Street	SSSC	AM	8.3	A	SSSC	AM	8.2	A	No
			PM	17.7	C		PM	14.3	B	No
17	Coast Highway - Missouri Avenue	SSSC	AM	10.8	B	SSSC	AM	10	A	No
			PM	15.7	C		PM	13.3	B	No
18	Coast Highway - Washington Avenue	SSSC	AM	9.9	A	RBT	AM	5.9	A	No
			PM	13.8	B		PM	12.9	B	No
19	Wisconsin Avenue - Pacific Street	AWSC	AM	10.1	B	AWSC	AM	9.7	A	No
			PM	51.3	F		PM	20.4	C	No
20	Wisconsin Avenue - Tremont Street	SSSC	AM	10.8	B	SSSC	AM	12.7	B	No
			PM	14.9	B		PM	30.8	D	No
21	Coast Highway - Wisconsin Avenue	Signalized	AM	14.5	B	RBT	AM	8.5	A	No
			PM	24.5	C		PM	57.8	F	Yes
22	Wisconsin Avenue - Freeman Street	SSSC	AM	11.5	B	SSSC	AM	10.9	B	No
			PM	19.4	C		PM	14.9	B	No
23	Wisconsin Avenue - Ditmar Street (North)	SSSC	AM	13.2	B	SSSC	AM	13.1	B	No
			PM	17.9	C		PM	17.9	C	No
24	Wisconsin Avenue - Ditmar Street (South)	AWSC	AM	9.5	A	AWSC	AM	9.7	A	No
			PM	23.7	C		PM	26.5	D	No
25	Oceanside Boulevard - Pacific Street	AWSC	AM	9.1	A	AWSC	AM	9.2	A	No
			PM	12.1	B		PM	12.6	B	No
26	Oceanside Boulevard - Tremont Street	SSSC	AM	14.3	B	SSSC	AM	13.8	B	No
			PM	91	F		PM	42	E	No
27	Coast Highway - Oceanside Boulevard	Signalized	AM	26.2	C	Signalized	AM	26.7	C	No
			PM	32.1	C		PM	47.4	D	No
28	Oceanside Boulevard - Ditmar Street	Signalized	AM	14.9	B	Signalized	AM	15.3	B	No
			PM	15.3	B		PM	15.6	B	No
29	Coast Highway - Morse Street	Signalized	AM	19.6	B	Signalized	AM	9.4	A	No
			PM	22.9	C		PM	15	B	No
30	Morse Street - Freeman Street	SSSC	AM	12.9	B	SSSC	AM	10.5	B	No
			PM	112.9	F		PM	16.8	C	No
31	Morse Street - Ditmar Street	SSSC	AM	9.5	A	SSSC	AM	9.3	A	No
			PM	11.5	B		PM	10.9	B	No
32	Cassidy Street - Pacific Street	AWSC	AM	8.6	A	AWSC	AM	8.6	A	No
			PM	16.8	C		PM	17	C	No
33	Cassidy Street - Broadway Street	SSSC	AM	16	C	SSSC	AM	11.6	B	No
			PM	397.4	F		PM	26.5	D	No

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 2				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
34	Cassidy Street - Tremont Street	SSSC	AM	10.1	B	SSSC	AM	10.3	B	No
			PM	13.1	B		PM	12.7	B	No
35	Coast Highway - Cassidy Street	Signalized	AM	18.5	B	Signalized	AM	12.8	B	No
			PM	20	C		PM	31.5	C	No
36	Cassidy Street - Freeman Street	SSSC	AM	21.4	C	SSSC	AM	11	B	No
			PM	OVF	F		PM	26.1	D	No
37	Cassidy Street - Ditmar Street	AWSC	AM	7.6	A	AWSC	AM	7.5	A	No
			PM	8.6	A		PM	8.5	A	No
38	Cassidy Street - Stewart Street	AWSC	AM	9.2	A	AWSC	AM	8.9	A	No
			PM	13.8	B		PM	12.4	B	No
39	Vista Way - Broadway Street	SSSC	AM	8.5	A	SSSC	AM	8	A	No
			PM	9.4	A		PM	8.4	A	No
40	Coast Highway - Vista Way	Signalized	AM	32.8	C	Signalized	AM	35.3	D	No
			PM	78.9	E		PM	54.9	D	No
41	Vista Way - Freeman Street	SSSC	AM	34	D	SSSC	AM	16.8	C	No
			PM	OVF	F		PM	49.4	E	No
42	Vista Way - Ditmar Street	SSSC	AM	26.2	D	SSSC	AM	25.2	D	No
			PM	294.2	F		PM	OVF	F	Yes
43	Vista Way - Stewart Street	SSSC	AM	22	C	SSSC	AM	22.1	C	No
			PM	69.1	F		PM	66.8	F	No
44	Coast Highway - Eaton Street	SSSC	AM	14.9	B	SSSC	AM	18.8	C	No
			PM	17.4	C		PM	24.5	C	No
45	Coast Highway - Michigan Avenue	Signalized	AM	4.7	A	RBT	AM	6.4	A	No
			PM	5.4	A		PM	19.4	C	No
46	Coast Highway - West Street	SSSC	AM	9.6	A	RBT	AM	4.9	A	No
			PM	11.2	B		PM	7.3	A	No
47	Coast Highway - Kelly Street	SSSC	AM	10	B	SSSC	AM	14.2	B	No
			PM	12.7	B		PM	69.4	F	Yes
48	Harbor/Vandergrift Blvd - I-5 NB On-Ramp/San Rafael Drive	Signalized	AM	15	B	Signalized	AM	16.6	B	No
			PM	37.4	D		PM	45.6	D	No
49	SR-76 - I-5 SB On-Ramp	Signalized	AM	4.9	A	Signalized	AM	5	A	No
			PM	4.5	A		PM	4.8	A	No
50	SR-76 - I-5 NB On/Off-Ramp	Signalized	AM	25.4	C	Signalized	AM	27	C	No
			PM	27.8	C		PM	31.6	C	No
51	Mission - I-5 SB Off-Ramp	Signalized	AM	11.6	B	Signalized	AM	11.3	B	No
			PM	13.8	B		PM	13.3	B	No
52	Oceanside - I-5 SB On/Off-Ramp	Signalized	AM	50.2	D	Signalized	AM	73.2	E	Yes
			PM	42.6	D		PM	51.1	D	Yes
53	Oceanside - I-5 NB On/Off-Ramp	Signalized	AM	37.7	D	Signalized	AM	40	D	Yes
			PM	65.7	E		PM	71.9	D	Yes
54	California - I-5 NB On-Ramp	AWSC	AM	7.6	A	AWSC	AM	7.7	A	No
			PM	7.6	A		PM	7.6	A	No
55	Cassidy - I-5 SB On/Off-Ramp	SSSC	AM	9.3	A	SSSC	AM	9.3	A	No
			PM	9.5	A		PM	9.5	A	No

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 2				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
56	Vista Way - I-5 SB On/Off Ramp	Signalized	AM	25.8	C	Signalized	AM	32.7	C	No
			PM	88	F		PM	89.9	F	Yes

Notes:

A. Delay is expressed as an average seconds of delay per vehicle

B. LOS – Level of Service

C. AWSC – All-way stop control intersection

D. SSSC – Side-street stop control intersection

E. OVF – Overflow, Synchro is unable to calculate a level of delay

F. RBT – Roundabout

G. The minimum acceptable LOS is "D" for intersections 1-47

H. The minimum acceptable LOS is "D"; a change from C or D to a lower LOS will cause an impact for intersections 48-56

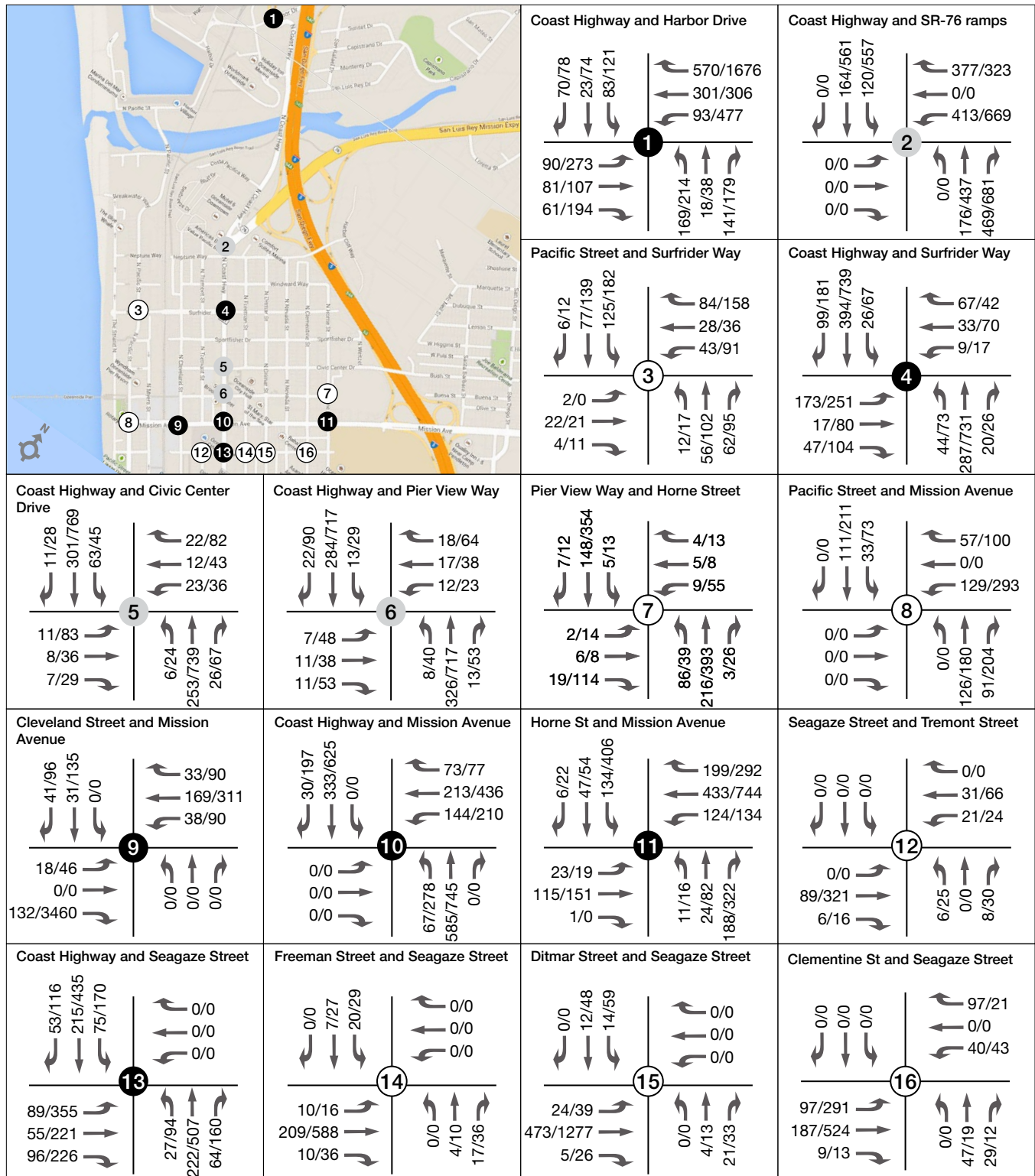
The following intersections are identified to generate significant impacts in the PM peak hour in the future with project conditions:

- Coast Highway & Pier View Way (#6)
- Seagaze Street & Ditmar Street (#15)
- Coast Highway & Wisconsin Boulevard (#21)
- Vista Way & Ditmar Street (#42)
- Coast Highway & Kelly Street (#47)
- Oceanside Boulevard & SB On/Off-Ramp (#52)
- Oceanside Boulevard & NB On/Off-Ramp (#53)
- Vista Way & I-5 SB On/Off Ramp (#56)

All other intersections are not impacted by the proposed project alternative 2.

Mitigation measures are discussed in Section 7.

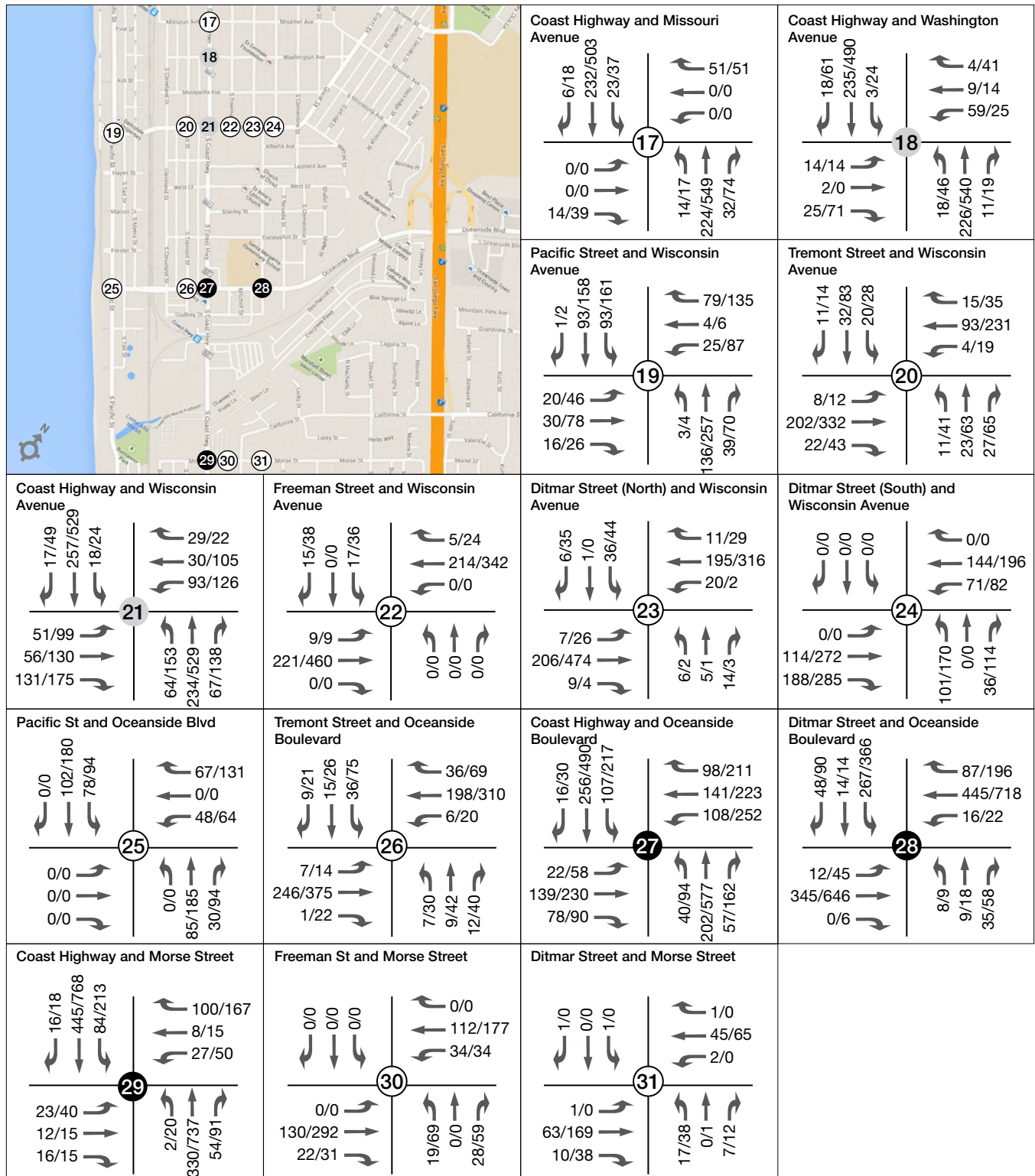
Figure 5-7a Future with Project Alternative 2 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

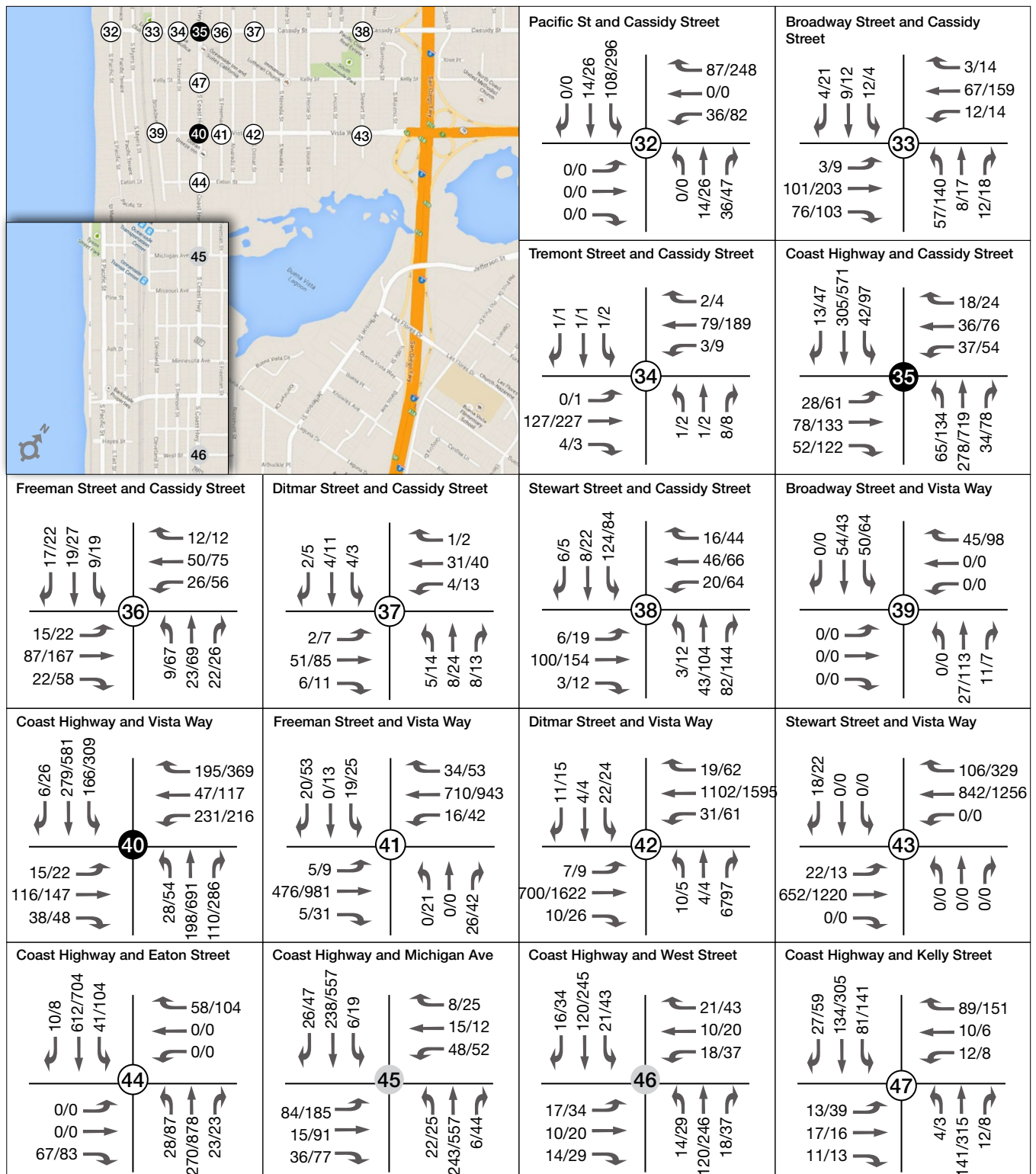
Figure 5-7b Future with Project Alternative 2 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

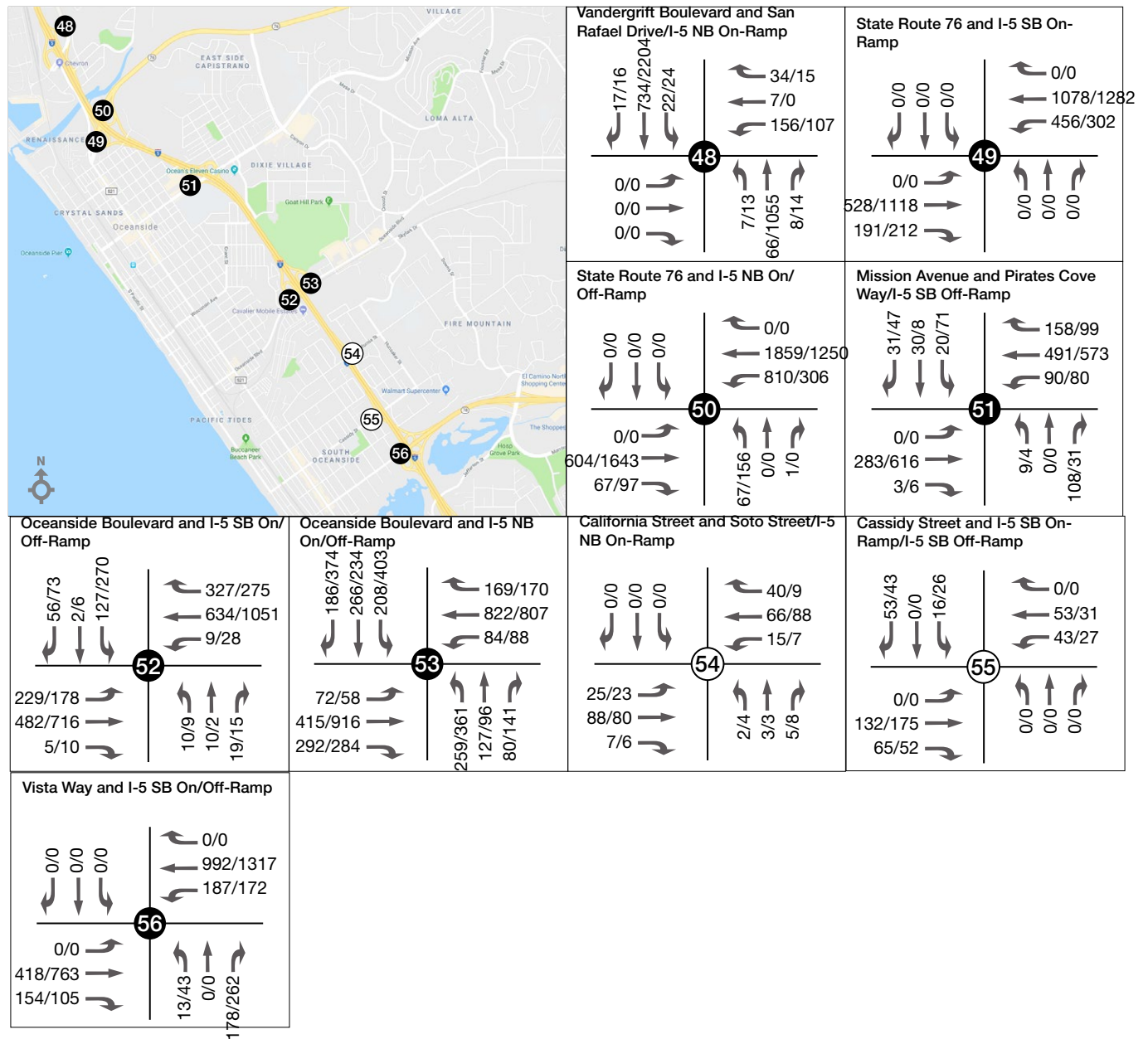
Figure 5-7c Future with Project Alternative 2 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

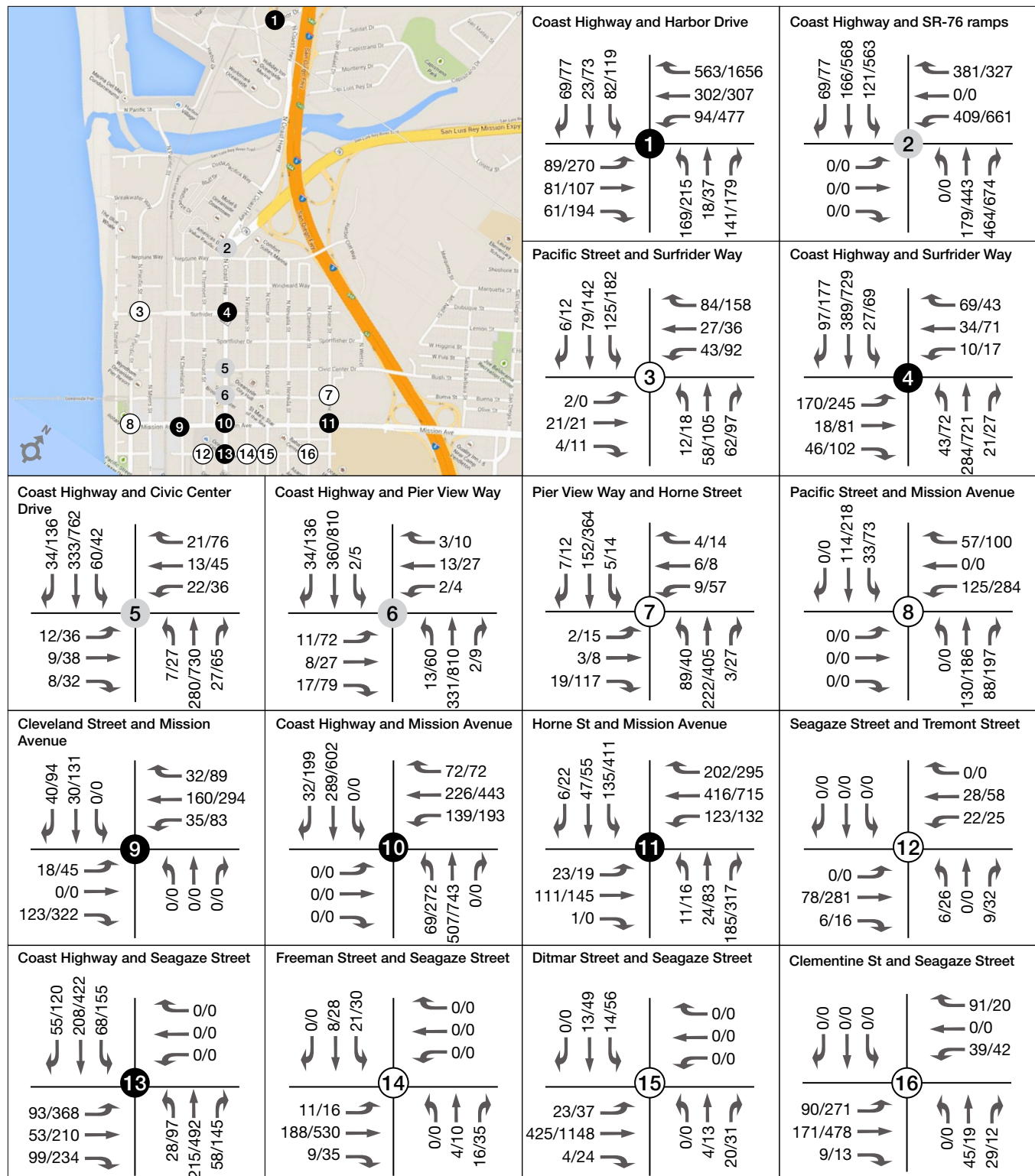
Figure 5-7d Future with Project Alternative 2 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

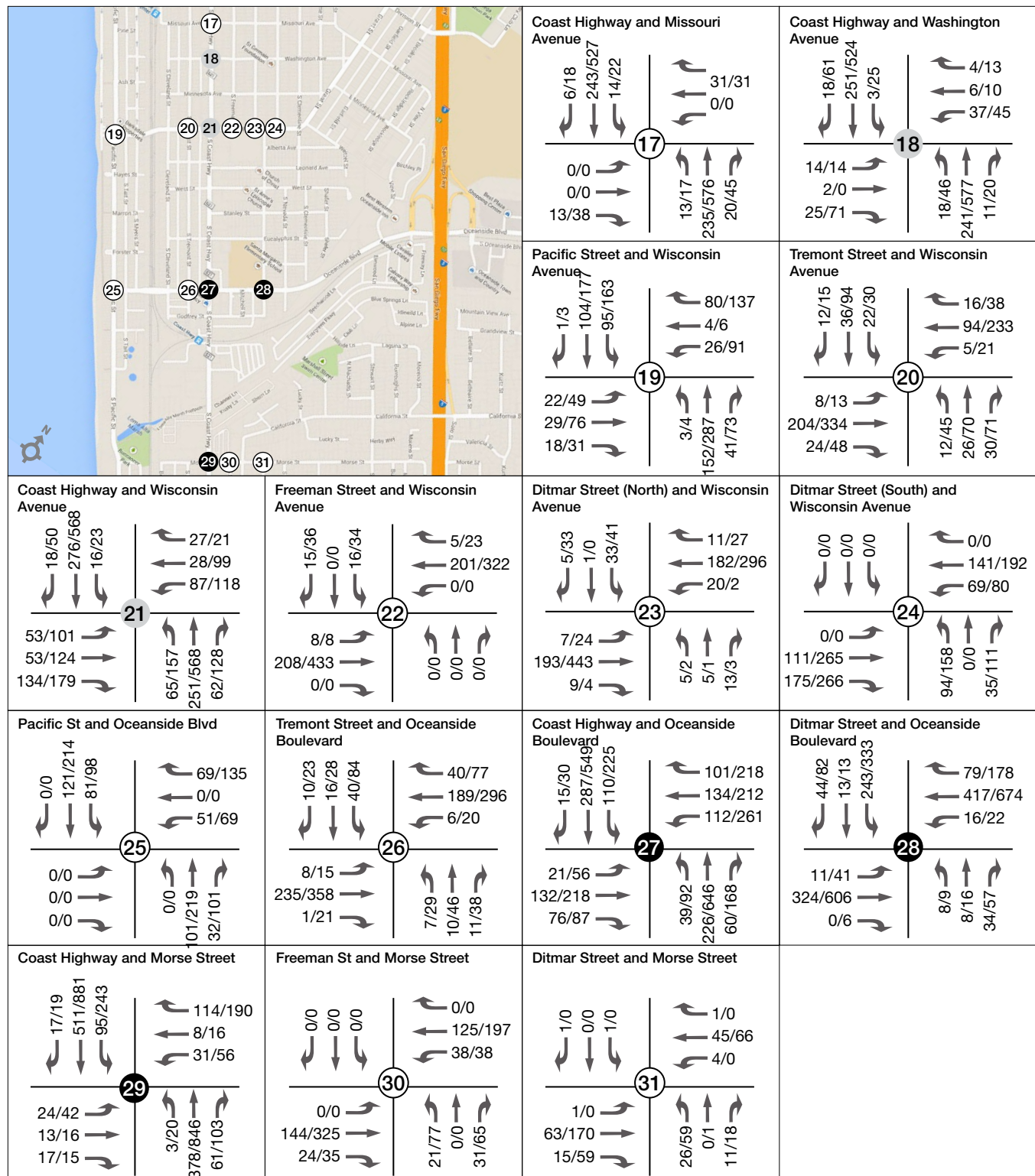
Figure 5-8a Future with Project Alternative 2 (Existing SR-78) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

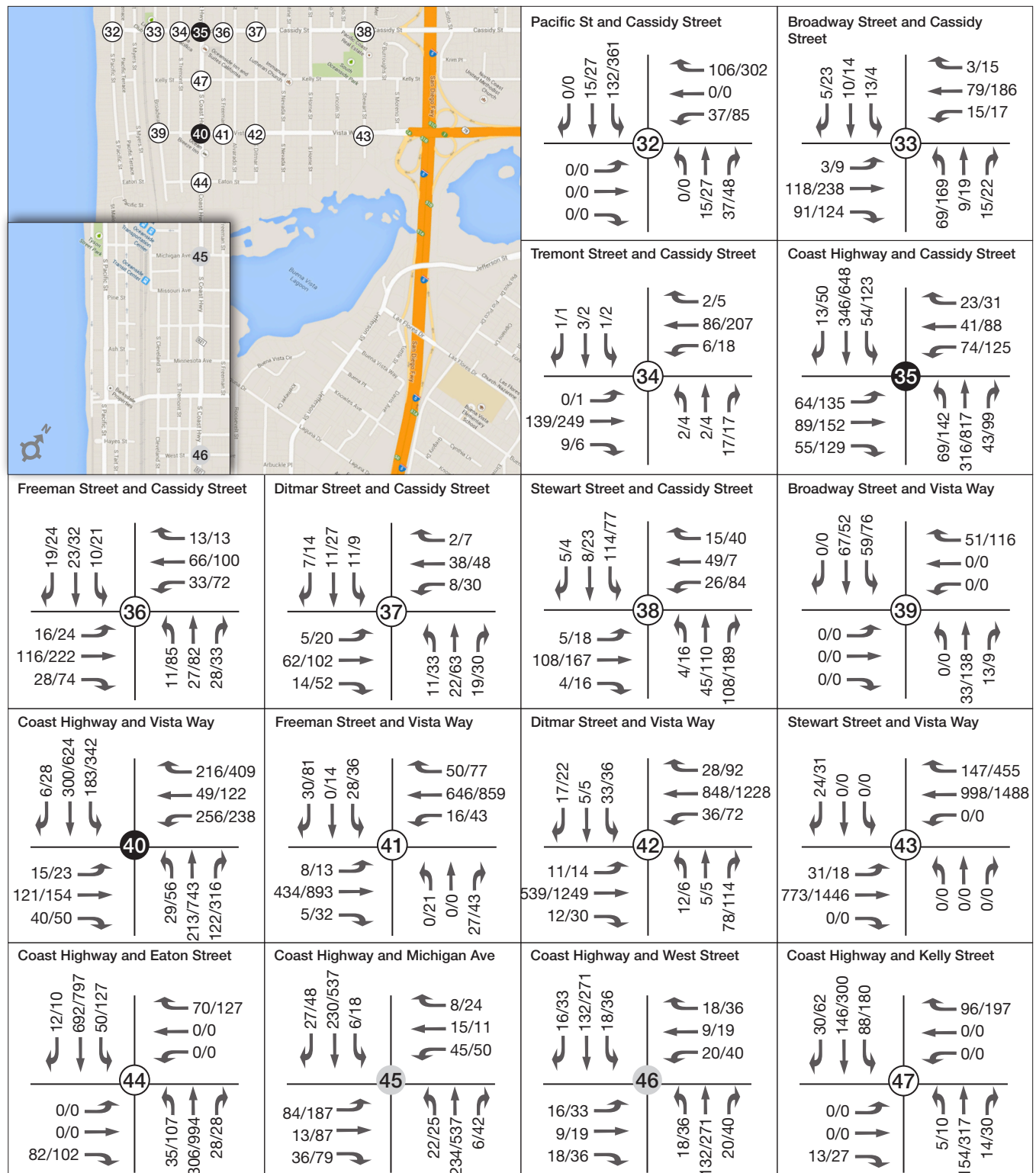
Figure 5-8b Future with Project Alternative 2 (Existing SR-78) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

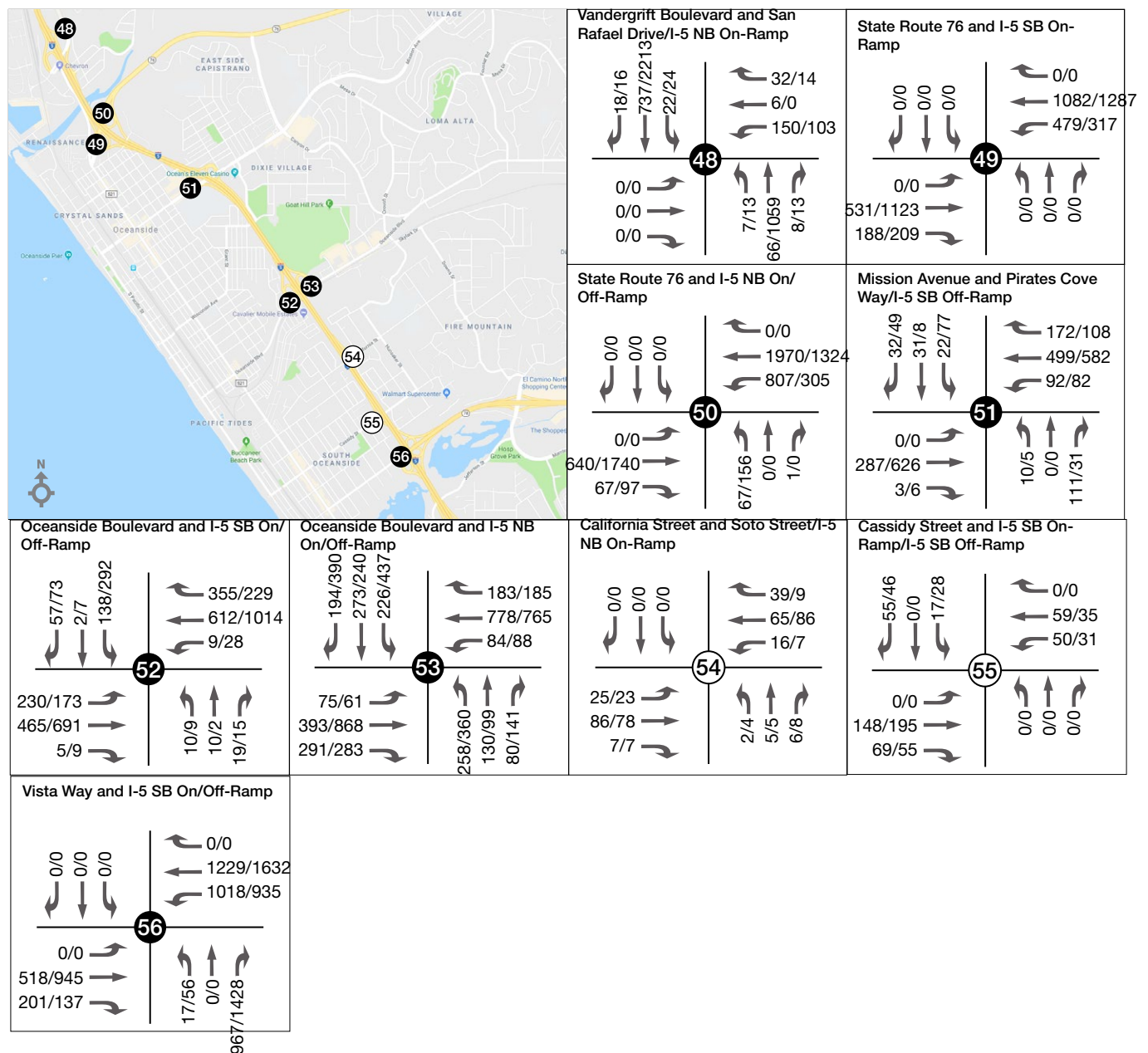
Figure 5-8c Future with Project Alternative 1 (Existing SR-78) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

Figure 5-8d Future with Project Alternative 2 (Existing SR-78) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

5.5 Year 2035 Future Conditions with Project Alternative 3 (Four-Lanes between Morse St and Vista Way) – General Vision Plan

This section examines traffic conditions with the Coast Highway Corridor project alternative 3 which proposes 2 lanes from Harbor Drive to Morse Street and four lanes between Morse Street and Vista Way with seven new roundabouts as described in section 3.6.3. The analysis was conducted for the Future (2035) under the Modified Vision Plan conditions.

5.5.1 Road Segment Volumes

Road segment volumes have been included for noise modeling purposes. Future road segment volumes with project alternative 3 are found in Appendix A. In addition to a review of daily ADT volumes, peak hour roadway volumes are also provided for reference in Appendix A. Peak hour roadway volumes can provide a more appropriate depiction of traffic conditions compared with daily roadway capacity.

5.5.2 Intersection Level of Service

This section examines traffic conditions with and without the Coast Highway Corridor project alternative 3. The analysis was conducted for the future conditions.

The intersection operations analysis for the future condition with project alternative 3 was performed consistent with the methodology outlined in Section 3. Table 5-9 presents the results for the future conditions traffic analysis with project alternative 3. A comparison between the future condition without and with project alternative 3 is also provided. Figure 5-9 contains the traffic volumes used for the future conditions with project alternative 3 analysis.

Table 5-9: LOS Analysis – Future Conditions with Project Alternative 3

INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 3				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
1	Coast Highway - I-5 Ramps / Harbor Drive	Signalized	AM	30.4	C	Signalized	AM	29.8	C	No
			PM	65.3	E		PM	55.8	E	No
2	Coast Highway - SR-76 Ramps	Signalized	AM	13.3	B	RBT	AM	3	A	No
			PM	27.7	C		PM	18	C	No
3	Surfrider Way - Pacific Street	AWSC	AM	9.7	A	AWSC	AM	9.7	A	No
			PM	14.5	B		PM	14.9	B	No
4	Coast Highway - Surfrider Way	Signalized	AM	12.8	B	Signalized	AM	9.4	A	No
			PM	15.6	B		PM	17.5	B	No
5	Coast Highway - Civic Center Drive	Signalized	AM	26.8	C	RBT	AM	7.1	A	No
			PM	14.6	B		PM	28.2	D	No
6	Coast Highway - Pier View Way	Signalized	AM	13.6	B	RBT	AM	7.3	A	No
			PM	12.5	B		PM	66.5	F	Yes
7	Pier View Way - Horne Street	AWSC	AM	9.2	A	AWSC	AM	9	A	No
			PM	15.6	C		PM	13.1	B	No
8	Mission Avenue - Pacific Street	AWSC	AM	9.2	A	AWSC	AM	9.3	A	No
			PM	17.3	C		PM	17.9	C	No
9	Mission Avenue - Cleveland Street	Signalized	AM	30.4	C	Signalized	AM	12.9	B	No
			PM	18.5	B		PM	14.8	B	No

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 3				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
10	Coast Highway - Mission Avenue	Signalized	AM	10.6	B	Signalized	AM	14.9	B	No
			PM	14	B		PM	27.9	C	No
11	Mission Avenue - Horne Street	Signalized	AM	7.1	A	Signalized	AM	13.2	B	No
			PM	12.1	B		PM	13	B	No
12	Seagaze Street - Tremont Street	SSSC	AM	10.1	B	SSSC	AM	9	A	No
			PM	22.2	C		PM	11.1	B	No
13	Coast Highway - Seagaze Street	Signalized	AM	18.7	B	Signalized	AM	13.2	B	No
			PM	23.9	C		PM	16.5	B	No
14	Seagaze Street - Freeman Street	SSSC	AM	10	B	SSSC	AM	10.1	B	No
			PM	14.4	B		PM	14.7	B	No
15	Seagaze Street - Ditmar Street	AWSC	AM	8.5	A	AWSC	AM	9	A	No
			PM	33.3	D		PM	53.5	F	Yes
16	Seagaze Street - Clementine Street	SSSC	AM	8.1	A	SSSC	AM	8.4	A	No
			PM	14.1	B		PM	15.7	C	No
17	Coast Highway - Missouri Avenue	SSSC	AM	13.1	B	SSSC	AM	9.9	A	No
			PM	33.7	D		PM	13	B	No
18	Coast Highway - Washington Avenue	SSSC	AM	12.4	B	RBT	AM	5.6	A	No
			PM	31.9	D		PM	11	B	No
19	Wisconsin Avenue - Pacific Street	AWSC	AM	9.7	A	AWSC	AM	14.5	B	No
			PM	28.7	D		PM	17.4	C	No
20	Wisconsin Avenue - Tremont Street	SSSC	AM	11.5	B	SSSC	AM	9.4	A	No
			PM	18.4	C		PM	23	C	No
21	Coast Highway - Wisconsin Avenue	Signalized	AM	10.6	B	RBT	AM	8.1	A	No
			PM	19.3	B		PM	42.1	E	Yes
22	Wisconsin Avenue - Freeman Street	SSSC	AM	9	A	SSSC	AM	11.4	B	No
			PM	9.5	A		PM	17	C	No
23	Wisconsin Avenue - Ditmar Street (North)	SSSC	AM	9.6	A	SSSC	AM	14.4	B	No
			PM	9.8	A		PM	23.6	C	No
24	Wisconsin Avenue - Ditmar Street (South)	AWSC	AM	7.5	A	AWSC	AM	10.3	B	No
			PM	7.8	A		PM	45.3	E	Yes
25	Oceanside Boulevard - Pacific Street	AWSC	AM	8.4	A	AWSC	AM	9	A	No
			PM	9.8	A		PM	11.7	B	No
26	Oceanside Boulevard - Tremont Street	SSSC	AM	12.4	B	SSSC	AM	13.8	B	No
			PM	24.6	C		PM	38.6	E	Yes
27	Coast Highway - Oceanside Boulevard	Signalized	AM	16.4	B	Signalized	AM	26.7	C	No
			PM	58.5	E		PM	36.2	D	No
28	Oceanside Boulevard - Ditmar Street	Signalized	AM	19.1	B	Signalized	AM	15.1	B	No
			PM	8.1	A		PM	19.4	B	No
29	Coast Highway - Morse Street	Signalized	AM	16.4	B	Signalized	AM	11.5	B	No
			PM	15.5	B		PM	19.7	B	No
30	Morse Street - Freeman Street	SSSC	AM	9.8	A	SSSC	AM	12	B	No
			PM	13.1	B		PM	45.4	E	Yes

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 3				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
31	Morse Street - Ditmar Street	SSSC	AM	9.1	A	SSSC	AM	9.4	A	No
			PM	10	B		PM	11.2	B	No
32	Cassidy Street - Pacific Street	AWSC	AM	8.1	A	AWSC	AM	8.3	A	No
			PM	11.1	B		PM	13.1	B	No
33	Cassidy Street - Broadway Street	SSSC	AM	11.5	B	SSSC	AM	11.6	B	No
			PM	23.8	C		PM	28	D	No
34	Cassidy Street - Tremont Street	SSSC	AM	10.1	B	SSSC	AM	9.8	A	No
			PM	13.1	B		PM	11.2	B	No
35	Coast Highway - Cassidy Street	Signalized	AM	15.5	B	Signalized	AM	19.6	B	No
			PM	19.6	B		PM	14.2	B	No
36	Cassidy Street - Freeman Street	SSSC	AM	11.7	B	SSSC	AM	11.8	B	No
			PM	21.2	C		PM	46.5	E	Yes
37	Cassidy Street - Ditmar Street	AWSC	AM	8.7	A	AWSC	AM	7.6	A	No
			PM	11.6	B		PM	8.6	A	No
38	Cassidy Street - Stewart Street	AWSC	AM	11	B	AWSC	AM	9.2	A	No
			PM	24.5	C		PM	11.8	B	No
39	Vista Way - Broadway Street	SSSC	AM	7.8	A	SSSC	AM	8.3	A	No
			PM	8.2	A		PM	9.1	A	No
40	Coast Highway - Vista Way	Signalized	AM	25	C	Signalized	AM	35.2	D	No
			PM	45.1	D		PM	50.7	D	No
41	Vista Way - Freeman Street	SSSC	AM	13.5	B	SSSC	AM	14.6	B	No
			PM	20	C		PM	29.9	D	No
42	Vista Way - Ditmar Street	SSSC	AM	14.8	B	SSSC	AM	18.9	C	No
			PM	25	D		PM	165.8	F	Yes
43	Vista Way - Stewart Street	SSSC	AM	13.2	B	SSSC	AM	16.5	C	No
			PM	20.2	C		PM	32.3	D	No
44	Coast Highway - Eaton Street	SSSC	AM	14.4	B	SSSC	AM	15.9	C	No
			PM	16.2	C		PM	19.3	C	No
45	Coast Highway - Michigan Avenue	Signalized	AM	7.5	A	RBT	AM	6.5	A	No
			PM	6.6	A		PM	21.8	C	No
46	Coast Highway - West Street	SSSC	AM	11.4	B	RBT	AM	4.5	A	No
			PM	18	C		PM	6.2	A	No
47	Coast Highway - Kelly Street	SSSC	AM	10.2	B	SSSC	AM	10.1	B	No
			PM	13.9	B		PM	13	B	No
48	Harbor/Vandergrift Blvd - I-5 NB On-Ramp/San Rafael Drive	Signalized	AM	15	B	Signalized	AM	16.6	B	No
			PM	36.6	D		PM	45.3	D	No
49	SR-76 - I-5 SB On-Ramp	Signalized	AM	4.8	A	Signalized	AM	4.9	A	No
			PM	4.5	A		PM	4.7	A	No
50	SR-76 - I-5 NB On/Off-Ramp	Signalized	AM	21.5	C	Signalized	AM	19.3	B	No
			PM	22.4	C		PM	33.9	C	No
51	Mission - I-5 SB Off-Ramp	Signalized	AM	11.5	B	Signalized	AM	11.3	B	No
			PM	13.5	B		PM	13.4	B	No
52		Signalized	AM	43.5	D	Signalized	AM	47.6	D	Yes

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 3				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
	Oceanside - I-5 SB On/Off-Ramp		PM	42.4	D		PM	55.0	D	Yes
53	Oceanside - I-5 NB On/Off-Ramp	Signalized	AM	39.8	D	Signalized	AM	44.8	D	Yes
			PM	65.3	E		PM	73	E	Yes
54	California - I-5 NB On- Ramp	AWSC	AM	7.6	A	AWSC	AM	7.6	A	No
			PM	7.5	A		PM	7.6	A	No
55	Cassidy - I-5 SB On/Off- Ramp	SSSC	AM	9.2	A	SSSC	AM	9.2	A	No
			PM	9.3	A		PM	9.3	A	No
56	Vista Way - I-5 SB On/Off Ramp	Signalized	AM	20.4	C	Signalized	AM	18.6	B	No
			PM	25.7	C		PM	31.2	C	No

Notes:

A. Delay is expressed as an average seconds of delay per vehicle

B. LOS – Level of Service

C. AWSC – All-way stop control intersection

D. SSSC – Side-street stop control intersection

E. OVF – Overflow, Synchro is unable to calculate a level of delay

F. RBT – Roundabout

G. The minimum acceptable LOS is "D" for intersections 1-47

H. The minimum acceptable LOS is "D"; a change from C or D to a lower LOS will cause an impact for intersections 48-56

The following intersections are identified to generate significant impacts in the future with project conditions:

- Coast Highway & Pier View Way (#6)
- Seagaze Street & Ditmar Street (#15)
- Coast Highway & Wisconsin Boulevard (#21)
- Wisconsin Avenue & Ditmar Street (South) (#24)
- Oceanside Boulevard & Tremont Street (#26)
- Morse Street & Freeman Street (#30)
- Cassidy Street & Freeman Street (#36)
- Vista Way & Ditmar Street (#42)
- Oceanside Boulevard & SB On/Off-Ramp (#52)
- Oceanside Boulevard & NB On/Off-Ramp (#53)

All other intersections are not impacted by the proposed alternative 3.

Mitigation measures are discussed in Section 7.

5.5.3 Vista Way/SR-78 & I-5 Existing Configuration

This section examines traffic conditions with the Coast Highway Corridor project alternative 3 throughout the corridor and assumes existing network conditions for the Vista Way/SR-78 and I-5 Interchange. The analysis was conducted for future (2035) conditions.

5.5.3.1 Road Segment Volumes

Road segment volumes have been included in Appendix A for use in noise modeling purposes. Future road segment volumes are extracted from SANDAG's regional model. In addition to a review of daily ADT volumes, peak hour roadway volumes are also provided for reference in Appendix A. Peak hour roadway volumes can provide a more appropriate depiction of traffic conditions compared with daily roadway capacity.

5.5.3.2 Intersection Level of Service

The intersection operations analysis for the future condition without project was performed consistent with the methodology outlined in Section 3. Table 5-10 presents the results for the future conditions traffic analysis with the proposed project under existing Vista Way/SR-78 & I-5 Interchange configuration. Figure 5-10 contains the traffic volumes used for the future condition analysis.

Table 5-10: LOS Analysis – Future Conditions with Project Alternative 3 (Existing SR-78)

INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 3				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
1	Coast Highway - I-5 Ramps / Harbor Drive	Signalized	AM	31.1	C	Signalized	AM	29.7	C	No
			PM	68.9	E		PM	55	D	No
2	Coast Highway - SR-76 Ramps	Signalized	AM	12.7	B	RBT	AM	3	A	No
			PM	25.6	C		PM	17.9	C	No
3	Surfrider Way - Pacific Street	AWSC	AM	10.4	B	AWSC	AM	9.7	A	No
			PM	19.5	C		PM	14.9	B	No
4	Coast Highway - Surfrider Way	Signalized	AM	16.4	B	Signalized	AM	9.7	A	No
			PM	17.1	B		PM	18.1	B	No
5	Coast Highway - Civic Center Drive	Signalized	AM	13.2	B	RBT	AM	7.1	A	No
			PM	15.6	B		PM	28.9	D	No
6	Coast Highway - Pier View Way	Signalized	AM	19.2	B	RBT	AM	7.3	A	No
			PM	8.7	A		PM	69.4	F	Yes
7	Pier View Way - Horne Street	AWSC	AM	9.4	A	AWSC	AM	9	A	No
			PM	17.6	C		PM	13	B	No
8	Mission Avenue - Pacific Street	AWSC	AM	9.5	A	AWSC	AM	9.3	A	No
			PM	19.4	C		PM	18.5	C	No
9	Mission Avenue - Cleveland Street	Signalized	AM	18.8	B	Signalized	AM	12.8	B	No
			PM	17.7	B		PM	14.8	B	No
10	Coast Highway - Mission Avenue	Signalized	AM	12	B	Signalized	AM	14.9	B	No
			PM	12.8	B		PM	28.2	C	No
11	Mission Avenue - Horne Street	Signalized	AM	6.9	A	Signalized	AM	13.2	B	No
			PM	10.7	B		PM	13	B	No

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 3				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
12	Seagaze Street - Tremont Street	SSSC	AM	9.8	A	SSSC	AM	9	A	No
			PM	17.1	C		PM	11.1	B	No
13	Coast Highway - Seagaze Street	Signalized	AM	15.8	B	Signalized	AM	13.3	B	No
			PM	22.7	C		PM	16.1	B	No
14	Seagaze Street - Freeman Street	SSSC	AM	10.1	B	SSSC	AM	10.1	B	No
			PM	15	B		PM	14.7	B	No
15	Seagaze Street - Ditmar Street	AWSC	AM	8.6	A	AWSC	AM	9	A	No
			PM	30.2	D		PM	51.4	F	Yes
16	Seagaze Street - Clementine Street	SSSC	AM	8.3	A	SSSC	AM	8.4	A	No
			PM	17.7	C		PM	16.8	C	No
17	Coast Highway - Missouri Avenue	SSSC	AM	10.8	B	SSSC	AM	9.8	A	No
			PM	15.7	C		PM	12.9	B	No
18	Coast Highway - Washington Avenue	SSSC	AM	9.9	A	RBT	AM	5.6	A	No
			PM	13.8	B		PM	10.8	B	No
19	Wisconsin Avenue - Pacific Street	AWSC	AM	10.1	B	AWSC	AM	9.4	A	No
			PM	51.3	F		PM	17.1	C	No
20	Wisconsin Avenue - Tremont Street	SSSC	AM	10.8	B	SSSC	AM	12.1	B	No
			PM	14.9	B		PM	22.5	C	No
21	Coast Highway - Wisconsin Avenue	Signalized	AM	14.5	B	RBT	AM	8	A	No
			PM	24.5	C		PM	40.3	E	Yes
22	Wisconsin Avenue - Freeman Street	SSSC	AM	11.5	B	SSSC	AM	11.4	B	No
			PM	19.4	C		PM	16.9	C	No
23	Wisconsin Avenue - Ditmar Street (North)	SSSC	AM	13.2	B	SSSC	AM	14.3	B	No
			PM	17.9	C		PM	23.4	C	No
24	Wisconsin Avenue - Ditmar Street (South)	AWSC	AM	9.5	A	AWSC	AM	10.3	B	No
			PM	23.7	C		PM	44	E	Yes
25	Oceanside Boulevard - Pacific Street	AWSC	AM	9.1	A	AWSC	AM	9	A	No
			PM	12.1	B		PM	11.7	B	No
26	Oceanside Boulevard - Tremont Street	SSSC	AM	14.3	B	SSSC	AM	13.8	B	No
			PM	91	F		PM	38.3	E	No
27	Coast Highway - Oceanside Boulevard	Signalized	AM	26.2	C	Signalized	AM	26.6	C	No
			PM	32.1	C		PM	36.2	D	No
28	Oceanside Boulevard - Ditmar Street	Signalized	AM	14.9	B	Signalized	AM	15.1	B	No
			PM	15.3	B		PM	19.1	B	No
29	Coast Highway - Morse Street	Signalized	AM	19.6	B	Signalized	AM	11.7	B	No
			PM	22.9	C		PM	19.9	B	No
30	Morse Street - Freeman Street	SSSC	AM	12.9	B	SSSC	AM	12	B	No
			PM	112.9	F		PM	44	E	No
31	Morse Street - Ditmar Street	SSSC	AM	9.5	A	SSSC	AM	9.5	A	No
			PM	11.5	B		PM	11.4	B	No
32	Cassidy Street - Pacific Street	AWSC	AM	8.6	A	AWSC	AM	8.3	A	No
			PM	16.8	C		PM	13.3	B	No
33	Cassidy Street - Broadway Street	SSSC	AM	16	C	SSSC	AM	11.7	B	No
			PM	397.4	F		PM	29.5	D	No

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INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 3				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
34	Cassidy Street - Tremont Street	SSSC	AM	10.1	B	SSSC	AM	9.8	A	No
			PM	13.1	B		PM	11.4	B	No
35	Coast Highway - Cassidy Street	Signalized	AM	18.5	B	Signalized	AM	25.4	C	No
			PM	20	C		PM	14.2	B	No
36	Cassidy Street - Freeman Street	SSSC	AM	21.4	C	SSSC	AM	11.9	B	No
			PM	OVF	F		PM	52.8	F	No
37	Cassidy Street - Ditmar Street	AWSC	AM	7.6	A	AWSC	AM	7.5	A	No
			PM	8.6	A		PM	8.5	A	No
38	Cassidy Street - Stewart Street	AWSC	AM	9.2	A	AWSC	AM	9.3	A	No
			PM	13.8	B		PM	12.2	B	No
39	Vista Way - Broadway Street	SSSC	AM	8.5	A	SSSC	AM	8.4	A	No
			PM	9.4	A		PM	9.2	A	No
40	Coast Highway - Vista Way	Signalized	AM	32.8	C	Signalized	AM	35.3	D	No
			PM	78.9	E		PM	52.2	D	No
41	Vista Way - Freeman Street	SSSC	AM	34	D	SSSC	AM	14.5	B	No
			PM	OVF	F		PM	29.5	D	No
42	Vista Way - Ditmar Street	SSSC	AM	26.2	D	SSSC	AM	18.7	C	No
			PM	294.2	F		PM	148.8	F	No
43	Vista Way - Stewart Street	SSSC	AM	22	C	SSSC	AM	16.6	C	No
			PM	69.1	F		PM	32.8	D	No
44	Coast Highway - Eaton Street	SSSC	AM	14.9	B	SSSC	AM	16.6	C	No
			PM	17.4	C		PM	13.6	B	No
45	Coast Highway - Michigan Avenue	Signalized	AM	4.7	A	RBT	AM	6.5	A	No
			PM	5.4	A		PM	21.2	C	No
46	Coast Highway - West Street	SSSC	AM	9.6	A	RBT	AM	4.5	A	No
			PM	11.2	B		PM	6.2	A	No
47	Coast Highway - Kelly Street	SSSC	AM	10	B	SSSC	AM	10	A	No
			PM	12.7	B		PM	12.8	B	No
48	Harbor/Vandergrift Blvd - I-5 NB On-Ramp/San Rafael Drive	Signalized	AM	15	B	Signalized	AM	16.6	B	No
			PM	37.4	D		PM	44.8	D	No
49	SR-76 - I-5 SB On-Ramp	Signalized	AM	4.9	A	Signalized	AM	4.9	A	No
			PM	4.5	A		PM	4.7	A	No
50	SR-76 - I-5 NB On/Off-Ramp	Signalized	AM	25.4	C	Signalized	AM	19.5	B	No
			PM	27.8	C		PM	35.6	D	No
51	Mission - I-5 SB Off-Ramp	Signalized	AM	11.6	B	Signalized	AM	11.3	B	No
			PM	13.8	B		PM	13.5	B	No
52	Oceanside - I-5 SB On/Off-Ramp	Signalized	AM	50.2	D	Signalized	AM	74	E	Yes
			PM	42.6	D		PM	52.4	D	Yes
53	Oceanside - I-5 NB On/Off-Ramp	Signalized	AM	37.7	D	Signalized	AM	42.3	D	Yes
			PM	65.7	E		PM	67.1	E	Yes
54	California - I-5 NB On-Ramp	AWSC	AM	7.6	A	AWSC	AM	7.7	A	No
			PM	7.6	A		PM	7.6	A	No
55	Cassidy - I-5 SB On/Off-Ramp	SSSC	AM	9.3	A	SSSC	AM	9.2	A	No
			PM	9.5	A		PM	9.3	A	No

TRAFFIC IMPACT ANALYSIS FOR THE
COAST HIGHWAY CORRIDOR STUDY

Prepared for City of Oceanside

INTERSECTION		FUTURE (2035) WITHOUT PROJECT				FUTURE (2035) WITH PROJECT ALTERNATIVE 3				IMPACT
		TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	TRAFFIC CONTROL	PEAK HOUR	DELAY (S)	LOS	
56	Vista Way - I-5 SB On/Off Ramp	Signalized	AM	25.8	C	Signalized	AM	18.5	B	No
			PM	88	F		PM	31	C	No

Notes:

A. Delay is expressed as an average seconds of delay per vehicle

B. LOS – Level of Service

C. AWSC – All-way stop control intersection

D. SSSC – Side-street stop control intersection

E. OVF – Overflow, Synchro is unable to calculate a level of delay

F. RBT – Roundabout

G. The minimum acceptable LOS is "D" for intersections 1-47

H. The minimum acceptable LOS is "D"; a change from C or D to a lower LOS will cause an impact for intersections 48-56

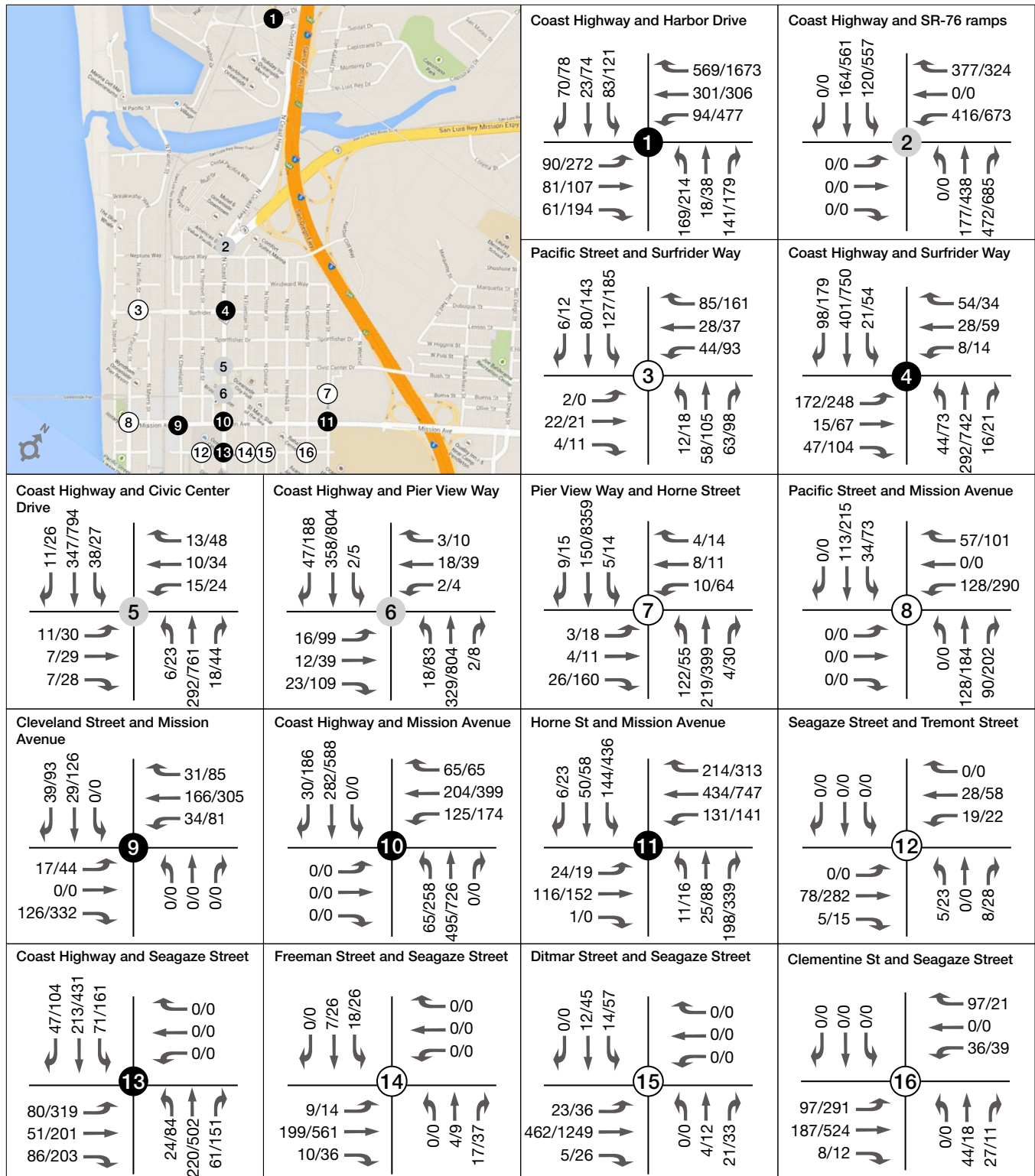
Change in LOS from acceptable LOS D or better to LOS E or F, and therefore significant traffic impacts, are identified for the following intersections for future with project conditions:

- Coast Highway & Pier View Way (#6)
- Seagaze Street & Ditmar Street (#15)
- Coast Highway & Wisconsin Boulevard (#21)
- Wisconsin Avenue & Ditmar Street (South) (#24)
- Oceanside Boulevard & I-5 SB On/Off-Ramp (#52)
- Oceanside Boulevard & I-5 NB On/Off-Ramp (#53)

All other intersections would operate with no anticipated significant impacts during both peak hours with the proposed project alternative 3.

Mitigation measures are discussed in Section 7.

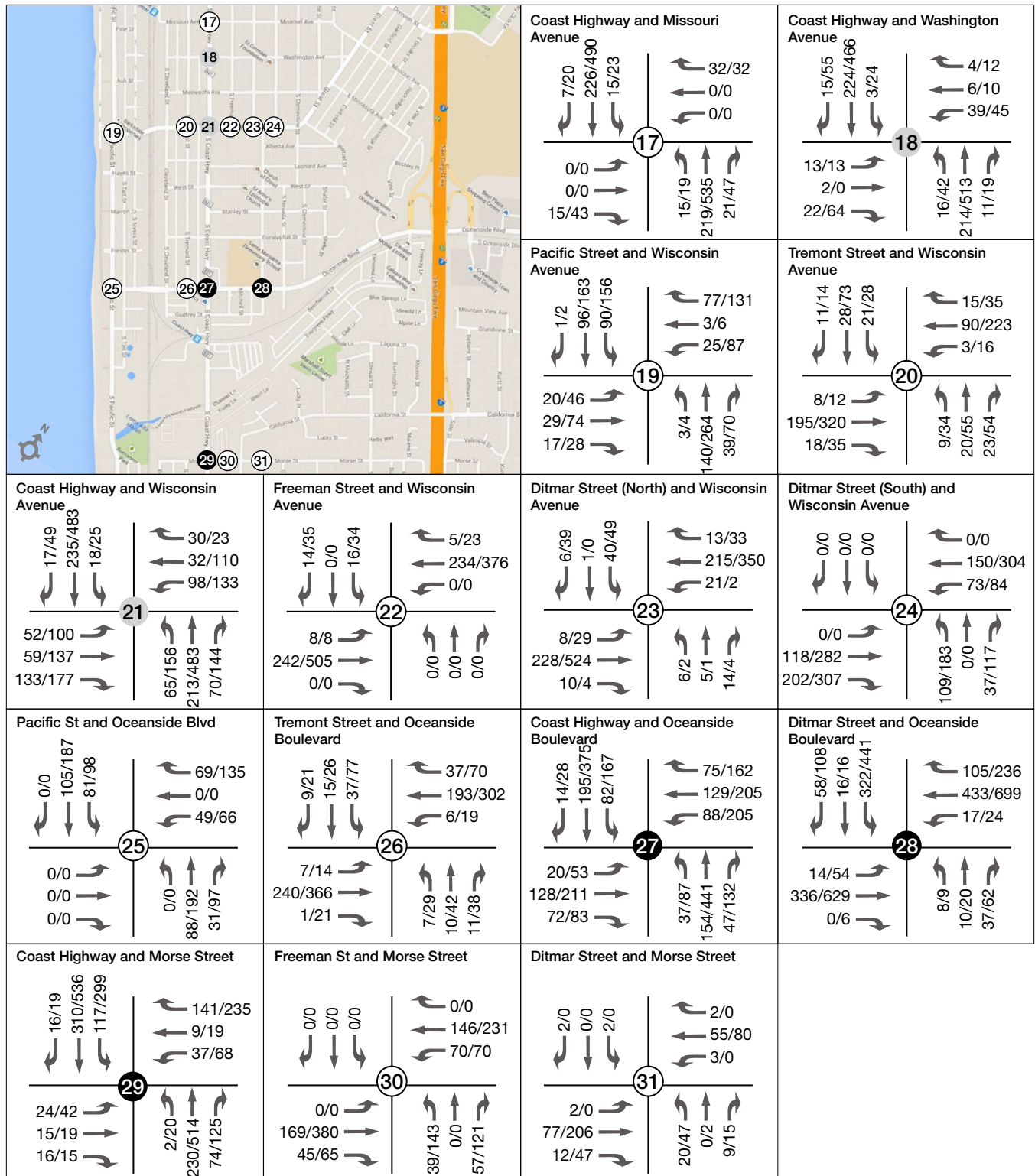
Figure 5-9a Future with Project Alternative 3 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

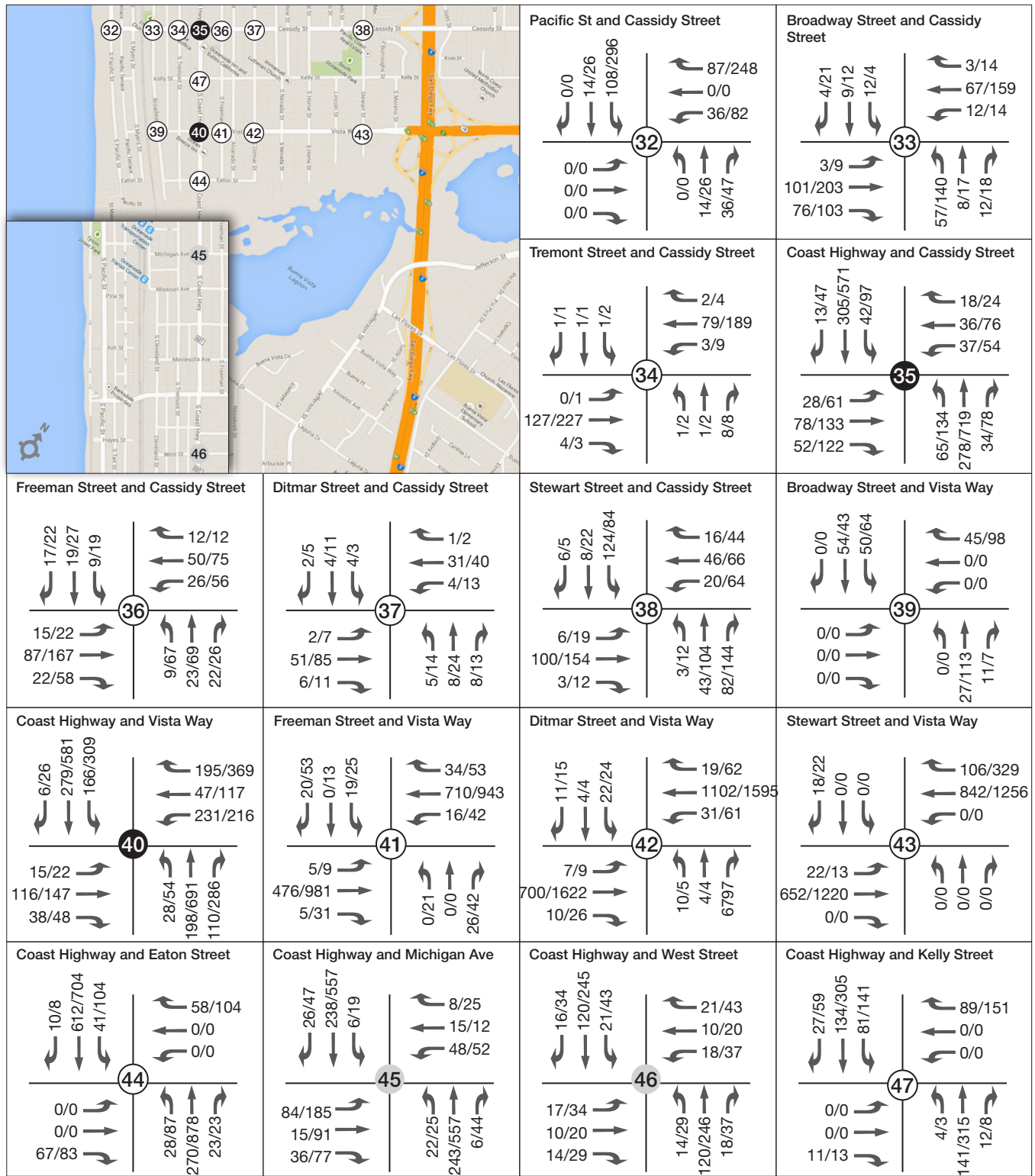
Figure 5-9b Future with Project Alternative 3 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

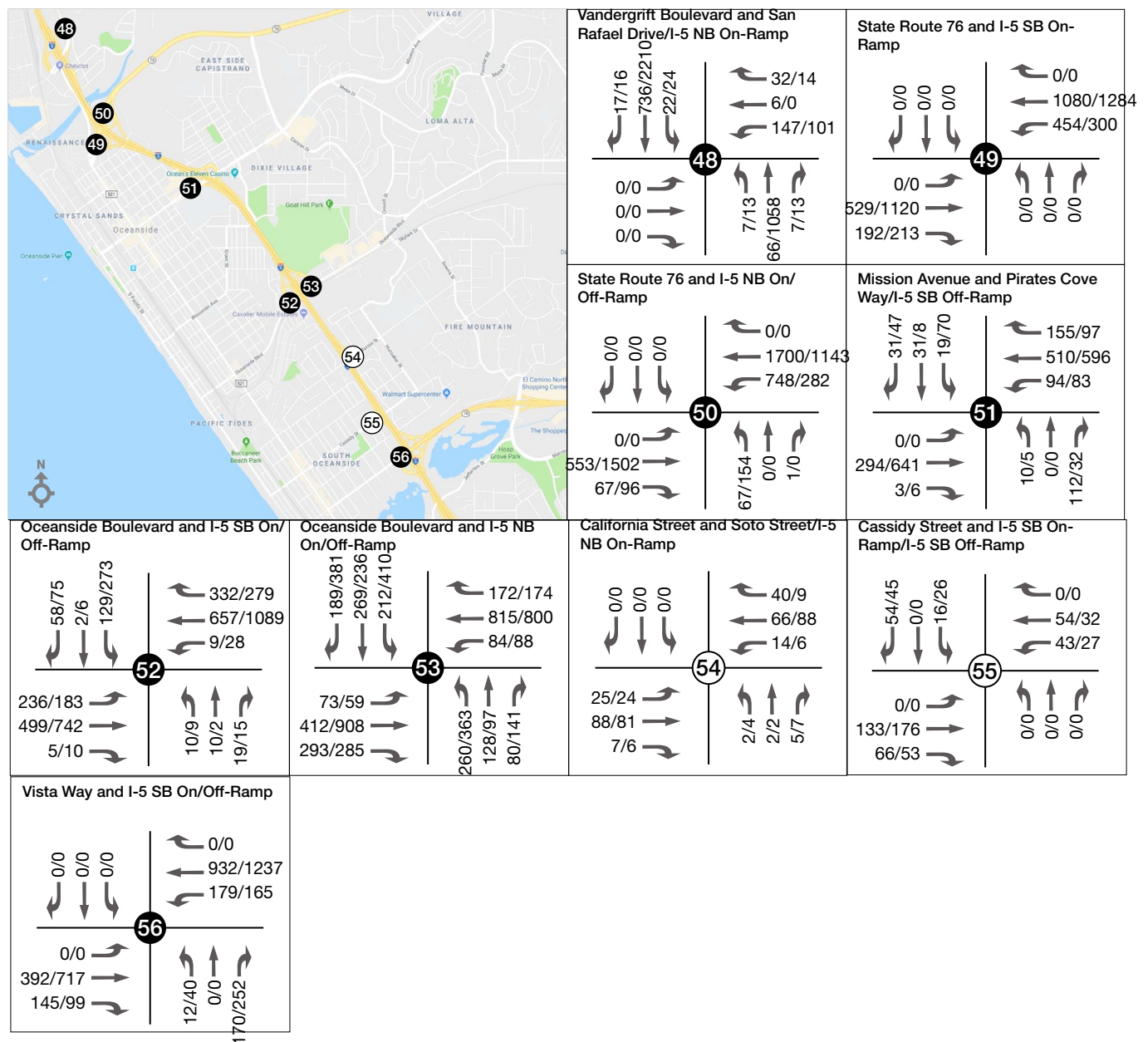
Figure 5-9c Future with Project Alternative 2 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

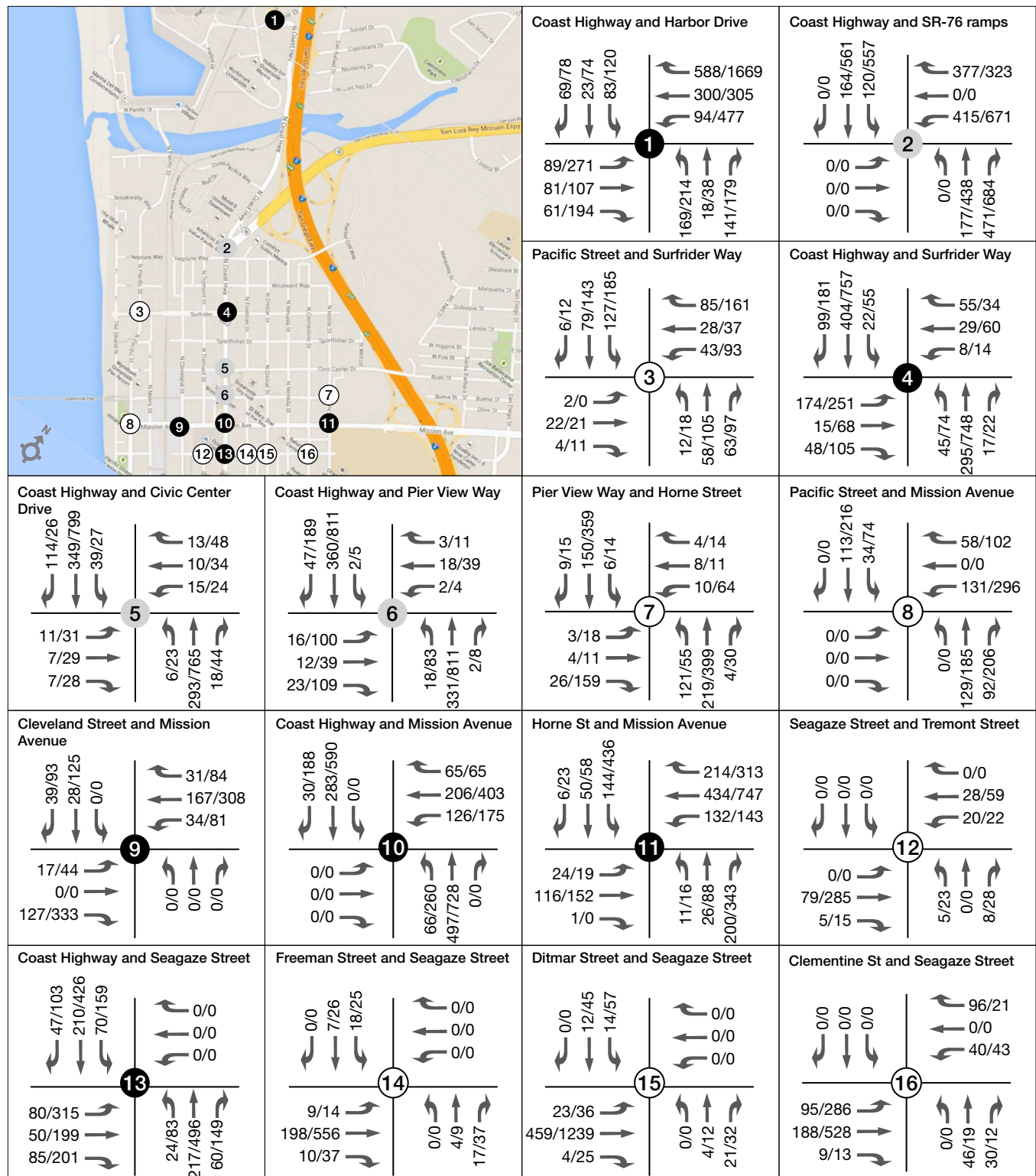
Figure 5-9d Future with Project Alternative 3 Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

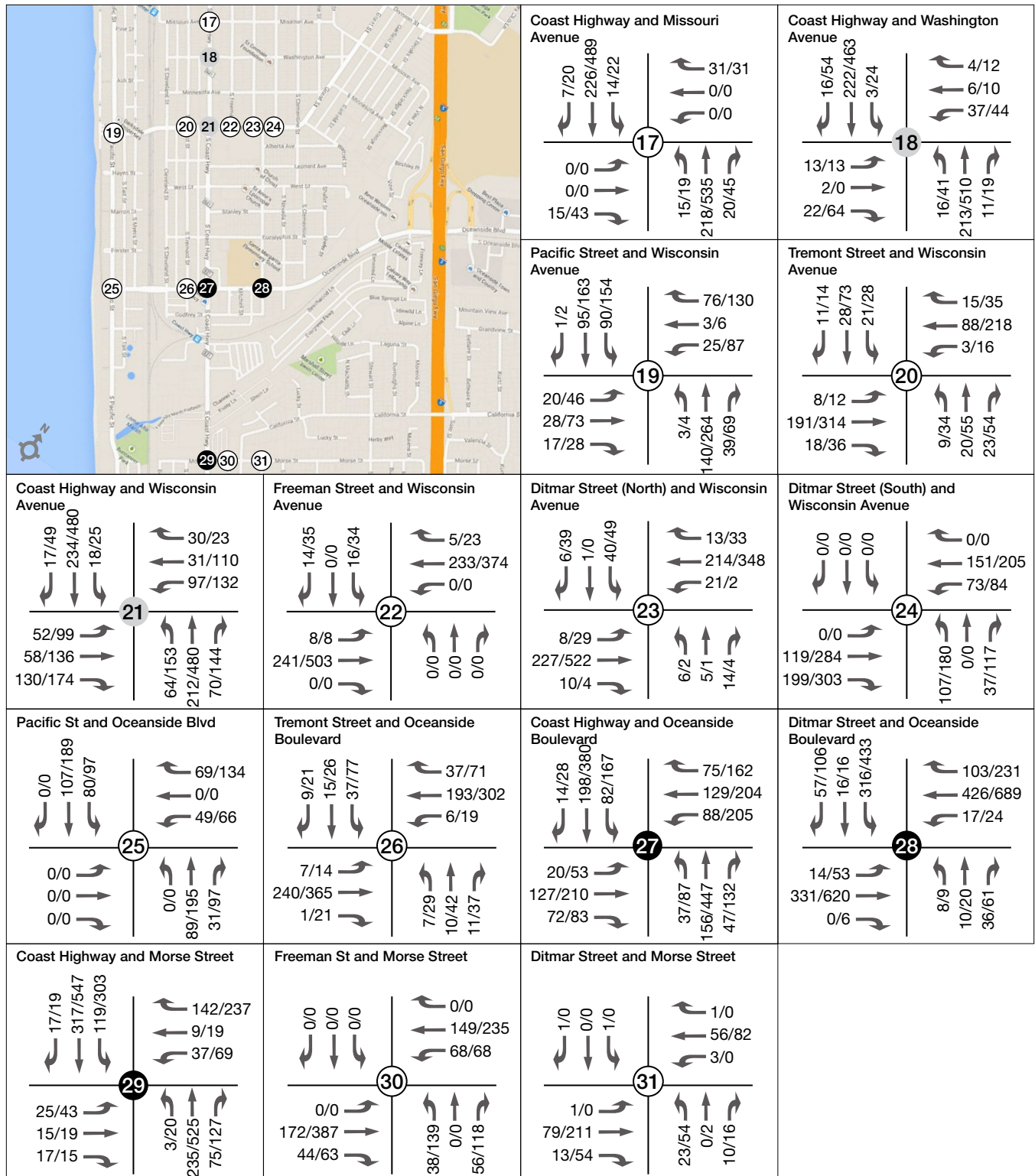
Figure 5-10a Future with Project Alternative 3 (Existing SR-78) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

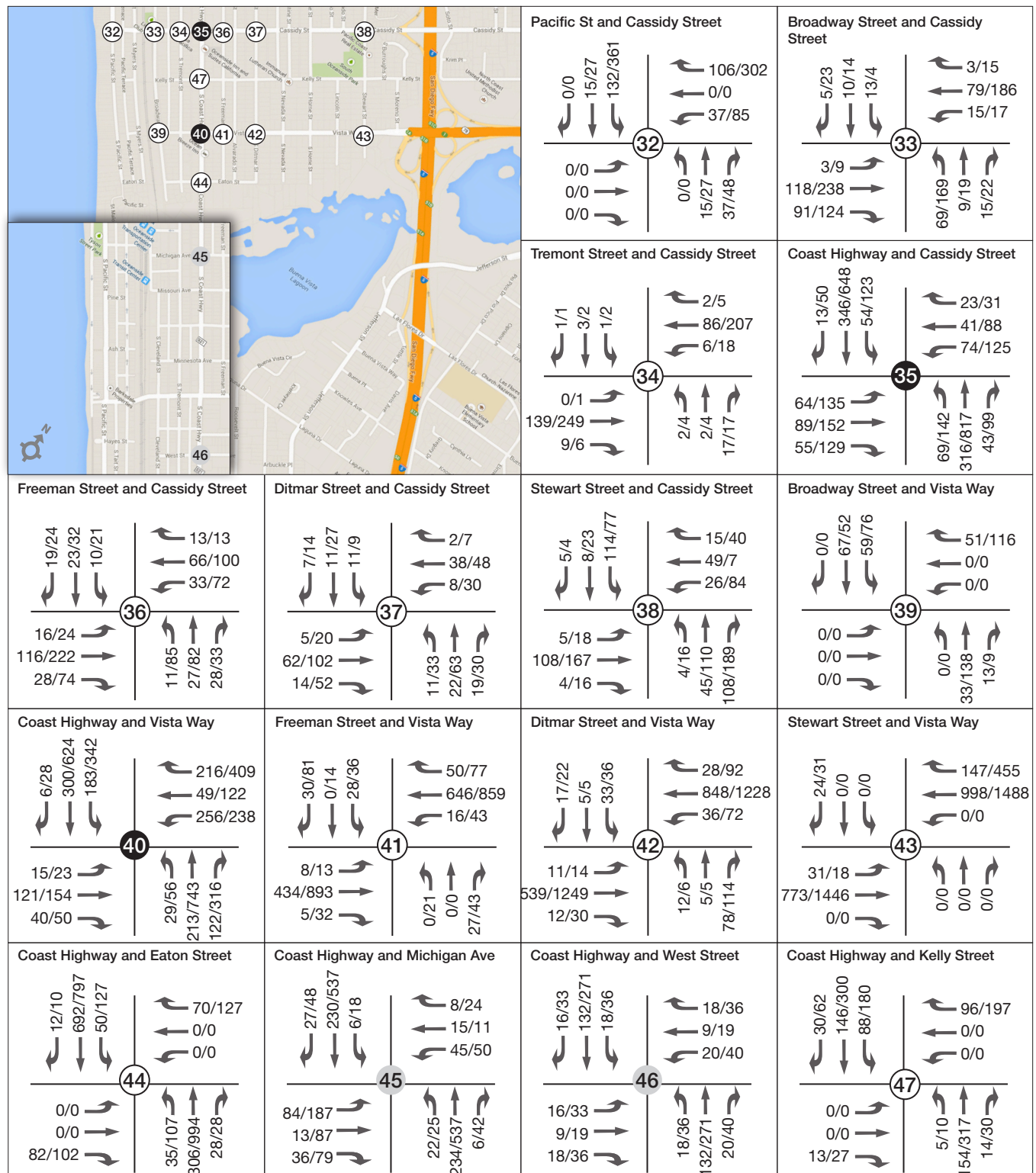
Figure 5-10b Future with Project Alternative 3 (Existing SR-78) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

Figure 5-10c Future with Project Alternative 2 (Existing SR-78) Peak Hour Volumes - AM & PM



Legend

● Signalized Intersections ○ Unsignalized Intersections ● Roundabout Intersections ###/### AM/PM Turning Movement Volume

[illegible]

 Signalized Intersections
 Unsignalized Intersections
 Roundabout Intersections
 AM/PM Turning Movement Volume

6 Vehicle Miles Traveled Analysis

As discussed in Section 3.4, Senate Bill 743 (SB 743) requires public agencies in the State of California to change how transportation impacts are assessed under the California Environmental Quality Act (CEQA), identifying the use of Vehicle Miles Traveled (VMT) as the primary metric for determining the transportation impact for new development projects. Because new metrics and guidelines in response to SB 743 have not yet been adopted by the State, the VMT analysis in this report is presented for reference purposes only. The traditional intersection level of service analysis presented earlier in this report remains the current metric used by the City of Oceanside to determine transportation impacts under CEQA.

The Governor's Office of Planning and Research (OPR) released the *Revised Proposal on Updates to the CEQA Guidelines on Evaluating Transportation Impacts in CEQA* in January 2016. This document outlines OPR's recommendations regarding methodology for conducting VMT analysis and establishing thresholds for determining significant transportation impacts as part of CEQA analysis for new projects. These recommendations include:

- Vehicle miles traveled is the primary metric for determining transportation impact across the state
- Land use development near transit or in VMT-efficient areas should be presumed to cause a less than significant transportation impact
- Transit, active transportation, and rehabilitation projects that do not add motor vehicle capacity should also be presumed to cause a less than significant impact
- Implementation should be phased in over time

OPR has provided a preliminary recommendation that new development projects be subject to a threshold of generating per capita or per employee VMT fifteen percent below that of existing development. This threshold is consistent with State goals regarding reductions in VMT. Local jurisdictions have the option of adopting more stringent standards for VMT reduction, but as noted above the state has not yet adopted a VMT standard at this time.

The land use changes that would be anticipated to occur with implementation of the Modified Vision Plan land use scenario and the zoning Incentive District included in this traffic analysis could result in development levels above those currently forecast for the corridor by SANDAG in the regional San Diego growth forecast. However, the projected growth beyond the current SANDAG model forecast that could occur under the incentives provided by the zoning Incentive District is consistent with the City's existing General Plan. As well, this increased level of development is consistent with the Coast Highway Vision and Strategic Plan (CHVSP), although the CHVSP is not formally adopted by the City of Oceanside. Importantly, the type of development that is being proposed and incentivized by the zoning Incentive District is consistent with SANDAG's smart growth principles in that the development would provide a mix of uses that help to reduce reliance on automobile trips, reduce VMT, and promote trips using transit and active transportation modes. Further, the roadway changes proposed to Coast Highway to reduce the number of automobile traffic lanes, add bicycle lanes, and improve the active transportation environment would all contribute to reducing VMT within the corridor and the study area.

With these complexities, the VMT analysis has been conducted using the SANDAG regional travel demand model, which considers a variety of factors related to the land use and transportation condition to determine mode of travel choice and VMT. The VMT forecasts used in this analysis were developed for the Existing, Future No Project, Future No Project with the Existing SR-78 configuration, Future with Project, Future with Project with the Existing SR-78 configuration, Future with Project Alternative 3, and Future with Project with the Existing SR-78 configuration scenarios to assess the impact of the potential project in the study area (defined as the portion of the city

between the beach and Interstate 5). Table 6.1 summarizes the per capita VMT forecasts generated using the SANDAG model.

Table 6-1: Vehicle Miles Traveled

Scenario	Forecast Daily VMT per capita	Percentage Change from Existing (Year 2008)
Existing Year 2008 (Model Base Year)	6.56	n/a
Future Year 2035 No Project	7.11	+8%
Future Year 2035 with Project	6.36	-3%
Future Year 2035 with Project Alternative 3	6.63	+1%
Future Year 2035 No Project - Existing SR-78	7.02	+6%
Future Year 2035 with Project - Existing SR-78	6.33	-4%
Future Year 2035 with Project Alternative 3 - Existing SR-78	6.61	+1%

Note: Year 2008 base scenario includes all of the SANDAG region.

Source: SANDAG – Series 12 Regional Growth Forecasts

When comparing the future scenarios at a per capita level (population), the Future No Project 2035 scenario increases VMT by 6 to 8 percent while the Future With Project 2035 scenario decreases VMT by 3 to 4 percent when compared to the baseline Existing Year condition. There is approximately a 1 percent increase for the Future with Project 2035 alternative 3 from the model base year. These results are expected as the project seeks to promote smart growth with strategies such as encouraging and emphasizing multi-modal transportation to increase access and mobility.

The forecast 3 percent reduction in VMT between the Existing (2008 Base Year) and the Future With Project Year 2035 condition does fall short of the 15 percentage reduction target identified in the OPR guidelines. However, the Future With Project condition does help to substantially reduce VMT from the 2008 base year condition and in particular the Baseline Year 2035 scenario. Per the draft OPR guidelines, measures to further reduce project-generated VMT would be focused on strategies that would further reduce or eliminate automobile trips. These strategies could include parking demand management, transportation demand management (promotion of transit use, carpool incentives, etc.), and further improvements to the roadway to promote travel by bicycling and walking.

7 Mitigation

This section identifies mitigation measures in order to achieve acceptable LOS, or restore LOS to a condition equal to the no project scenario. The following mitigation measures would be required to avoid significant project impacts.

7.1 Existing Condition

Analysis results for existing conditions found the project to have two significant impacts and the project alternatives were found to have no significant impact.

7.1.1 Project Scenario

- Coast Highway and Oceanside Boulevard (#27)
- Coast Highway and Cassidy Street (#35)

Table 7-1 provides the project scenario mitigation measures for each intersection. The mitigation measures listed are what would be required for the intersection to operate at an acceptable level of service. In all cases, the significant impact would be the direct result of the proposed project, and as such, the project would be fully responsible for implementation of the mitigation measures.

Table 7-1: Mitigation Measures – Existing with Project

LOCATION		MITIGATION MEASURE	ADDITIONAL COMMENTS	ACTION BY CITY	MITIGATED CONDITIONS	
					DELAY (S)	LOS
27	Coast Hwy & Oceanside Blvd	Maintain Signal	Merging of two lanes to one lane will occur north of intersection before Wisconsin Ave	Incorporate changes to project	41.2	D
35	Coast Hwy & Cassidy St	Maintain Signal	No other adjustments required	Incorporate changes to project	19.2	B

7.1.2 Project Alternative 1 Scenario

No significant impacts are observed with project alternative 1 during both peak hours.

7.1.3 Project Alternative 2 Scenario

No significant impacts are observed with project alternative 2 during both peak hours.

7.1.4 Project Alternative 3 Scenario

No significant impacts are observed with project alternative 3 during both peak hours.

7.2 Future Condition

This section includes analysis results for future conditions that have been impacted in both the Buildout and Existing configurations for the SR-78/I-5 interchange.

7.2.1 Project Scenario

Table 7-2 and Table 7-3 provides the project scenario mitigation measures for each intersection. The mitigation measures listed is what would be required for the intersection to operate at an acceptable level of service. In all cases, the significant impact would be the direct result of the proposed project, and as such, the project would be fully responsible for implementation of the mitigation measures.

Four intersections, Coast Highway & Wisconsin Avenue (#21), Vista Way & Stewart Street (#43), Oceanside & I-5 SB On-/Off-Ramp (#52), and Vista Way & I-5 SB On/Off Ramp (#56) are not mitigatable and would require the city to submit a statement of overriding consideration. The Coast Highway & Wisconsin Avenue intersection could be mitigated by maintaining the existing traffic signal, but it would disrupt the flow of traffic due to the roundabout north of the intersection as well as the adjacent intersections being unsignalized. Therefore, Coast Highway & Wisconsin Avenue will remain a roundabout. The Vista Way & Stewart Street intersection would require lane modification through addition of lanes for mitigation. However, with the recent road diet installed by the city along Vista Way, lane modifications would be inconsistent with the vision and goals of the City. Installation of a traffic signal at this intersection is not feasible due to the close proximity of the signalized intersection of Vista Way with the southbound I-5 ramps.

Table 7-2: Mitigation Measures – Future with Project (Buildout SR-78)

INTERSECTION		MITIGATION MEASURE	FUTURE WITH PROJECT					
			TRAFFIC	PEAK HOUR	BUILDOUT SR-78		W/ MITIGATION	
			CONTROL		DELAY (S)	LOS	DELAY (S)	LOS
4	Coast Highway - Surfrider Way	Maintain existing Traffic Signal	RBT	PM	83.4	F	19.2	B
15	Seagaze Street - Ditmar Street	Convert AWSC to Traffic Signal	AWSC	PM	55.5	F	13.0	B
21	Coast Highway - Wisconsin Avenue	Not mitigatable	RBT	PM	49.2	E	N/A	N/A
26	Oceanside Boulevard - Tremont Street	Convert SSSC to AWSC	SSSC	PM	41.1	E	19.2	C
27	Coast Highway - Oceanside Boulevard	Maintain existing Traffic Signal	RBT	PM	57.8	F	45.0	D
29	Coast Highway - Morse Street	Maintain existing Traffic Signal	RBT	PM	71.1	F	20.5	C
35	Coast Highway - Cassidy Street	Maintain existing Traffic Signal	RBT	PM	249.9	F	51.1	D
40	Coast Highway - Vista Way	Maintain two nb lane configuration	Signalized	PM	64.2	E	54.2	D
42	Vista Way - Ditmar Street	Convert SSSC to Traffic Signal	SSSC	PM	585.5	F	11.5	B
43	Vista Way - Stewart Street	Not mitigatable	SSSC	PM	35.3	E	N/A	N/A

INTERSECTION		MITIGATION MEASURE	FUTURE WITH PROJECT					
			TRAFFIC	PEAK HOUR	BUILDOUT SR-78		W/ MITIGATION	
			CONTROL		DELAY (S)	LOS	DELAY (S)	LOS
52	Oceanside – I-5 SB On/Off-Ramp	Not mitigatable	Signalized	AM	74.5	E	N/A	N/A
52	Oceanside – I-5 SB On/Off-Ramp	Not mitigatable	Signalized	PM	51.1	D	N/A	N/A
53	Oceanside – I-5 NB On/Off-Ramp	Modify EB approach to add right-turn pocket (40')	Signalized	AM	38.7	D	35.2	D
53	Oceanside – I-5 NB On/Off-Ramp	Modify EB approach to add right-turn pocket (40')	Signalized	PM	71.9	E	55.9	E
56	Vista Way - I-5 SB On/Off Ramp	Not mitigatable	Signalized	PM	89.9	F	N/A	N/A

Table 7-3: Mitigation Measures – Future with Project (Existing SR-78)

INTERSECTION		MITIGATION MEASURE	FUTURE WITH PROJECT					
			TRAFFIC	PEAK HOUR	EXISTING SR-78		W/ MITIGATION	
			CONTROL		DELAY (S)	LOS	DELAY (S)	LOS
4	Coast Highway - Surfrider Way	Maintain existing Traffic Signal	RBT	PM	71	F	19.6	B
6	Coast Highway - Pier View Way	Maintain existing Traffic Signal	RBT	PM	46.4	E	8.7	A
15	Seagaze Street - Ditmar Street	Convert AWSC to Traffic Signal	AWSC	PM	38	E	13.2	B
21	Coast Highway - Wisconsin Avenue	Not mitigatable	RBT	PM	57.8	F	N/A	N/A
27	Coast Highway - Oceanside Boulevard	Maintain existing Traffic Signal	RBT	PM	254	F	47.4	D
29	Coast Highway - Morse Street	Maintain existing Traffic Signal	RBT	PM	134.8	F	25.9	C
35*	Coast Highway - Cassidy Street	Maintain existing Traffic Signal	RBT	PM	166.3	F	66.4	E
42	Vista Way - Ditmar Street	Convert SSSC to Traffic Signal	SSSC	PM	--	F	18.3	B
52	Oceanside – I-5 SB On/Off-Ramp	Not mitigatable	Signalized	AM	74.5	E	N/A	N/A
52	Oceanside – I-5 SB On/Off-Ramp	Not mitigatable	Signalized	PM	51.1	D	N/A	N/A
53	Oceanside – I-5 NB On/Off-Ramp	Modify EB approach to add right-turn pocket (40')	Signalized	AM	38.7	D	35.2	D
53	Oceanside – I-5 NB On/Off-Ramp	Modify EB approach to add right-turn pocket (40')	Signalized	PM	71.9	E	55.6	E
56	Vista Way - I-5 SB On/Off Ramp	Not mitigatable	Signalized	PM	89.9	F	N/A	N/A

7.2.2 Project Alternative 1 Scenario

Table 7-6 and Table 7-7 provides the project alternative 1 scenario mitigation measures for each intersection. The mitigation measures listed is what would be required for the intersection to operate at an acceptable level of service. In all cases, the significant impact would be the direct result of the proposed project, and as such, the project would be fully responsible for implementation of the mitigation measures.

Four intersections, Coast Highway & Wisconsin Avenue (#21), Vista Way & Stewart Street (#43), Oceanside Boulevard and I-5 SB On/Off-Ramp (#52), and Vista Way & I-5 SB On/Off Ramp (#56) are not mitigatable and would require the city to submit a statement of overriding consideration. The Coast Highway & Wisconsin Avenue intersection could be mitigated by maintaining the existing traffic signal, but it would disrupt the flow of traffic due to the roundabout north of the intersection as well as the adjacent intersections being unsignalized. Therefore, Coast Highway & Wisconsin Avenue will remain a roundabout. The Vista Way & Stewart Street intersection would require lane modification through addition of lanes for mitigation. However, with the recent road diet installed by the city along Vista Way, lane modifications would be inconsistent with the vision and goals of the City. Installation of a traffic signal at this intersection is not feasible due to the close proximity of the signalized intersection of Vista Way with the southbound I-5 ramps.

Table 7-4: Mitigation Measures – Future with Project Alternative 1 (Buildout SR-78)

INTERSECTION		MITIGATION MEASURE	FUTURE WITH PROJECT (ALT 1)					
			TRAFFIC	PEAK HOUR	BUILDOUT SR-78		W/ MITIGATION	
			CONTROL		DELAY (S)	LOS	DELAY (S)	LOS
15	Seagaze Street - Ditmar Street	Convert AWSC to Traffic Signal	AWSC	PM	55.5	F	13.0	B
21	Coast Highway - Wisconsin Avenue	Not mitigatable	RBT	PM	49.2	E	N/A	N/A
26	Oceanside Boulevard - Tremont Street	Convert SSSC to AWSC	SSSC	PM	41.1	E	19.2	C
42	Vista Way - Ditmar Street	Convert SSSC to Traffic Signal	SSSC	PM	472.7	F	11.5	B
43	Vista Way - Stewart Street	Not mitigatable	SSSC	PM	35.3	E	N/A	N/A
52	Oceanside – I-5 SB On/Off-Ramp	Not mitigatable	Signalized	AM	75.9	E	N/A	N/A
52	Oceanside – I-5 SB On/Off-Ramp	Not mitigatable	Signalized	PM	51.1	D	N/A	N/A
53	Oceanside – I-5 NB On/Off-Ramp	Modify EB approach to add right-turn pocket (40')	Signalized	AM	40.0	D	36.5	D
53	Oceanside – I-5 NB On/Off-Ramp	Modify EB approach to add right-turn pocket (40')	Signalized	PM	71.9	E	52.0	D
56	Vista Way - I-5 SB On/Off Ramp	Not mitigatable	Signalized	PM	89.9	F	N/A	N/A

Table 7-5: Mitigation Measures – Future with Project Alternative 1 (Existing SR-78)

INTERSECTION		MITIGATION MEASURE	FUTURE WITH PROJECT (ALT 1)					
			TRAFFIC	PEAK HOUR	EXISTING SR-78		W/ MITIGATION	
			CONTROL		DELAY (S)	LOS	DELAY (S)	LOS
6	Coast Highway - Pier View Way	Maintain existing Traffic Signal	RBT	PM	46.4	E	8.7	A
15	Seagaze Street - Ditmar Street	Convert AWSC to Traffic Signal	AWSC	PM	38	E	13.2	B
21	Coast Highway - Wisconsin Avenue	Not mitigatable	RBT	PM	57.8	F	N/A	N/A
42	Vista Way - Ditmar Street	Convert SSSC to Traffic Signal	SSSC	PM	--	F	18.3	B
47	Coast Highway - Kelly Street	Convert SSSC to Traffic Signal and restripe eb/wb right turn into a shared left-thru- right	SSSC	PM	69.4	F	5.8	A
52	Oceanside - I-5 SB On/Off-Ramp	Not mitigatable	Signalized	AM	75.9	E	N/A	N/A
52	Oceanside - I-5 SB On/Off-Ramp	Not mitigatable	Signalized	PM	51.1	D	N/A	N/A
53	Oceanside – I-5 NB On/Off-Ramp	Modify EB approach to add right-turn pocket (40')	Signalized	AM	40	D	36.5	D
53	Oceanside – I-5 NB On/Off-Ramp	Modify EB approach to add right-turn pocket (40')	Signalized	PM	71.9	E	55.6	E
56	Vista Way - I-5 SB On/Off Ramp	Not mitigatable	Signalized	PM	89.9	F	N/A	N/A

7.2.3 Project Alternative 2 Scenario

Table 7-8 and Table 7-9 provides the project alternative 2 scenario mitigation measures for each intersection. The mitigation measures listed is what would be required for the intersection to operate at an acceptable level of service. In all cases, the significant impact would be the direct result of the proposed project, and as such, the project would be fully responsible for implementation of the mitigation measures.

Four intersections, Coast Highway & Wisconsin Avenue (#21), Vista Way & Stewart Street (#43), Oceanside Boulevard and I-5 SB On/Off-Ramp (#52), and Vista Way & I-5 SB On/Off Ramp (#56) are not mitigatable and would require the city to submit a statement of overriding consideration. The Coast Highway & Wisconsin Avenue intersection could be mitigated by maintaining the existing traffic signal, but it would disrupt the flow of traffic due to the roundabout north of the intersection as well as the adjacent intersections being unsignalized. Therefore, Coast Highway & Wisconsin Avenue will remain a roundabout. The Vista Way & Stewart Street intersection would require lane modification through addition of lanes for mitigation. However, with the recent road diet installed by the city along Vista Way, lane modifications would be inconsistent with the vision and goals of the City. Installation of a traffic signal at this intersection is not feasible due to the close proximity of the signalized intersection of Vista Way with the southbound I-5 ramps.

Table 7-6: Mitigation Measures – Future with Project Alternative 2 (Buildout SR-78)

INTERSECTION		MITIGATION MEASURE	FUTURE WITH PROJECT (ALT 2)					
			TRAFFIC	PEAK HOUR	BUILDOUT SR-78		W/ MITIGATION	
			CONTROL		DELAY (S)	LOS	DELAY (S)	LOS
15	Seagaze Street - Ditmar Street	Convert AWSC to Traffic Signal	AWSC	PM	55.5	F	13.0	B
21	Coast Highway - Wisconsin Avenue	Not mitigatable	RBT	PM	49.2	E	N/A	N/A
26	Oceanside Boulevard - Tremont Street	Convert SSSC to AWSC	SSSC	PM	41.1	E	19.2	C
42	Vista Way - Ditmar Street	Convert SSSC to Traffic Signal	SSSC	PM	472.7	F	11.5	B
43	Vista Way - Stewart Street	Not mitigatable	SSSC	PM	35.3	E	N/A	N/A
52	Oceanside – I-5 SB On/Off-Ramp	Not mitigatable	Signalized	AM	75.9	E	N/A	N/A
52	Oceanside – I-5 SB On/Off-Ramp	Not mitigatable	Signalized	PM	51.1	D	N/A	N/A
53	Oceanside – I-5 NB On/Off-Ramp	Modify EB approach to add right-turn pocket (40')	Signalized	AM	40.0	D	36.5	D
53	Oceanside – I-5 NB On/Off-Ramp	Modify EB approach to add right-turn pocket (40')	Signalized	PM	71.9	E	52	D
56	Vista Way - I-5 SB On/Off Ramp	Not mitigatable	Signalized	PM	89.9	F	N/A	N/A

Table 7-7: Mitigation Measures – Future with Project Alternative 2 (Existing SR-78)

INTERSECTION		MITIGATION MEASURE	FUTURE WITH PROJECT (ALT 2)					
			TRAFFIC	PEAK HOUR	EXISTING SR-78		W/ MITIGATION	
			CONTROL		DELAY (S)	LOS	DELAY (S)	LOS
6	Coast Highway - Pier View Way	Maintain existing Traffic Signal	RBT	PM	46.4	E	8.7	A
15	Seagaze Street - Ditmar Street	Convert AWSC to Traffic Signal	AWSC	PM	38	E	13.2	B
21	Coast Highway - Wisconsin Avenue	Not mitigatable	RBT	PM	57.8	F	N/A	N/A
42	Vista Way - Ditmar Street	Convert SSSC to Traffic Signal	SSSC	PM	--	F	18.3	B
47	Coast Highway - Kelly Street	Convert SSSC to Traffic Signal and restripe eb/wb right turn into a shared left-thru--right	SSSC	PM	69.4	F	5.8	A
52	Oceanside - I-5 SB On/Off-Ramp	Not mitigatable	Signalized	AM	73.2	E	N/A	N/A
52	Oceanside - I-5 SB On/Off-Ramp	Not mitigatable	Signalized	PM	51.1	D	N/A	N/A
53	Oceanside – I-5 NB On/Off-Ramp	Modify EB approach to add right-turn pocket (40')	Signalized	AM	40	D	36.5	D
53	Oceanside – I-5 NB On/Off-Ramp	Modify EB approach to add right-turn pocket (40')	Signalized	PM	71.9	D	55.6	D
56	Vista Way - I-5 SB On/Off Ramp	Not mitigatable	Signalized	PM	89.9	F	N/A	N/A

7.2.4 Project Alternative 3 Scenario

Table 7-10 and Table 7-11 provides the project alternative 3 scenario mitigation measures for each intersection. The mitigation measures listed is what would be required for the intersection to operate at an acceptable level of service. In all cases, the significant impact would be the direct result of the proposed project, and as such, the project would be fully responsible for implementation of the mitigation measures.

Three intersections, Coast Highway & Wisconsin Avenue (#21), Wisconsin Avenue & Ditmar Street (#24), and Oceanside Boulevard and I-5 SB On/Off-Ramp (#52) are not mitigatable and would require the city to submit a statement of overriding consideration. The Coast Highway & Wisconsin Avenue intersection could be mitigated by maintaining the existing traffic signal, but it would disrupt the flow of traffic due to the roundabout north of the intersection as well as the adjacent intersections being unsignalized. Therefore, Coast Highway & Wisconsin Avenue will remain a roundabout. The Wisconsin Avenue and Ditmar Street intersection would require the implementation of a traffic signal. The conversion of the intersection into a traffic control will not be realistic due to the location of the intersection as it is in a residential area.

Table 7-8: Mitigation Measures – Future with Project Alternative 3 (Buildout SR-78)

INTERSECTION		MITIGATION MEASURE	FUTURE WITH PROJECT (ALT 3)					
			TRAFFIC	PEAK HOUR	BUILDOUT SR-78		W/ MITIGATION	
			CONTROL		DELAY (S)	LOS	DELAY (S)	LOS
6	Coast Highway - Pier View Way	Maintain existing Traffic Signal	RBT	PM	66.5	F	12.4	B
15	Seagaze Street - Ditmar Street	Convert AWSC to Traffic Signal	AWSC	PM	53.5	F	7.2	A
21	Coast Highway - Wisconsin Avenue	Not mitigatable	RBT	PM	42.1	E	N/A	N/A
24	Wisconsin Avenue - Ditmar Street (South)	Not mitigatable	AWSC	PM	45.3	E	N/A	N/A
26	Oceanside Boulevard - Tremont Street	Convert SSSC to AWSC	SSSC	PM	38.6	E	18.2	C
30	Morse Street - Freeman Street	Convert SSSC to AWSC	SSSC	PM	45.4	E	20.1	C
36	Cassidy Street - Freeman Street	Convert SSSC to Traffic Signal	SSSC	PM	46.5	E	7.8	A
42	Vista Way - Ditmar Street	Convert SSSC to Traffic Signal	SSSC	PM	165.8	F	10.6	B
52	Oceanside – I-5 SB On/Off-Ramp	Not mitigatable	Signalized	AM	47.6	D	N/A	N/A
52	Oceanside – I-5 SB On/Off-Ramp	Not mitigatable	Signalized	PM	55	D	N/A	N/A
53	Oceanside - NB On/Off-Ramp	Modify EB approach to add right-turn pocket (40')	Signalized	AM	44.8	D	38.5	D
53	Oceanside - NB On/Off-Ramp	Modify EB approach to add right-turn pocket (40')	Signalized	PM	73	E	52	D

Table 7-9: Mitigation Measures – Future with Project Alternative 3 (Existing SR-78)

INTERSECTION		MITIGATION MEASURE	FUTURE WITH PROJECT (ALT 3)					
			TRAFFIC	PEAK HOUR	EXISTING SR-78		W/ MITIGATION	
			CONTROL		DELAY (S)	LOS	DELAY (S)	LOS
6	Coast Highway - Pier View Way	Maintain existing Traffic Signal	RBT	PM	69.4	F	12.4	B
15	Seagaze Street - Ditmar Street	Convert AWSC to Traffic Signal	AWSC	PM	51.4	F	7.1	A
21	Coast Highway - Wisconsin Avenue	Not mitigatable	RBT	PM	40.3	E	N/A	N/A
24	Wisconsin Avenue - Ditmar Street (South)	Not mitigatable	AWSC	PM	44	E	N/A	N/A
52	Oceanside - I-5 SB On/Off-Ramp	Sb configuration will include two left turn lanes and a shared thru-right lane with a storage length of 100 feet	Signalized	AM	74	E	N/A	N/A
52	Oceanside - I-5 SB On/Off-Ramp	Sb configuration will include two left turn lanes and a shared thru-right lane with a storage length of 100 feet	Signalized	PM	52.4	D	N/A	N/A
53	Oceanside - NB On/Off-Ramp	Modify EB approach to add right-turn pocket (40')	Signalized	AM	42.3	D	37.2	D
53	Oceanside - NB On/Off-Ramp	Modify EB approach to add right-turn pocket (40')	Signalized	PM	67.1	E	47.2	E

8 Pedestrian Accessibility

The roadway improvements and modifications proposed as part of the Coast Highway Corridor Study would be designed and constructed consistent with the requirements of the Americans With Disabilities Act (ADA). The project features are intended to increase accessibility and safety for pedestrians throughout the corridor. Traffic calming features such as new mid-block crosswalks, and roundabouts to reduce automobile speeds and conflicts at currently signalized intersections will all contribute to improving pedestrian mobility and safety in the project area.

The city has been requested to specifically assess potential impacts to mobility and safety for blind and visually impaired pedestrians at intersections that are proposed to have roundabouts replace existing traffic signals. To address this concern, the consultant team researched current traffic engineering practices related to roundabout design and research that has been conducted at a national level regarding pedestrian crossings at roundabouts for blind and visually impaired pedestrians.

National Cooperative Highway Research Program (NCHRP) Report 674, Crossing Solutions at Roundabouts and Channelized Turn Lanes for Pedestrians with Vision Disabilities, specifically researches and addresses issues with crossing safety at roundabouts for blind and visually impaired pedestrians.

Findings from this report include:

This research concludes that while some blind research participants had difficulties crossing single-lane roundabouts in a safe manner, these sites appear not to pose crossing difficulties that are beyond those experienced by many blind travelers at similar signalized intersections. The accessibility of single-lane roundabouts seems to be critically linked to:

- o Low vehicle speeds at the crosswalk, where reduced vehicle speeds are the result of good geometric design as opposed to driver willingness to reduce speeds due to the possibility of encountering a pedestrian;
- o The willingness of a majority of drivers to yield to pedestrians;
- o Properly installed detectable warning surfaces at all transition points between sidewalk and the street, including the pedestrian splitter island; and
- o Availability of instruction customized to roundabout crossings to explain to pedestrians the intersection geometry and the expected traffic patterns at the crossing.

The report also recommends that specific design features be considered in the roundabout design process to help improve safety for blind and visually impaired pedestrians. These recommendations include:

- Design the roundabout to ensure that vehicles entering the roundabout are restricted to a maximum travel speed of 15 miles per hour.
- Incorporate an audible surface treatment such as a metal plate or rumble strip in the roadway pavement that automobiles would travel over prior to approaching the pedestrian crossing. This feature would provide pedestrians with an audible cue about an approaching vehicle.
- Incorporate a push button activated crossing warning system such as a rectangular rapid flashing beacon (RRFB) at pedestrian crossings that pedestrians would be able to activate to alert drivers to their presence.

- Provide raised crosswalks that improve the visibility of pedestrians and force drivers to reduce their travel speed when entering the roundabout.

The City of Oceanside will evaluate and consider the design features identified above during the design stages of the project development process for the Coast Highway Corridor Study.

9 Parking Inventory

This section identifies the existing on-street public parking resources along both sides of Coast Highway and how these parking resources will alter on a block-by-block basis under the project scenario as well as Alternatives 1, 2, and 3 outlined in Table 9-1 through Table 9-5, respectively. All conditions assume 22 feet per parallel parking space.

Existing parking spaces take into account fire lanes and driveways while the project scenarios only take into account driveways. It was assumed that the existing fire lanes will be changed in the project scenarios due to parking being shown available in those areas. Spaces are added to segments 4 and 5 in the project scenarios due to lanes being converted from two through lanes with no parking to one through lane with a lane for parking and biking. Additionally, available on-street parking spaces in the first half of the corridor reduced due to the roundabouts in the project scenarios.

Table 9-1: Existing Parking Supply

Segment	Block	West Side			East Side			Total
		Parallel	Angled	Temp	Parallel	Angled	Temp	
1	Harbor Dr to SR-76	27	18	0	0	0	0	45
2	SR-76 to Neptune Way	0	0	0	0	0	0	0
	Neptune Way to Windward Way	0	0	0	1	0	0	1
	Windward Way to Surfrider Way	0	0	0	4	0	0	4
	Surfrider Way to Sportfisher Dr	5	0	0	3	0	0	8
	Sportfisher Dr to Civic Center Dr	13	0	0	5	0	4	22
	Civic Center Dr to Pierview Way	9	0	0	9	0	0	18
	Pierview Way to Mission Ave	9	0	0	9	0	0	18
	Mission Ave to Seagaze Dr	0	0	0	0	0	0	0
	Seagaze Dr to Michigan Ave	19	0	0	15	0	0	34
	Michigan Ave to Missouri Ave	12	0	0	15	0	0	27
	Missouri Ave to Washington Ave	13	0	0	13	0	0	26
	Washington Ave to Minnesota Ave	12	0	0	13	0	0	25
3	Minnesota Ave to Wisconsin Ave	8	0	0	8	0	0	16
	Wisconsin Ave to West St	22	0	0	13	0	0	35
	West St to Eucalyptus St	18	0	0	20	0	0	38
4	Eucalyptus St to Oceanside Blvd	20	0	0	5	0	0	25
	Oceanside to Godfrey St	0	0	0	0	0	0	0
5	Godfrey St to Morse St	0	0	0	6	0	0	6
	Morse St to Whaley St	11	0	0	12	0	0	23
	Whaley St to Cassidy St	15	0	0	15	0	0	30
	Cassidy St to Kelly St	11	0	0	10	0	0	21
	Kelly St to Vista Way	9	0	0	12	0	0	21
								443

Table 9-2: With Project Parking Supply

Segment	Block	West Side			East Side			Total
		Street	Angled	Temp	Street	Angled	Temp	
1	Harbor to SR-76	27	18	0	0	0	0	45
2	SR-76 to Neptune Way	0	0	0	0	0	0	0
	Neptune Way to Windward Way	0	0	0	0	0	0	0
	Windward Way to Surfrider Way	0	0	0	0	0	0	0
	Surfrider Way to Sportfisher Dr	3	0	0	3	0	0	6
	Sportfisher Dr to Civic Center Dr	5	0	0	5	0	4	14
	Civic Center Dr to Pierview Way	4	0	0	4	0	0	8
	Pierview Way to Mission Ave	0	0	0	0	0	0	0
	Mission Ave to Seagaze Dr	0	0	0	0	0	0	0
	Seagaze Dr to Michigan Ave	14	0	0	15	0	0	29
	Michigan Ave to Missouri Ave	11	0	0	11	0	0	22
	Missouri Ave to Washington Ave	12	0	0	12	0	0	24
	Washington Ave to Minnesota Ave	12	0	0	12	0	0	24
	Minnesota Ave to Wisconsin Ave	11	0	0	11	0	0	22
3	Wisconsin Ave to West St	15	0	0	7	0	0	22
	West St to Eucalyptus St	18	0	0	8	0	0	26
	Eucalyptus St to Oceanside Blvd	16	0	0	15	0	0	31
4	Oceanside to Godfrey St	1	0	0	3	0	0	4
	Godfrey St to Morse St	40	0	0	48	0	0	88
5	Morse St to Whaley St	14	0	0	13	0	0	27
	Whaley St to Cassidy St	20	0	0	16	0	0	36
	Cassidy St to Kelly St	14	0	0	9	0	0	23
	Kelly St to Vista Way	0	0	0	10	0	0	10
								461

Table 9-3: With Project (Alternative 1) Parking Supply

Segment	Block	West Side			East Side			Total
		Street	Angled	Temp	Street	Angled	Temp	
1	Harbor to SR-76	27	18	0	0	0	0	45
2	SR-76 to Neptune Way	0	0	0	0	0	0	0
	Neptune Way to Windward Way	0	0	0	0	0	0	0
	Windward Way to Surfrider Way	0	0	0	0	0	0	0
	Surfrider Way to Sportfisher Dr	3	0	0	3	0	0	6
	Sportfisher Dr to Civic Center Dr	5	0	0	5	0	4	14
	Civic Center Dr to Pierview Way	4	0	0	4	0	0	8
	Pierview Way to Mission Ave	0	0	0	0	0	0	0
	Mission Ave to Seagaze Dr	0	0	0	0	0	0	0
	Seagaze Dr to Michigan Ave	14	0	0	15	0	0	29
	Michigan Ave to Missouri Ave	11	0	0	11	0	0	22
	Missouri Ave to Washington Ave	12	0	0	12	0	0	24
	Washington Ave to Minnesota Ave	12	0	0	12	0	0	24
	Minnesota Ave to Wisconsin Ave	11	0	0	11	0	0	22
3	Wisconsin Ave to West St	15	0	0	7	0	0	22
	West St to Eucalyptus St	18	0	0	8	0	0	26
	Eucalyptus St to Oceanside Blvd	16	0	0	15	0	0	31
4	Oceanside to Godfrey St	0	0	0	0	0	0	0
	Godfrey St to Morse St	0	0	0	6	0	0	6
5	Morse St to Whaley St	11	0	0	12	0	0	23
	Whaley St to Cassidy St	15	0	0	15	0	0	30
	Cassidy St to Kelly St	11	0	0	10	0	0	21
	Kelly St to Vista Way	9	0	0	12	0	0	21
								374

Table 9-4: With Project (Alternative 2) Parking Supply

Segment	Block	West Side			East Side			Total
		Street	Angled	Temp	Street	Angled	Temp	
1	Harbor to SR-76	27	18	0	0	0	0	45
2	SR-76 to Neptune Way	0	0	0	0	0	0	0
	Neptune Way to Windward Way	0	0	0	0	0	0	0
	Windward Way to Surfrider Way	0	0	0	0	0	0	0
	Surfrider Way to Sportfisher Dr	3	0	0	3	0	0	6
	Sportfisher Dr to Civic Center Dr	5	0	0	5	0	4	14
	Civic Center Dr to Pierview Way	4	0	0	4	0	0	8
	Pierview Way to Mission Ave	0	0	0	0	0	0	0
	Mission Ave to Seagaze Dr	0	0	0	0	0	0	0
	Seagaze Dr to Michigan Ave	14	0	0	15	0	0	29
	Michigan Ave to Missouri Ave	11	0	0	11	0	0	22
	Missouri Ave to Washington Ave	12	0	0	12	0	0	24
	Washington Ave to Minnesota Ave	12	0	0	12	0	0	24
	Minnesota Ave to Wisconsin Ave	11	0	0	11	0	0	22
3	Wisconsin Ave to West St	15	0	0	7	0	0	22
	West St to Eucalyptus St	18	0	0	8	0	0	26
	Eucalyptus St to Oceanside Blvd	16	0	0	15	0	0	31
4	Oceanside to Godfrey St	1	0	0	3	0	0	4
	Godfrey St to Morse St	40	0	0	48	0	0	88
5	Morse St to Whaley St	11	0	0	12	0	0	23
	Whaley St to Cassidy St	15	0	0	15	0	0	30
	Cassidy St to Kelly St	11	0	0	10	0	0	21
	Kelly St to Vista Way	9	0	0	12	0	0	21
								460

Table 9-5: With Project (Alternative 3) Parking Supply

Segment	Block	West Side			East Side			Total
		Street	Angled	Temp	Street	Angled	Temp	
1	Harbor to SR-76	27	18	0	0	0	0	45
2	SR-76 to Neptune Way	0	0	0	0	0	0	0
	Neptune Way to Windward Way	0	0	0	0	0	0	0
	Windward Way to Surfrider Way	0	0	0	0	0	0	0
	Surfrider Way to Sportfisher Dr	3	0	0	3	0	0	6
	Sportfisher Dr to Civic Center Dr	5	0	0	5	0	4	14
	Civic Center Dr to Pierview Way	4	0	0	4	0	0	8
	Pierview Way to Mission Ave	0	0	0	0	0	0	0
	Mission Ave to Seagaze Dr	0	0	0	0	0	0	0
	Seagaze Dr to Michigan Ave	14	0	0	15	0	0	29
	Michigan Ave to Missouri Ave	11	0	0	11	0	0	22
	Missouri Ave to Washington Ave	12	0	0	12	0	0	24
	Washington Ave to Minnesota Ave	12	0	0	12	0	0	24
	Minnesota Ave to Wisconsin Ave	11	0	0	11	0	0	22
3	Wisconsin Ave to West St	15	0	0	7	0	0	22
	West St to Eucalyptus St	18	0	0	8	0	0	26
	Eucalyptus St to Oceanside Blvd	16	0	0	15	0	0	31
4	Oceanside to Godfrey St	1	0	0	3	0	0	4
	Godfrey St to Morse St	40	0	0	48	0	0	88
5	Morse St to Whaley St	11	0	0	12	0	0	23
	Whaley St to Cassidy St	15	0	0	15	0	0	30
	Cassidy St to Kelly St	11	0	0	10	0	0	21
	Kelly St to Vista Way	9	0	0	12	0	0	21
								460

10 Conclusions and Recommendations

The Coast Highway Corridor Study would transform Coast Highway into a Complete Street that accommodates all modes of travel in a safe and efficient manner. Key elements of the project include a continuous Class II striped bicycle lane from Harbor Drive to the South City Limit, a single lane of travel for automobile traffic throughout the corridor (with some segments having a second southbound lane), additional mid-block crosswalks, roundabouts in place of traffic signals where physically feasible, and other enhancements to landscaping.

This TIA report was prepared to assess the potential circulation impacts associated with the Coast Highway Corridor Study. The traffic analysis examined existing year 2013 and future year 2035 conditions without project, with project, and with three project alternatives. Traffic operations were evaluated at study intersections for the AM and PM peak hour for each scenario.

The analysis results indicate the anticipated traffic impacts identified for both the existing and future conditions are mostly mitigatable, resulting in less than significant impacts overall as a result of the project. Only five intersections were found to be un-mitigatable and are recommended for a Statement of Overriding Consideration and are listed below:

- Coast Highway & Wisconsin Avenue (#21)
- Wisconsin Avenue & Ditmar Street (#24)
- Vista Way & Stewart Street (#43)
- Oceanside Boulevard & I-5 SB On/Off-Ramp (#52)
- Vista Way & I-5 SB On/Off Ramp (#56)

The VMT analysis contained in this report shows that forecast VMT for the Future Year 2035 No Project scenarios are approximately +6% to +8% whereas the Future Year 2035 with Project scenarios are forecasted to be around -3% to -4%. The VMT forecasted for the Future Year 2035 with Project alternative 3 scenarios are approximately +1%. The reduction in VMT is expected due to project's purpose of promoting smart growth strategies and multi-modal transportation.

The project will alter the number of parking spaces available along Coast Highway. The project, project alternative 2 and 3 scenarios results in a net positive of approximately 18 parking spaces over existing conditions and the project alternative 1 is the removal of approximately 69 parking spaces.

Further, the project will provide enhanced infrastructure and facilities for bicyclists and pedestrians, making travel along and across Coast Highway safer for these travel modes. The proposed roundabouts are also intended to help improve traffic safety and traffic flow along Coast Highway. Combined with the environmental mitigation measures identified in this report, the project and project alternatives are anticipated to result in positive benefits for mobility in the Coast Highway corridor.

11 Appendices

Appendix A – Roadway Segment Volumes

EXISTING WITHOUT PROJECT

Street Segment	From	To	Lanes	Classification	LOS E Capacity	Average Daily Traffic (ADT)			Peak Hour		
						Existing (2013)	V/C	LOS	Existing (2013)	V/C	LOS
Coast Hwy	Harbor Dr	SR-76 Ramps	2TWLT	Collector	15,000	9,400	0.627	C	840	0.328	A
	SR-76 Ramps	Civic Center Dr	4U	Secondary Collector	25,000	15,500	0.620	C	1,390	0.271	A
	Civic Center Dr	Seagaze Dr	4U	Secondary Collector	25,000	16,500	0.660	C	1,480	0.289	A
	Seagaze Dr	Wisconsin Ave	4U	Secondary Collector	25,000	15,600	0.624	C	1,400	0.273	A
	Wisconsin Ave	Oceanside Blvd	4U	Secondary Collector	25,000	18,500	0.740	D	1,660	0.324	A
	Oceanside Blvd	Morse St	4TWLT	Secondary Collector	30,000	19,100	0.637	C	1,720	0.336	A
	Morse St	Cassidy St	4U	Secondary Collector	25,000	16,900	0.676	C	1,520	0.297	A
	Cassidy St	Vista Way	4U	Secondary Collector	25,000	18,400	0.736	D	1,660	0.324	A
	Vista Way	Southern City Limits	3TWLT	Secondary Collector	22,500	16,700	0.742	D	1,500	0.391	A
Pacific St	Surfrider Way	Seagaze Dr	2U	Collector	10,000	4,600	0.460	B	420	0.164	A
	Seagaze Dr	Wisconsin Ave	2U	Collector	10,000	5,200	0.520	B	460	0.180	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	4,100	0.410	B	370	0.145	A
	Oceanside Blvd	Cassidy St	2U	Collector	10,000	3,600	0.360	A	330	0.129	A
Surfrider Way	Pacific St	Coast Hwy	2D	Collector	10,000	5,800	0.580	C	520	0.203	A
Mission Ave	Pacific St	Coast Hwy	4U	Secondary Collector	25,000	9,400	0.376	B	840	0.164	A
	Coast Hwy	Clementine St	4U	Secondary Collector	25,000	12,400	0.496	B	1,120	0.219	A
Seagaze St	Coast Hwy	Clementine St	2U	Collector	10,000	2,300	0.230	A	200	0.078	A
Cleveland St	Civic Center Dr	Mission Ave	2U	Collector	10,000	1,600	0.160	A	150	0.059	A
Tremont St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	1,100	0.500	A	100	0.039	A
	Wisconsin Ave	Oceanside Blvd	2U	Local	2,200	1,200	0.545	A	110	0.043	A
	Cassidy St	Vista Way	2U	Local	2,200	600	0.273	A	50	0.020	A
Freeman St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	600	0.273	A	50	0.020	A
	Morse St	Cassidy St	2U	Local	2,200	600	0.273	A	50	0.020	A
Ditmar St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	800	0.364	A	70	0.027	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	2,500	0.250	A	220	0.086	A
	Morse St	Cassidy St	2U	Local	2,200	500	0.227	A	50	0.020	A
Wisconsin Ave	Cleveland	Coast Hwy	2U	Collector	10,000	4,700	0.470	B	430	0.168	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	2,300	0.230	A	210	0.082	A
Oceanside Blvd	Cleveland	Coast Hwy	2U	Collector	10,000	4,500	0.450	B	400	0.156	A
	Coast Hwy	Ditmar St	4U	Secondary Collector	25,000	14,500	0.580	C	1,300	0.254	A
Broadway St	Cassidy St	Vista Way	2U	Collector	10,000	1,900	0.190	A	170	0.066	A
Morse St	Coast Hwy	Ditmar St	2U	Collector	10,000	2,600	0.260	A	230	0.090	A
Cassidy St	Broadway St	Coast Hwy	2U	Collector	10,000	4,600	0.460	B	410	0.160	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	4,700	0.470	B	420	0.164	A
Vista Way	Broadway St	Coast Hwy	2U	Collector	10,000	2,200	0.220	A	200	0.078	A
	Coast Hwy	Ditmar St	3TWLT	Collector	22,500	16,500	0.733	D	1,480	0.385	A

Notes:

A. #D - Total number of lanes in both directions divided by a raised median

B. #U - Total number of undivided lanes in both directions

C. #TWLT - Total number of lanes in both directions with a center continuous two-way left turn lane

D. LOS E capacity is based on criteria established in the City of Oceanside Circulation Element and/or County of San Diego Public Road Standards

E. Peak hour volumes uses HCM 2000 methodology; 9% peak hour factor and 20% volume reduction per lane was assumed (due to posted 25mph signs)

F. ADT - Average Daily Traffic Volumes

G. LOS - Level of Service

EXISTING WITH PROJECT

Street Segment	From	To	Lanes	Classification	LOS E Capacity	Average Daily Traffic (ADT)			Peak Hour		
						Existing (2013)	V/C	LOS	Existing (2013)	V/C	LOS
Coast Hwy	Harbor Dr	SR-76 Ramps	2TWLT	Collector	15,000	9,400	0.627	C	840	0.328	A
	SR-76 Ramps	Civic Center Dr	3TWLT/2D	Collector	19,000	15,500	0.816	E	1,390	0.362	A
	Civic Center Dr	Seagaze Dr	2D	Collector	19,000	16,500	0.868	E	1,480	0.578	A
	Seagaze Dr	Wisconsin Ave	2D	Collector	19,000	15,600	0.821	E	1,400	0.547	A
	Wisconsin Ave	Oceanside Blvd	2D	Collector	19,000	18,500	0.974	E	1,660	0.648	B
	Oceanside Blvd	Morse St	2TWLT	Collector	15,000	19,100	1.273	F	1,720	0.672	B
	Morse St	Cassidy St	2D	Collector	19,000	16,900	0.889	E	1,520	0.594	A
	Cassidy St	Vista Way	2D	Collector	19,000	18,400	0.968	E	1,660	0.648	B
Pacific St	Vista Way	Southern City Limits	3TWLT	Secondary Collector	22,500	16,700	0.742	D	1,500	0.293	A
	Surfrider Way	Seagaze Dr	2U	Collector	10,000	4,600	0.460	B	420	0.164	A
	Seagaze Dr	Wisconsin Ave	2U	Collector	10,000	5,200	0.520	B	460	0.180	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	4,100	0.410	B	370	0.145	A
Surfrider Way	Oceanside Blvd	Cassidy St	2U	Collector	10,000	3,600	0.360	A	330	0.129	A
	Pacific St	Coast Hwy	2D	Collector	10,000	5,800	0.580	C	520	0.203	A
Mission Ave	Pacific St	Coast Hwy	4U	Secondary Collector	25,000	9,400	0.376	B	840	0.164	A
	Coast Hwy	Clementine St	4U	Secondary Collector	25,000	12,400	0.496	B	1,120	0.219	A
Seagaze St	Coast Hwy	Clementine St	2U	Collector	10,000	2,300	0.230	A	200	0.078	A
Cleveland St	Civic Center Dr	Mission Ave	2U	Collector	10,000	1,600	0.160	A	150	0.059	A
Tremont St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	1,100	0.500	A	100	0.039	A
	Wisconsin Ave	Oceanside Blvd	2U	Local	2,200	1,200	0.545	A	110	0.043	A
	Cassidy St	Vista Way	2U	Local	2,200	600	0.273	A	50	0.020	A
Freeman St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	600	0.273	A	50	0.020	A
	Morse St	Cassidy St	2U	Local	2,200	600	0.273	A	50	0.020	A
Ditmar St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	800	0.364	A	70	0.027	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	2,500	0.250	A	220	0.086	A
	Morse St	Cassidy St	2U	Local	2,200	500	0.227	A	50	0.020	A
Wisconsin Ave	Cleveland	Coast Hwy	2U	Collector	10,000	4,700	0.470	B	430	0.168	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	2,300	0.230	A	210	0.082	A
Oceanside Blvd	Cleveland	Coast Hwy	2U	Collector	10,000	4,500	0.450	B	400	0.156	A
	Coast Hwy	Ditmar St	4U	Secondary Collector	25,000	14,500	0.580	C	1,300	0.254	A
Broadway St	Cassidy St	Vista Way	2U	Collector	10,000	1,900	0.190	A	170	0.066	A
Morse St	Coast Hwy	Ditmar St	2U	Collector	10,000	2,600	0.260	A	230	0.090	A
Cassidy St	Broadway St	Coast Hwy	2U	Collector	10,000	4,600	0.460	B	410	0.160	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	4,700	0.470	B	420	0.164	A
Vista Way	Broadway St	Coast Hwy	2U	Collector	10,000	2,200	0.220	A	200	0.078	A
	Coast Hwy	Ditmar St	3TWLT	Collector	22,500	16,500	0.733	D	1,480	0.385	A

Notes:

A. #D - Total number of lanes in both directions divided by a raised median

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C. #TWLT - Total number of lanes in both directions with a center continuous two-way left turn lane

D. LOS E capacity is based on criteria established in the City of Oceanside Circulation Element and/or County of San Diego Public Road Standards

E. Peak hour volumes uses HCM 2000 methodology; 9% peak hour factor and 20% volume reduction per lane was assumed (due to posted 25mph signs)

F. ADT - Average Daily Traffic Volumes

G. LOS - Level of Service

EXISTING WITH PROJECT ALTERNATIVE 1

Street Segment	From	To	Lanes	Classification	LOS E Capacity	Average Daily Traffic (ADT)			Peak Hour		
						Existing (2013)	V/C	LOS	Existing (2013)	V/C	LOS
Coast Hwy	Harbor Dr	SR-76 Ramps	2TWLT	Collector	15,000	9,400	0.627	C	840	0.328	A
	SR-76 Ramps	Civic Center Dr	3TWLT/2D	Collector	19,000	15,500	0.816	E	1,390	0.543	A
	Civic Center Dr	Seagaze Dr	2D	Collector	19,000	16,500	0.868	E	1,480	0.578	A
	Seagaze Dr	Wisconsin Ave	2D	Collector	19,000	15,600	0.821	E	1,400	0.547	A
	Wisconsin Ave	Oceanside Blvd	2D	Collector	19,000	18,500	0.974	E	1,660	0.648	B
	Oceanside Blvd	Morse St	4TWLT	Secondary Collector	30,000	19,100	0.637	C	1,720	0.336	A
	Morse St	Cassidy St	4U	Secondary Collector	25,000	16,900	0.676	C	1,520	0.297	A
	Cassidy St	Vista Way	4U	Secondary Collector	25,000	18,400	0.736	D	1,660	0.324	A
	Vista Way	Southern City Limits	3TWLT	Secondary Collector	22,500	16,700	0.742	D	1,500	0.391	A
Pacific St	Surfrider Way	Seagaze Dr	2U	Collector	10,000	4,600	0.460	B	420	0.164	A
	Seagaze Dr	Wisconsin Ave	2U	Collector	10,000	5,200	0.520	B	460	0.180	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	4,100	0.410	B	370	0.145	A
	Oceanside Blvd	Cassidy St	2U	Collector	10,000	3,600	0.360	A	330	0.129	A
Surfrider Way	Pacific St	Coast Hwy	2D	Collector	10,000	5,800	0.580	C	520	0.203	A
Mission Ave	Pacific St	Coast Hwy	4U	Secondary Collector	25,000	9,400	0.376	B	840	0.164	A
	Coast Hwy	Clementine St	4U	Secondary Collector	25,000	12,400	0.496	B	1,120	0.219	A
Seagaze St	Coast Hwy	Clementine St	2U	Collector	10,000	2,300	0.230	A	200	0.078	A
Cleveland St	Civic Center Dr	Mission Ave	2U	Collector	10,000	1,600	0.160	A	150	0.059	A
Tremont St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	1,100	0.500	A	100	0.039	A
	Wisconsin Ave	Oceanside Blvd	2U	Local	2,200	1,200	0.545	A	110	0.043	A
	Cassidy St	Vista Way	2U	Local	2,200	600	0.273	A	50	0.020	A
Freeman St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	600	0.273	A	50	0.020	A
	Morse St	Cassidy St	2U	Local	2,200	600	0.273	A	50	0.020	A
Ditmar St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	800	0.364	A	70	0.027	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	2,500	0.250	A	220	0.086	A
	Morse St	Cassidy St	2U	Local	2,200	500	0.227	A	50	0.020	A
Wisconsin Ave	Cleveland	Coast Hwy	2U	Collector	10,000	4,700	0.470	B	430	0.168	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	2,300	0.230	A	210	0.082	A
Oceanside Blvd	Cleveland	Coast Hwy	2U	Collector	10,000	4,500	0.450	B	400	0.156	A
	Coast Hwy	Ditmar St	4U	Secondary Collector	25,000	14,500	0.580	C	1,300	0.254	A
Broadway St	Cassidy St	Vista Way	2U	Collector	10,000	1,900	0.190	A	170	0.066	A
Morse St	Coast Hwy	Ditmar St	2U	Collector	10,000	2,600	0.260	A	230	0.090	A
Cassidy St	Broadway St	Coast Hwy	2U	Collector	10,000	4,600	0.460	B	410	0.160	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	4,700	0.470	B	420	0.164	A
Vista Way	Broadway St	Coast Hwy	2U	Collector	10,000	2,200	0.220	A	200	0.078	A
	Coast Hwy	Ditmar St	3TWLT	Collector	22,500	16,500	0.733	D	1,480	0.385	A

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F. ADT - Average Daily Traffic Volumes

G. LOS - Level of Service

EXISTING WITH PROJECT ALTERNATIVE 2

Street Segment	From	To	Lanes	Classification	LOS E Capacity	Average Daily Traffic (ADT)			Peak Hour		
						Existing (2013)	V/C	LOS	Existing (2013)	V/C	LOS
Coast Hwy	Harbor Dr	SR-76 Ramps	2TWLT	Collector	15,000	9,400	0.627	C	840	0.328	A
	SR-76 Ramps	Civic Center Dr	3TWLT/2D	Collector	19,000	15,500	0.816	E	1,390	0.543	A
	Civic Center Dr	Seagaze Dr	2D	Collector	19,000	16,500	0.868	E	1,480	0.578	A
	Seagaze Dr	Wisconsin Ave	2D	Collector	19,000	15,600	0.821	E	1,400	0.547	A
	Wisconsin Ave	Oceanside Blvd	2D	Collector	19,000	18,500	0.974	E	1,660	0.648	B
	Oceanside Blvd	Morse St	2TWLT	Collector	15,000	19,100	1.273	F	1,720	0.672	B
	Morse St	Cassidy St	4U	Secondary Collector	25,000	16,900	0.676	C	1,520	0.297	A
	Cassidy St	Vista Way	4U	Secondary Collector	25,000	18,400	0.736	D	1,660	0.324	A
	Vista Way	Southern City Limits	3TWLT	Secondary Collector	22,500	16,700	0.742	D	1,500	0.391	A
Pacific St	Surfrider Way	Seagaze Dr	2U	Collector	10,000	4,600	0.460	B	420	0.164	A
	Seagaze Dr	Wisconsin Ave	2U	Collector	10,000	5,200	0.520	B	460	0.180	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	4,100	0.410	B	370	0.145	A
	Oceanside Blvd	Cassidy St	2U	Collector	10,000	3,600	0.360	A	330	0.129	A
Surfrider Way	Pacific St	Coast Hwy	2D	Collector	10,000	5,800	0.580	C	520	0.203	A
Mission Ave	Pacific St	Coast Hwy	4U	Secondary Collector	25,000	9,400	0.376	B	840	0.164	A
	Coast Hwy	Clementine St	4U	Secondary Collector	25,000	12,400	0.496	B	1,120	0.219	A
Seagaze St	Coast Hwy	Clementine St	2U	Collector	10,000	2,300	0.230	A	200	0.078	A
Cleveland St	Civic Center Dr	Mission Ave	2U	Collector	10,000	1,600	0.160	A	150	0.059	A
Tremont St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	1,100	0.500	A	100	0.039	A
	Wisconsin Ave	Oceanside Blvd	2U	Local	2,200	1,200	0.545	A	110	0.043	A
	Cassidy St	Vista Way	2U	Local	2,200	600	0.273	A	50	0.020	A
Freeman St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	600	0.273	A	50	0.020	A
	Morse St	Cassidy St	2U	Local	2,200	600	0.273	A	50	0.020	A
Ditmar St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	800	0.364	A	70	0.027	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	2,500	0.250	A	220	0.086	A
	Morse St	Cassidy St	2U	Local	2,200	500	0.227	A	50	0.020	A
Wisconsin Ave	Cleveland	Coast Hwy	2U	Collector	10,000	4,700	0.470	B	430	0.168	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	2,300	0.230	A	210	0.082	A
Oceanside Blvd	Cleveland	Coast Hwy	2U	Collector	10,000	4,500	0.450	B	400	0.156	A
	Coast Hwy	Ditmar St	4U	Secondary Collector	25,000	14,500	0.580	C	1,300	0.254	A
Broadway St	Cassidy St	Vista Way	2U	Collector	10,000	1,900	0.190	A	170	0.066	A
Morse St	Coast Hwy	Ditmar St	2U	Collector	10,000	2,600	0.260	A	230	0.090	A
Cassidy St	Broadway St	Coast Hwy	2U	Collector	10,000	4,600	0.460	B	410	0.160	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	4,700	0.470	B	420	0.164	A
Vista Way	Broadway St	Coast Hwy	2U	Collector	10,000	2,200	0.220	A	200	0.078	A
	Coast Hwy	Ditmar St	3TWLT	Collector	22,500	16,500	0.733	D	1,480	0.385	A

Notes:

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F. ADT - Average Daily Traffic Volumes

G. LOS - Level of Service

EXISTING WITH PROJECT ALTERNATIVE 3

Street Segment	From	To	Lanes	Classification	LOS E Capacity	Average Daily Traffic (ADT)			Peak Hour		
						Existing (2013)	V/C	LOS	Existing (2013)	V/C	LOS
Coast Hwy	Harbor Dr	SR-76 Ramps	2TWLT	Collector	15,000	9,400	0.627	C	840	0.328	A
	SR-76 Ramps	Civic Center Dr	3TWLT/2D	Collector	19,000	15,500	0.816	E	1,390	0.543	A
	Civic Center Dr	Seagaze Dr	2D	Collector	19,000	16,500	0.868	E	1,480	0.578	A
	Seagaze Dr	Wisconsin Ave	2D	Collector	19,000	15,600	0.821	E	1,400	0.547	A
	Wisconsin Ave	Oceanside Blvd	2D	Collector	19,000	18,500	0.974	E	1,660	0.648	B
	Oceanside Blvd	Morse St	2TWLT	Collector	15,000	19,100	1.273	F	1,720	0.672	B
	Morse St	Cassidy St	4U	Secondary Collector	25,000	16,900	0.676	C	1,520	0.297	A
	Cassidy St	Vista Way	4U	Secondary Collector	25,000	18,400	0.736	D	1,660	0.324	A
	Vista Way	Southern City Limits	3TWLT	Secondary Collector	22,500	16,700	0.742	D	1,500	0.391	A
Pacific St	Surfrider Way	Seagaze Dr	2U	Collector	10,000	4,600	0.460	B	420	0.164	A
	Seagaze Dr	Wisconsin Ave	2U	Collector	10,000	5,200	0.520	B	460	0.180	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	4,100	0.410	B	370	0.145	A
	Oceanside Blvd	Cassidy St	2U	Collector	10,000	3,600	0.360	A	330	0.129	A
Surfrider Way	Pacific St	Coast Hwy	2D	Collector	10,000	5,800	0.580	C	520	0.203	A
Mission Ave	Pacific St	Coast Hwy	4U	Secondary Collector	25,000	9,400	0.376	B	840	0.164	A
	Coast Hwy	Clementine St	4U	Secondary Collector	25,000	12,400	0.496	B	1,120	0.219	A
Seagaze St	Coast Hwy	Clementine St	2U	Collector	10,000	2,300	0.230	A	200	0.078	A
Cleveland St	Civic Center Dr	Mission Ave	2U	Collector	10,000	1,600	0.160	A	150	0.059	A
Tremont St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	1,100	0.500	A	100	0.039	A
	Wisconsin Ave	Oceanside Blvd	2U	Local	2,200	1,200	0.545	A	110	0.043	A
	Cassidy St	Vista Way	2U	Local	2,200	600	0.273	A	50	0.020	A
Freeman St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	600	0.273	A	50	0.020	A
	Morse St	Cassidy St	2U	Local	2,200	600	0.273	A	50	0.020	A
Ditmar St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	800	0.364	A	70	0.027	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	2,500	0.250	A	220	0.086	A
	Morse St	Cassidy St	2U	Local	2,200	500	0.227	A	50	0.020	A
Wisconsin Ave	Cleveland	Coast Hwy	2U	Collector	10,000	4,700	0.470	B	430	0.168	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	2,300	0.230	A	210	0.082	A
Oceanside Blvd	Cleveland	Coast Hwy	2U	Collector	10,000	4,500	0.450	B	400	0.156	A
	Coast Hwy	Ditmar St	4U	Secondary Collector	25,000	14,500	0.580	C	1,300	0.254	A
Broadway St	Cassidy St	Vista Way	2U	Collector	10,000	1,900	0.190	A	170	0.066	A
Morse St	Coast Hwy	Ditmar St	2U	Collector	10,000	2,600	0.260	A	230	0.090	A
Cassidy St	Broadway St	Coast Hwy	2U	Collector	10,000	4,600	0.460	B	410	0.160	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	4,700	0.470	B	420	0.164	A
Vista Way	Broadway St	Coast Hwy	2U	Collector	10,000	2,200	0.220	A	200	0.078	A
	Coast Hwy	Ditmar St	3TWLT	Collector	22,500	16,500	0.733	D	1,480	0.385	A

Notes:

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F. ADT - Average Daily Traffic Volumes

G. LOS - Level of Service

FUTURE WITHOUT PROJECT

Street Segment	From	To	Lanes	Classification	LOS E Capacity	Average Daily Traffic (ADT)			Peak Hour		
						Future (2035)	V/C	LOS	Future (2035)	V/C	LOS
Coast Hwy	Harbor Dr	SR-76 Ramps	2TWLT	Collector	15,000	17,600	1.173	F	1,580	0.617	B
	SR-76 Ramps	Civic Center Dr	4U	Secondary Collector	25,000	20,400	0.816	D	1,830	0.357	A
	Civic Center Dr	Seagaze Dr	4U	Secondary Collector	25,000	17,500	0.700	C	1,570	0.307	A
	Seagaze Dr	Wisconsin Ave	4U	Secondary Collector	25,000	18,000	0.720	D	1,620	0.316	A
	Wisconsin Ave	Oceanside Blvd	4U	Secondary Collector	25,000	22,700	0.908	E	2,040	0.398	A
	Oceanside Blvd	Morse St	4TWLT	Secondary Collector	30,000	21,500	0.717	D	1,940	0.379	A
	Morse St	Cassidy St	4U	Secondary Collector	25,000	17,500	0.700	C	1,570	0.307	A
	Cassidy St	Vista Way	4U	Secondary Collector	25,000	15,600	0.624	C	1,410	0.275	A
	Vista Way	Southern City Limits	3TWLT	Secondary Collector	22,500	17,200	0.764	D	1,540	0.401	A
Pacific St	Surfrider Way	Seagaze Dr	2U	Collector	10,000	11,700	1.170	F	1,050	0.410	A
	Seagaze Dr	Wisconsin Ave	2U	Collector	10,000	9,700	0.970	E	880	0.344	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	5,400	0.540	B	490	0.191	A
	Oceanside Blvd	Cassidy St	2U	Collector	10,000	5,400	0.540	B	490	0.191	A
Surfrider Way	Pacific St	Coast Hwy	2D	Collector	10,000	7,300	0.730	C	660	0.258	A
Mission Ave	Pacific St	Coast Hwy	4U	Secondary Collector	25,000	10,700	0.428	B	960	0.188	A
	Coast Hwy	Clementine St	4U	Secondary Collector	25,000	11,600	0.464	B	1,040	0.203	A
Seagaze St	Coast Hwy	Clementine St	2U	Collector	10,000	7,300	0.730	C	660	0.258	A
Cleveland St	Civic Center Dr	Mission Ave	2U	Collector	10,000	3,500	0.350	A	310	0.121	A
Tremont St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	1,800	0.818	A	160	0.063	A
	Wisconsin Ave	Oceanside Blvd	2U	Local	2,200	1,500	0.682	A	130	0.051	A
	Cassidy St	Vista Way	2U	Local	2,200	300	0.136	A	30	0.012	A
Freeman St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	400	0.182	A	40	0.016	A
	Morse St	Cassidy St	2U	Local	2,200	2,200	1.000	C	200	0.078	A
Ditmar St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	900	0.409	A	80	0.031	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	4,300	0.430	B	390	0.152	A
	Morse St	Cassidy St	2U	Local	2,200	1,200	0.545	A	110	0.043	A
Wisconsin Ave	Cleveland	Coast Hwy	2U	Collector	10,000	6,900	0.690	C	620	0.242	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	2,000	0.200	A	180	0.070	A
Oceanside Blvd	Cleveland	Coast Hwy	2U	Collector	10,000	6,900	0.690	C	620	0.242	A
	Coast Hwy	Ditmar St	4U	Secondary Collector	25,000	17,300	0.692	C	1,550	0.303	A
Broadway St	Cassidy St	Vista Way	2U	Collector	10,000	3,400	0.340	A	310	0.121	A
Morse St	Coast Hwy	Ditmar St	2U	Collector	10,000	5,100	0.510	B	460	0.180	A
Cassidy St	Broadway St	Coast Hwy	2U	Collector	10,000	2,500	0.250	A	230	0.090	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	7,600	0.760	D	690	0.270	A
Vista Way	Broadway St	Coast Hwy	2U	Collector	10,000	3,100	0.310	A	280	0.109	A
	Coast Hwy	Ditmar St	3TWLT	Collector	22,500	18,400	0.818	D	1,650	0.430	A

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FUTURE WITH PROJECT

Street Segment	From	To	Lanes	Classification	LOS E Capacity	Average Daily Traffic (ADT)			Peak Hour		
						Future (2035)	V/C	LOS	Future (2035)	V/C	LOS
Coast Hwy	Harbor Dr	SR-76 Ramps	2TWLT	Collector	15,000	21,500	1.433	F	1,940	0.758	C
	SR-76 Ramps	Civic Center Dr	3TWLT/2D	Collector	19,000	23,300	1.226	F	2,100	0.820	D
	Civic Center Dr	Seagaze Dr	2D	Collector	19,000	19,000	1.000	F	1,710	0.668	B
	Seagaze Dr	Wisconsin Ave	2D	Collector	19,000	13,100	0.689	C	1,180	0.461	A
	Wisconsin Ave	Oceanside Blvd	2D	Collector	19,000	14,300	0.753	D	1,290	0.504	A
	Oceanside Blvd	Morse St	2TWLT	Collector	15,000	21,400	1.427	F	1,920	0.750	C
	Morse St	Cassidy St	2D	Collector	19,000	18,600	0.979	E	1,670	0.652	B
	Cassidy St	Vista Way	2D	Collector	19,000	14,700	0.774	D	1,320	0.516	A
	Vista Way	Southern City Limits	3TWLT	Secondary Collector	22,500	15,200	0.676	D	1,370	0.268	A
Pacific St	Surfrider Way	Seagaze Dr	2U	Collector	10,000	12,500	1.250	F	1,130	0.441	A
	Seagaze Dr	Wisconsin Ave	2U	Collector	10,000	10,700	1.070	F	960	0.375	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	6,700	0.670	C	600	0.234	A
	Oceanside Blvd	Cassidy St	2U	Collector	10,000	7,300	0.730	C	650	0.254	A
Surfrider Way	Pacific St	Coast Hwy	2D	Collector	10,000	9,500	0.950	E	850	0.332	A
Mission Ave	Pacific St	Coast Hwy	4U	Secondary Collector	25,000	11,200	0.448	B	1,010	0.197	A
	Coast Hwy	Clementine St	4U	Secondary Collector	25,000	8,900	0.356	A	800	0.156	A
Seagaze St	Coast Hwy	Clementine St	2U	Collector	10,000	7,400	0.740	C	670	0.262	A
Cleveland St	Civic Center Dr	Mission Ave	2U	Collector	10,000	3,700	0.370	A	330	0.129	A
Tremont St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	3,300	1.500	C	290	0.113	A
	Wisconsin Ave	Oceanside Blvd	2U	Local	2,200	2,900	1.318	C	260	0.102	A
	Cassidy St	Vista Way	2U	Local	2,200	400	0.182	A	30	0.012	A
Freeman St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	1,000	0.455	A	90	0.035	A
	Morse St	Cassidy St	2U	Local	2,200	2,800	1.273	C	260	0.102	A
Ditmar St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	700	0.318	A	60	0.023	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	9,500	0.950	E	860	0.336	A
	Morse St	Cassidy St	2U	Local	2,200	1,300	0.591	A	110	0.043	A
Wisconsin Ave	Cleveland	Coast Hwy	2U	Collector	10,000	8,400	0.840	D	760	0.297	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	7,600	0.760	D	690	0.270	A
Oceanside Blvd	Cleveland	Coast Hwy	2U	Collector	10,000	9,400	0.940	E	840	0.328	A
	Coast Hwy	Ditmar St	4U	Secondary Collector	25,000	14,500	0.580	C	1,310	0.256	A
Broadway St	Cassidy St	Vista Way	2U	Collector	10,000	3,500	0.350	A	310	0.121	A
Morse St	Coast Hwy	Ditmar St	2U	Collector	10,000	5,800	0.580	C	520	0.203	A
Cassidy St	Broadway St	Coast Hwy	2U	Collector	10,000	6,600	0.660	C	600	0.234	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	4,300	0.430	B	390	0.152	A
Vista Way	Broadway St	Coast Hwy	2U	Collector	10,000	3,300	0.330	A	300	0.117	A
	Coast Hwy	Ditmar St	3TWLT	Collector	22,500	21,400	0.951	E	1,930	0.503	A

Notes:

A. #D - Total number of lanes in both directions divided by a raised median

B. #U - Total number of undivided lanes in both directions

C. #TWLT - Total number of lanes in both directions with a center continuous two-way left turn lane

D. LOS E capacity is based on criteria established in the City of Oceanside Circulation Element and/or County of San Diego Public Road Standards

E. Peak hour volumes uses HCM 2000 methodology; 9% peak hour factor and 20% volume reduction per lane was assumed (due to posted 25mph signs)

F. ADT - Average Daily Traffic Volumes

G. LOS - Level of Service

FUTURE WITH PROJECT EXISTING SR-78

Street Segment	From	To	Lanes	Classification	LOS E Capacity	Average Daily Traffic (ADT)			Peak Hour		
						Future (2035)	V/C	LOS	Future (2035)	V/C	LOS
Coast Hwy	Harbor Dr	SR-76 Ramps	2TWLT	Collector	15,000	21,800	1.453	F	1,960	0.766	C
	SR-76 Ramps	Civic Center Dr	3TWLT/2D	Collector	19,000	22,900	1.205	F	2,060	0.805	D
	Civic Center Dr	Seagaze Dr	2D	Collector	19,000	18,900	0.995	E	1,700	0.664	B
	Seagaze Dr	Wisconsin Ave	2D	Collector	19,000	11,400	0.600	B	1,020	0.398	A
	Wisconsin Ave	Oceanside Blvd	2D	Collector	19,000	15,700	0.826	E	1,410	0.551	A
	Oceanside Blvd	Morse St	2TWLT	Collector	15,000	24,700	1.647	F	2,220	0.867	D
	Morse St	Cassidy St	2D	Collector	19,000	21,100	1.111	F	1,900	0.742	C
	Cassidy St	Vista Way	2D	Collector	19,000	22,600	1.189	F	2,040	0.797	C
	Vista Way	Southern City Limits	3TWLT	Secondary Collector	22,500	16,800	0.747	D	1,520	0.297	A
Pacific St	Surfrider Way	Seagaze Dr	2U	Collector	10,000	12,600	1.260	F	1,130	0.441	A
	Seagaze Dr	Wisconsin Ave	2U	Collector	10,000	9,600	0.960	E	870	0.340	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	7,800	0.780	D	700	0.273	A
	Oceanside Blvd	Cassidy St	2U	Collector	10,000	8,600	0.860	D	770	0.301	A
Surfrider Way	Pacific St	Coast Hwy	2D	Collector	10,000	9,300	0.930	E	830	0.324	A
Mission Ave	Pacific St	Coast Hwy	4U	Secondary Collector	25,000	10,600	0.424	B	960	0.188	A
	Coast Hwy	Clementine St	4U	Secondary Collector	25,000	8,600	0.344	A	780	0.152	A
Seagaze St	Coast Hwy	Clementine St	2U	Collector	10,000	6,700	0.670	C	600	0.234	A
Cleveland St	Civic Center Dr	Mission Ave	2U	Collector	10,000	3,600	0.360	A	330	0.129	A
Tremont St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	3,400	1.545	C	300	0.117	A
	Wisconsin Ave	Oceanside Blvd	2U	Local	2,200	3,200	1.455	C	290	0.113	A
	Cassidy St	Vista Way	2U	Local	2,200	500	0.227	A	40	0.016	A
Freeman St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	1,000	0.455	A	90	0.035	A
	Morse St	Cassidy St	2U	Local	2,200	3,100	1.409	C	280	0.109	A
Ditmar St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	600	0.273	A	60	0.023	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	8,700	0.870	D	780	0.305	A
	Morse St	Cassidy St	2U	Local	2,200	2,100	0.955	A	190	0.074	A
Wisconsin Ave	Cleveland	Coast Hwy	2U	Collector	10,000	8,500	0.850	D	760	0.297	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	6,500	0.650	C	590	0.230	A
Oceanside Blvd	Cleveland	Coast Hwy	2U	Collector	10,000	8,900	0.890	D	800	0.313	A
	Coast Hwy	Ditmar St	4U	Secondary Collector	25,000	13,800	0.552	C	1,240	0.242	A
Broadway St	Cassidy St	Vista Way	2U	Collector	10,000	4,200	0.420	B	380	0.148	A
Morse St	Coast Hwy	Ditmar St	2U	Collector	10,000	6,600	0.660	C	590	0.230	A
Cassidy St	Broadway St	Coast Hwy	2U	Collector	10,000	6,900	0.690	C	620	0.242	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	5,800	0.580	C	520	0.203	A
Vista Way	Broadway St	Coast Hwy	2U	Collector	10,000	3,400	0.340	A	310	0.121	A
	Coast Hwy	Ditmar St	3TWLT	Collector	22,500	37,600	1.671	F	3,380	0.880	D

Notes:

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D. LOS E capacity is based on criteria established in the City of Oceanside Circulation Element and/or County of San Diego Public Road Standards

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F. ADT - Average Daily Traffic Volumes

G. LOS - Level of Service

FUTURE WITH PROJECT ALTERNATIVE 1

Street Segment	From	To	Lanes	Classification	LOS E Capacity	Average Daily Traffic (ADT)			Peak Hour		
						Future (2035)	V/C	LOS	Future (2035)	V/C	LOS
Coast Hwy	Harbor Dr	SR-76 Ramps	2TWLT	Collector	15,000	21,500	1.433	F	1,940	0.758	C
	SR-76 Ramps	Civic Center Dr	3TWLT/2D	Collector	19,000	23,300	1.226	F	2,100	0.820	D
	Civic Center Dr	Seagaze Dr	2D	Collector	19,000	19,000	1.000	F	1,710	0.668	B
	Seagaze Dr	Wisconsin Ave	2D	Collector	19,000	13,100	0.689	C	1,180	0.461	A
	Wisconsin Ave	Oceanside Blvd	2D	Collector	19,000	14,300	0.753	D	1,290	0.504	A
	Oceanside Blvd	Morse St	4TWLT	Secondary Collector	30,000	21,400	0.713	D	1,920	0.375	A
	Morse St	Cassidy St	4U	Secondary Collector	25,000	18,600	0.744	D	1,670	0.326	A
	Cassidy St	Vista Way	4U	Secondary Collector	25,000	14,700	0.588	C	1,320	0.258	A
	Vista Way	Southern City Limits	3TWLT	Secondary Collector	22,500	15,200	0.676	D	1,370	0.357	A
Pacific St	Surfrider Way	Seagaze Dr	2U	Collector	10,000	12,500	1.250	F	1,130	0.441	A
	Seagaze Dr	Wisconsin Ave	2U	Collector	10,000	10,700	1.070	F	960	0.375	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	6,700	0.670	C	600	0.234	A
	Oceanside Blvd	Cassidy St	2U	Collector	10,000	7,300	0.730	C	650	0.254	A
Surfrider Way	Pacific St	Coast Hwy	2D	Collector	10,000	9,500	0.950	E	850	0.332	A
Mission Ave	Pacific St	Coast Hwy	4U	Secondary Collector	25,000	11,200	0.448	B	1,010	0.197	A
	Coast Hwy	Clementine St	4U	Secondary Collector	25,000	8,900	0.356	A	800	0.156	A
Seagaze St	Coast Hwy	Clementine St	2U	Collector	10,000	7,400	0.740	C	670	0.262	A
Cleveland St	Civic Center Dr	Mission Ave	2U	Collector	10,000	3,700	0.370	A	330	0.129	A
Tremont St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	3,300	1.500	C	290	0.113	A
	Wisconsin Ave	Oceanside Blvd	2U	Local	2,200	2,900	1.318	C	260	0.102	A
	Cassidy St	Vista Way	2U	Local	2,200	400	0.182	A	30	0.012	A
Freeman St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	1,000	0.455	A	90	0.035	A
	Morse St	Cassidy St	2U	Local	2,200	2,800	1.273	C	260	0.102	A
Ditmar St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	700	0.318	A	60	0.023	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	9,500	0.950	E	860	0.336	A
	Morse St	Cassidy St	2U	Local	2,200	1,300	0.591	A	110	0.043	A
Wisconsin Ave	Cleveland	Coast Hwy	2U	Collector	10,000	8,400	0.840	D	760	0.297	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	7,600	0.760	D	690	0.270	A
Oceanside Blvd	Cleveland	Coast Hwy	2U	Collector	10,000	9,400	0.940	E	840	0.328	A
	Coast Hwy	Ditmar St	4U	Secondary Collector	25,000	14,500	0.580	C	1,310	0.256	A
Broadway St	Cassidy St	Vista Way	2U	Collector	10,000	3,500	0.350	A	310	0.121	A
Morse St	Coast Hwy	Ditmar St	2U	Collector	10,000	5,800	0.580	C	520	0.203	A
Cassidy St	Broadway St	Coast Hwy	2U	Collector	10,000	6,600	0.660	C	600	0.234	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	4,300	0.430	B	390	0.152	A
Vista Way	Broadway St	Coast Hwy	2U	Collector	10,000	3,300	0.330	A	300	0.117	A
	Coast Hwy	Ditmar St	3TWLT	Collector	22,500	21,400	0.951	E	1,930	0.503	A

Notes:

A. #D - Total number of lanes in both directions divided by a raised median

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E. Peak hour volumes uses HCM 2000 methodology; 9% peak hour factor and 20% volume reduction per lane was assumed (due to posted 25mph signs)

F. ADT - Average Daily Traffic Volumes

G. LOS - Level of Service

FUTURE WITH PROJECT ALTERNATIVE 1 EXISTING SR-78

Street Segment	From	To	Lanes	Classification	LOS E Capacity	Average Daily Traffic (ADT)			Peak Hour		
						Future (2035)	V/C	LOS	Future (2035)	V/C	LOS
Coast Hwy	Harbor Dr	SR-76 Ramps	2TWLT	Collector	15,000	21,800	1.453	F	1,960	0.766	C
	SR-76 Ramps	Civic Center Dr	3TWLT/2D	Collector	19,000	22,900	1.205	F	2,060	0.805	D
	Civic Center Dr	Seagaze Dr	2D	Collector	19,000	18,900	0.995	E	1,700	0.664	B
	Seagaze Dr	Wisconsin Ave	2D	Collector	19,000	11,400	0.600	B	1,020	0.398	A
	Wisconsin Ave	Oceanside Blvd	2D	Collector	19,000	15,700	0.826	E	1,410	0.551	A
	Oceanside Blvd	Morse St	4TWLT	Secondary Collector	30,000	24,700	0.823	D	2,220	0.434	A
	Morse St	Cassidy St	4U	Secondary Collector	25,000	21,100	0.844	D	1,900	0.371	A
	Cassidy St	Vista Way	4U	Secondary Collector	25,000	22,600	0.904	E	2,040	0.398	A
	Vista Way	Southern City Limits	3TWLT	Secondary Collector	22,500	16,800	0.747	D	1,520	0.396	A
Pacific St	Surfrider Way	Seagaze Dr	2U	Collector	10,000	12,600	1.260	F	1,130	0.441	A
	Seagaze Dr	Wisconsin Ave	2U	Collector	10,000	9,600	0.960	E	870	0.340	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	7,800	0.780	D	700	0.273	A
	Oceanside Blvd	Cassidy St	2U	Collector	10,000	8,600	0.860	D	770	0.301	A
Surfrider Way	Pacific St	Coast Hwy	2D	Collector	10,000	9,300	0.930	E	830	0.324	A
Mission Ave	Pacific St	Coast Hwy	4U	Secondary Collector	25,000	10,600	0.424	B	960	0.188	A
	Coast Hwy	Clementine St	4U	Secondary Collector	25,000	8,600	0.344	A	780	0.152	A
Seagaze St	Coast Hwy	Clementine St	2U	Collector	10,000	6,700	0.670	C	600	0.234	A
Cleveland St	Civic Center Dr	Mission Ave	2U	Collector	10,000	3,600	0.360	A	330	0.129	A
Tremont St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	3,400	1.545	C	300	0.117	A
	Wisconsin Ave	Oceanside Blvd	2U	Local	2,200	3,200	1.455	C	290	0.113	A
	Cassidy St	Vista Way	2U	Local	2,200	500	0.227	A	40	0.016	A
Freeman St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	1,000	0.455	A	90	0.035	A
	Morse St	Cassidy St	2U	Local	2,200	3,100	1.409	C	280	0.109	A
Ditmar St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	600	0.273	A	60	0.023	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	8,700	0.870	D	780	0.305	A
	Morse St	Cassidy St	2U	Local	2,200	2,100	0.955	A	190	0.074	A
Wisconsin Ave	Cleveland	Coast Hwy	2U	Collector	10,000	8,500	0.850	D	760	0.297	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	6,500	0.650	C	590	0.230	A
Oceanside Blvd	Cleveland	Coast Hwy	2U	Collector	10,000	8,900	0.890	D	800	0.313	A
	Coast Hwy	Ditmar St	4U	Secondary Collector	25,000	13,800	0.552	C	1,240	0.242	A
Broadway St	Cassidy St	Vista Way	2U	Collector	10,000	4,200	0.420	B	380	0.148	A
Morse St	Coast Hwy	Ditmar St	2U	Collector	10,000	6,600	0.660	C	590	0.230	A
Cassidy St	Broadway St	Coast Hwy	2U	Collector	10,000	6,900	0.690	C	620	0.242	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	5,800	0.580	C	520	0.203	A
Vista Way	Broadway St	Coast Hwy	2U	Collector	10,000	3,400	0.340	A	310	0.121	A
	Coast Hwy	Ditmar St	3TWLT	Collector	22,500	37,600	1.671	F	3,380	0.880	D

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F. ADT - Average Daily Traffic Volumes

G. LOS - Level of Service

FUTURE WITH PROJECT ALTERNATIVE 2

Street Segment	From	To	Lanes	Classification	LOS E Capacity	Average Daily Traffic (ADT)			Peak Hour		
						Future (2035)	V/C	LOS	Future (2035)	V/C	LOS
Coast Hwy	Harbor Dr	SR-76 Ramps	2TWLT	Collector	15,000	21,500	1.433	F	1,940	0.758	C
	SR-76 Ramps	Civic Center Dr	3TWLT/2D	Collector	19,000	23,300	1.226	F	2,100	0.820	D
	Civic Center Dr	Seagaze Dr	2D	Collector	19,000	19,000	1.000	F	1,710	0.668	B
	Seagaze Dr	Wisconsin Ave	2D	Collector	19,000	13,100	0.689	C	1,180	0.461	A
	Wisconsin Ave	Oceanside Blvd	2D	Collector	19,000	14,300	0.753	D	1,290	0.504	A
	Oceanside Blvd	Morse St	2TWLT	Collector	15,000	21,400	1.427	F	1,920	0.750	C
	Morse St	Cassidy St	4U	Secondary Collector	25,000	18,600	0.744	D	1,670	0.326	A
	Cassidy St	Vista Way	4U	Secondary Collector	25,000	14,700	0.588	C	1,320	0.258	A
	Vista Way	Southern City Limits	3TWLT	Secondary Collector	22,500	15,200	0.676	D	1,370	0.357	A
Pacific St	Surfrider Way	Seagaze Dr	2U	Collector	10,000	12,500	1.250	F	1,130	0.441	A
	Seagaze Dr	Wisconsin Ave	2U	Collector	10,000	10,700	1.070	F	960	0.375	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	6,700	0.670	C	600	0.234	A
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Surfrider Way	Pacific St	Coast Hwy	2D	Collector	10,000	9,500	0.950	E	850	0.332	A
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Tremont St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	3,300	1.500	C	290	0.113	A
	Wisconsin Ave	Oceanside Blvd	2U	Local	2,200	2,900	1.318	C	260	0.102	A
	Cassidy St	Vista Way	2U	Local	2,200	400	0.182	A	30	0.012	A
Freeman St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	1,000	0.455	A	90	0.035	A
	Morse St	Cassidy St	2U	Local	2,200	2,800	1.273	C	260	0.102	A
Ditmar St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	700	0.318	A	60	0.023	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	9,500	0.950	E	860	0.336	A
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	Coast Hwy	Ditmar St	2U	Collector	10,000	7,600	0.760	D	690	0.270	A
Oceanside Blvd	Cleveland	Coast Hwy	2U	Collector	10,000	9,400	0.940	E	840	0.328	A
	Coast Hwy	Ditmar St	4U	Secondary Collector	25,000	14,500	0.580	C	1,310	0.256	A
Broadway St	Cassidy St	Vista Way	2U	Collector	10,000	3,500	0.350	A	310	0.121	A
Morse St	Coast Hwy	Ditmar St	2U	Collector	10,000	5,800	0.580	C	520	0.203	A
Cassidy St	Broadway St	Coast Hwy	2U	Collector	10,000	6,600	0.660	C	600	0.234	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	4,300	0.430	B	390	0.152	A
Vista Way	Broadway St	Coast Hwy	2U	Collector	10,000	3,300	0.330	A	300	0.117	A
	Coast Hwy	Ditmar St	3TWLT	Collector	22,500	21,400	0.951	E	1,930	0.503	A

Notes:

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B. #U - Total number of undivided lanes in both directions

C. #TWLT - Total number of lanes in both directions with a center continuous two-way left turn lane

D. LOS E capacity is based on criteria established in the City of Oceanside Circulation Element and/or County of San Diego Public Road Standards

E. Peak hour volumes uses HCM 2000 methodology; 9% peak hour factor and 20% volume reduction per lane was assumed (due to posted 25mph signs)

F. ADT - Average Daily Traffic Volumes

G. LOS - Level of Service

FUTURE WITH PROJECT ALTERNATIVE 2 EXISTING SR-78

Street Segment	From	To	Lanes	Classification	LOS E Capacity	Average Daily Traffic (ADT)			Peak Hour		
						Future (2035)	V/C	LOS	Future (2035)	V/C	LOS
Coast Hwy	Harbor Dr	SR-76 Ramps	2TWLT	Collector	15,000	21,800	1.453	F	1,960	0.766	C
	SR-76 Ramps	Civic Center Dr	3TWLT/2D	Collector	19,000	22,900	1.205	F	2,060	0.805	D
	Civic Center Dr	Seagaze Dr	2D	Collector	19,000	18,900	0.995	E	1,700	0.664	B
	Seagaze Dr	Wisconsin Ave	2D	Collector	19,000	11,400	0.600	B	1,020	0.398	A
	Wisconsin Ave	Oceanside Blvd	2D	Collector	19,000	15,700	0.826	E	1,410	0.551	A
	Oceanside Blvd	Morse St	2TWLT	Collector	19,000	24,700	1.300	F	2,220	0.867	D
	Morse St	Cassidy St	4U	Secondary Collector	25,000	21,100	0.844	D	1,900	0.371	A
	Cassidy St	Vista Way	4U	Secondary Collector	25,000	22,600	0.904	E	2,040	0.398	A
	Vista Way	Southern City Limits	3TWLT	Secondary Collector	22,500	16,800	0.747	D	1,520	0.396	A
Pacific St	Surfrider Way	Seagaze Dr	2U	Collector	10,000	12,600	1.260	F	1,130	0.441	A
	Seagaze Dr	Wisconsin Ave	2U	Collector	10,000	9,600	0.960	E	870	0.340	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	7,800	0.780	D	700	0.273	A
	Oceanside Blvd	Cassidy St	2U	Collector	10,000	8,600	0.860	D	770	0.301	A
Surfrider Way	Pacific St	Coast Hwy	2D	Collector	10,000	9,300	0.930	E	830	0.324	A
Mission Ave	Pacific St	Coast Hwy	4U	Secondary Collector	25,000	10,600	0.424	B	960	0.188	A
	Coast Hwy	Clementine St	4U	Secondary Collector	25,000	8,600	0.344	A	780	0.152	A
Seagaze St	Coast Hwy	Clementine St	2U	Collector	10,000	6,700	0.670	C	600	0.234	A
Cleveland St	Civic Center Dr	Mission Ave	2U	Collector	10,000	3,600	0.360	A	330	0.129	A
Tremont St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	3,400	1.545	C	300	0.117	A
	Wisconsin Ave	Oceanside Blvd	2U	Local	2,200	3,200	1.455	C	290	0.113	A
	Cassidy St	Vista Way	2U	Local	2,200	500	0.227	A	40	0.016	A
Freeman St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	1,000	0.455	A	90	0.035	A
	Morse St	Cassidy St	2U	Local	2,200	3,100	1.409	C	280	0.109	A
Ditmar St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	600	0.273	A	60	0.023	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	8,700	0.870	D	780	0.305	A
	Morse St	Cassidy St	2U	Local	2,200	2,100	0.955	A	190	0.074	A
Wisconsin Ave	Cleveland	Coast Hwy	2U	Collector	10,000	8,500	0.850	D	760	0.297	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	6,500	0.650	C	590	0.230	A
Oceanside Blvd	Cleveland	Coast Hwy	2U	Collector	10,000	8,900	0.890	D	800	0.313	A
	Coast Hwy	Ditmar St	4U	Secondary Collector	25,000	13,800	0.552	C	1,240	0.242	A
Broadway St	Cassidy St	Vista Way	2U	Collector	10,000	4,200	0.420	B	380	0.148	A
Morse St	Coast Hwy	Ditmar St	2U	Collector	10,000	6,600	0.660	C	590	0.230	A
Cassidy St	Broadway St	Coast Hwy	2U	Collector	10,000	6,900	0.690	C	620	0.242	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	5,800	0.580	C	520	0.203	A
Vista Way	Broadway St	Coast Hwy	2U	Collector	10,000	3,400	0.340	A	310	0.121	A
	Coast Hwy	Ditmar St	3TWLT	Collector	22,500	37,600	1.671	F	3,380	0.880	D

Notes:

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D. LOS E capacity is based on criteria established in the City of Oceanside Circulation Element and/or County of San Diego Public Road Standards

E. Peak hour volumes uses HCM 2000 methodology; 9% peak hour factor and 20% volume reduction per lane was assumed (due to posted 25mph signs)

F. ADT - Average Daily Traffic Volumes

G. LOS - Level of Service

FUTURE WITH PROJECT ALTERNATIVE 3

Street Segment	From	To	Lanes	Classification	LOS E Capacity	Average Daily Traffic (ADT)			Peak Hour		
						Future (2035)	V/C	LOS	Future (2035)	V/C	LOS
Coast Hwy	Harbor Dr	SR-76 Ramps	2TWLT	Collector	15,000	21,400	1.427	F	1,930	0.754	C
	SR-76 Ramps	Civic Center Dr	3TWLT/2D	Collector	19,000	23,100	1.216	F	2,080	0.813	D
	Civic Center Dr	Seagaze Dr	2D	Collector	19,000	19,600	1.032	F	1,760	0.688	B
	Seagaze Dr	Wisconsin Ave	2D	Collector	19,000	10,900	0.574	B	980	0.383	A
	Wisconsin Ave	Oceanside Blvd	2D	Collector	19,000	11,800	0.621	C	1,060	0.414	A
	Oceanside Blvd	Morse St	2TWLT	Secondary Collector	15,000	17,500	1.167	F	1,570	0.613	B
	Morse St	Cassidy St	4U	Secondary Collector	25,000	11,300	0.452	B	1,020	0.199	A
	Cassidy St	Vista Way	4U	Secondary Collector	25,000	10,800	0.432	B	970	0.189	A
	Vista Way	Southern City Limits	3TWLT	Secondary Collector	22,500	14,200	0.631	C	1,280	0.333	A
Pacific St	Surfrider Way	Seagaze Dr	2U	Collector	10,000	12,600	1.260	F	1,130	0.441	A
	Seagaze Dr	Wisconsin Ave	2U	Collector	10,000	10,600	1.060	F	950	0.371	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	7,000	0.700	C	630	0.246	A
	Oceanside Blvd	Cassidy St	2U	Collector	10,000	7,500	0.750	D	670	0.262	A
Surfrider Way	Pacific St	Coast Hwy	2D	Collector	10,000	9,400	0.940	E	850	0.332	A
Mission Ave	Pacific St	Coast Hwy	4U	Secondary Collector	25,000	11,300	0.452	B	1,010	0.197	A
	Coast Hwy	Clementine St	4U	Secondary Collector	25,000	8,000	0.320	A	720	0.141	A
Seagaze St	Coast Hwy	Clementine St	2U	Collector	10,000	7,300	0.730	C	660	0.258	A
Cleveland St	Civic Center Dr	Mission Ave	2U	Collector	10,000	3,500	0.350	A	310	0.121	A
Tremont St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	3,000	1.364	C	270	0.105	A
	Wisconsin Ave	Oceanside Blvd	2U	Local	2,200	2,700	1.227	C	240	0.094	A
	Cassidy St	Vista Way	2U	Local	2,200	1,300	0.591	A	120	0.047	A
Freeman St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	1,000	0.455	A	90	0.035	A
	Morse St	Cassidy St	2U	Local	2,200	5,600	2.545	C	500	0.195	A
Ditmar St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	800	0.364	A	70	0.027	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	11,600	1.160	F	1,040	0.406	A
	Morse St	Cassidy St	2U	Local	2,200	1,500	0.682	A	140	0.055	A
Wisconsin Ave	Cleveland	Coast Hwy	2U	Collector	10,000	7,900	0.790	D	710	0.277	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	8,400	0.840	D	760	0.297	A
Oceanside Blvd	Cleveland	Coast Hwy	2U	Collector	10,000	9,200	0.920	E	830	0.324	A
	Coast Hwy	Ditmar St	4U	Secondary Collector	25,000	13,100	0.524	C	1,180	0.230	A
Broadway St	Cassidy St	Vista Way	2U	Collector	10,000	5,600	0.560	C	500	0.195	A
Morse St	Coast Hwy	Ditmar St	2U	Collector	10,000	8,200	0.820	D	740	0.289	A
Cassidy St	Broadway St	Coast Hwy	2U	Collector	10,000	3,200	0.320	A	280	0.109	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	4,400	0.440	B	390	0.152	A
Vista Way	Broadway St	Coast Hwy	2U	Collector	10,000	4,000	0.400	B	360	0.141	A
	Coast Hwy	Ditmar St	3TWLT	Collector	22,500	30,800	1.369	F	2,770	0.721	C

Notes:

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D. LOS E capacity is based on criteria established in the City of Oceanside Circulation Element and/or County of San Diego Public Road Standards

E. Peak hour volumes uses HCM 2000 methodology; 9% peak hour factor and 20% volume reduction per lane was assumed (due to posted 25mph signs)

F. ADT - Average Daily Traffic Volumes

G. LOS - Level of Service

FUTURE WITH PROJECT ALTERNATIVE 3 EXISTING SR-78

Street Segment	From	To	Lanes	Classification	LOS E Capacity	Average Daily Traffic (ADT)			Peak Hour		
						Future (2035)	V/C	LOS	Future (2035)	V/C	LOS
Coast Hwy	Harbor Dr	SR-76 Ramps	2TWLT	Collector	15,000	21,400	1.427	F	1,930	0.754	C
	SR-76 Ramps	Civic Center Dr	3TWLT/2D	Collector	19,000	23,300	1.226	F	2,100	0.820	D
	Civic Center Dr	Seagaze Dr	2D	Collector	19,000	19,700	1.037	F	1,770	0.691	B
	Seagaze Dr	Wisconsin Ave	2D	Collector	19,000	10,800	0.568	B	980	0.383	A
	Wisconsin Ave	Oceanside Blvd	2D	Collector	19,000	11,800	0.621	C	1,060	0.414	A
	Oceanside Blvd	Morse St	2TWLT	Collector	15,000	17,800	1.187	F	1,600	0.625	B
	Morse St	Cassidy St	4U	Secondary Collector	25,000	11,600	0.464	B	1,040	0.203	A
	Cassidy St	Vista Way	4U	Secondary Collector	25,000	11,000	0.440	B	990	0.193	A
	Vista Way	Southern City Limits	3TWLT	Secondary Collector	22,500	14,600	0.649	C	1,320	0.344	A
Pacific St	Surfrider Way	Seagaze Dr	2U	Collector	10,000	12,700	1.270	F	1,150	0.449	A
	Seagaze Dr	Wisconsin Ave	2U	Collector	10,000	10,500	1.050	F	950	0.371	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	7,000	0.700	C	630	0.246	A
	Oceanside Blvd	Cassidy St	2U	Collector	10,000	7,600	0.760	D	680	0.266	A
Surfrider Way	Pacific St	Coast Hwy	2D	Collector	10,000	9,500	0.950	E	860	0.336	A
Mission Ave	Pacific St	Coast Hwy	4U	Secondary Collector	25,000	11,300	0.452	B	1,020	0.199	A
	Coast Hwy	Clementine St	4U	Secondary Collector	25,000	8,100	0.324	A	730	0.143	A
Seagaze St	Coast Hwy	Clementine St	2U	Collector	10,000	7,200	0.720	C	650	0.254	A
Cleveland St	Civic Center Dr	Mission Ave	2U	Collector	10,000	3,400	0.340	A	310	0.121	A
Tremont St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	3,000	1.364	C	270	0.105	A
	Wisconsin Ave	Oceanside Blvd	2U	Local	2,200	2,700	1.227	C	240	0.094	A
	Cassidy St	Vista Way	2U	Local	2,200	1,600	0.727	A	140	0.055	A
Freeman St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	1,000	0.455	A	90	0.035	A
	Morse St	Cassidy St	2U	Local	2,200	5,400	2.455	C	480	0.188	A
Ditmar St	Michigan Ave	Wisconsin Ave	2U	Local	2,200	800	0.364	A	70	0.027	A
	Wisconsin Ave	Oceanside Blvd	2U	Collector	10,000	11,400	1.140	F	1,030	0.402	A
	Morse St	Cassidy St	2U	Local	2,200	1,800	0.818	A	160	0.063	A
Wisconsin Ave	Cleveland	Coast Hwy	2U	Collector	10,000	7,700	0.770	D	700	0.273	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	8,400	0.840	D	760	0.297	A
Oceanside Blvd	Cleveland	Coast Hwy	2U	Collector	10,000	9,200	0.920	E	830	0.324	A
	Coast Hwy	Ditmar St	4U	Secondary Collector	25,000	13,000	0.520	C	1,170	0.229	A
Broadway St	Cassidy St	Vista Way	2U	Collector	10,000	5,800	0.580	C	520	0.203	A
Morse St	Coast Hwy	Ditmar St	2U	Collector	10,000	8,500	0.850	D	760	0.297	A
Cassidy St	Broadway St	Coast Hwy	2U	Collector	10,000	2,900	0.290	A	260	0.102	A
	Coast Hwy	Ditmar St	2U	Collector	10,000	4,700	0.470	B	420	0.164	A
Vista Way	Broadway St	Coast Hwy	2U	Collector	10,000	4,000	0.400	B	360	0.141	A
	Coast Hwy	Ditmar St	3TWLT	Collector	22,500	30,800	1.369	F	2,770	0.721	C

Notes:

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F. ADT - Average Daily Traffic Volumes

G. LOS - Level of Service

Appendix B – Trip Caps

Daily Trips	Node - OceanSide Transit Center												Avenue - Missouri Ave to Wisconsin Ave												Commercial Village - Wisconsin Avenue												Avenue 2 - Wisconsin Ave to OceanSide Blvd												Node - Sprinter Station												Avenue 3 - Channel Lane to Whalley												Node - South O												Commercial Village - South O												TOTAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																															
	TAZs: 4736, 4737, 4693, 4695, 555, 4701												TAZs: 4702, 4703, 4704, 4706												TAZs: 4706, 569, 615, 4709, 4707, 4739												TAZs: 4739, 4707, 4761, 4740, 4710, 4743, 4711												TAZs: 4743, 4711, 607, 4713, 4715, 4716, 4718, 629, 4720												TAZs: 629, 4720, 4721, 4722, 4744, 4745												TAZ: 4734												TAZs: 663, 4746, 4727, 4747, 707, 4748, 4728																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																											
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Appendix C – Existing Count Data

ITM Peak Hour Summary

Prepared by:

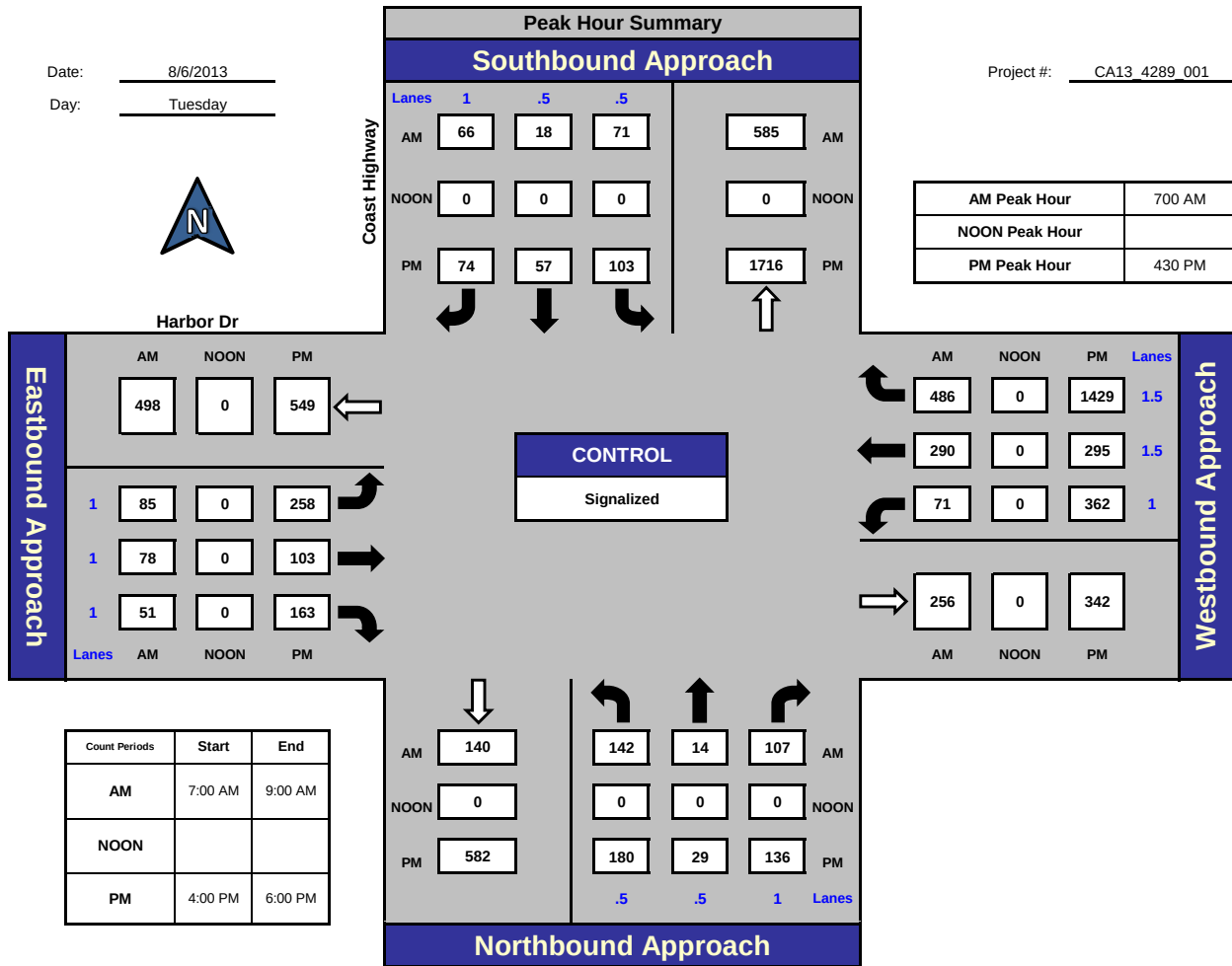


National Data & Surveying Services

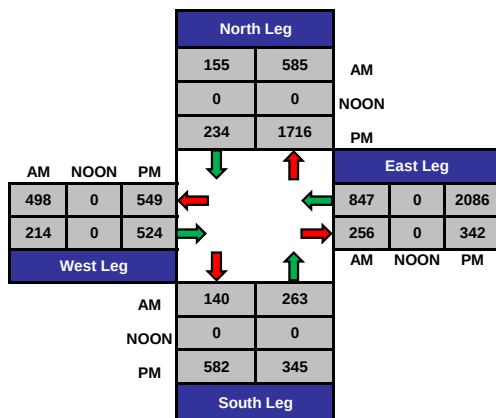
Coast Highway and Harbor Dr., City of Oceanside

Date: 8/6/2013
Day: Tuesday

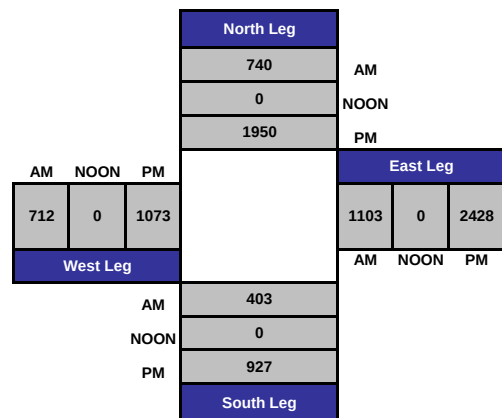
Project #: CA13 4289 001



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

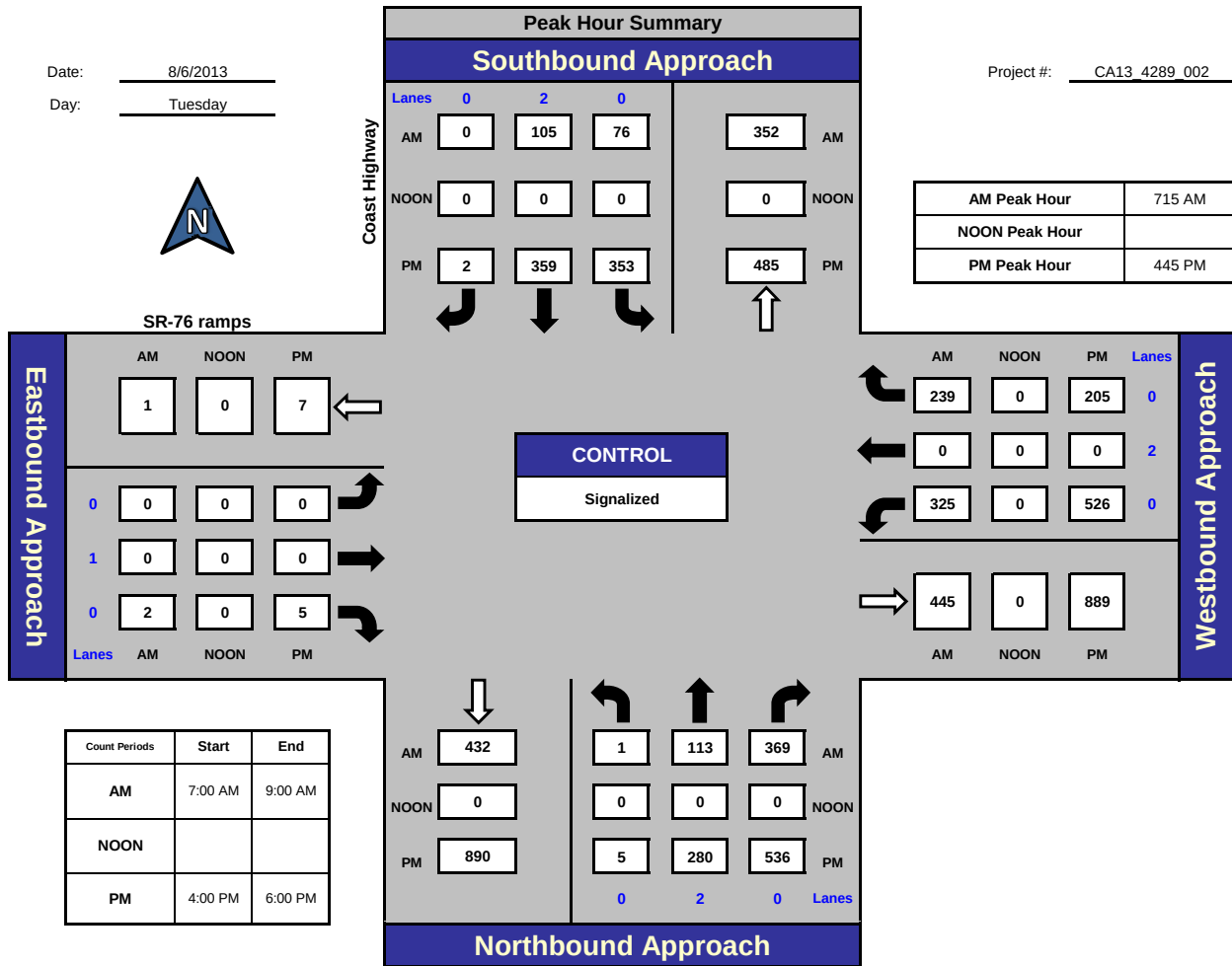


National Data & Surveying Services

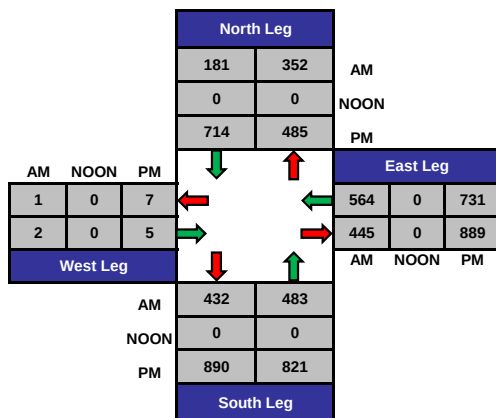
Coast Highway and SR-76 ramps , City of Oceanside

Date: 8/6/2013
Day: Tuesday

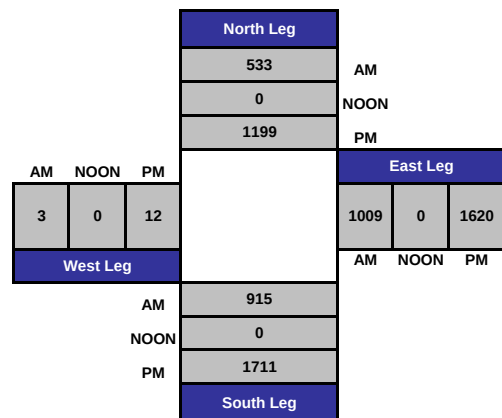
Project #: CA13 4289 002



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:



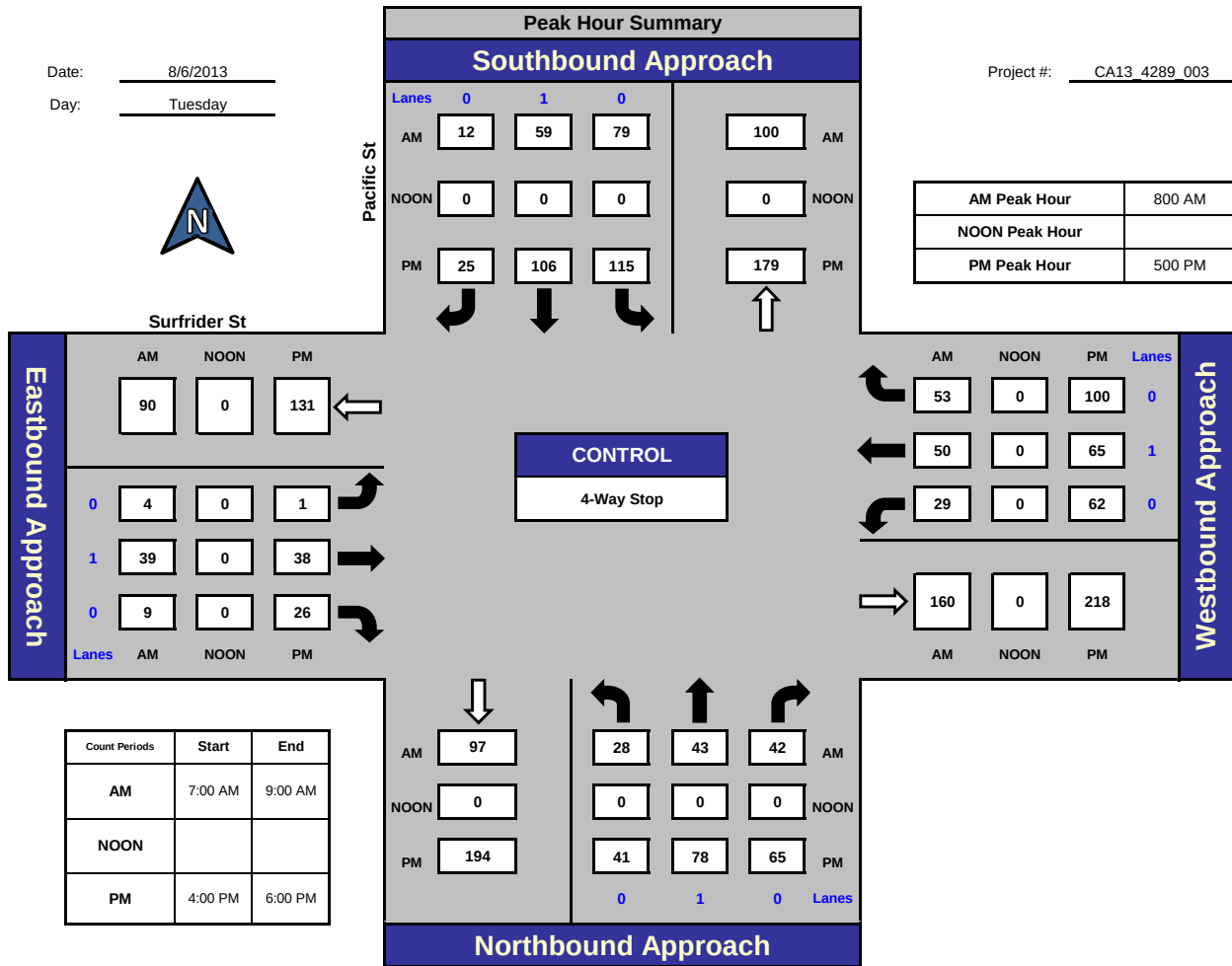
National Data & Surveying Services

Pacific St and Surfrider St, City of Oceanside

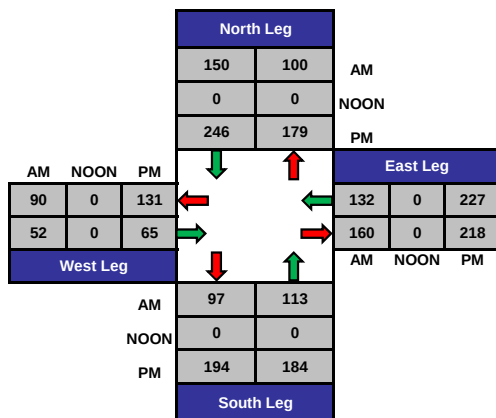
Date: 8/6/2013

Day: Tuesday

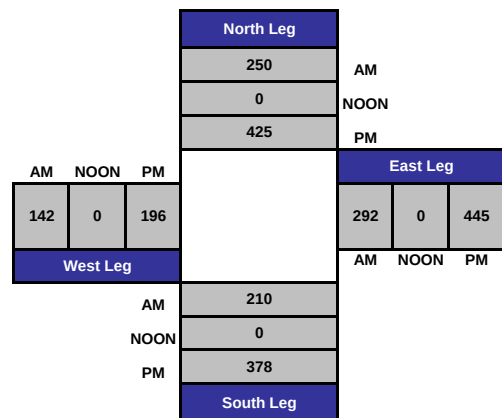
Project #: CA13 4289 003



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

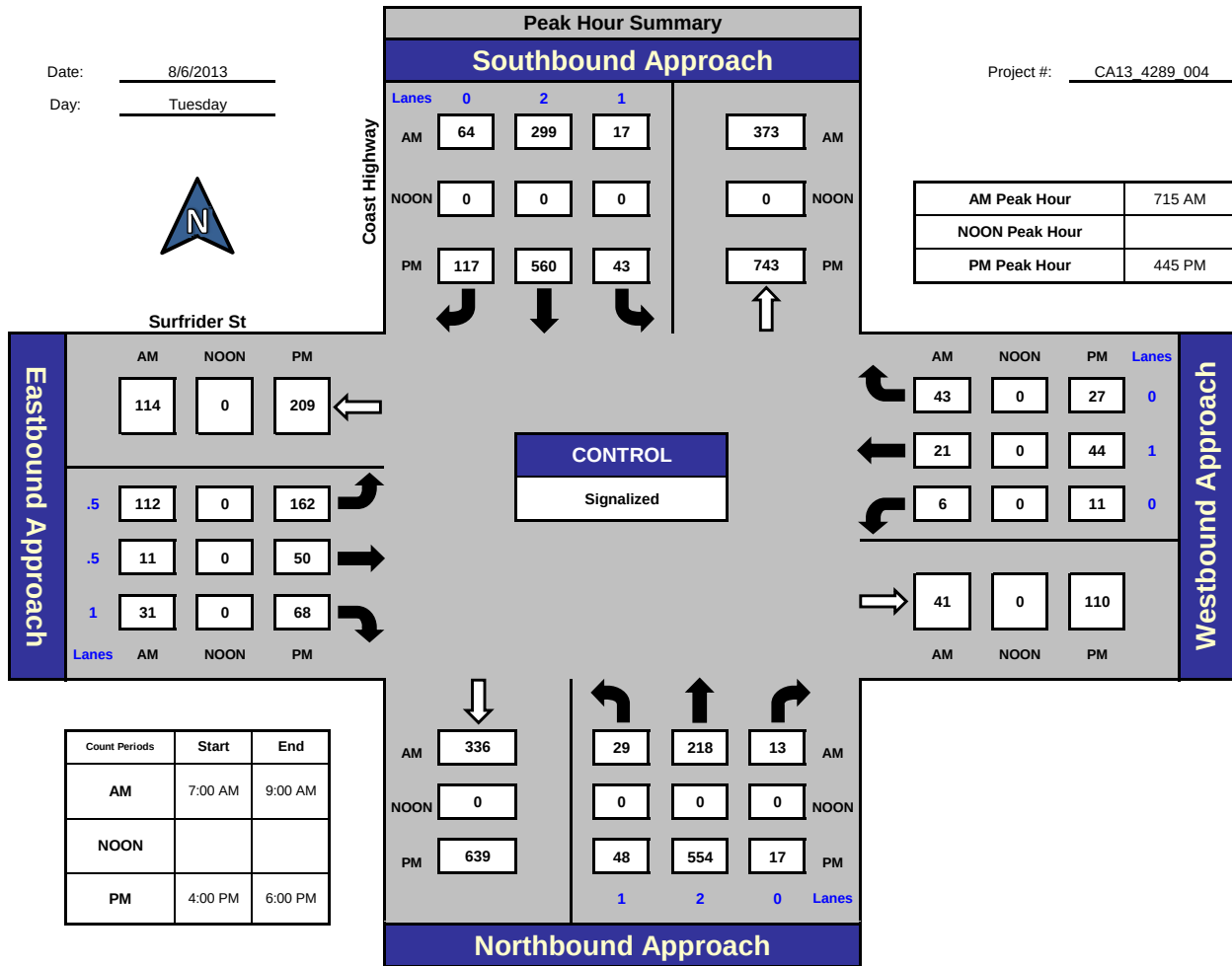


National Data & Surveying Services

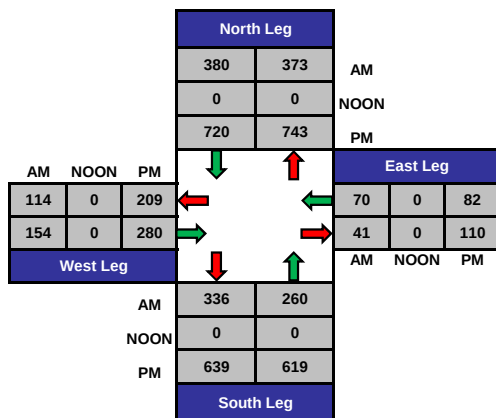
Coast Highway and Surfrider St , City of Oceanside

Date: 8/6/2013
Day: Tuesday

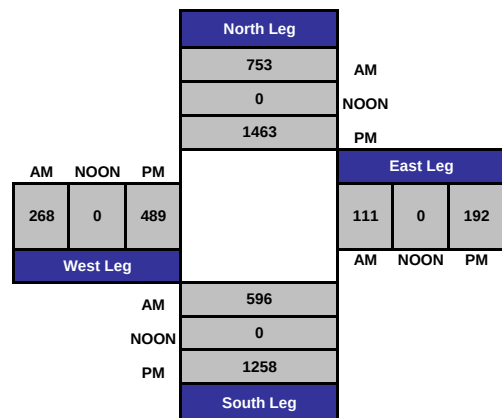
Project #: CA13 4289 004



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

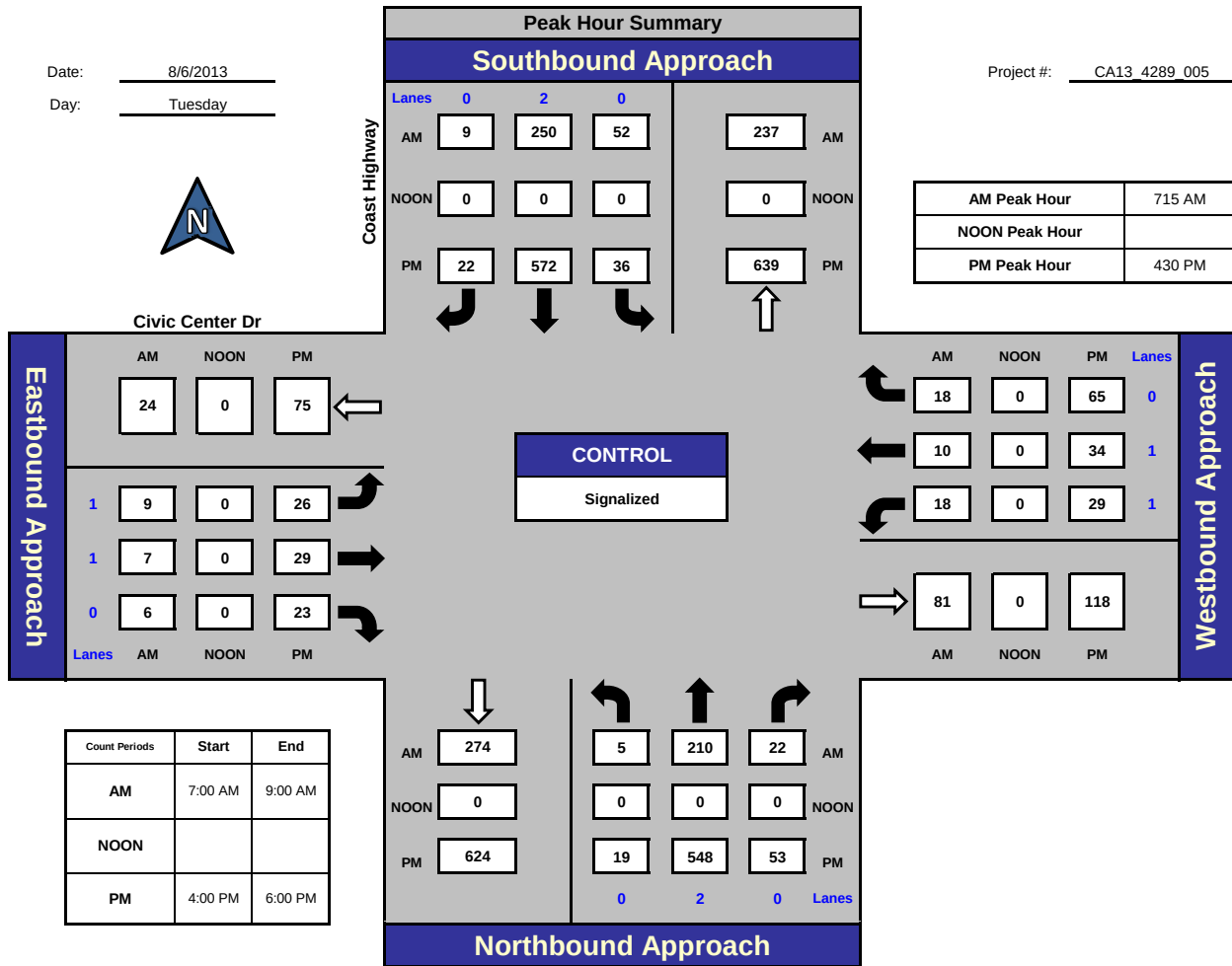


National Data & Surveying Services

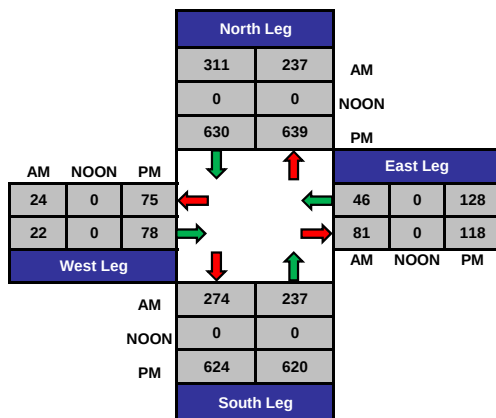
Coast Highway and Civic Center Dr., City of Oceanside

Date: 8/6/2013
Day: Tuesday

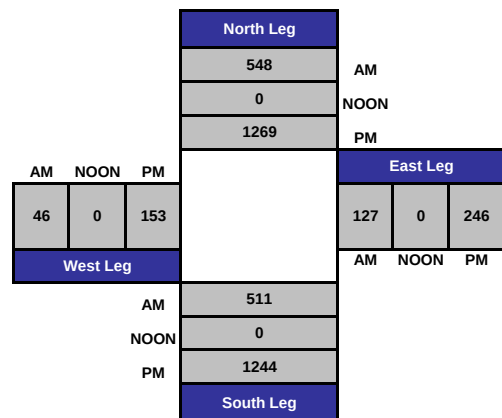
Project #: CA13 4289 005



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

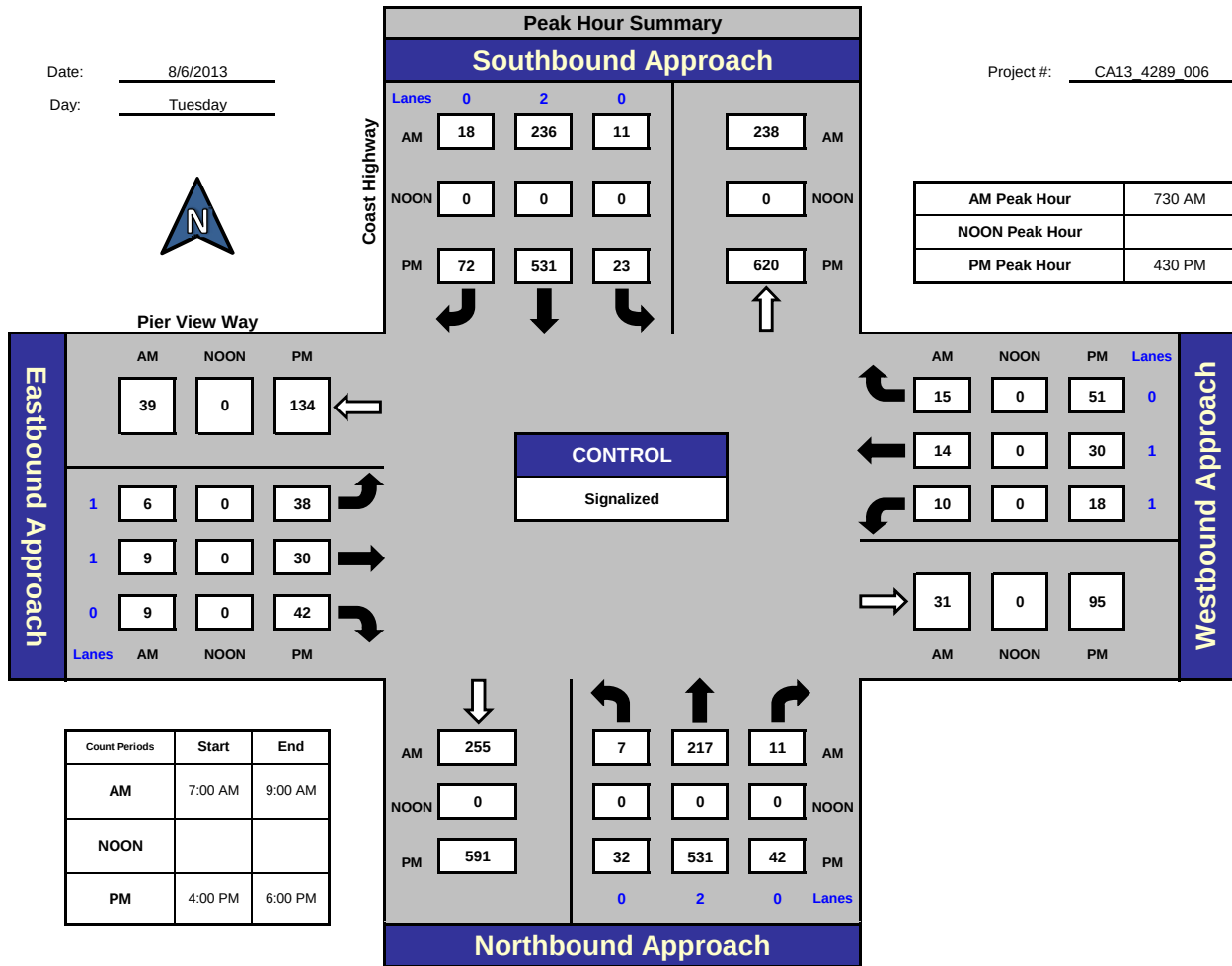


National Data & Surveying Services

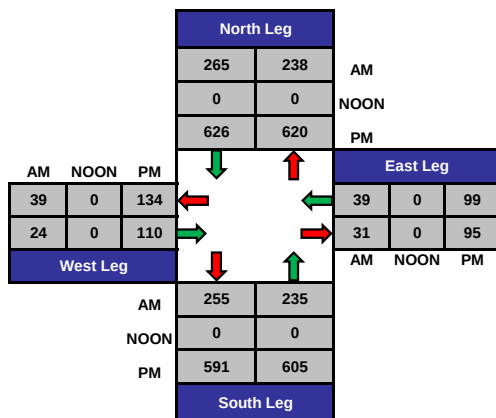
Coast Highway and Pier View Way, City of Oceanside

Date: 8/6/2013
Day: Tuesday

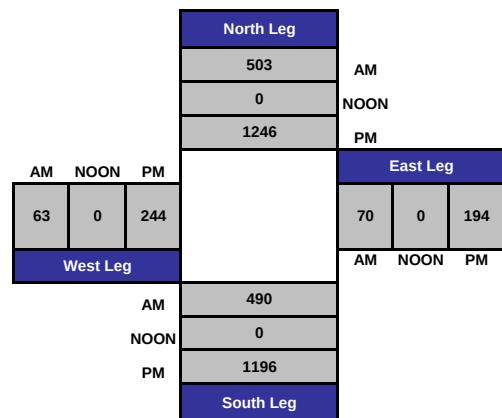
Project #: CA13 4289 006



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

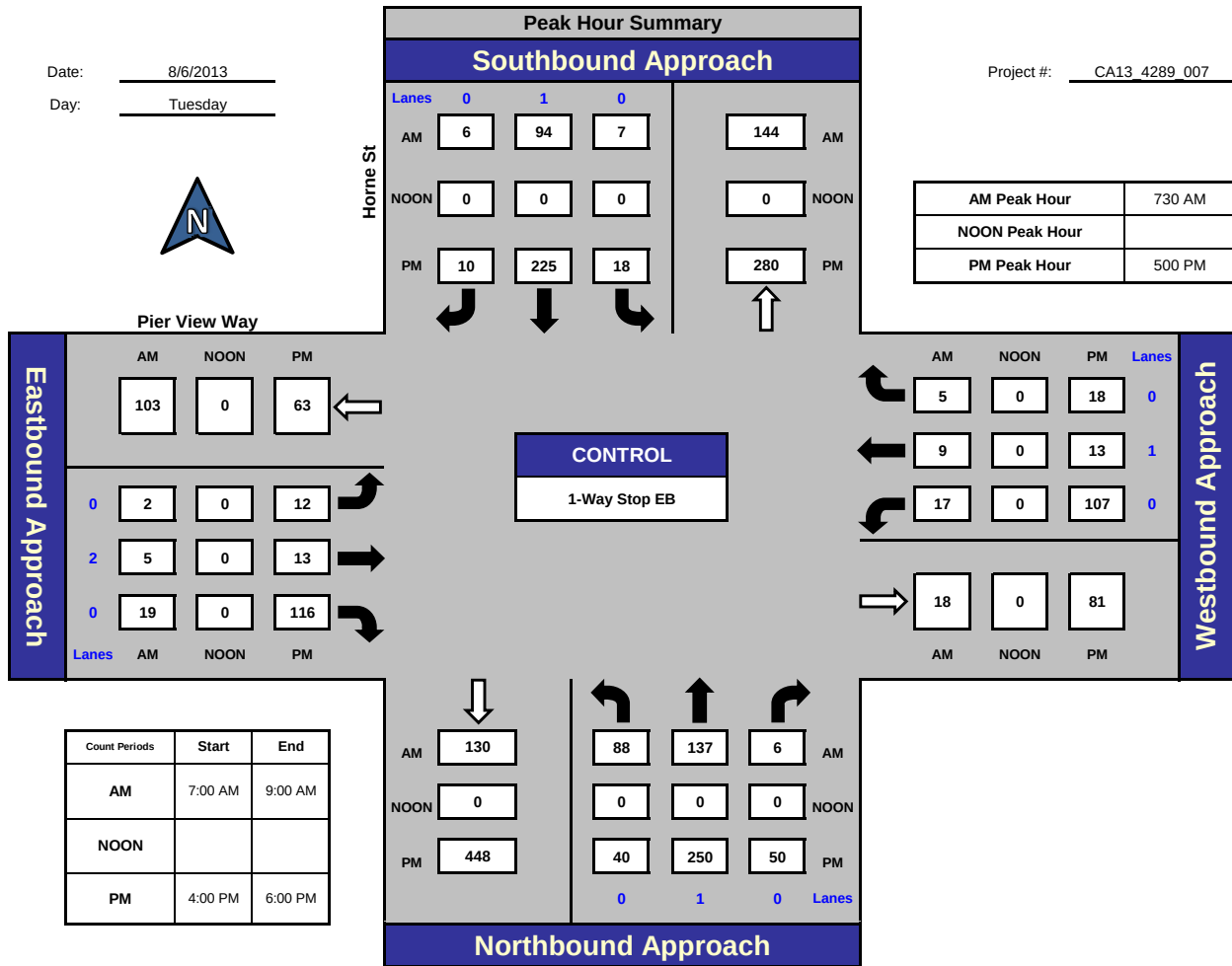


National Data & Surveying Services

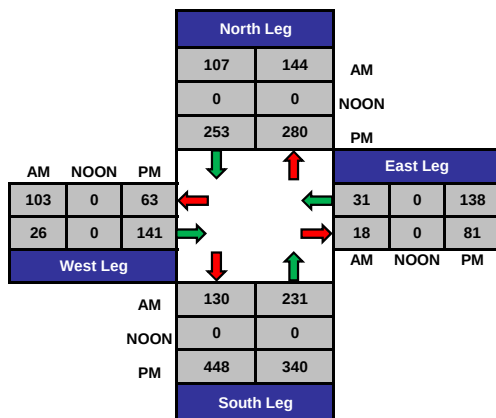
Horne St and Pier View Way, City of Oceanside

Date: 8/6/2013
Day: Tuesday

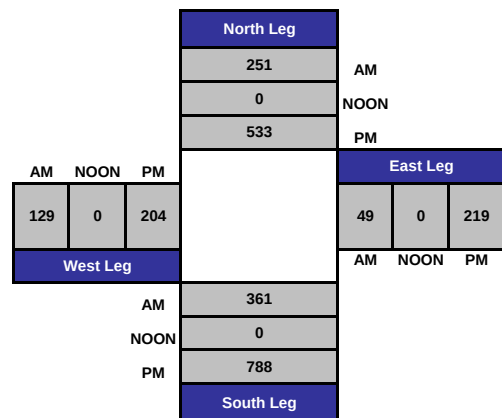
Project #: CA13 4289 007



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

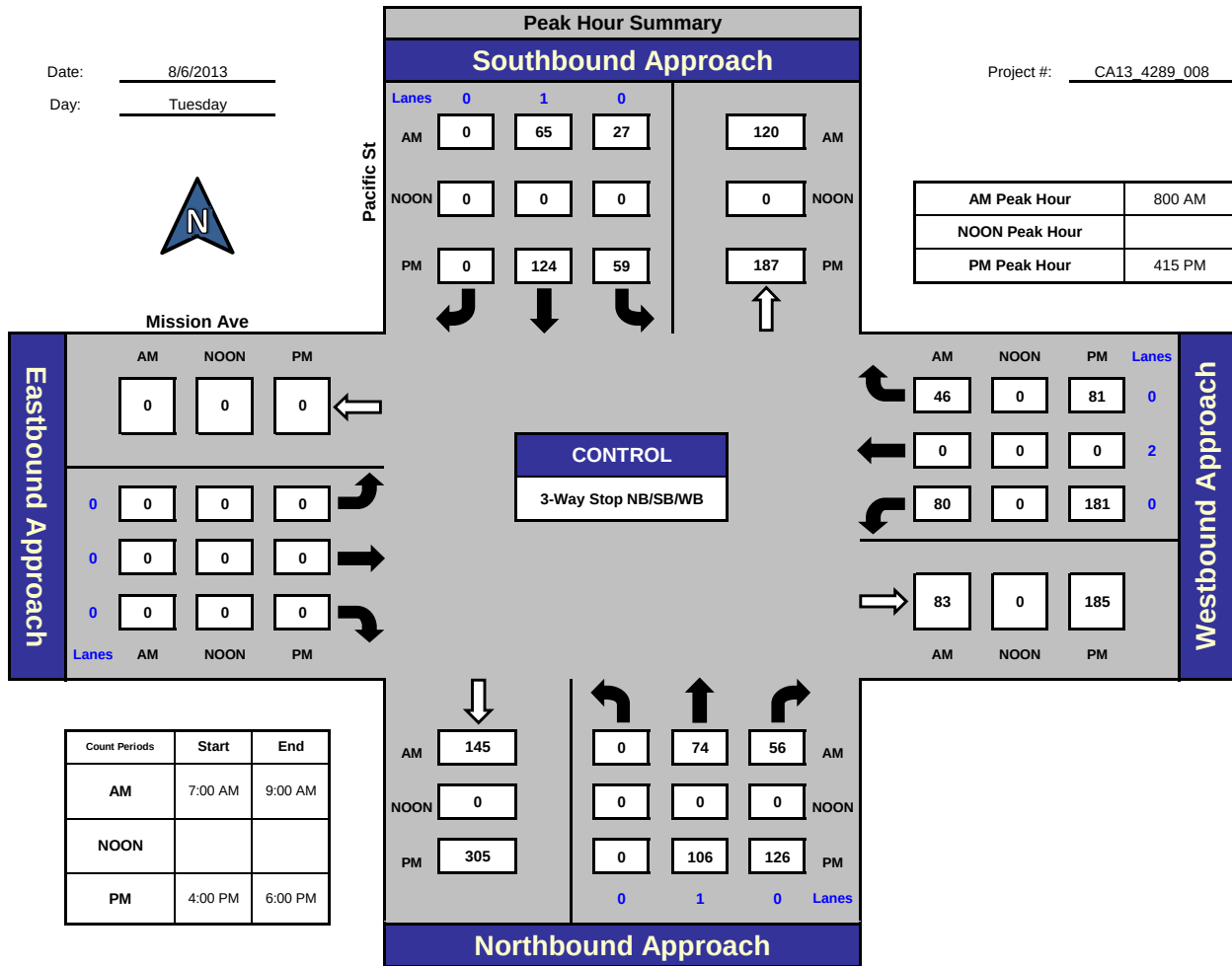


National Data & Surveying Services

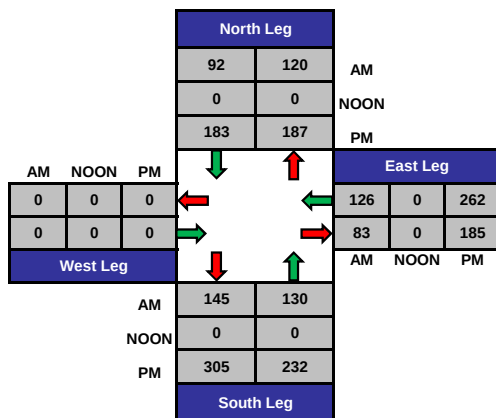
Pacific St and Mission Ave , City of Oceanside

Date: 8/6/2013
Day: Tuesday

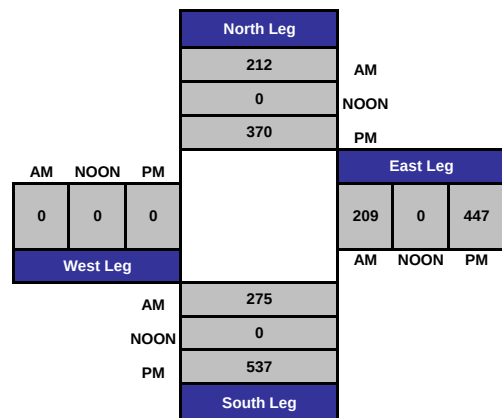
Project #: CA13 4289 008



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

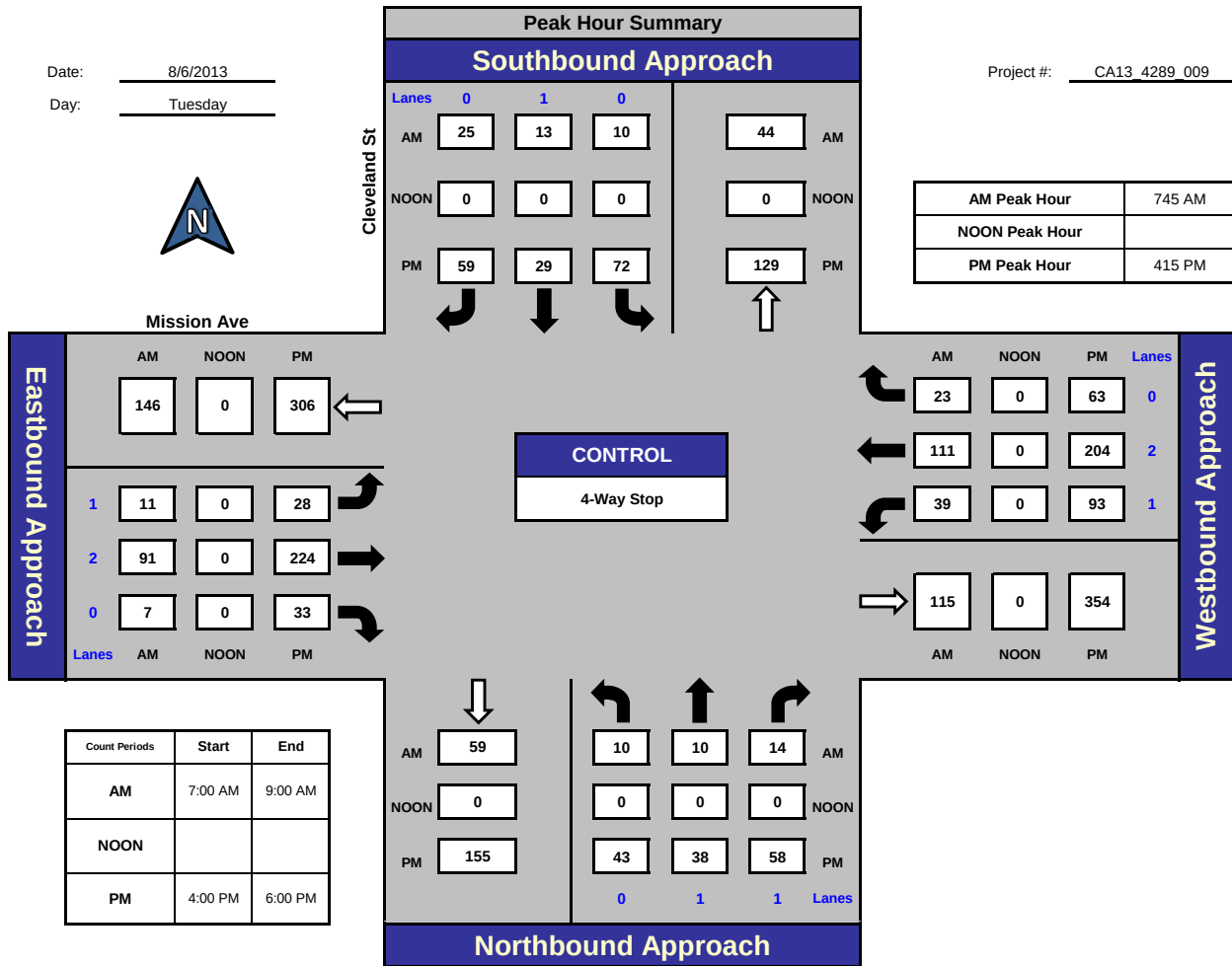


National Data & Surveying Services

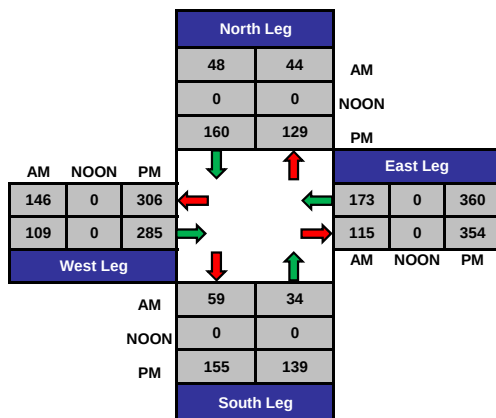
Cleveland St and Mission Ave , City of Oceanside

Date: 8/6/2013
Day: Tuesday

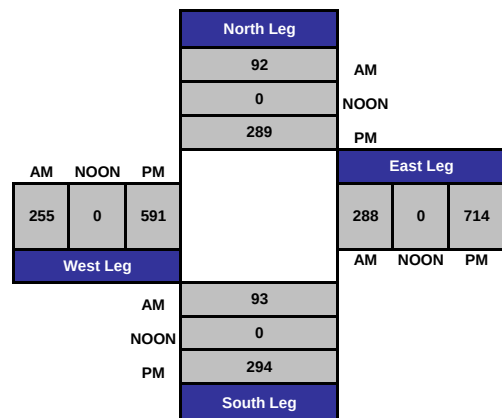
Project #: CA13 4289 009



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

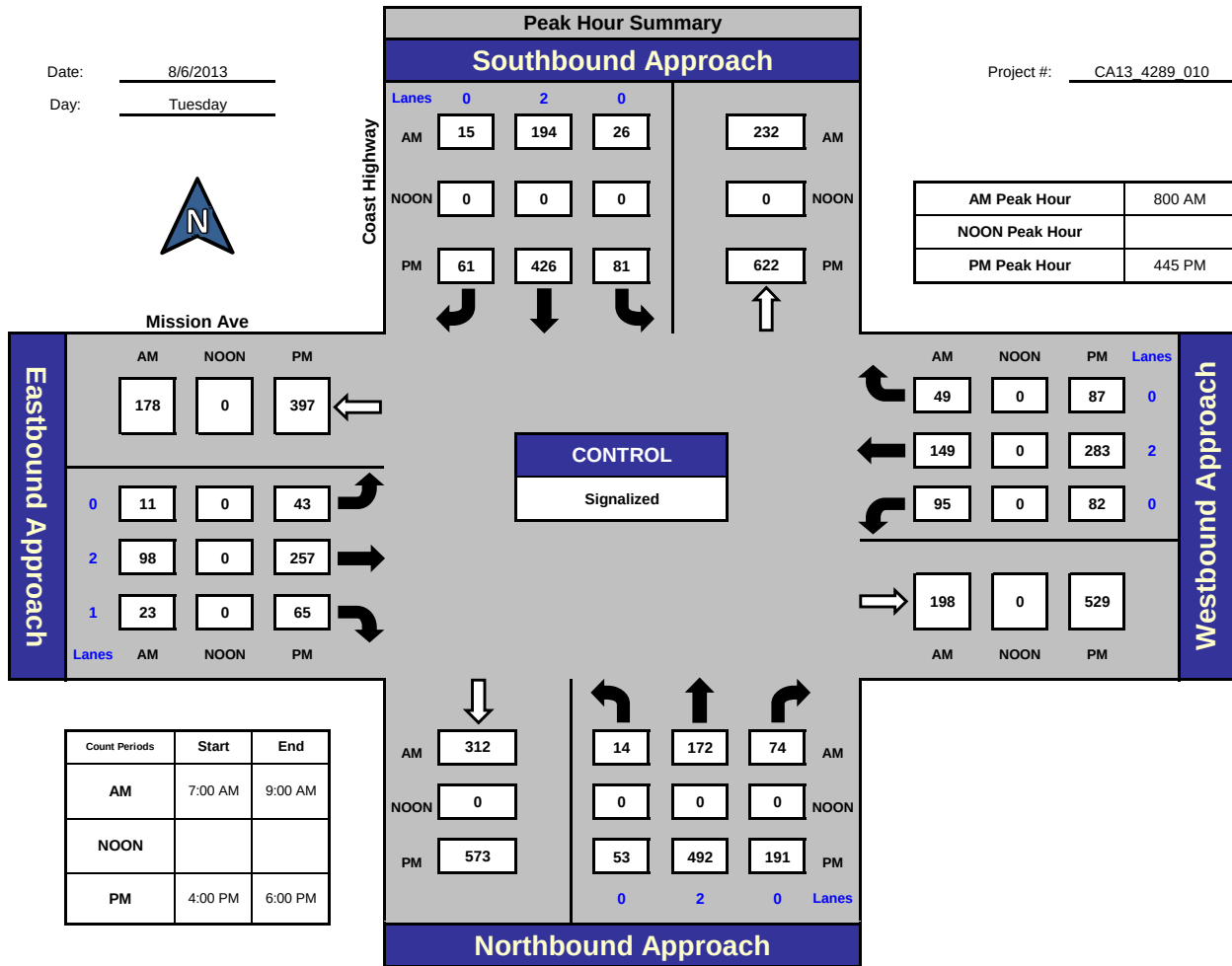


National Data & Surveying Services

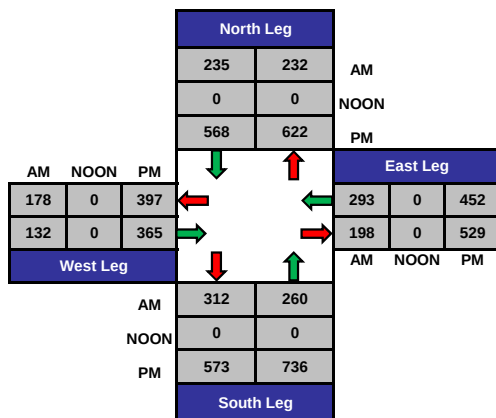
Coast Highway and Mission Ave., City of Oceanside

Date: 8/6/2013
Day: Tuesday

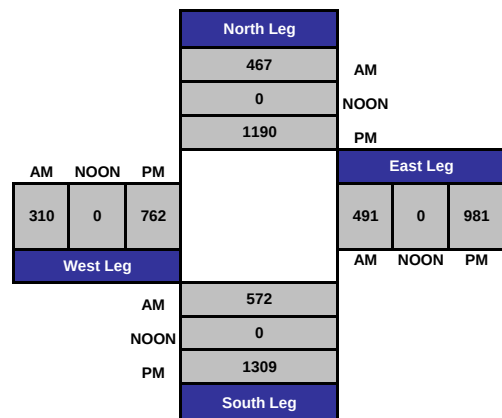
Project #: CA13 4289 010



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

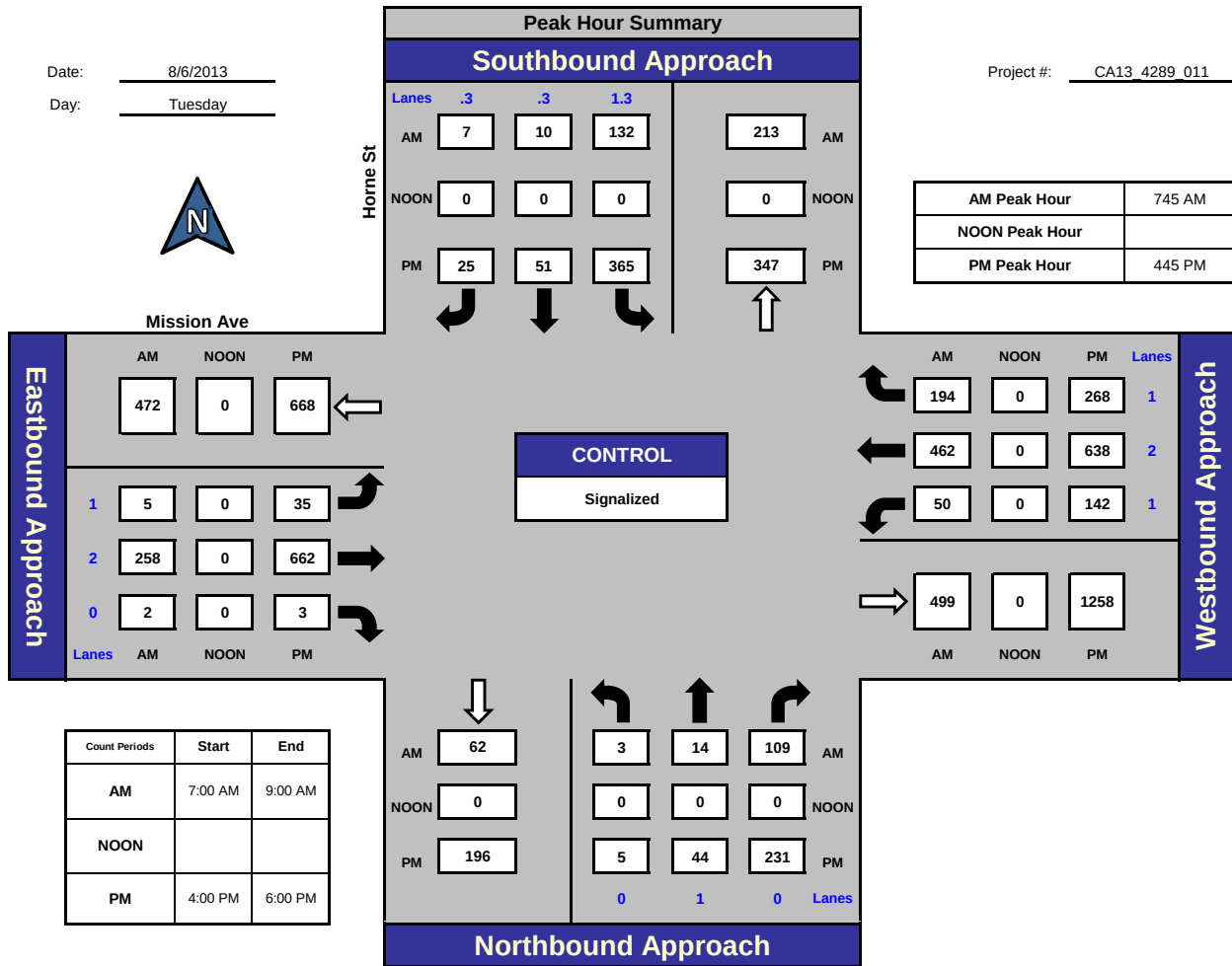


National Data & Surveying Services

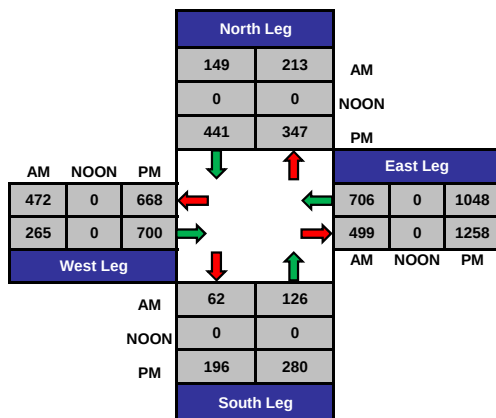
Horne St and Mission Ave , City of Oceanside

Date: 8/6/2013
Day: Tuesday

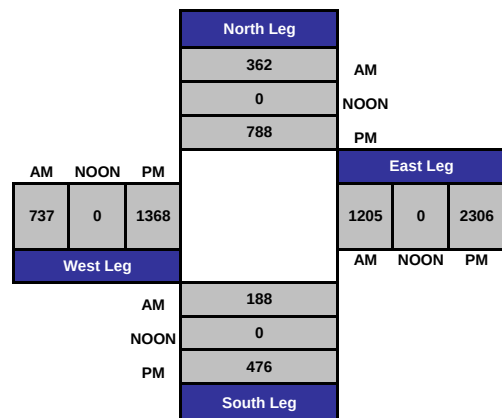
Project #: CA13 4289 011



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

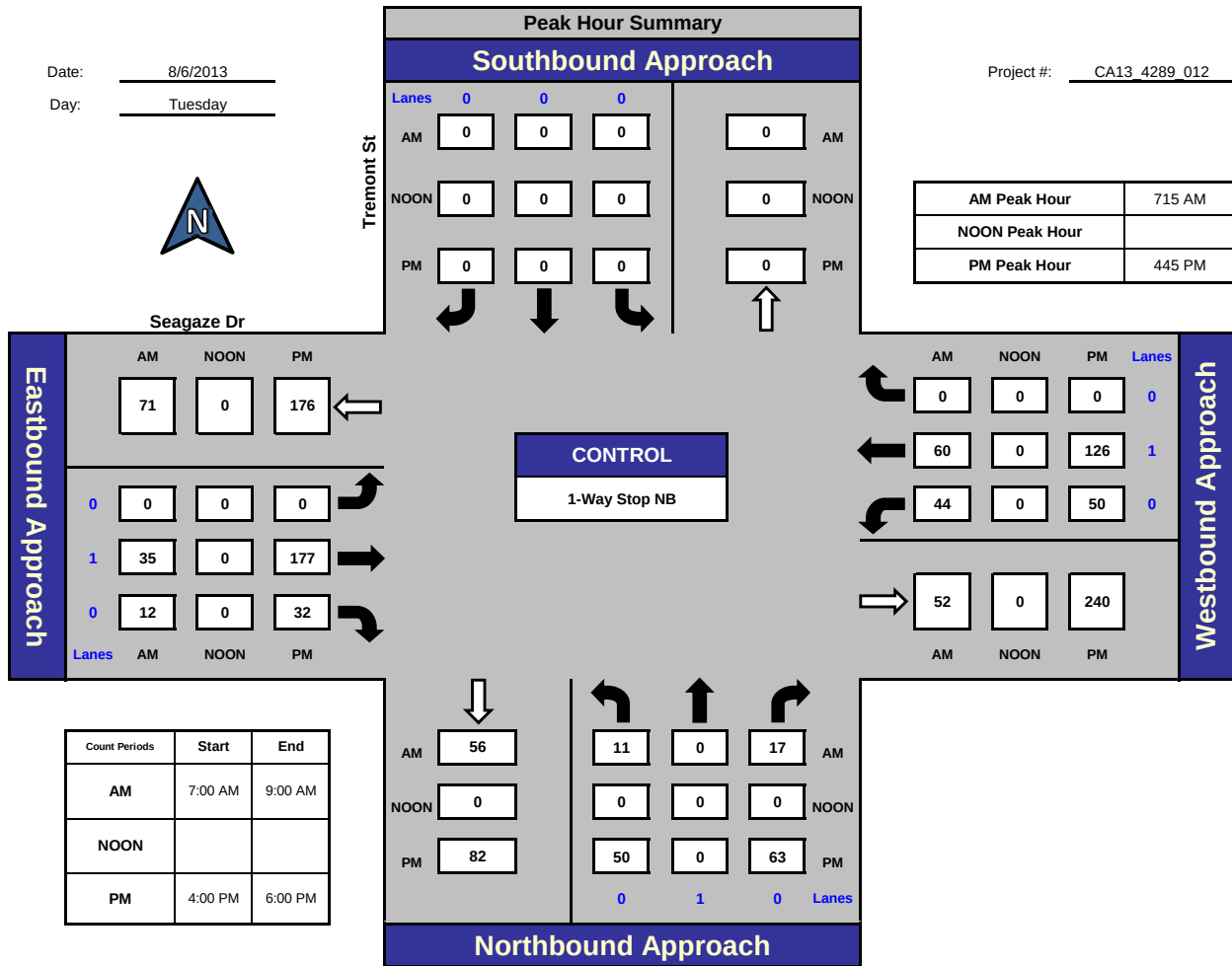


National Data & Surveying Services

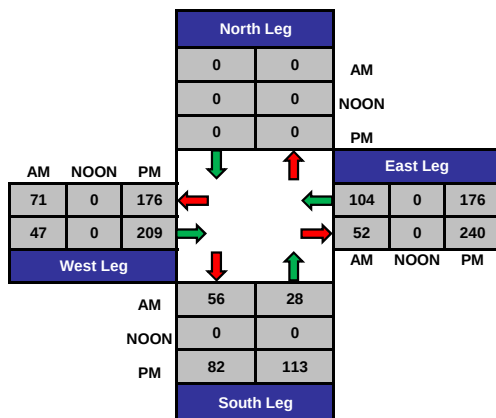
Tremont St and Seagaze Dr , City of Oceanside

Date: 8/6/2013
Day: Tuesday

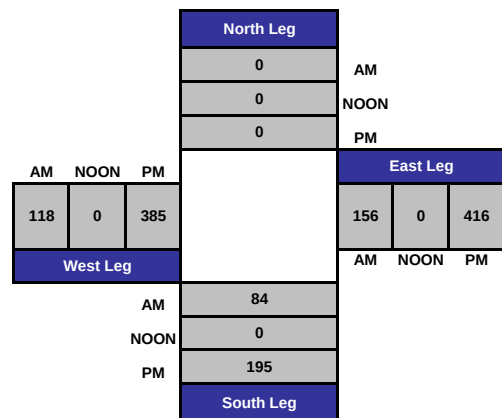
Project #: CA13 4289 012



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

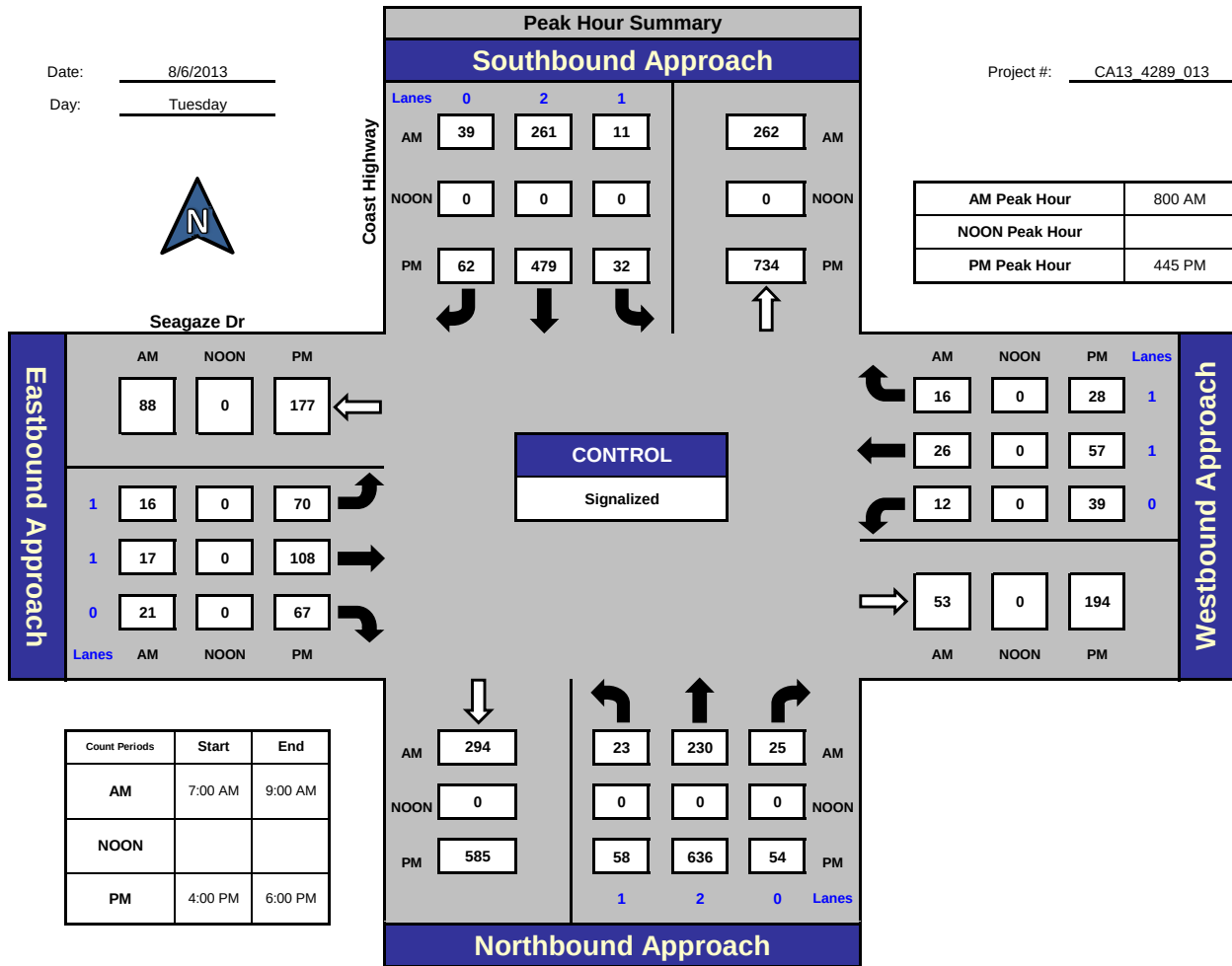


National Data & Surveying Services

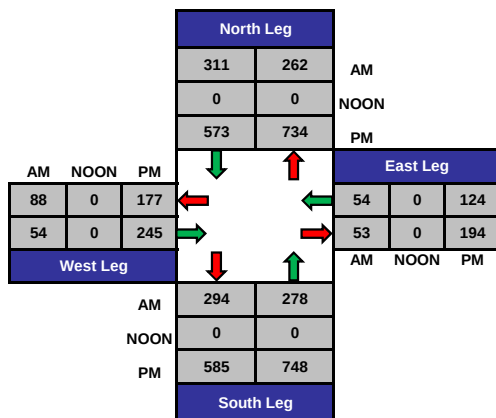
Coast Highway and Seagaze Dr , City of Oceanside

Date: 8/6/2013
Day: Tuesday

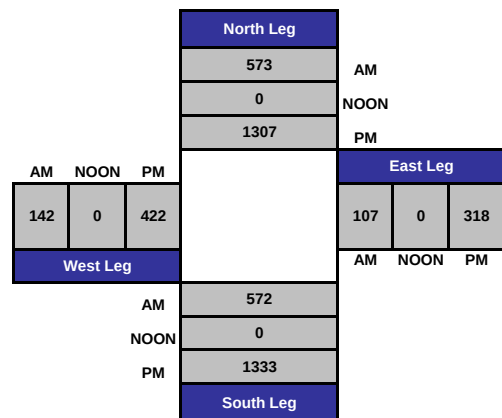
Project #: CA13 4289 013



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

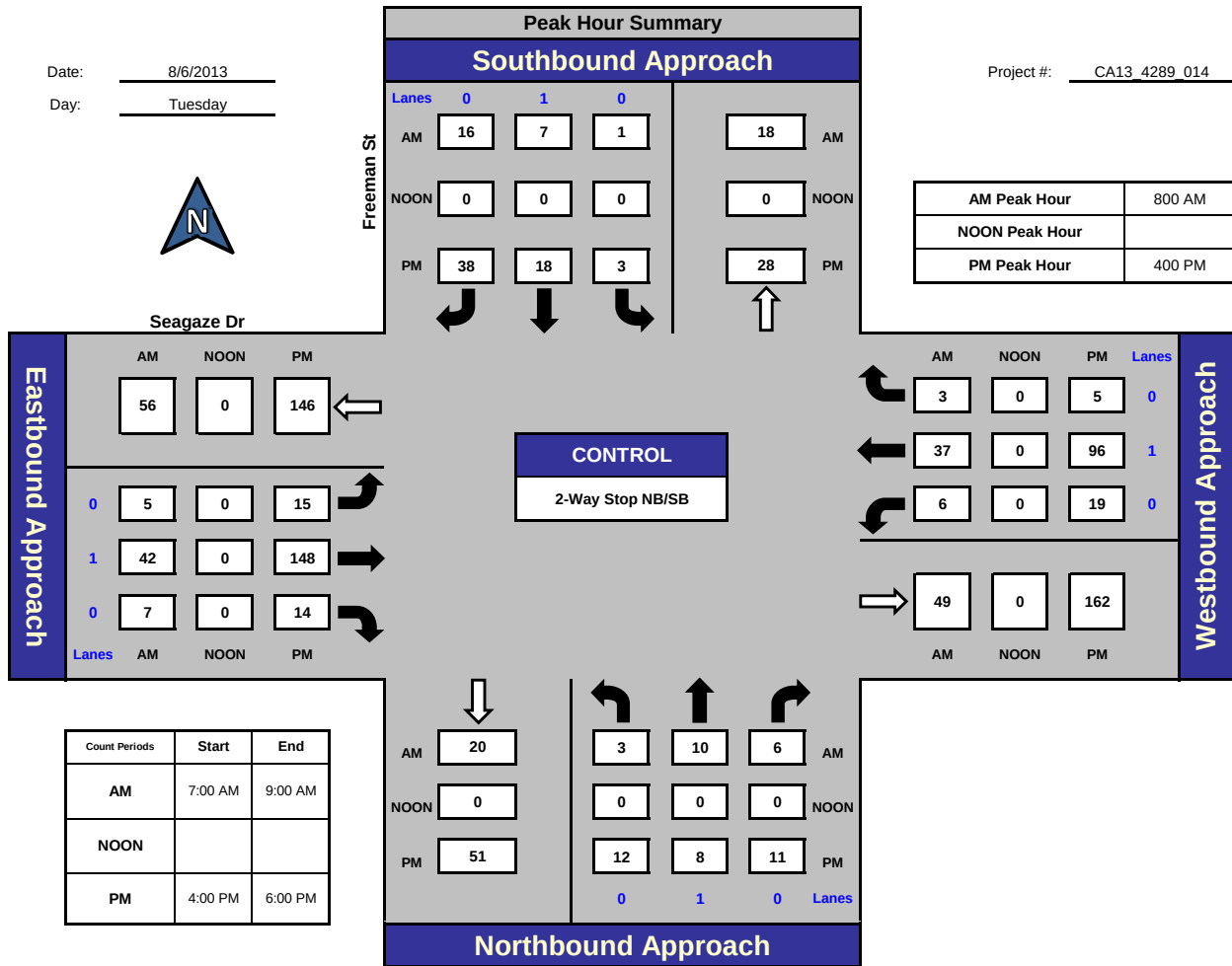


National Data & Surveying Services

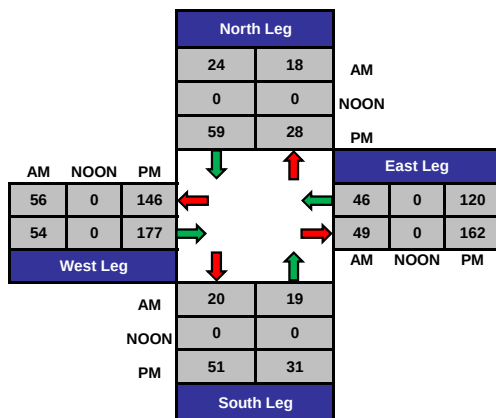
Freeman St and Seagaze Dr , City of Oceanside

Date: 8/6/2013
Day: Tuesday

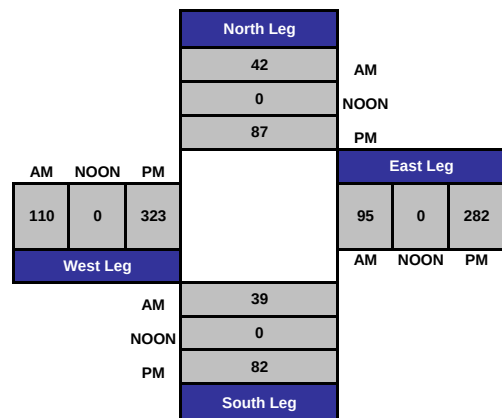
Project #: CA13 4289 014



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

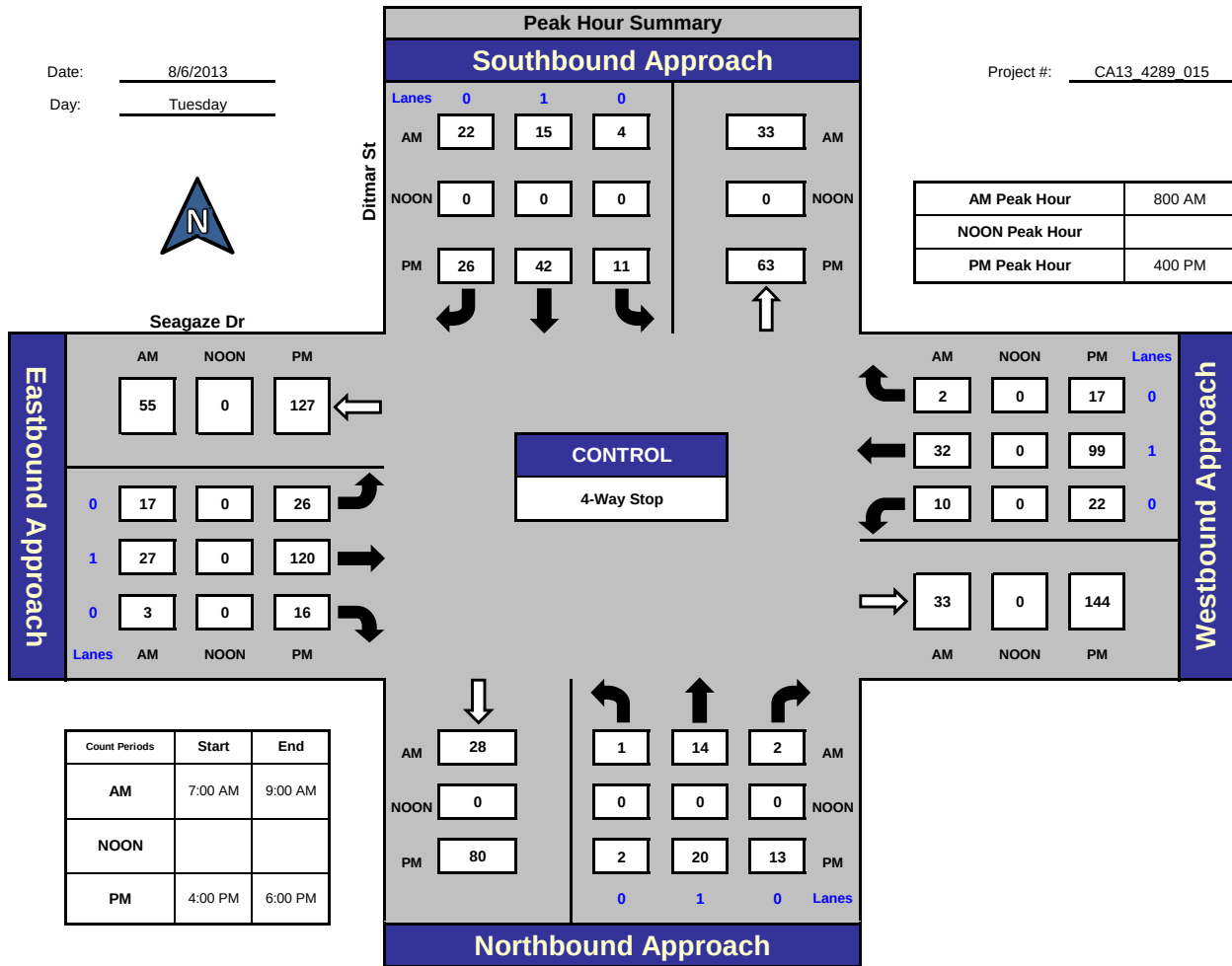


National Data & Surveying Services

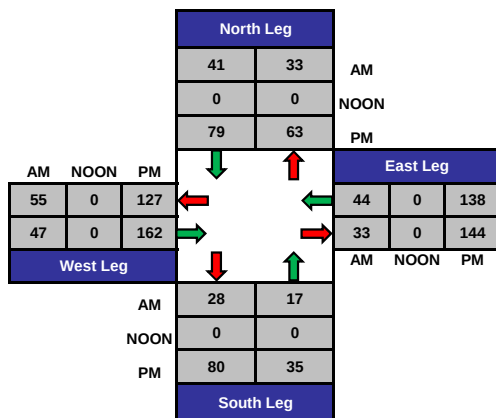
Ditmar St and Seagaze Dr , City of Oceanside

Date: 8/6/2013
Day: Tuesday

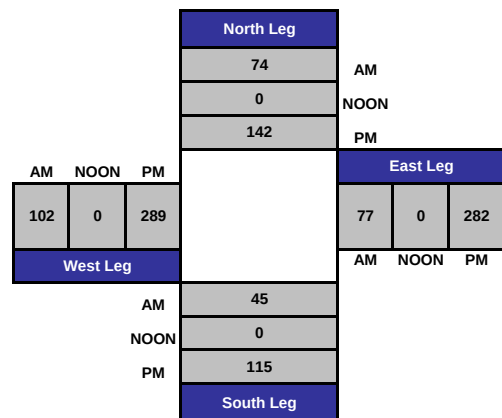
Project #: CA13 4289 015



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:



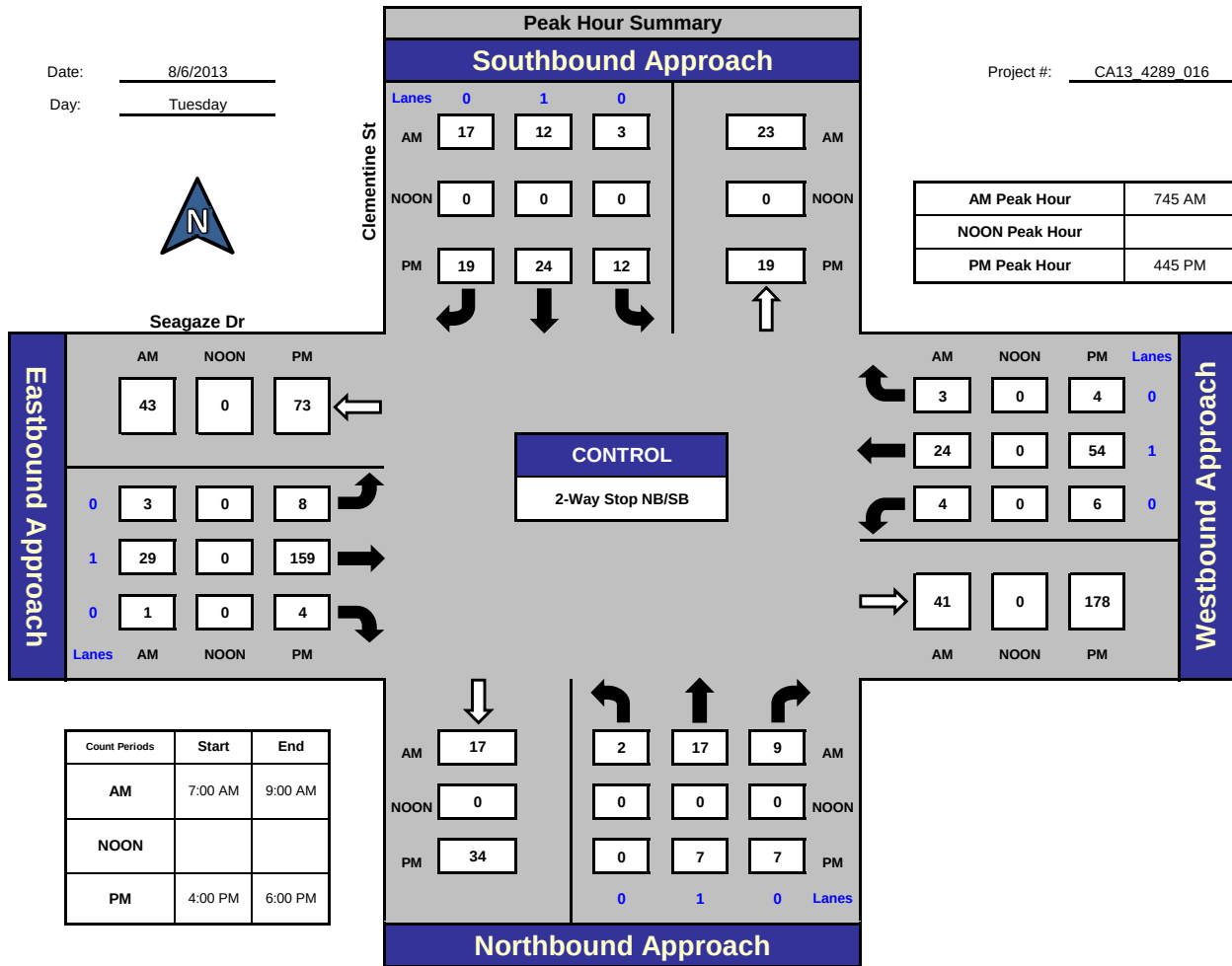
National Data & Surveying Services

Clementine St and Seagaze Dr , City of Oceanside

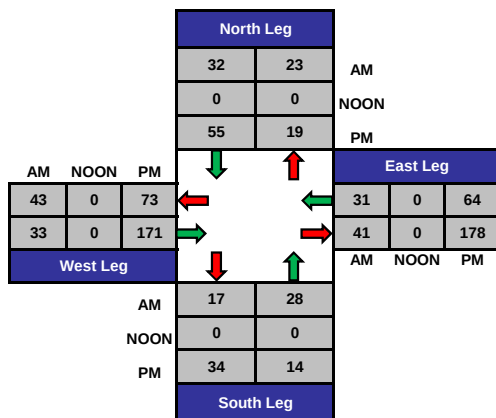
Date: 8/6/2013

Day: Tuesday

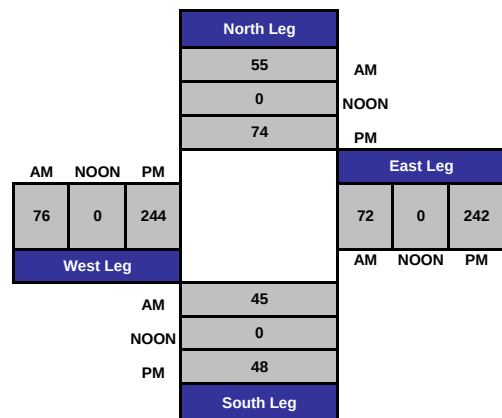
Project #: CA13 4289 016



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

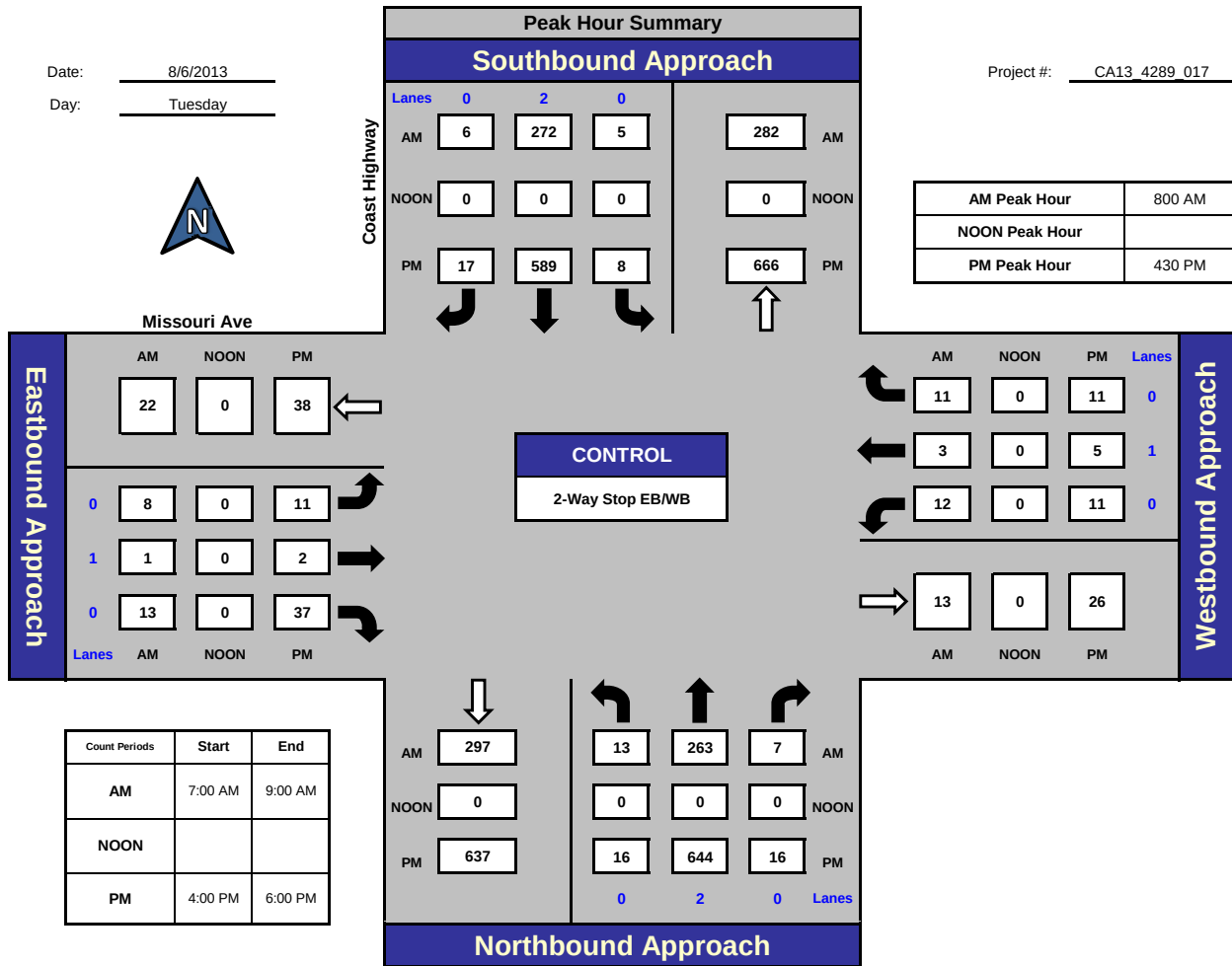


National Data & Surveying Services

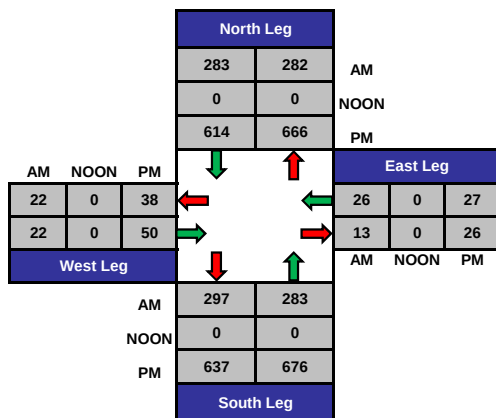
Coast Highway and Missouri Ave , City of Oceanside

Date: 8/6/2013
Day: Tuesday

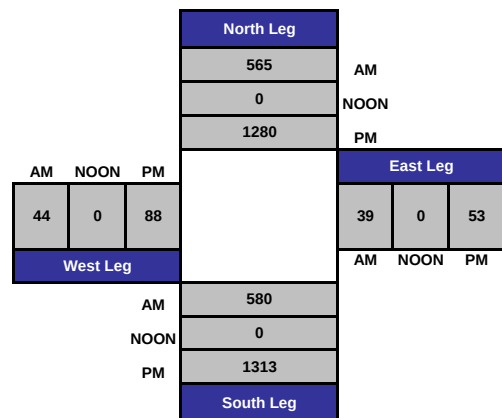
Project #: CA13 4289 017



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

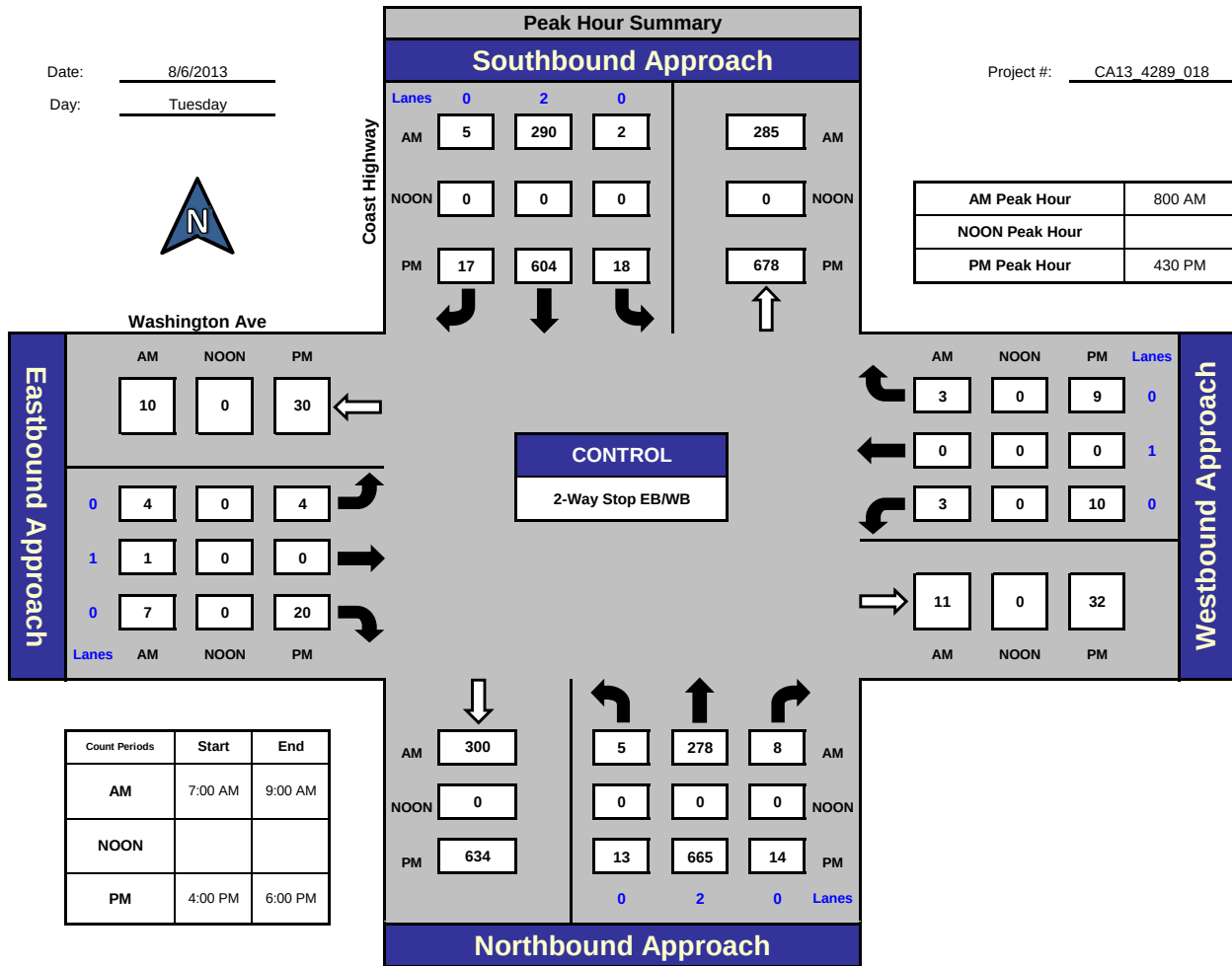


National Data & Surveying Services

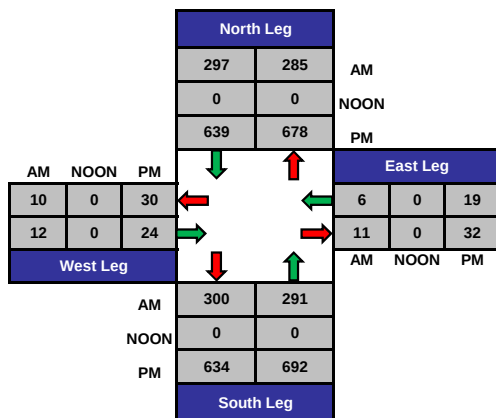
Coast Highway and Washington Ave , City of Oceanside

Date: 8/6/2013
Day: Tuesday

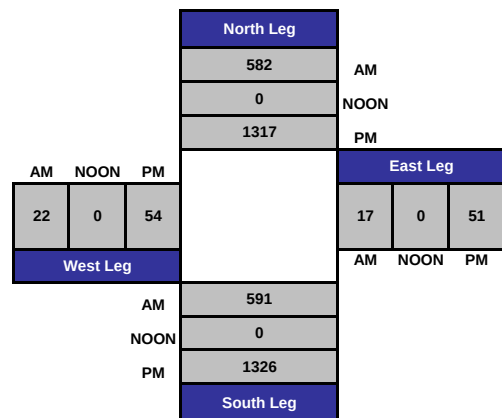
Project #: CA13 4289 018



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

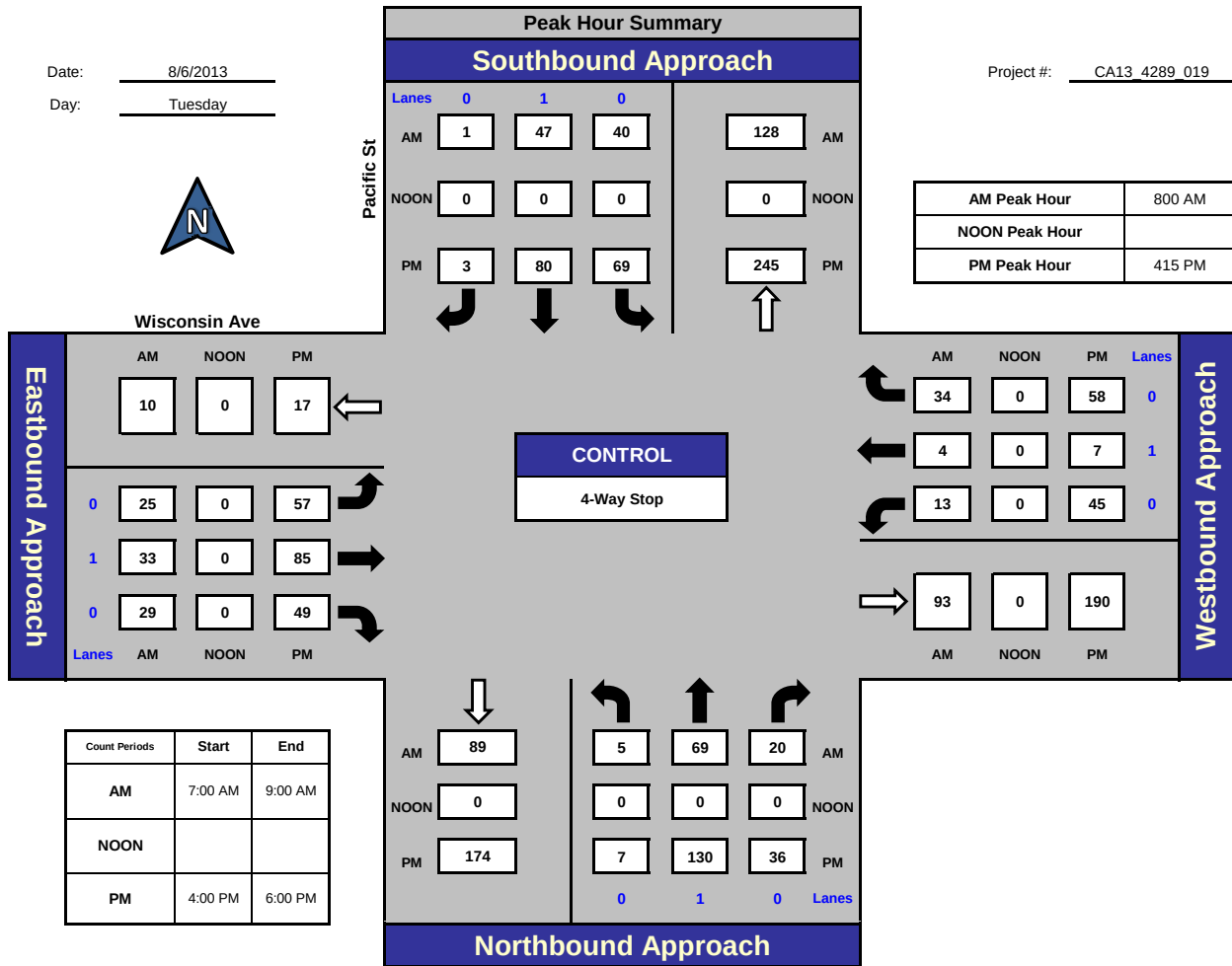


National Data & Surveying Services

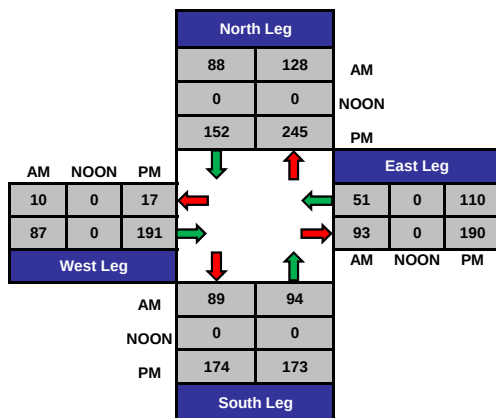
Pacific St and Wisconsin Ave , City of Oceanside

Date: 8/6/2013
Day: Tuesday

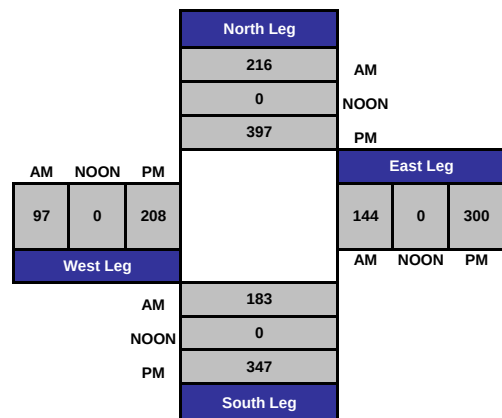
Project #: CA13 4289 019



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

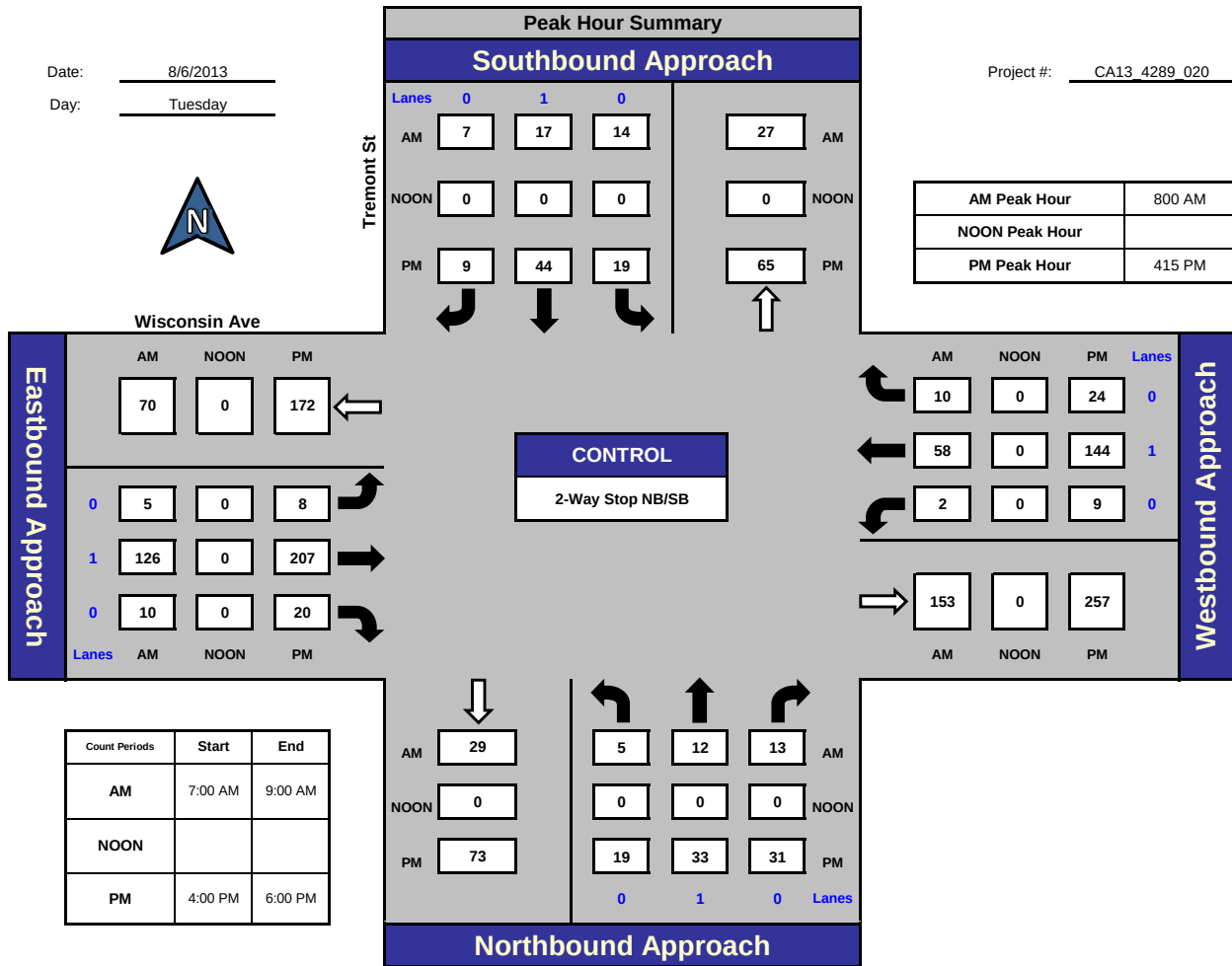


National Data & Surveying Services

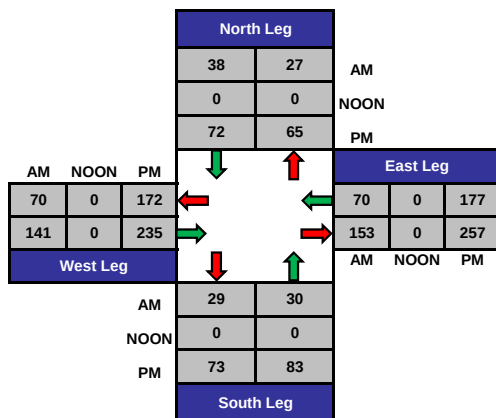
Tremont St and Wisconsin Ave , City of Oceanside

Date: 8/6/2013
Day: Tuesday

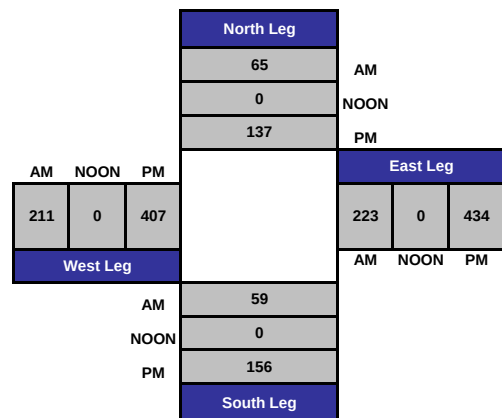
Project #: CA13 4289 020



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

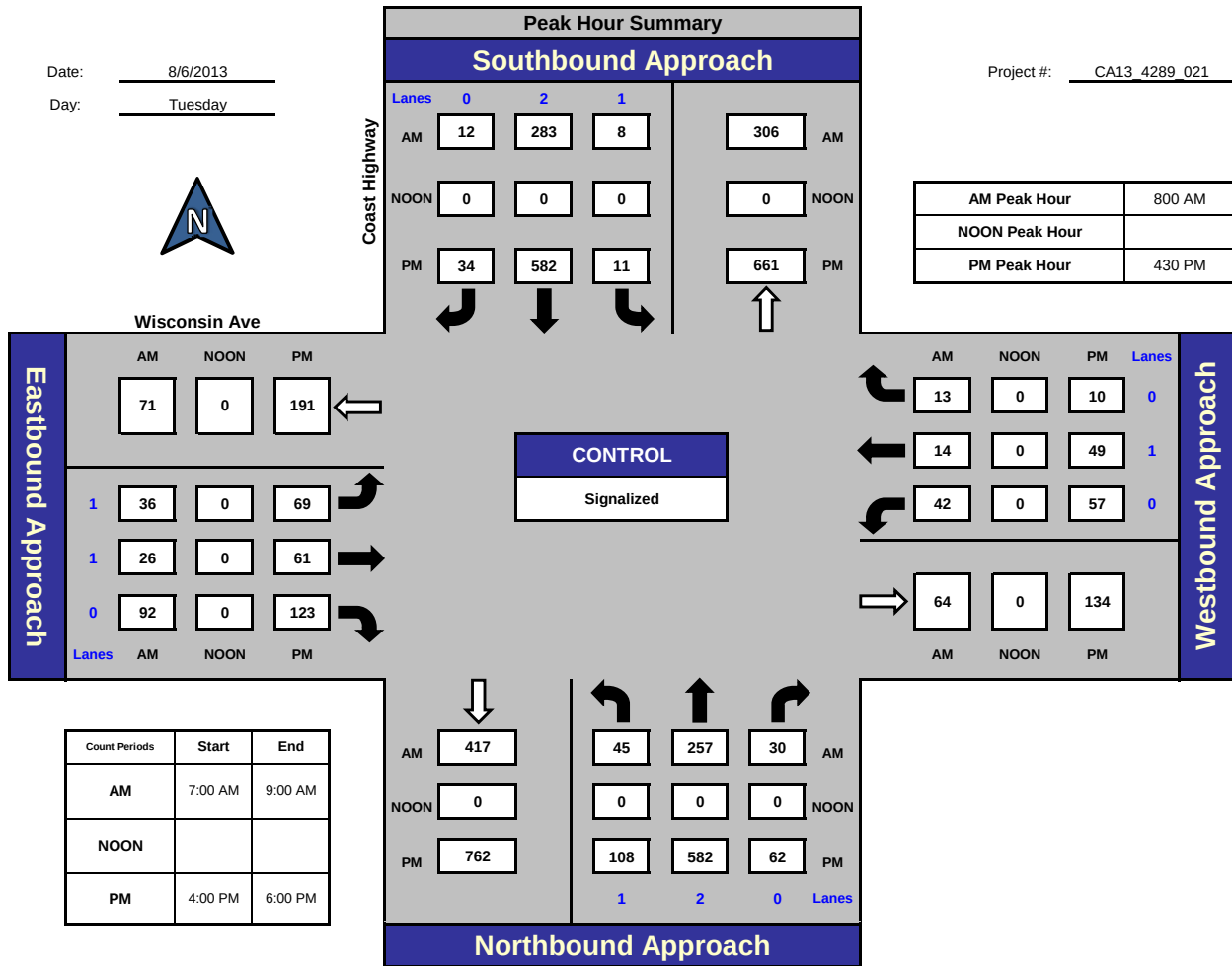


National Data & Surveying Services

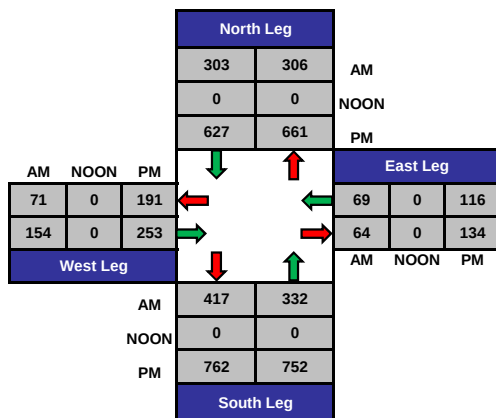
Coast Highway and Wisconsin Ave , City of Oceanside

Date: 8/6/2013
Day: Tuesday

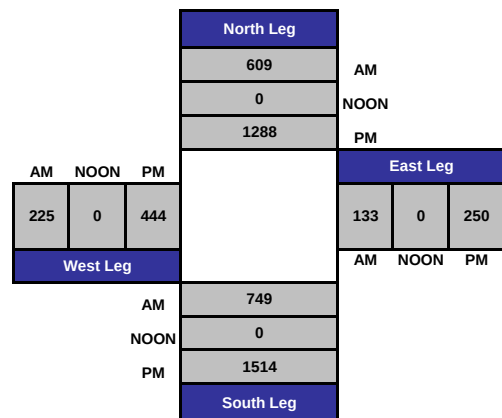
Project #: CA13 4289 021



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

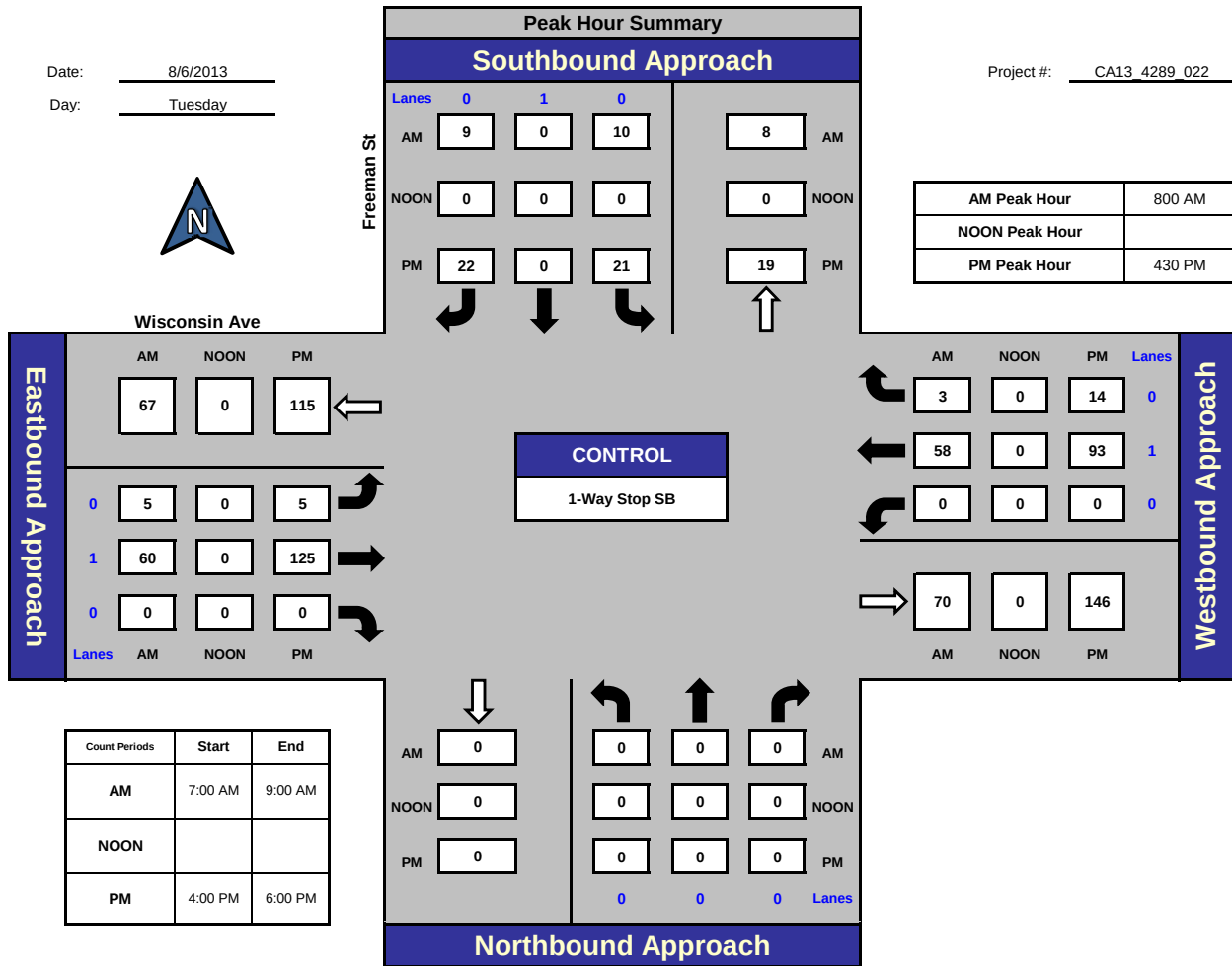


National Data & Surveying Services

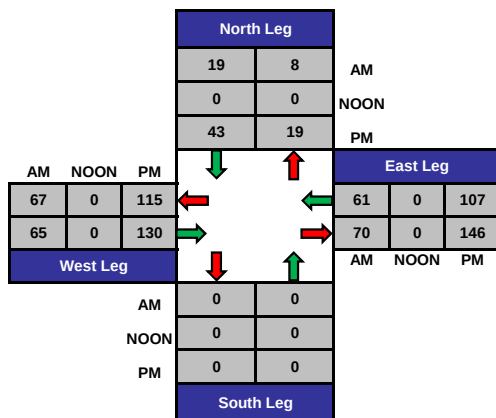
Freeman St and Wisconsin Ave , City of Oceanside

Date: 8/6/2013
Day: Tuesday

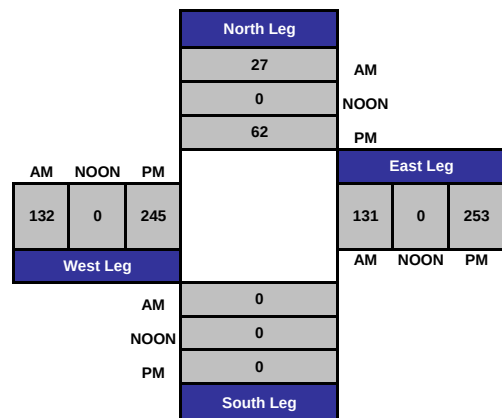
Project #: CA13 4289 022



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

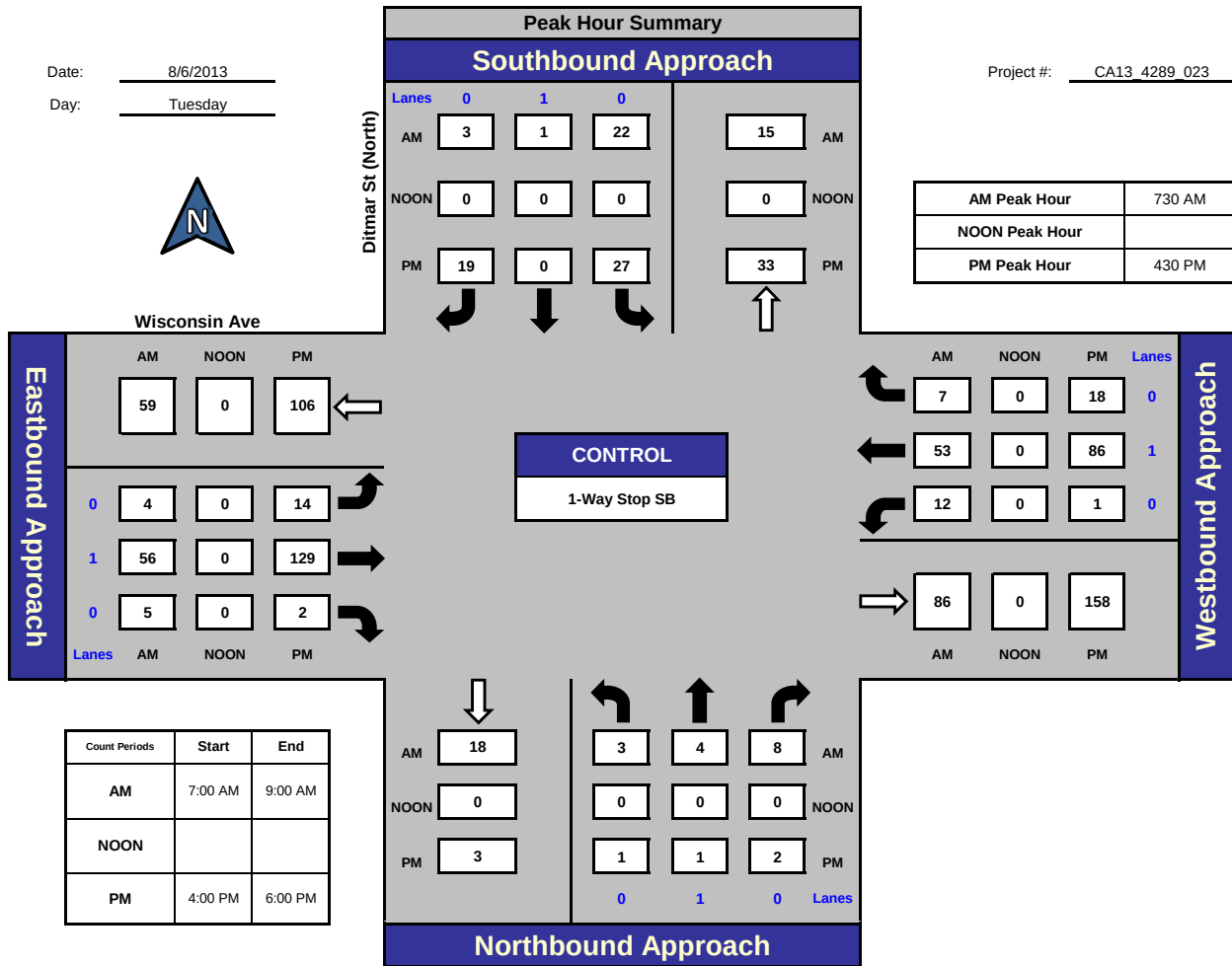


National Data & Surveying Services

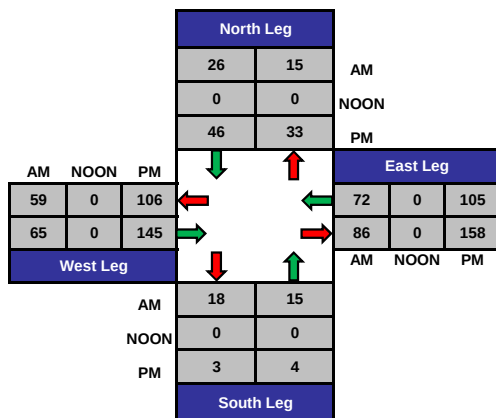
Ditmar St (North) and Wisconsin Ave , City of Oceanside

Date: 8/6/2013
Day: Tuesday

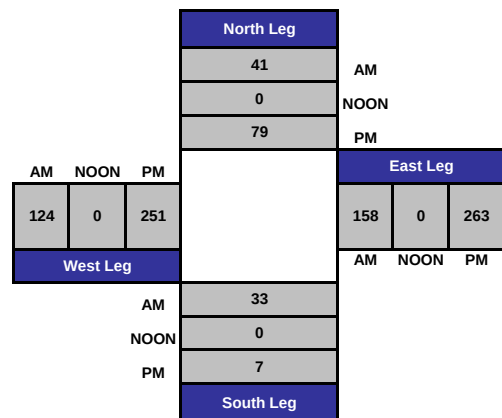
Project #: CA13 4289 023



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:



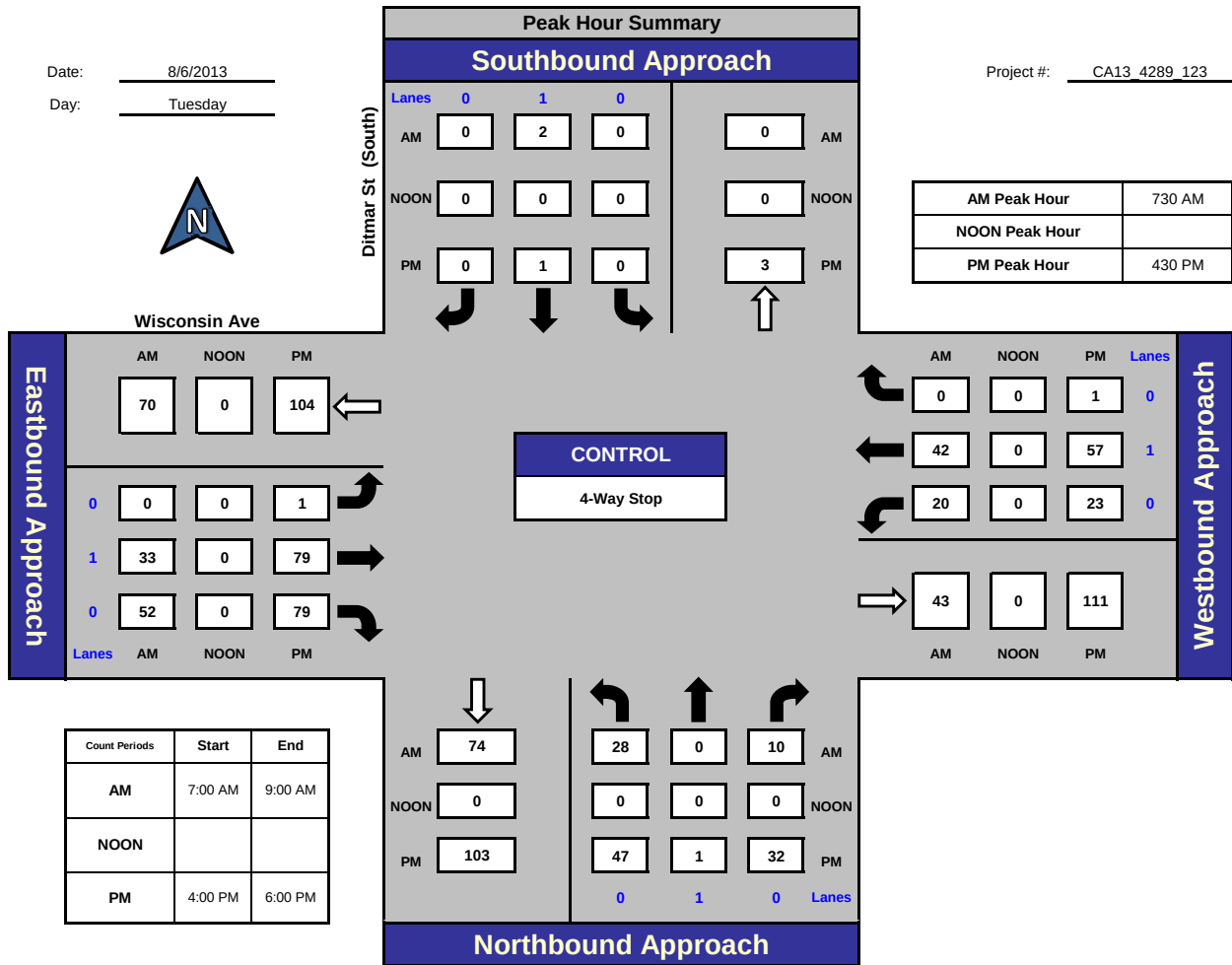
National Data & Surveying Services

Ditmar St (South) and Wisconsin Ave , City of Oceanside

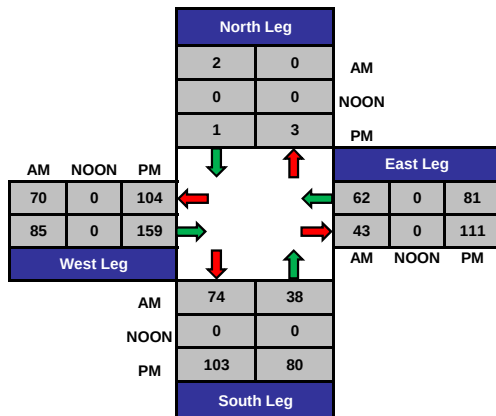
Date: 8/6/2013

Day: Tuesday

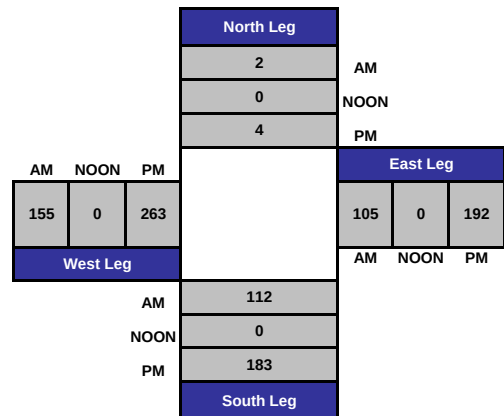
Project #: CA13 4289 123



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

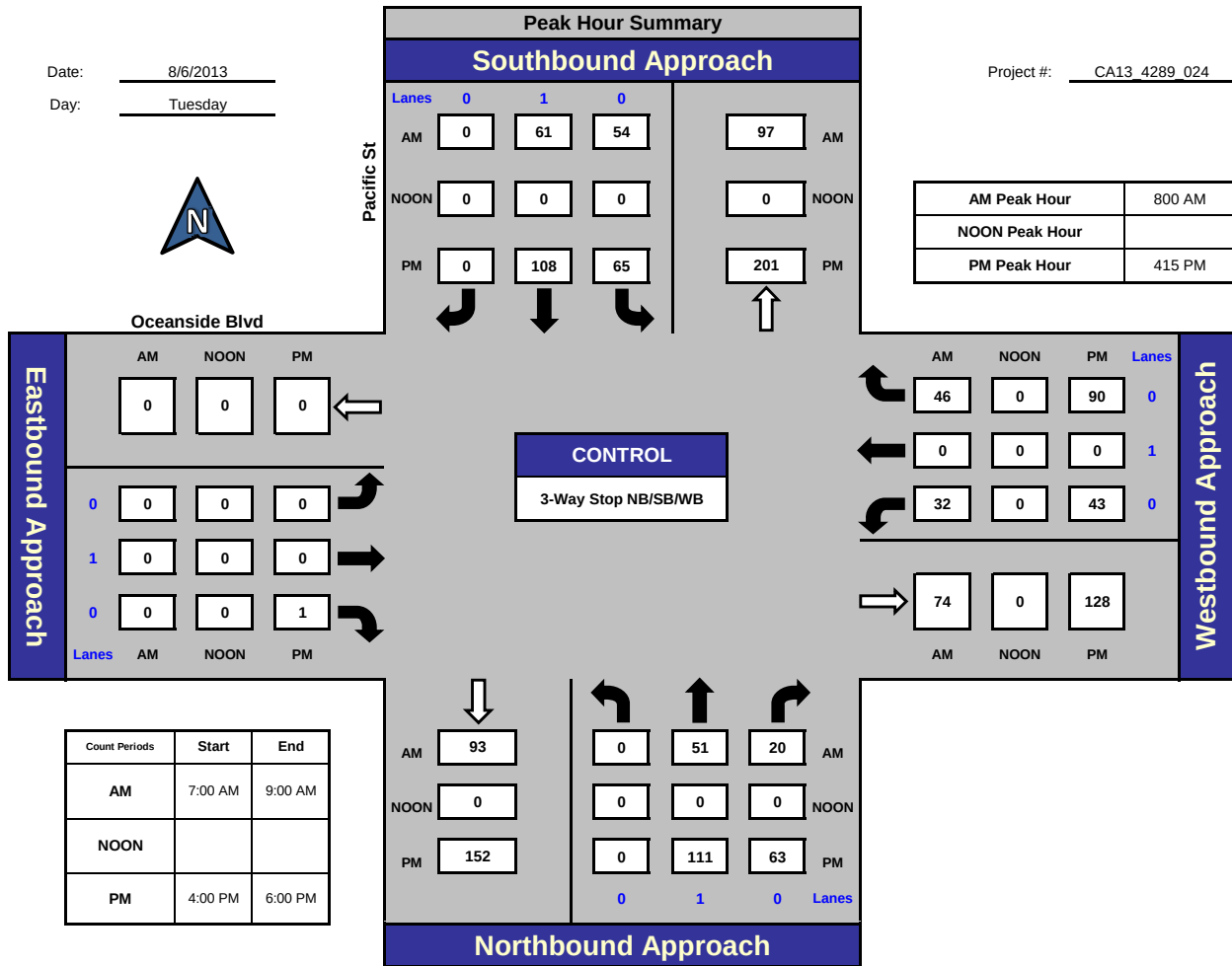


National Data & Surveying Services

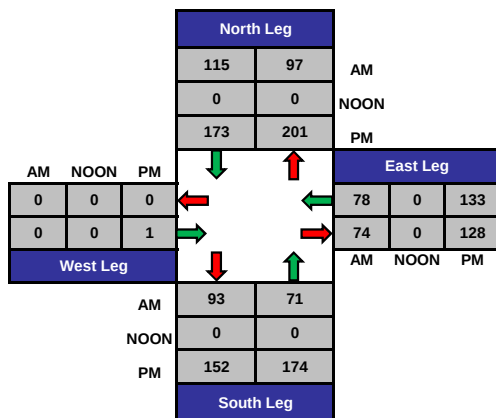
Pacific St and Oceanside Blvd , City of Oceanside

Date: 8/6/2013
Day: Tuesday

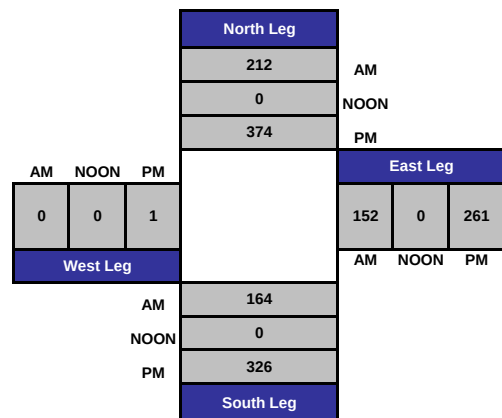
Project #: CA13 4289 024



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

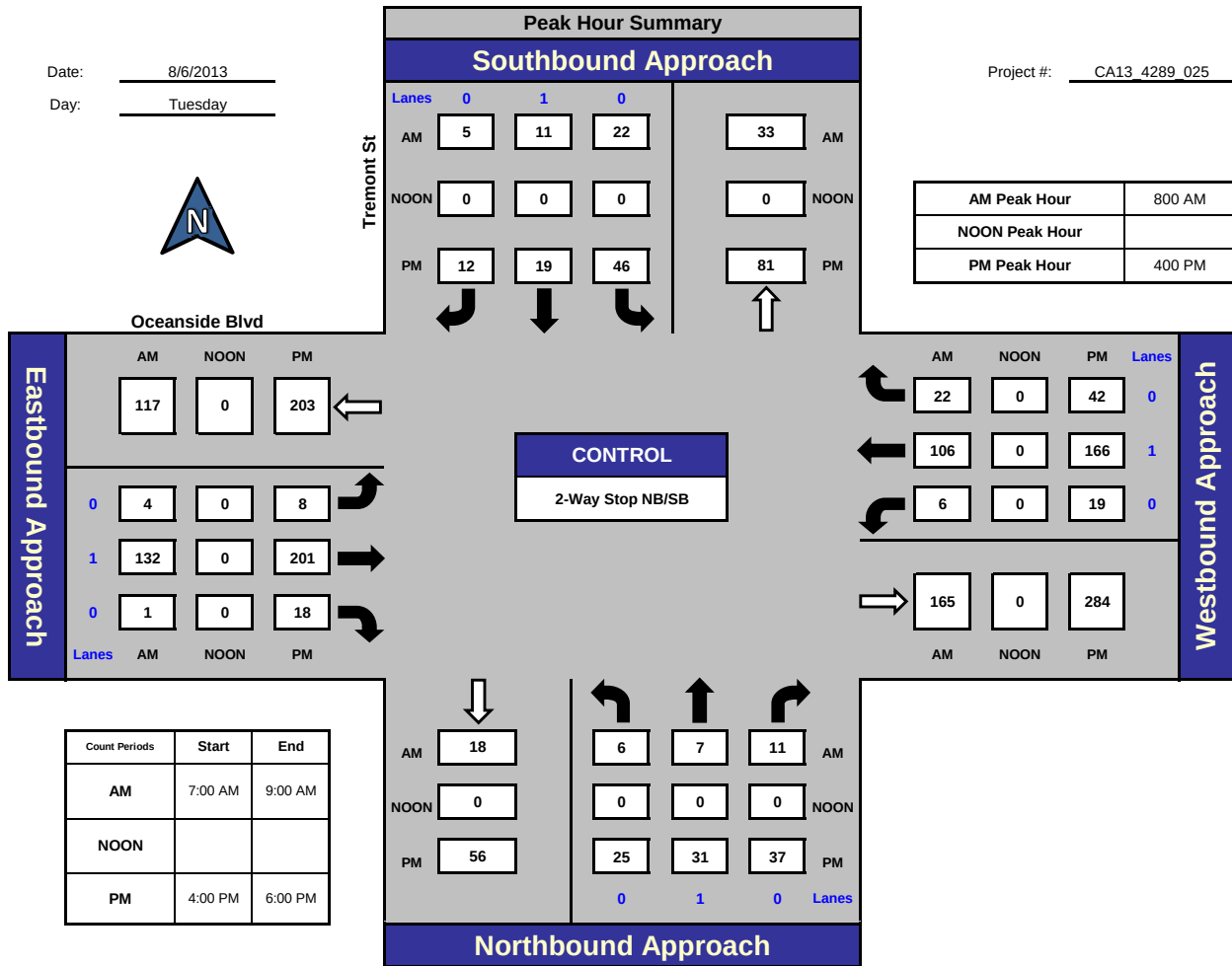


National Data & Surveying Services

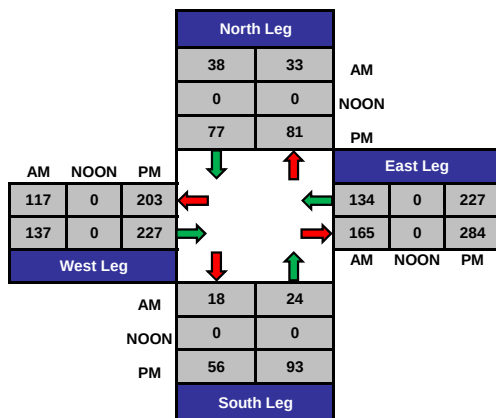
Tremont St and Oceanside Blvd , City of Oceanside

Date: 8/6/2013
Day: Tuesday

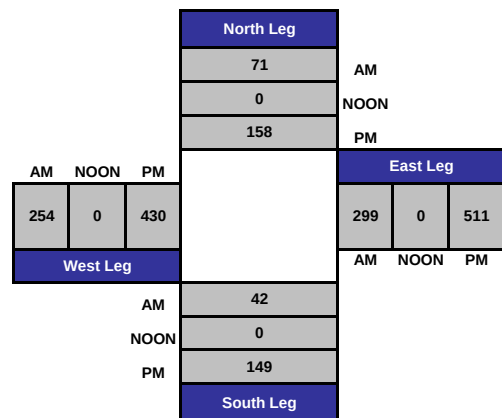
Project #: CA13 4289 025



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

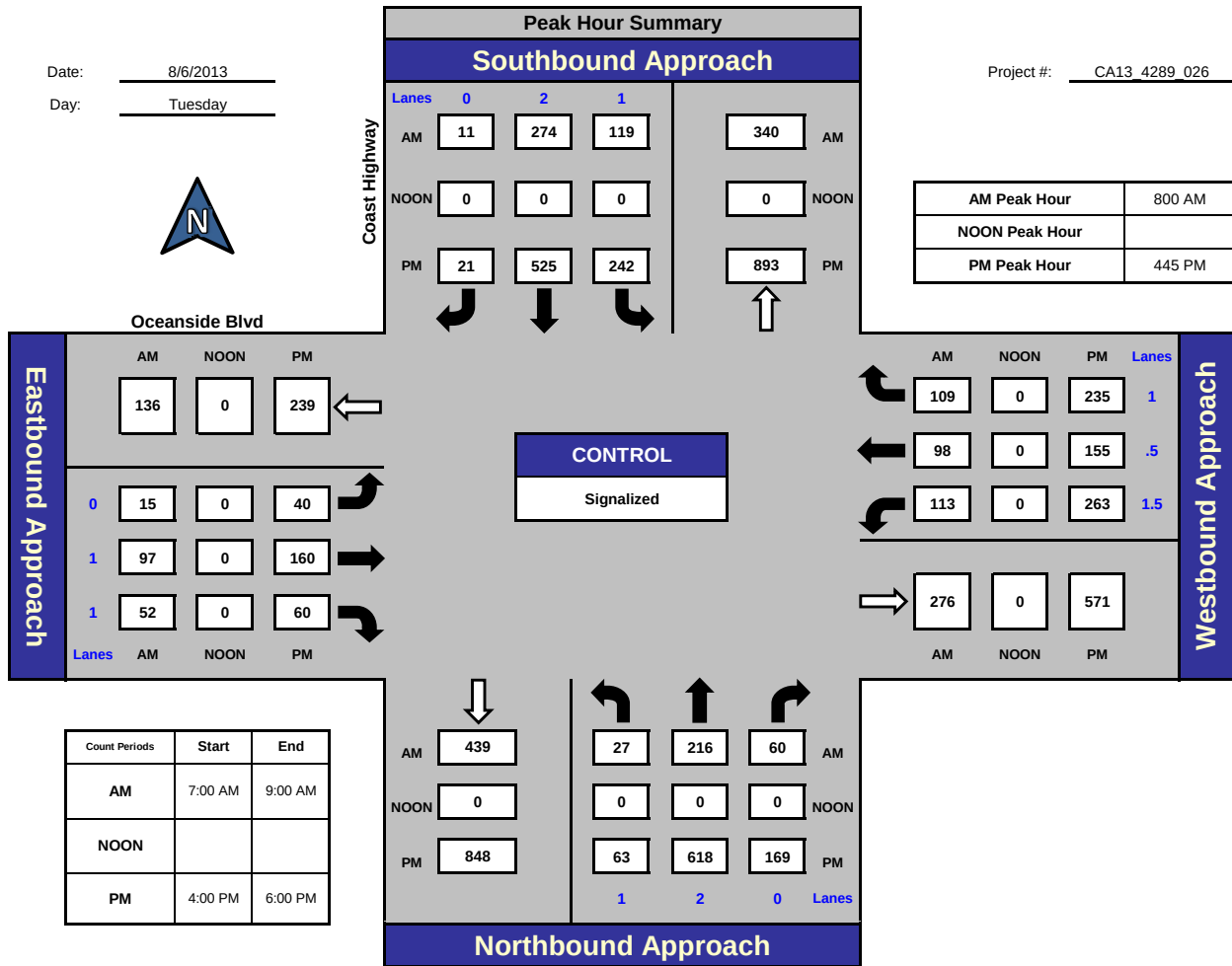


National Data & Surveying Services

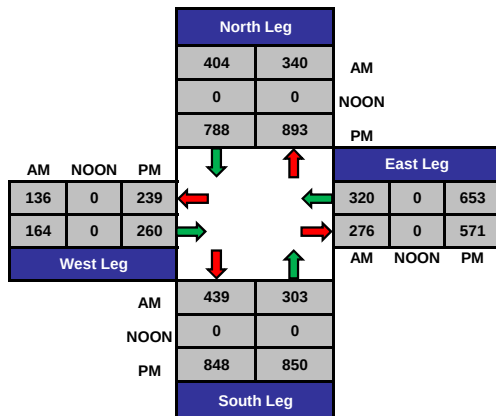
Coast Highway and Oceanside Blvd , City of Oceanside

Date: 8/6/2013
Day: Tuesday

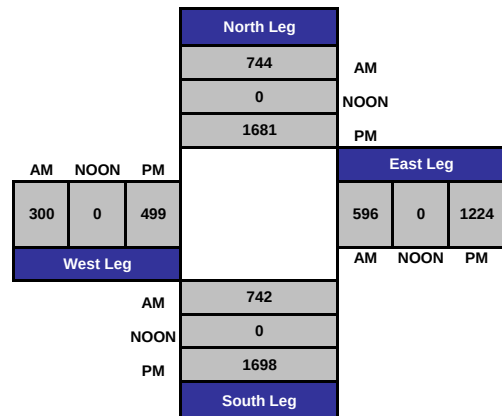
Project #: CA13 4289 026



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

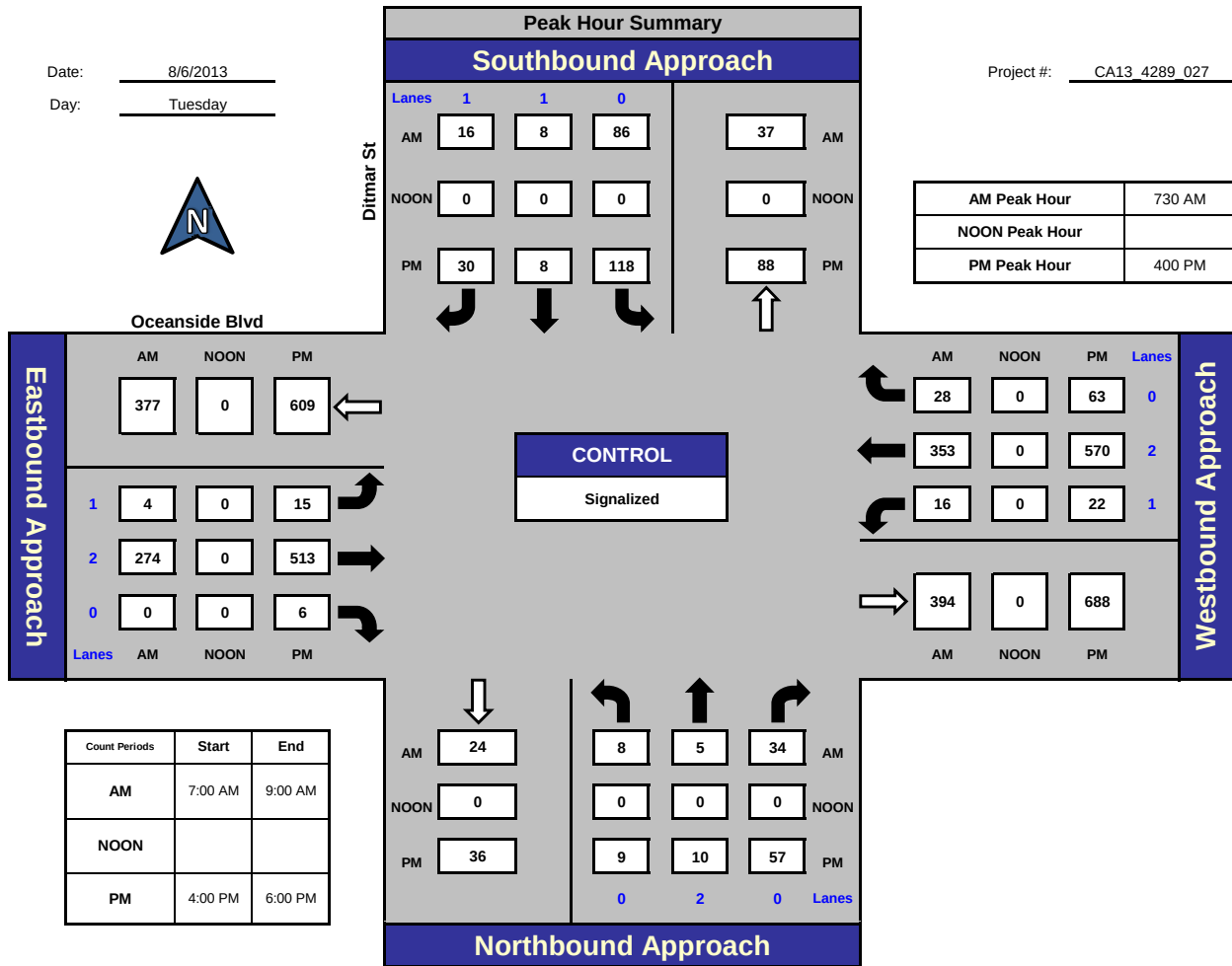


National Data & Surveying Services

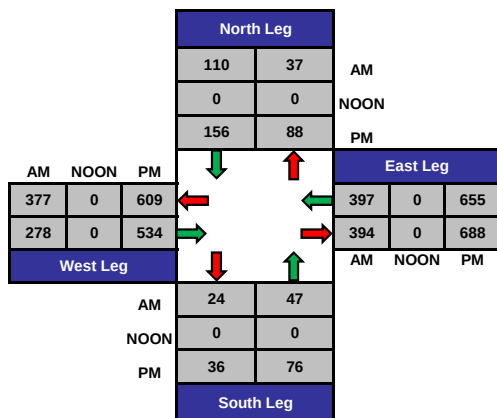
Ditmar St and Oceanside Blvd , City of Oceanside

Date: 8/6/2013
Day: Tuesday

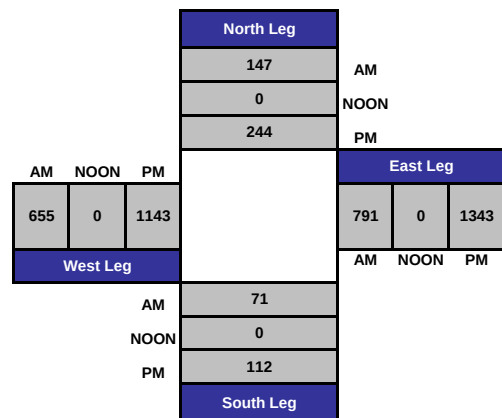
Project #: CA13 4289 027



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:



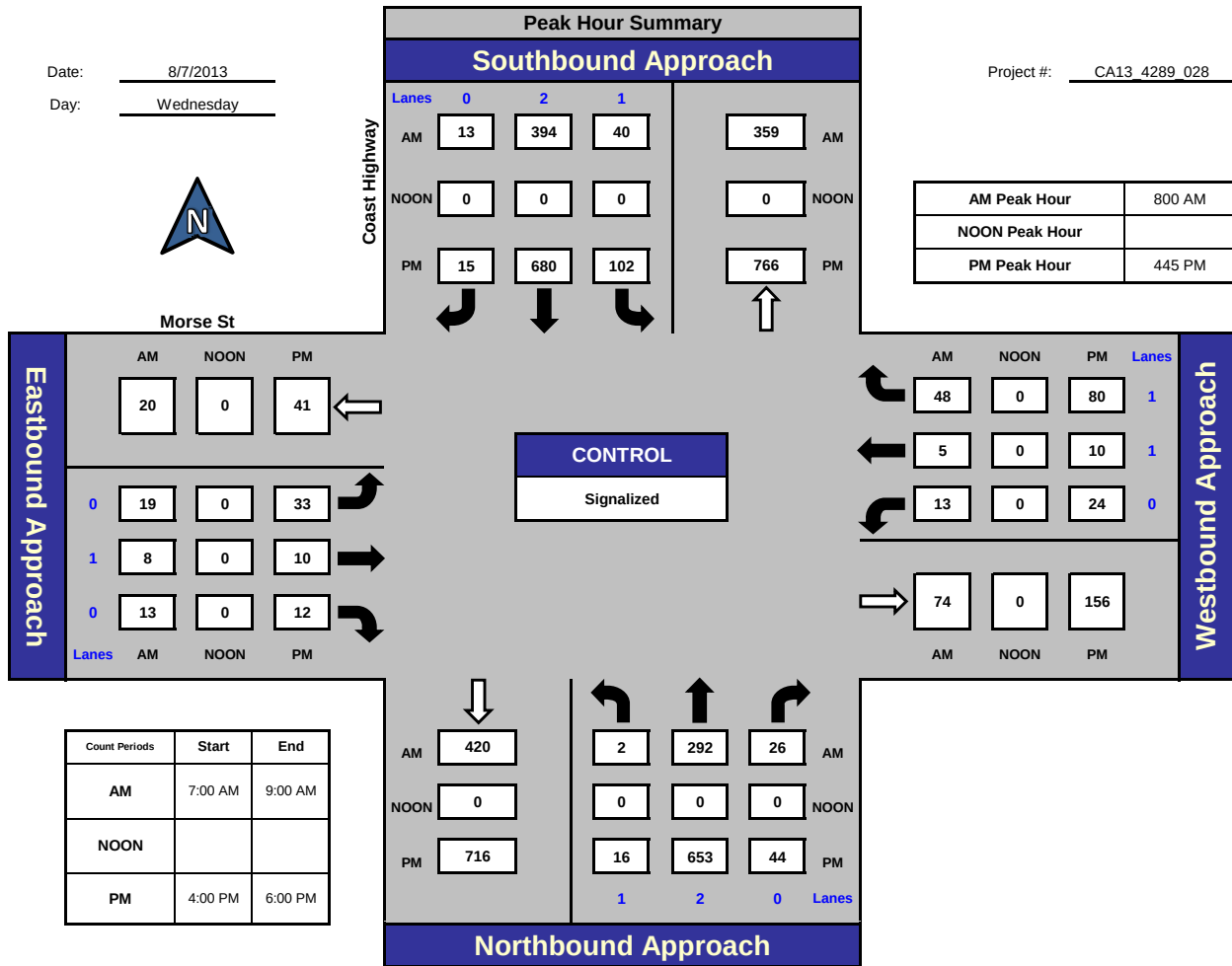
National Data & Surveying Services

Coast Highway and Morse St , City of Oceanside

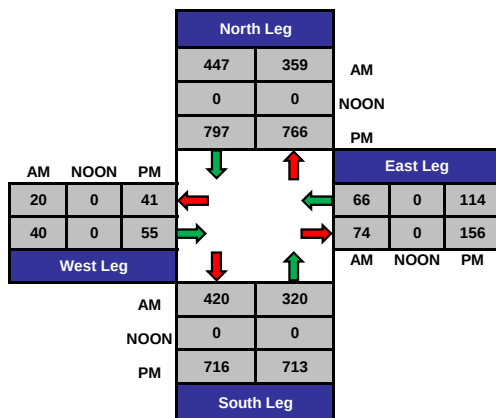
Date: 8/7/2013

Day: Wednesday

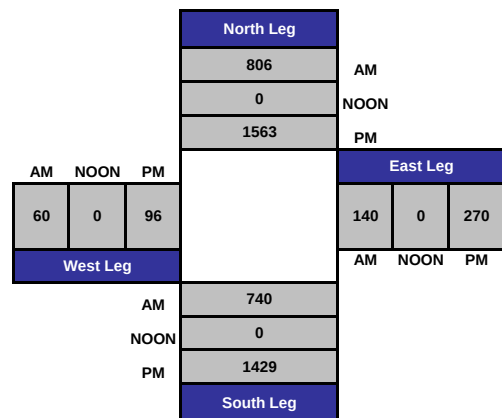
Project #: CA13 4289 028



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:



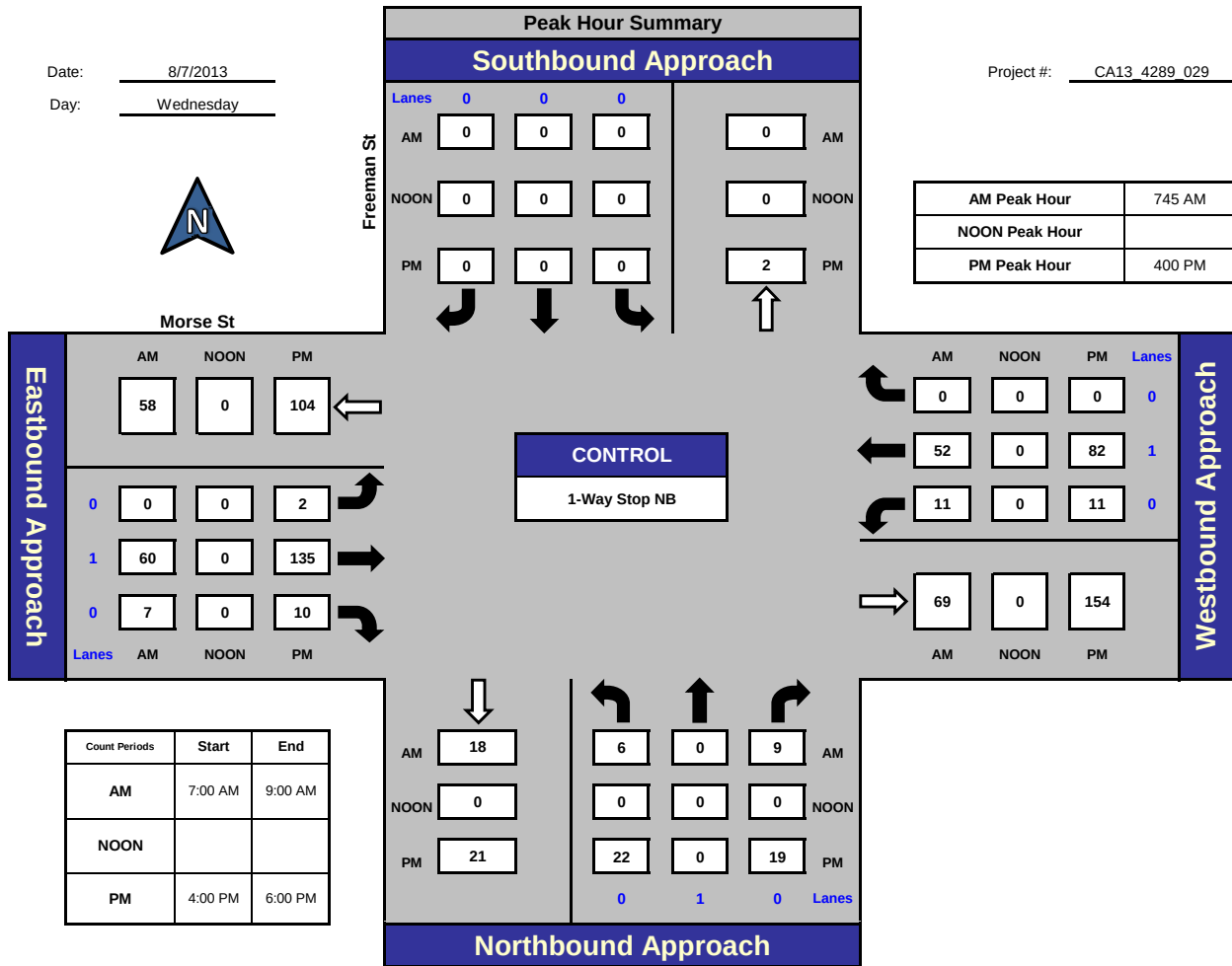
National Data & Surveying Services

Freeman St and Morse St , City of Oceanside

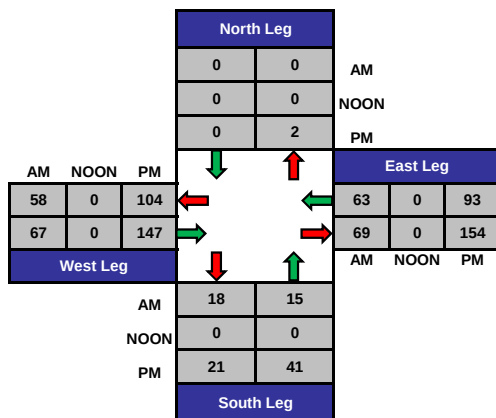
Date: 8/7/2013

Day: Wednesday

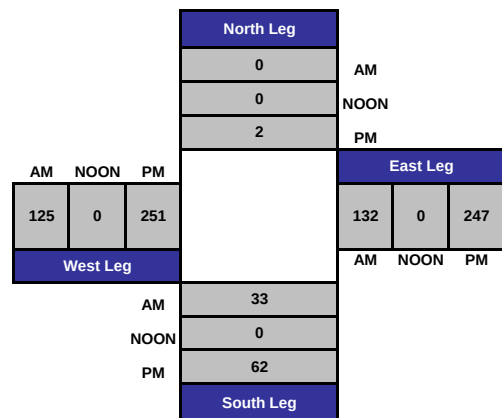
Project #: CA13 4289 029



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

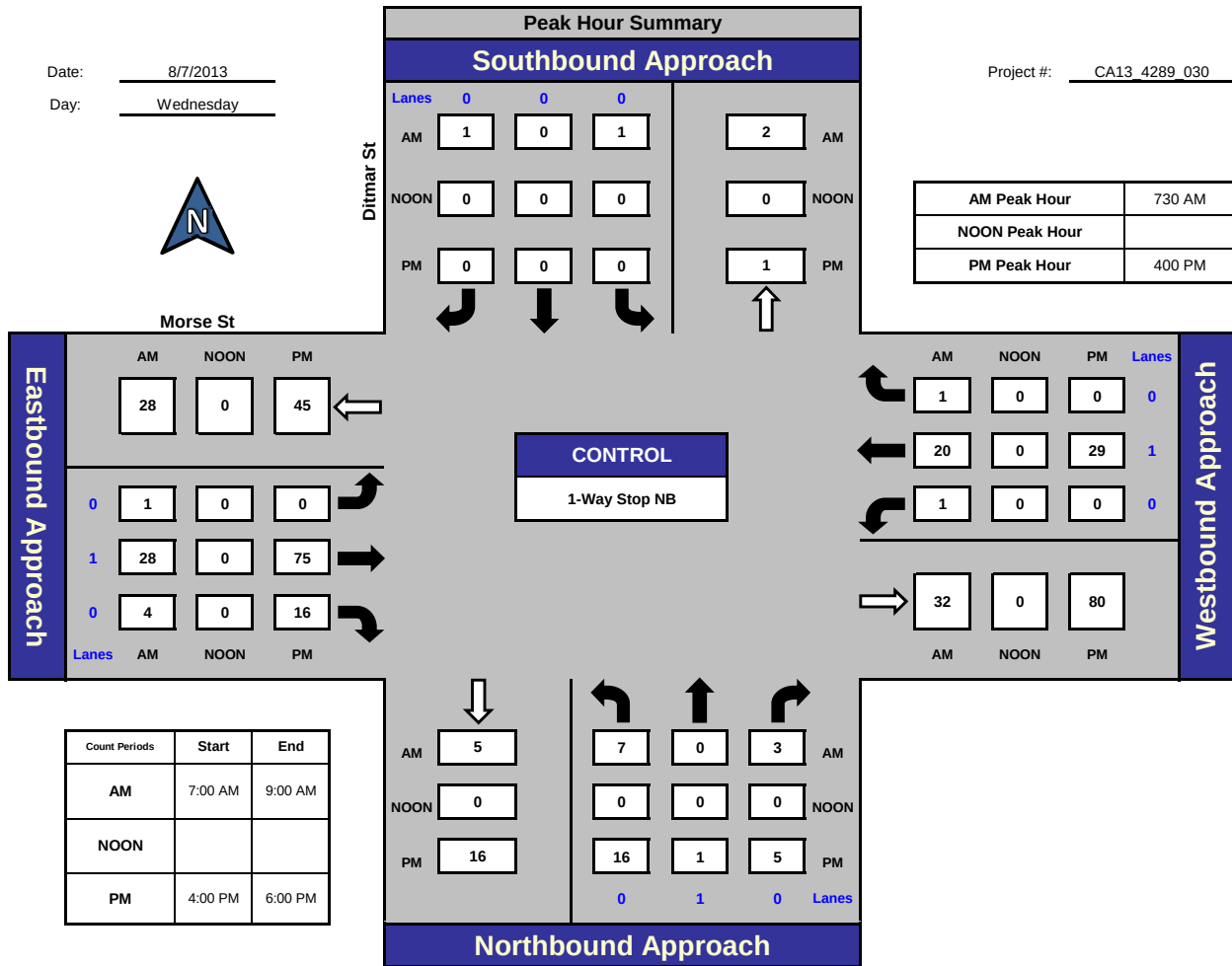


National Data & Surveying Services

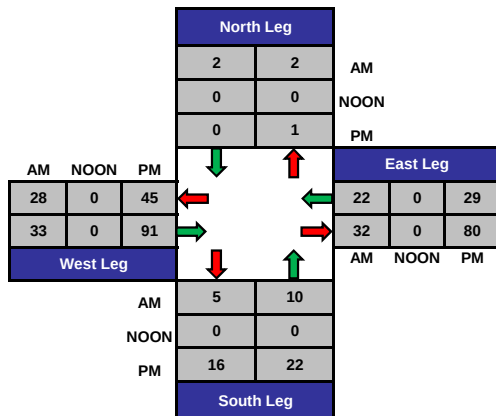
Ditmar St and Morse St, City of Oceanside

Date: 8/7/2013
Day: Wednesday

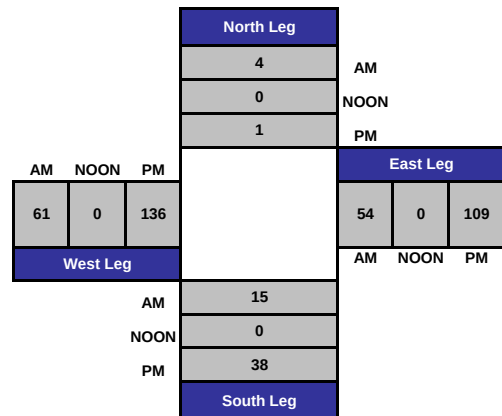
Project #: CA13 4289 030



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

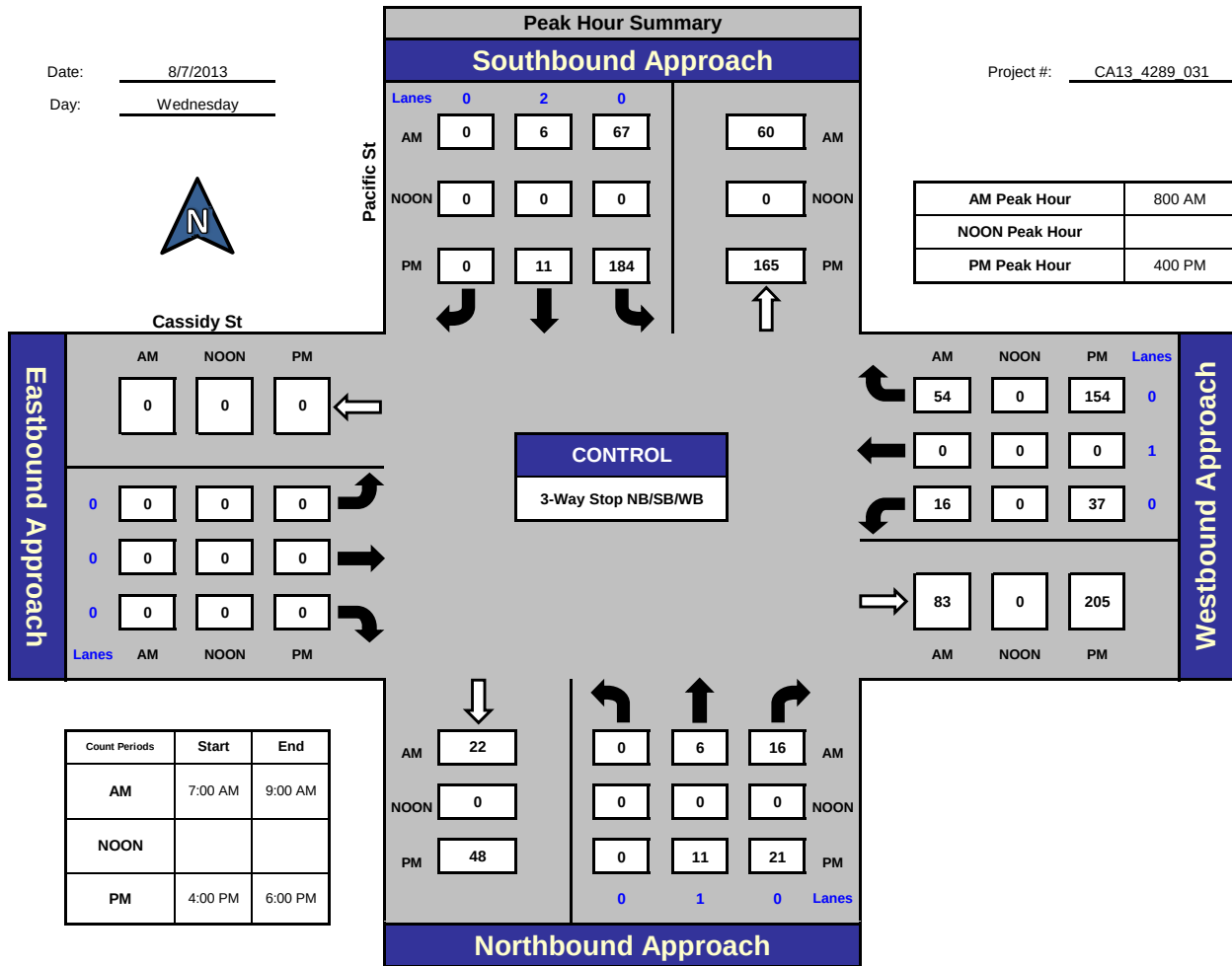


National Data & Surveying Services

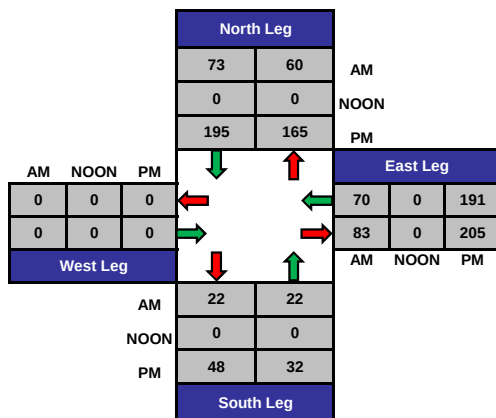
Pacific St and Cassidy St, City of Oceanside

Date: 8/7/2013
Day: Wednesday

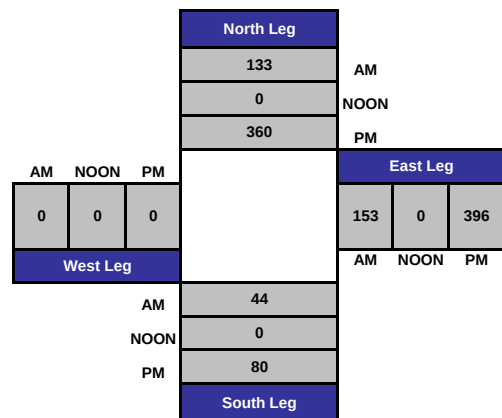
Project #: CA13 4289 031



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

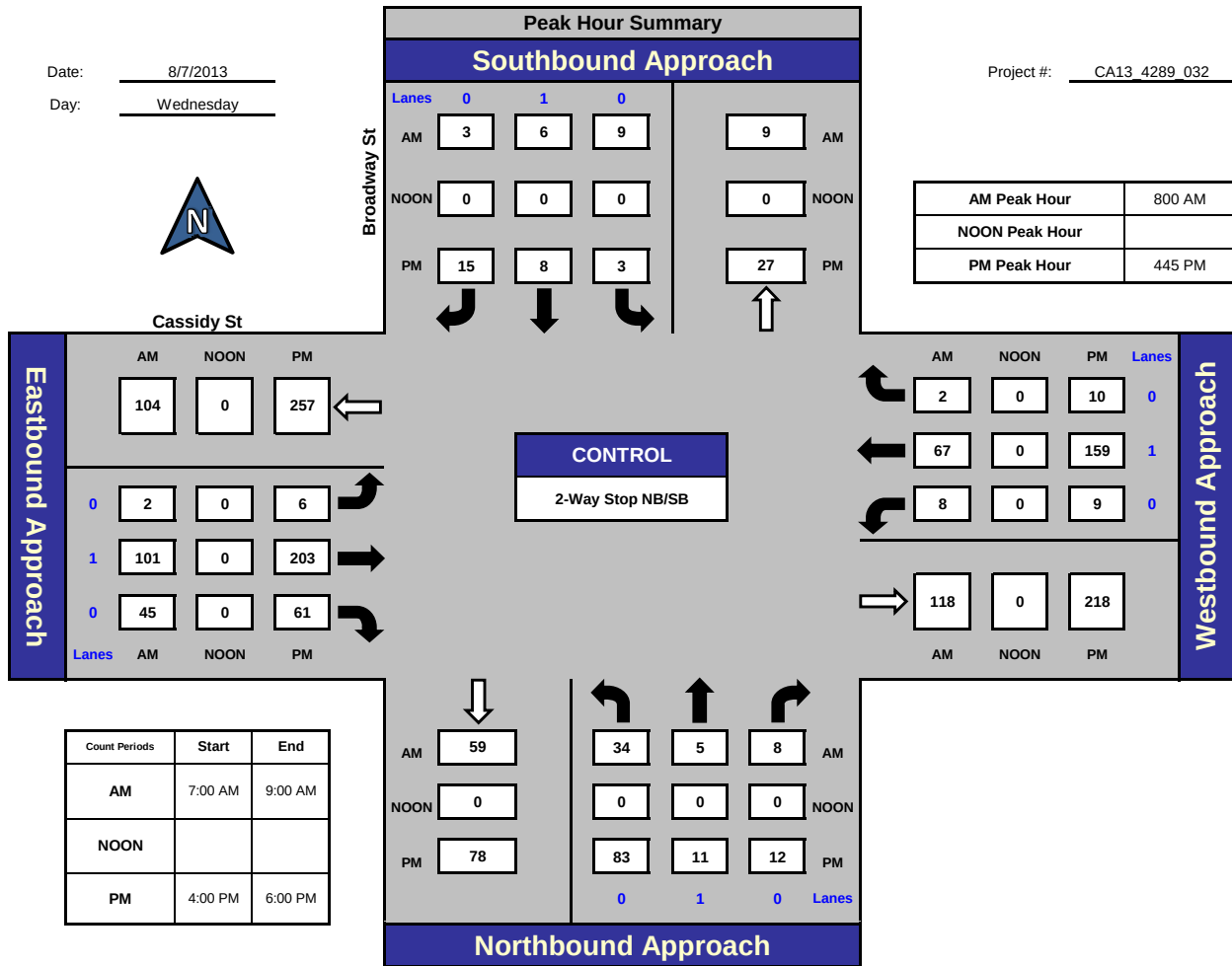


National Data & Surveying Services

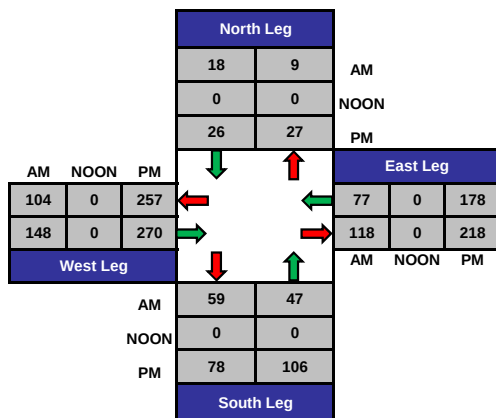
Broadway St and Cassidy St, City of Oceanside

Date: 8/7/2013
Day: Wednesday

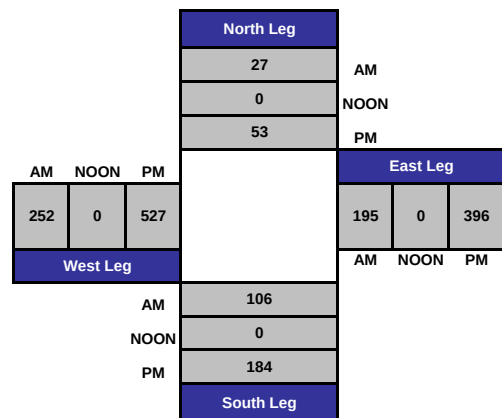
Project #: CA13 4289 032



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

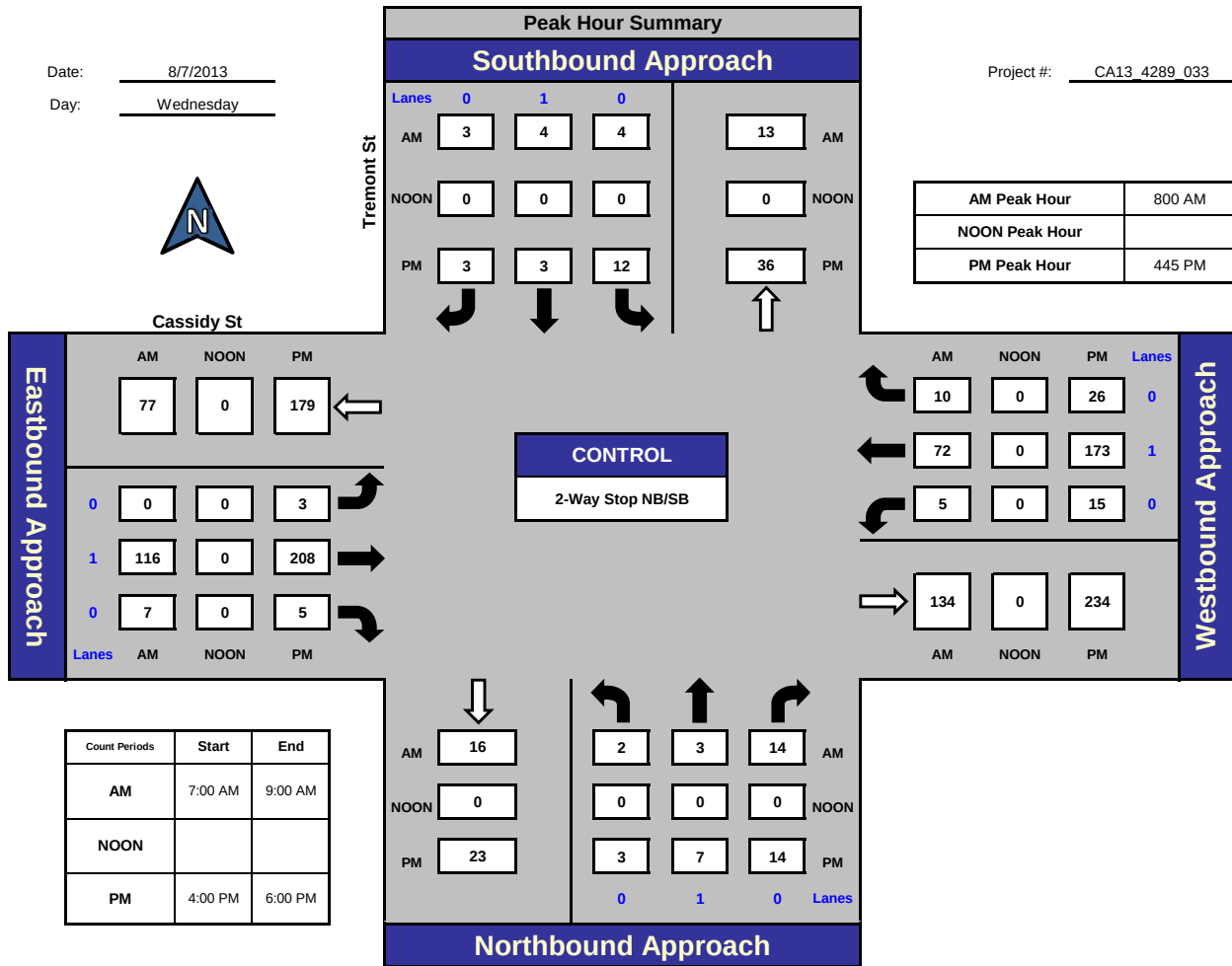


National Data & Surveying Services

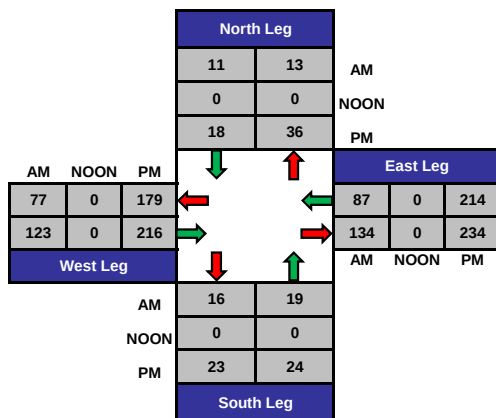
Tremont St and Cassidy St, City of Oceanside

Date: 8/7/2013
Day: Wednesday

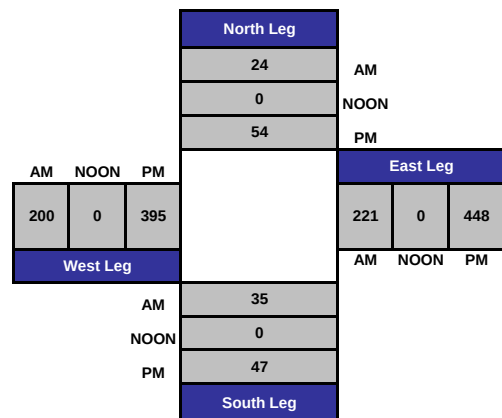
Project #: CA13 4289 033



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:



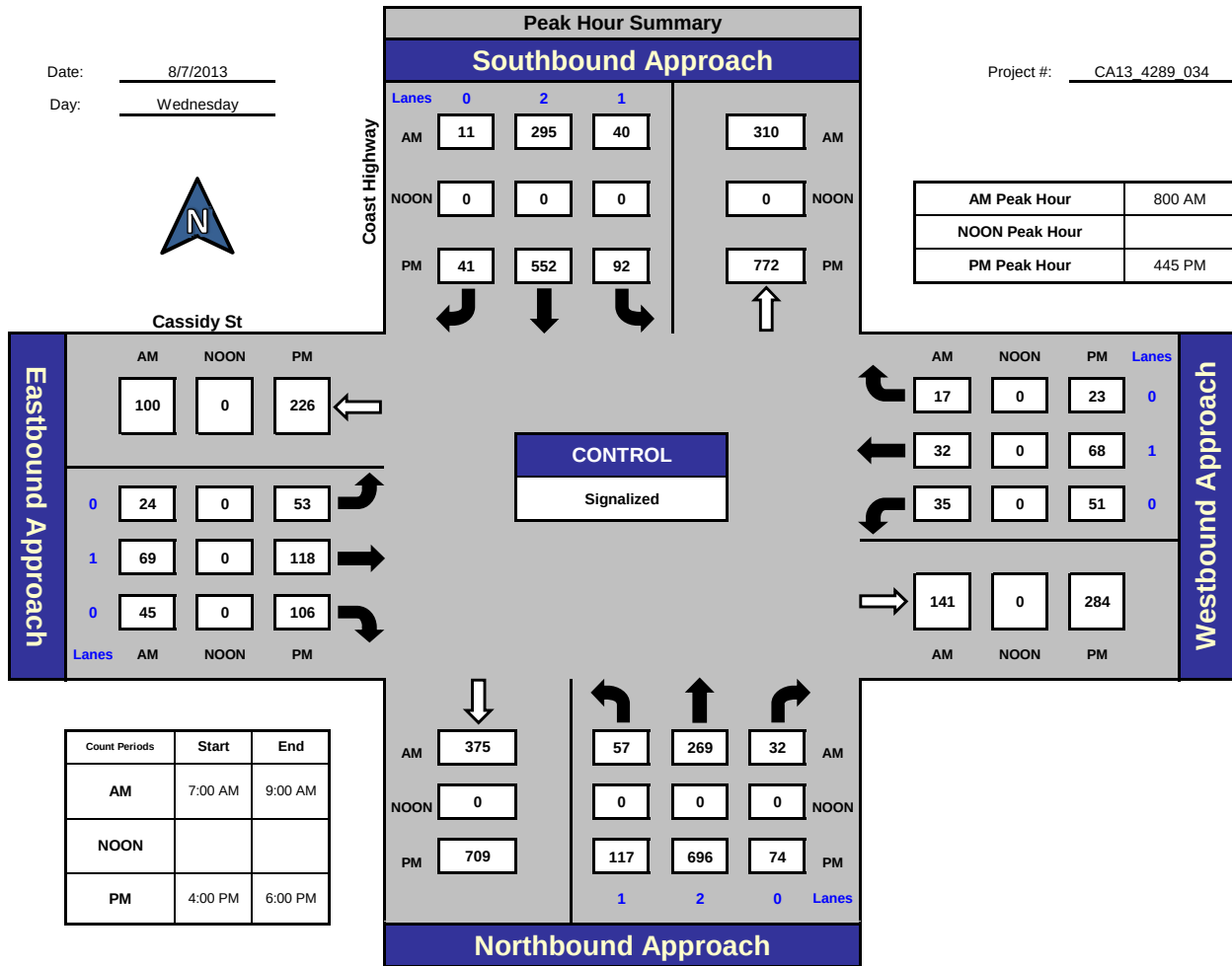
National Data & Surveying Services

Coast Highway and Cassidy St , City of Oceanside

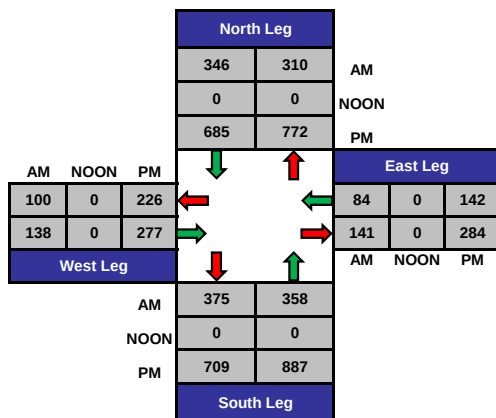
Date: 8/7/2013

Day: Wednesday

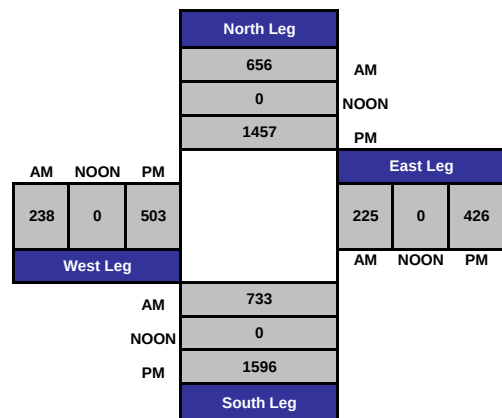
Project #: CA13 4289 034



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:



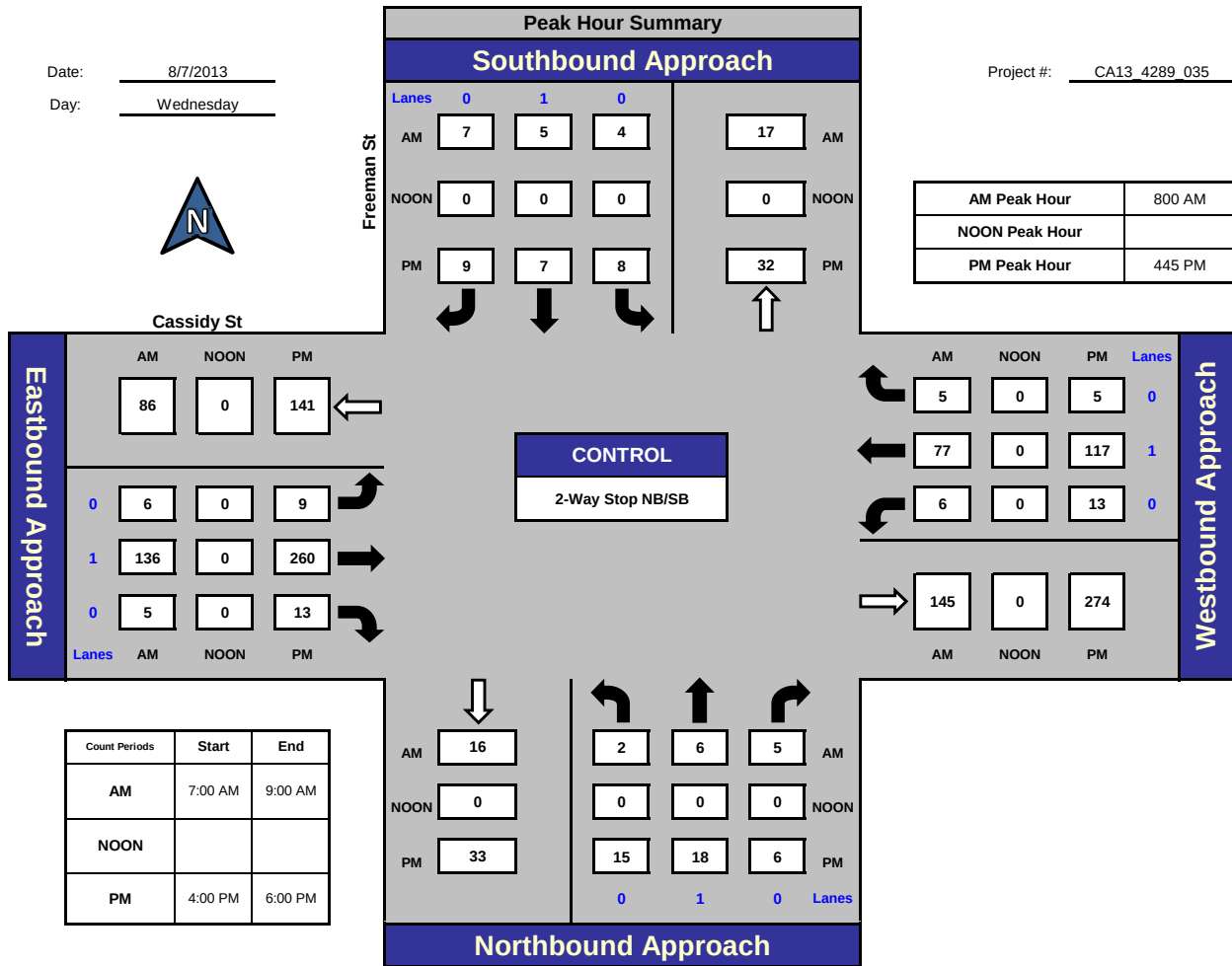
National Data & Surveying Services

Freeman St and Cassidy St, City of Oceanside

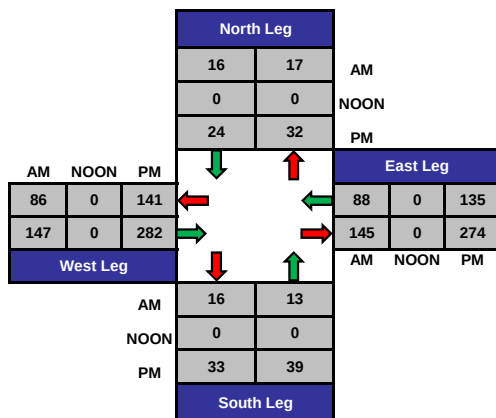
Date: 8/7/2013

Day: Wednesday

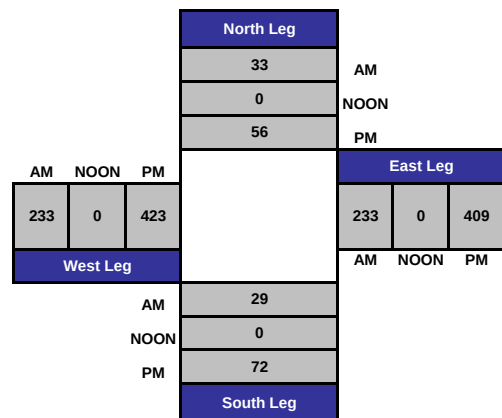
Project #: CA13 4289 035



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:



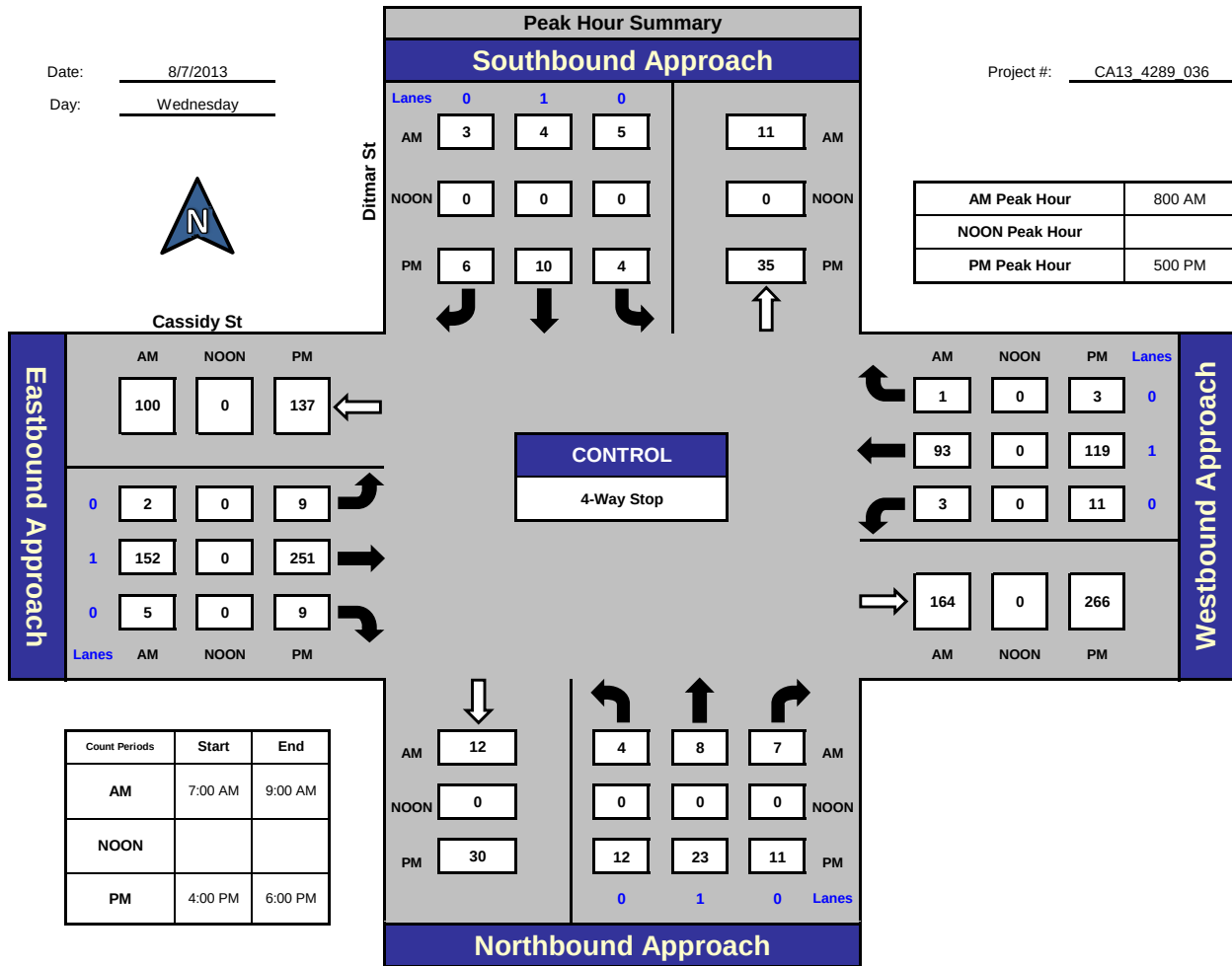
National Data & Surveying Services

Ditmar St and Cassidy St, City of Oceanside

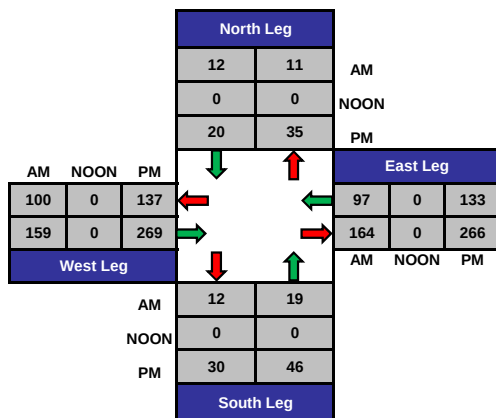
Date: 8/7/2013

Day: Wednesday

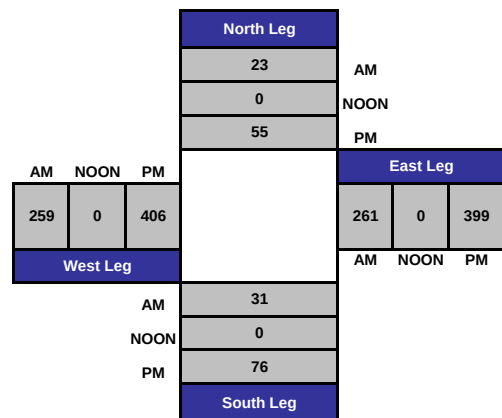
Project #: CA13 4289 036



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

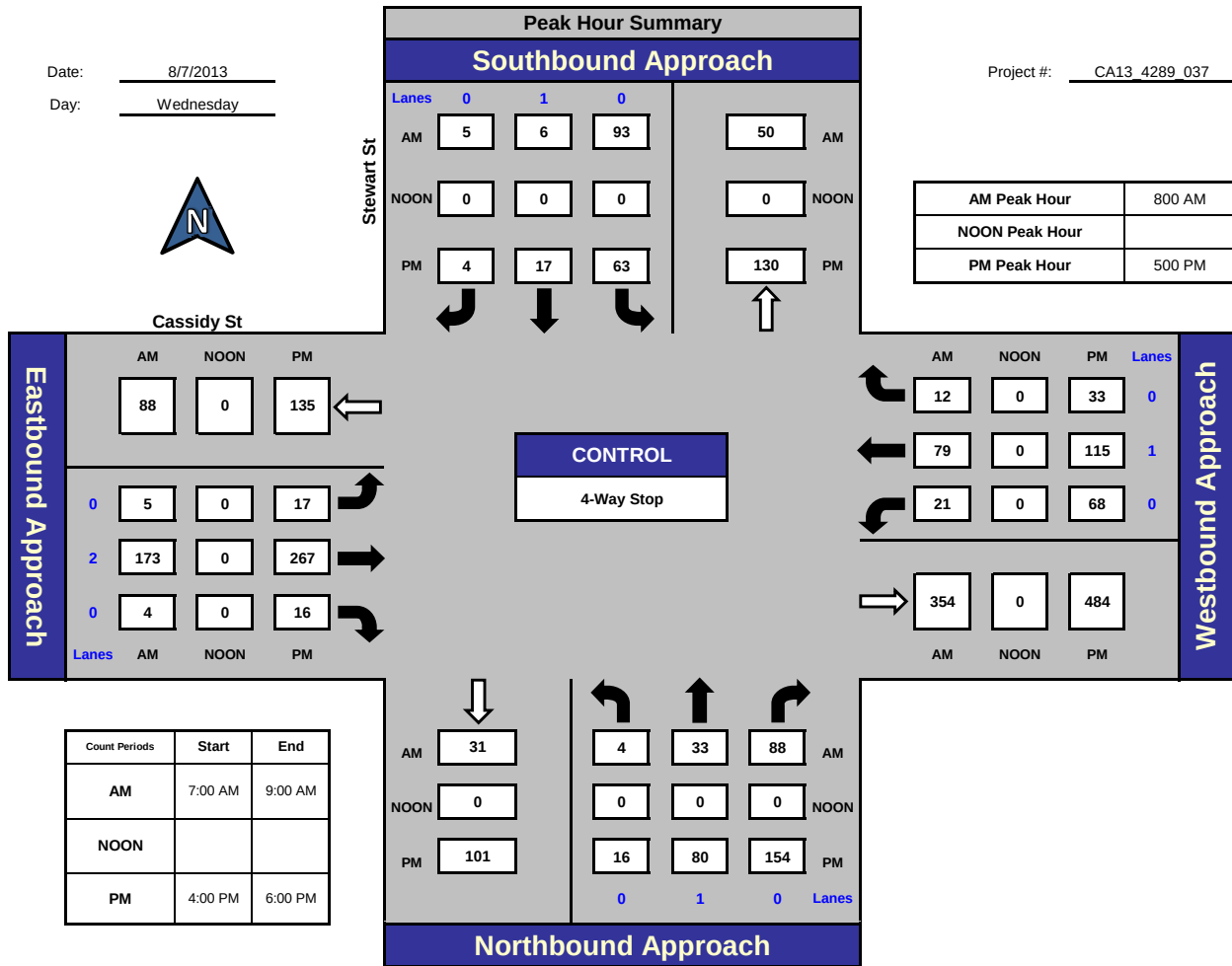


National Data & Surveying Services

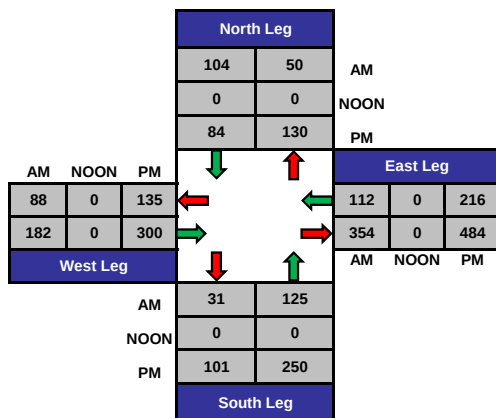
Stewart St and Cassidy St, City of Oceanside

Date: 8/7/2013
Day: Wednesday

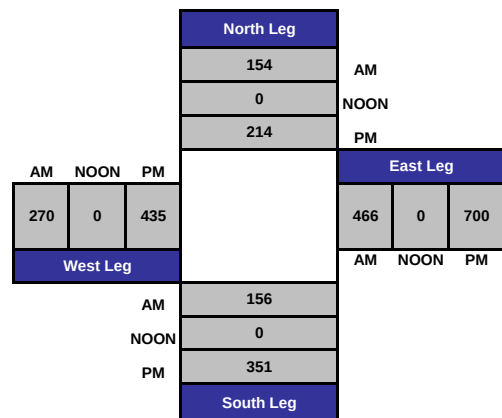
Project #: CA13 4289 037



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

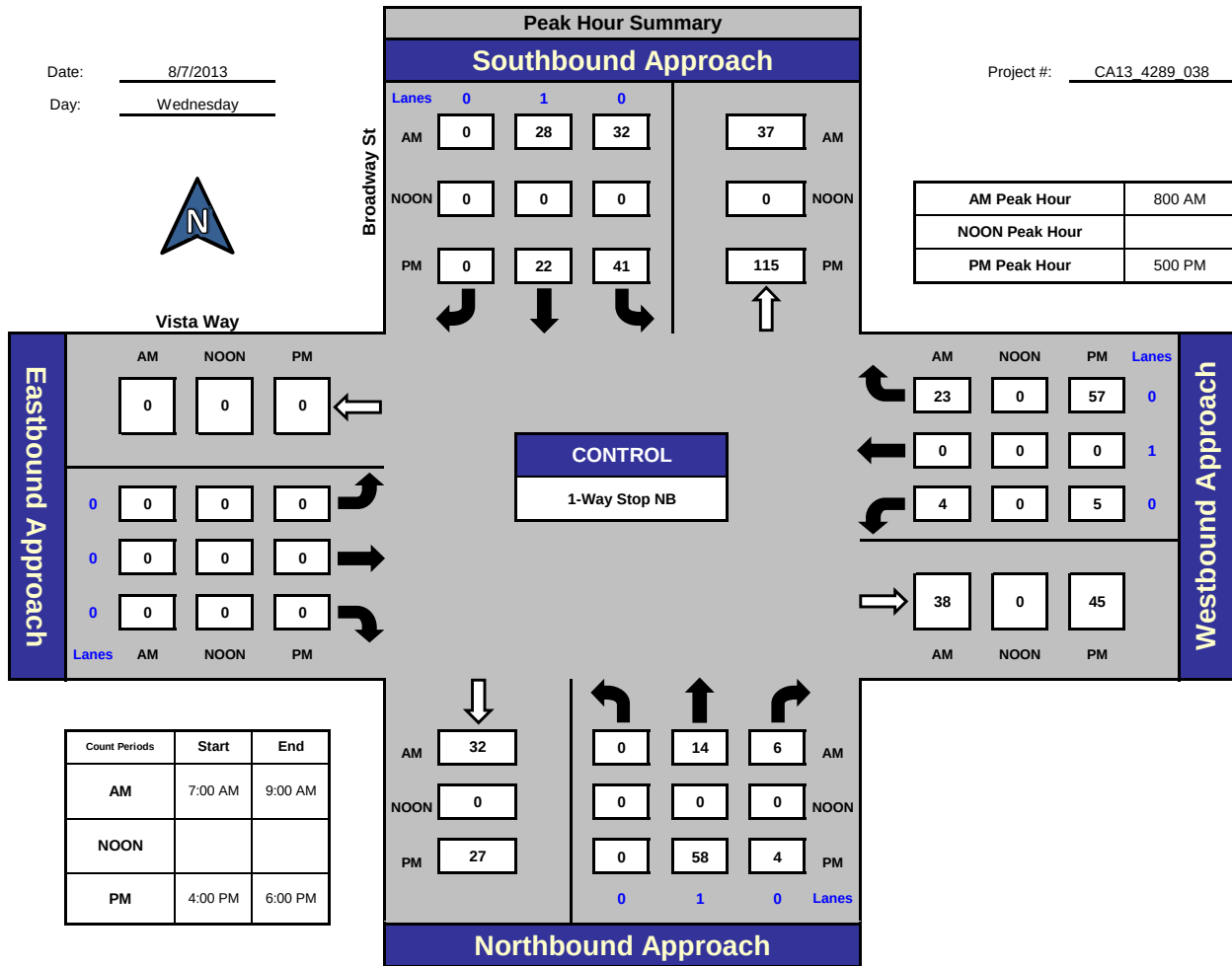


National Data & Surveying Services

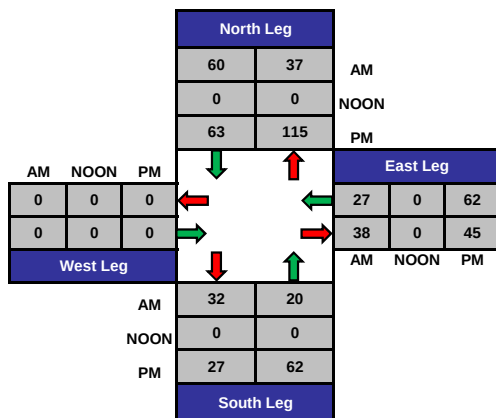
Broadway St and Vista Way, City of Oceanside

Date: 8/7/2013
Day: Wednesday

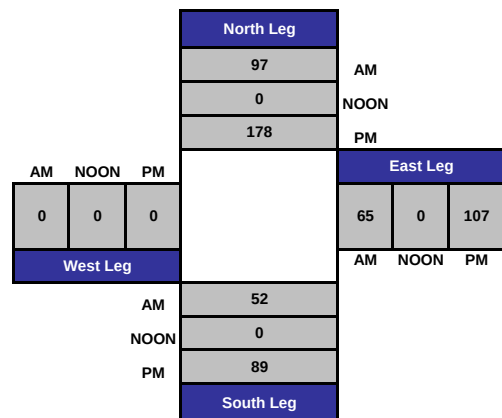
Project #: CA13 4289 038



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:



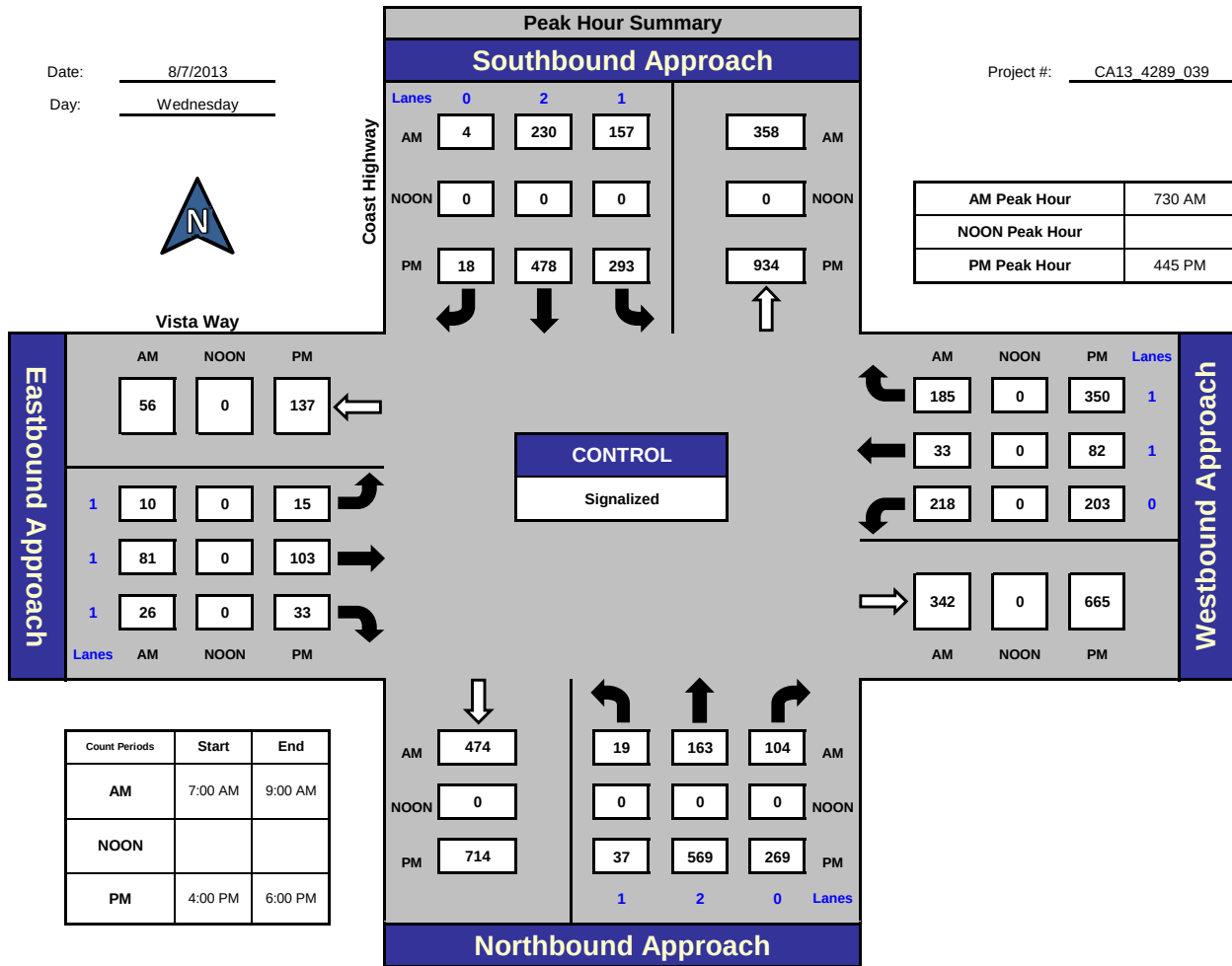
National Data & Surveying Services

Coast Highway and Vista Way, City of Oceanside

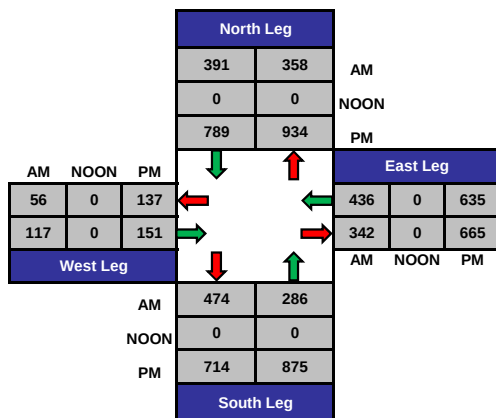
Date: 8/7/2013

Day: Wednesday

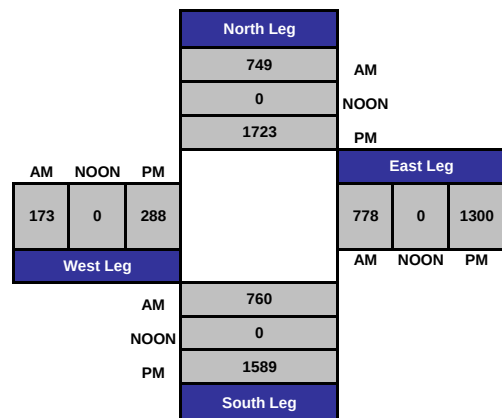
Project #: CA13 4289 039



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

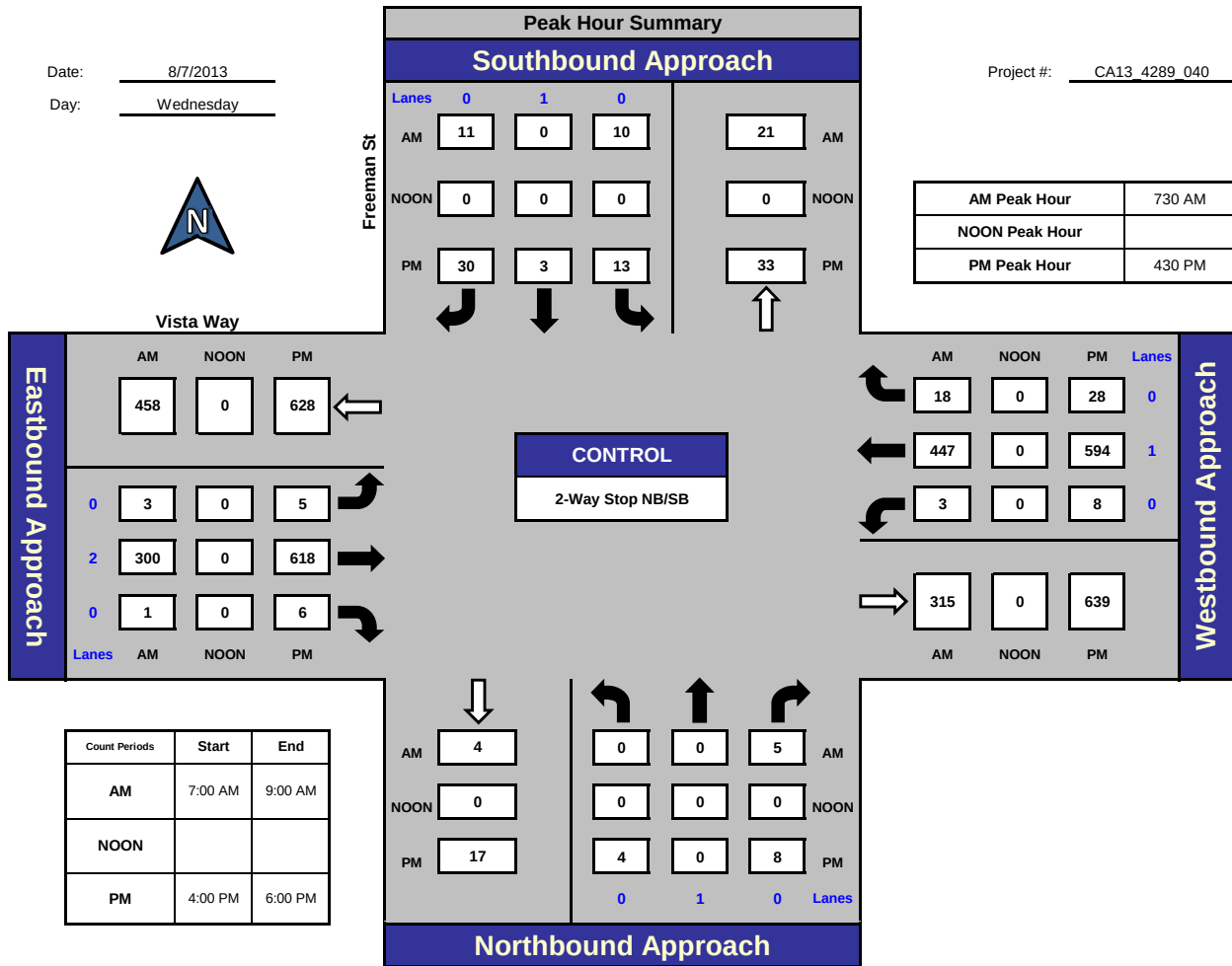


National Data & Surveying Services

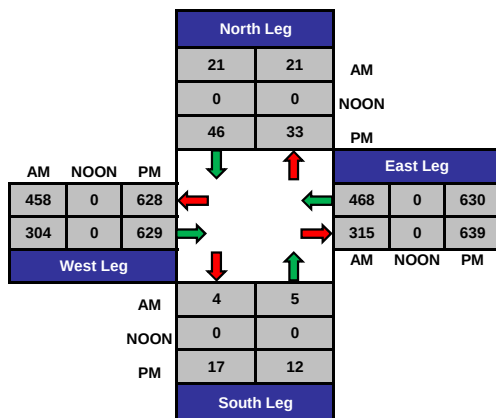
Freeman St and Vista Way, City of Oceanside

Date: 8/7/2013
Day: Wednesday

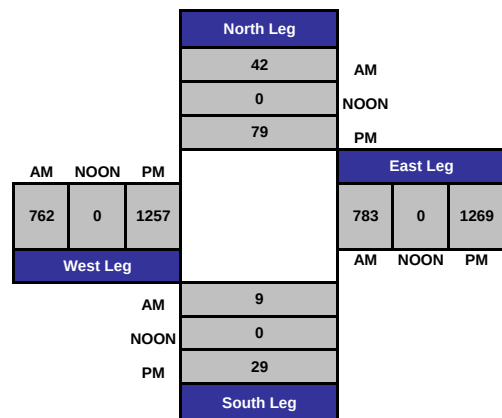
Project #: CA13 4289 040



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:

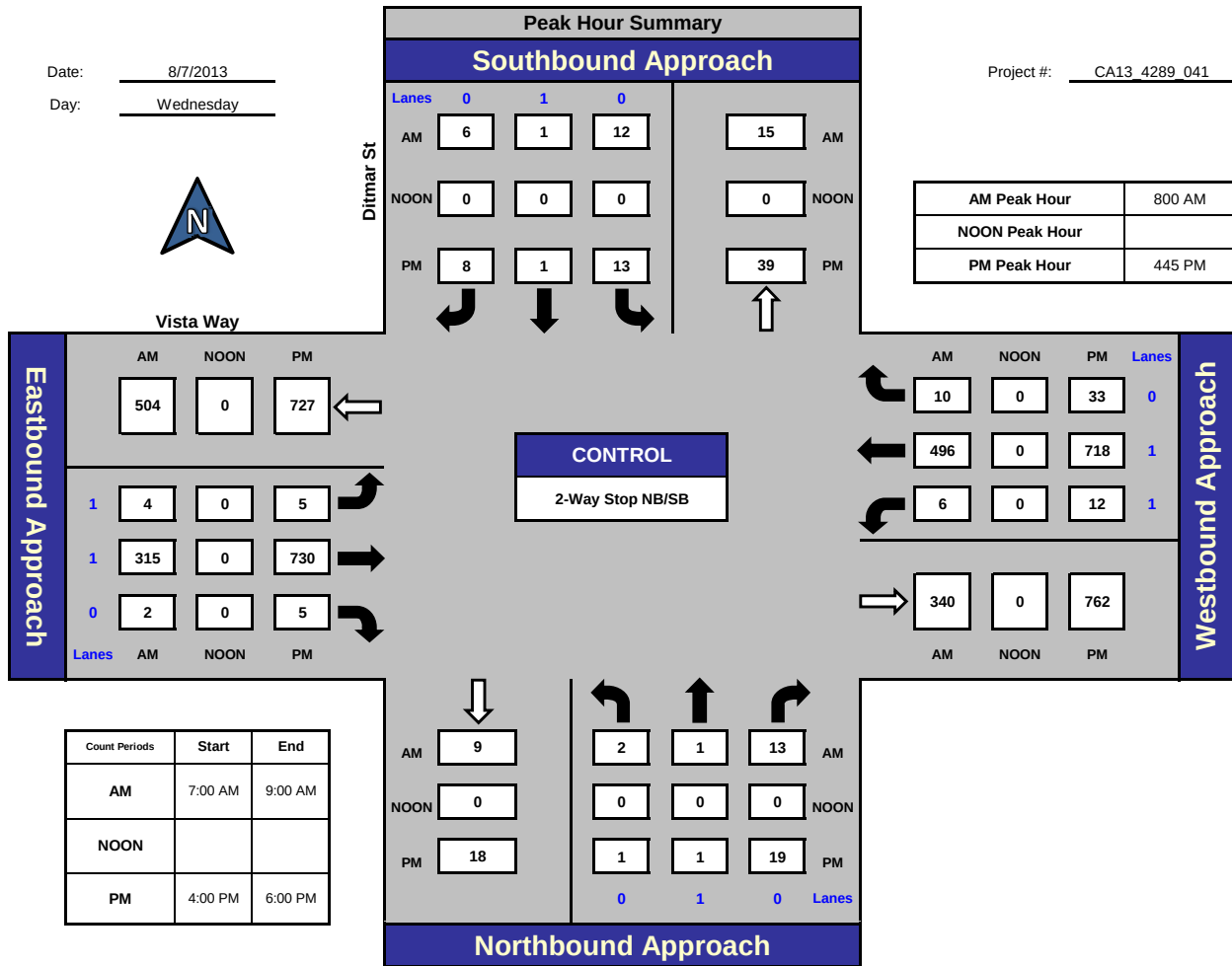


National Data & Surveying Services

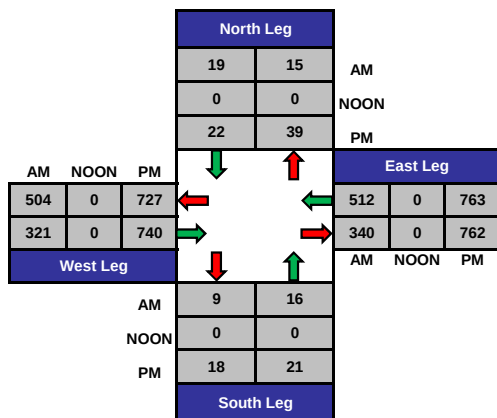
Ditmar St and Vista Way, City of Oceanside

Date: 8/7/2013
Day: Wednesday

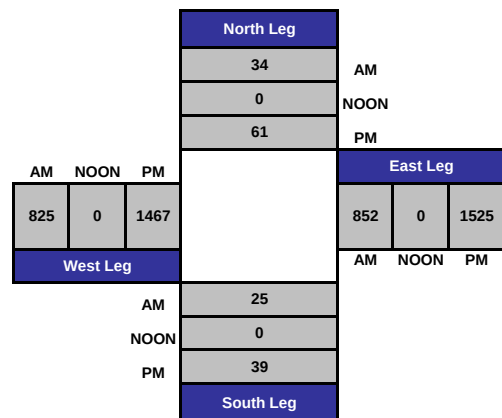
Project #: CA13 4289 041



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:



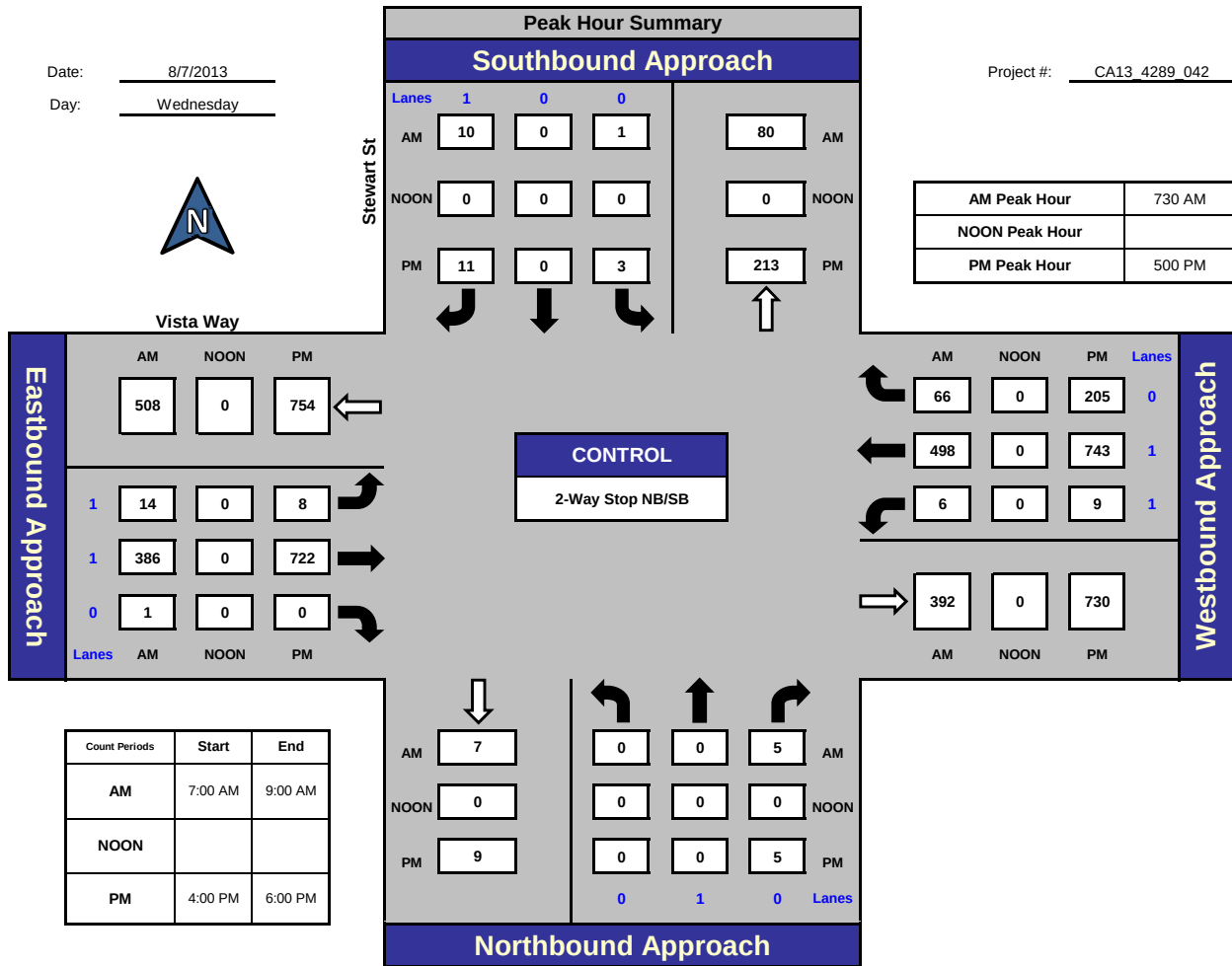
National Data & Surveying Services

Stewart St and Vista Way, City of Oceanside

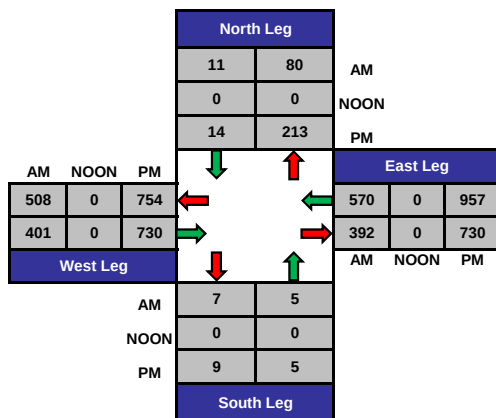
Date: 8/7/2013

Day: Wednesday

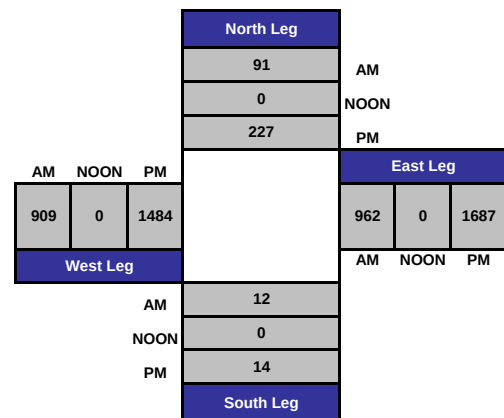
Project #: CA13 4289 042



Total Ins & Outs



Total Volume Per Leg



ITM Peak Hour Summary

Prepared by:



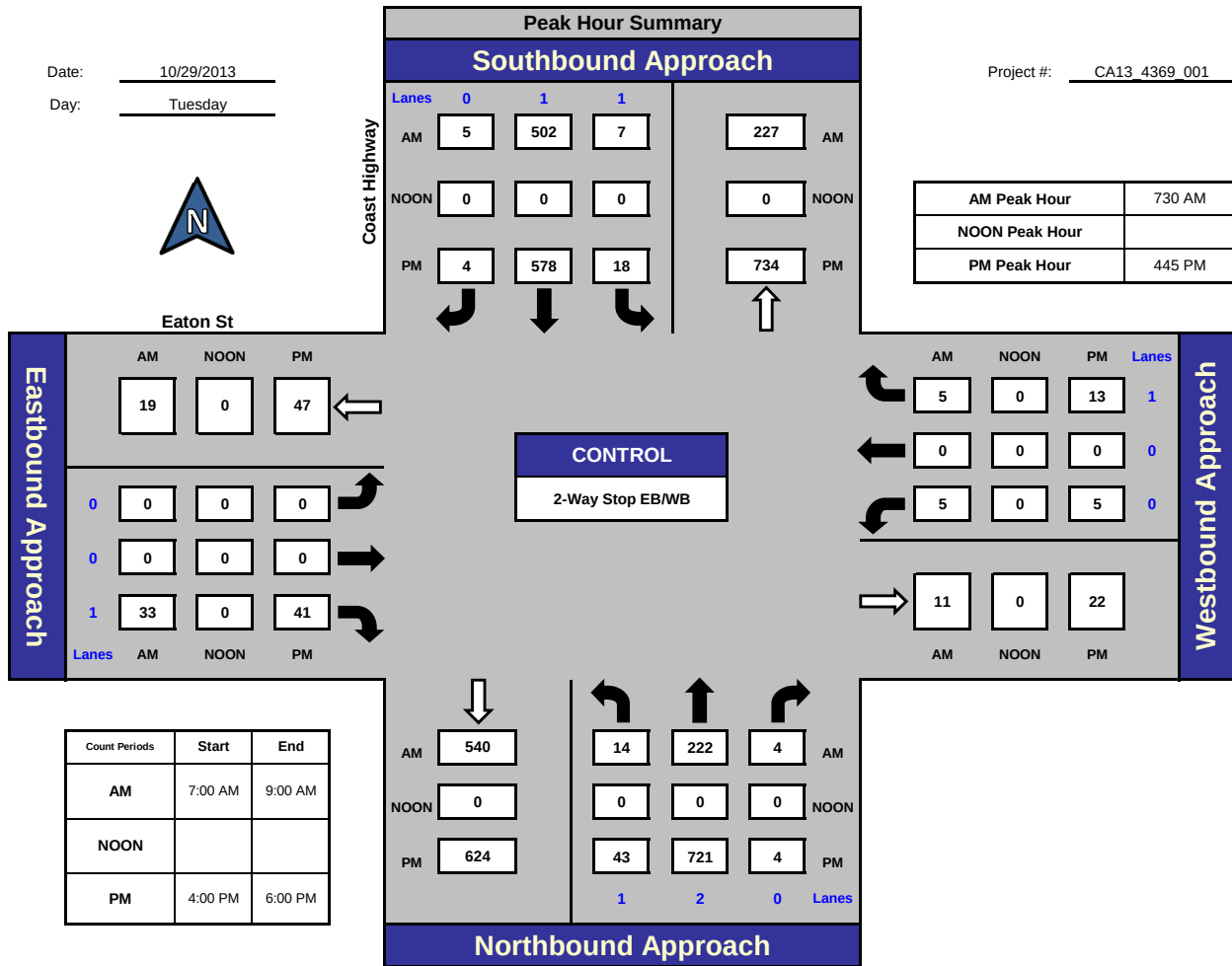
National Data & Surveying Services

Coast Highway and Eaton St., City of Oceanside

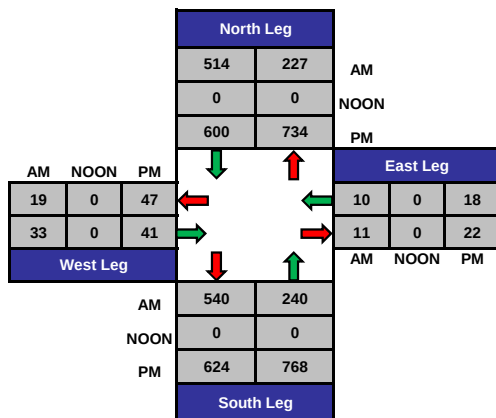
Date: 10/29/2013

Day: Tuesday

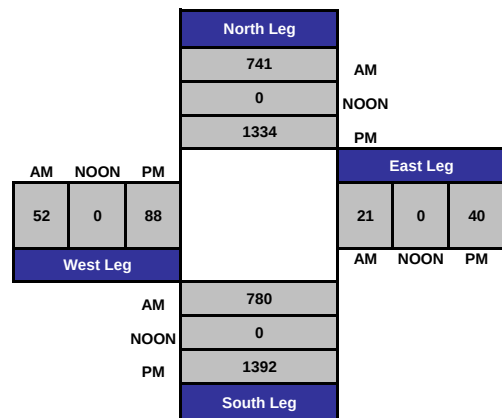
Project #: CA13 4369 001



Total Ins & Outs



Total Volume Per Leg



County of San Diego
N/S: Vandegrift Boulevard/Harbor Drive
E/W: I-5 NB On Ramp/San Rafael Drive
Weather: Clear

File Name : 01_CSD_Vandegrift_Harbor_5N On_San Rafael AM
Site Code :
Start Date : 3/13/2018
Page No : 1

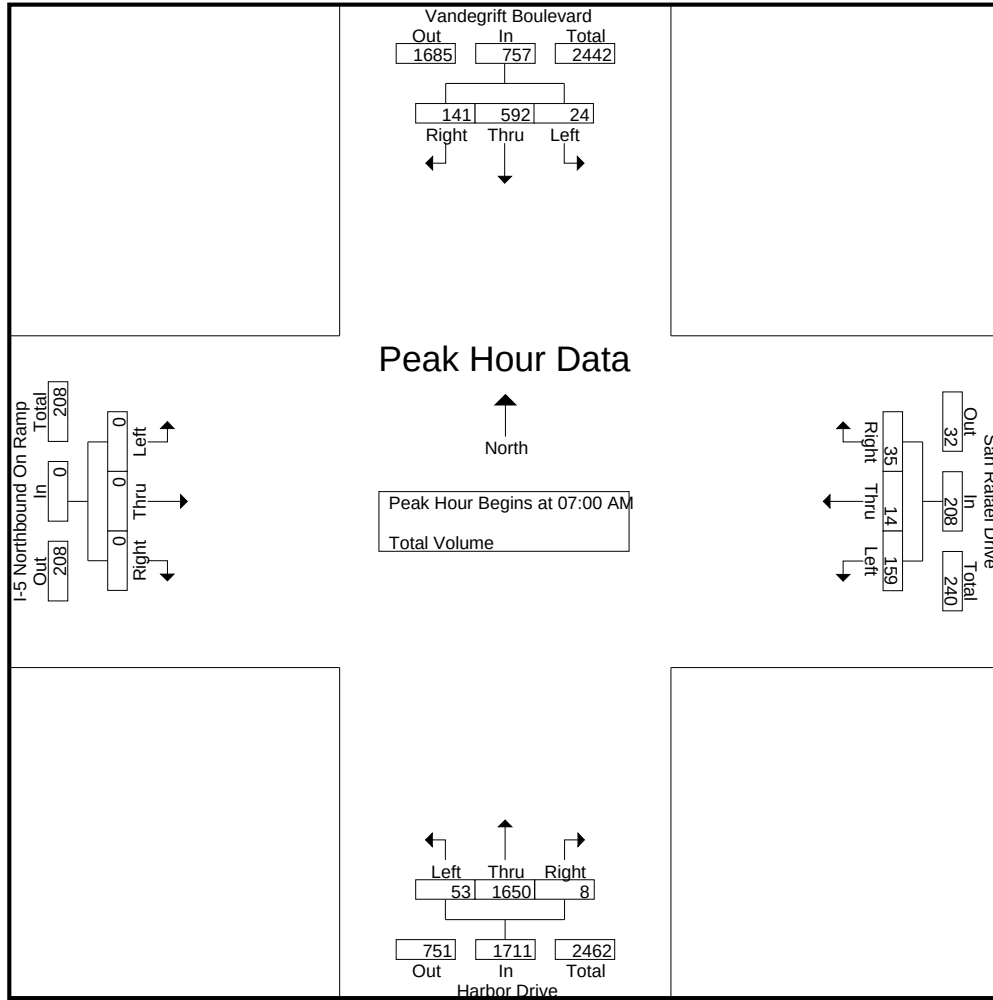
Groups Printed- Total Volume

	Vandegrift Boulevard Southbound				San Rafael Drive Westbound				Harbor Drive Northbound				I-5 Northbound On Ramp Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	9	137	55	201	43	2	13	58	8	471	4	483	0	0	0	0	742
07:15 AM	7	143	45	195	44	4	10	58	13	442	1	456	0	0	0	0	709
07:30 AM	1	144	19	164	33	5	10	48	22	412	1	435	0	0	0	0	647
07:45 AM	7	168	22	197	39	3	2	44	10	325	2	337	0	0	0	0	578
Total	24	592	141	757	159	14	35	208	53	1650	8	1711	0	0	0	0	2676
08:00 AM	6	149	19	174	40	7	1	48	12	231	2	245	0	0	0	0	467
08:15 AM	6	130	24	160	50	3	2	55	21	209	3	233	0	0	0	0	448
08:30 AM	0	153	12	165	40	5	3	48	16	176	1	193	0	0	0	0	406
08:45 AM	6	120	21	147	37	6	1	44	12	173	2	187	0	0	0	0	378
Total	18	552	76	646	167	21	7	195	61	789	8	858	0	0	0	0	1699
Grand Total	42	1144	217	1403	326	35	42	403	114	2439	16	2569	0	0	0	0	4375
Apprch %	3	81.5	15.5		80.9	8.7	10.4		4.4	94.9	0.6		0	0	0		
Total %	1	26.1	5	32.1	7.5	0.8	1	9.2	2.6	55.7	0.4	58.7	0	0	0	0	

	Vandegrift Boulevard Southbound				San Rafael Drive Westbound				Harbor Drive Northbound				I-5 Northbound On Ramp Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	9	137	55	201	43	2	13	58	8	471	4	483	0	0	0	0	742
07:15 AM	7	143	45	195	44	4	10	58	13	442	1	456	0	0	0	0	709
07:30 AM	1	144	19	164	33	5	10	48	22	412	1	435	0	0	0	0	647
07:45 AM	7	168	22	197	39	3	2	44	10	325	2	337	0	0	0	0	578
Total Volume	24	592	141	757	159	14	35	208	53	1650	8	1711	0	0	0	0	2676
% App. Total	3.2	78.2	18.6		76.4	6.7	16.8		3.1	96.4	0.5		0	0	0		
PHF	.667	.881	.641	.942	.903	.700	.673	.897	.602	.876	.500	.886	.000	.000	.000	.000	.902

County of San Diego
N/S: Vandegrift Boulevard/Harbor Drive
E/W: I-5 NB On Ramp/San Rafael Drive
Weather: Clear

File Name : 01_CSD_Vandegrift_Harbor_5N On_San Rafael AM
Site Code :
Start Date : 3/13/2018
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:00 AM			
+0 mins.	9	137	55	201	43	2	13	58	8	471	4	483	0	0	0	0
+15 mins.	7	143	45	195	44	4	10	58	13	442	1	456	0	0	0	0
+30 mins.	1	144	19	164	33	5	10	48	22	412	1	435	0	0	0	0
+45 mins.	7	168	22	197	39	3	2	44	10	325	2	337	0	0	0	0
Total Volume	24	592	141	757	159	14	35	208	53	1650	8	1711	0	0	0	0
% App. Total	3.2	78.2	18.6		76.4	6.7	16.8		3.1	96.4	0.5		0	0	0	
PHF	.667	.881	.641	.942	.903	.700	.673	.897	.602	.876	.500	.886	.000	.000	.000	.000

County of San Diego
N/S: Vandegrift Boulevard/Harbor Drive
E/W: I-5 NB On Ramp/San Rafael Drive
Weather: Clear

File Name : 01_CSD_Vandegrift_Harbor_5N On_San Rafael PM
Site Code :
Start Date : 3/13/2018
Page No : 1

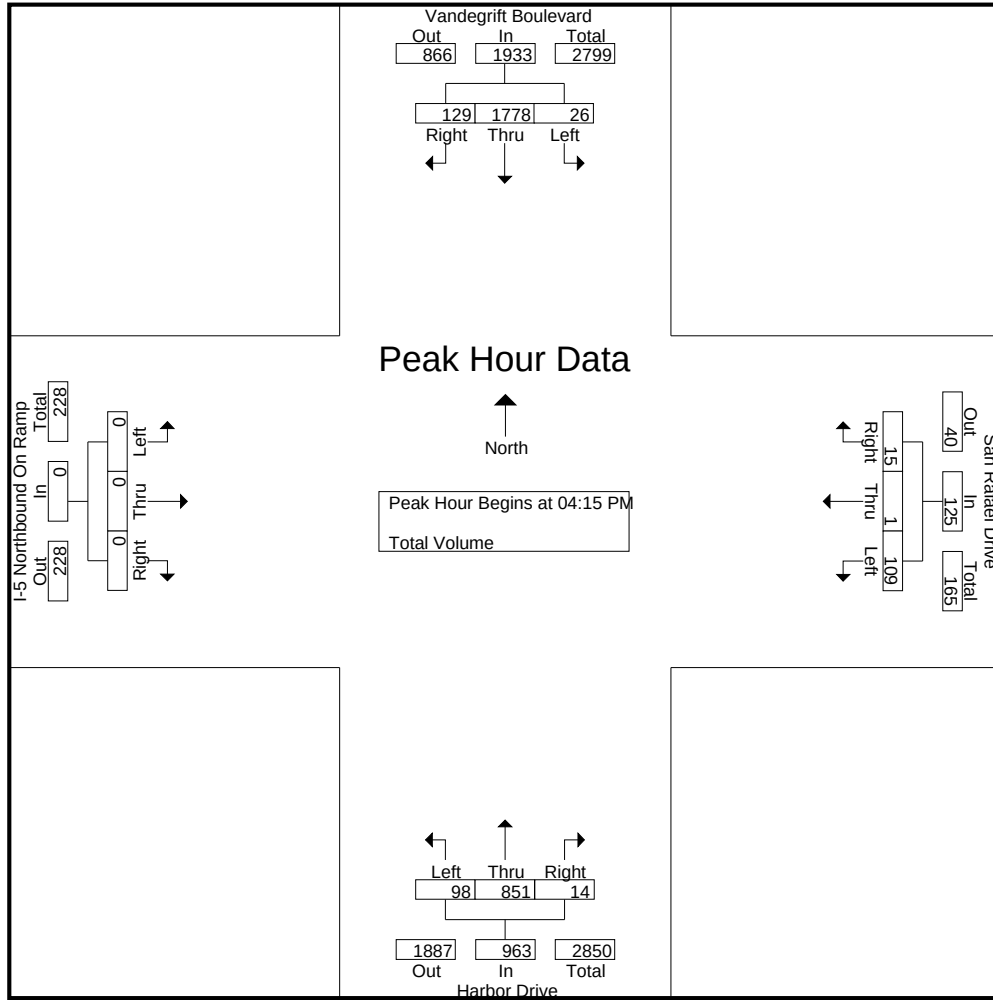
Groups Printed- Total Volume

	Vandegrift Boulevard Southbound				San Rafael Drive Westbound				Harbor Drive Northbound				I-5 Northbound On Ramp Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	6	419	49	474	37	2	1	40	28	191	7	226	0	0	0	0	740
04:15 PM	6	429	30	465	29	0	4	33	28	201	2	231	0	0	0	0	729
04:30 PM	8	455	38	501	27	1	5	33	30	210	4	244	0	0	0	0	778
04:45 PM	7	447	39	493	24	0	5	29	23	210	4	237	0	0	0	0	759
Total	27	1750	156	1933	117	3	15	135	109	812	17	938	0	0	0	0	3006
05:00 PM	5	447	22	474	29	0	1	30	17	230	4	251	0	0	0	0	755
05:15 PM	1	370	29	400	31	0	1	32	20	232	6	258	0	0	0	0	690
05:30 PM	4	407	20	431	29	3	6	38	22	227	8	257	0	0	0	0	726
05:45 PM	8	310	19	337	19	1	0	20	25	186	3	214	0	0	0	0	571
Total	18	1534	90	1642	108	4	8	120	84	875	21	980	0	0	0	0	2742
Grand Total	45	3284	246	3575	225	7	23	255	193	1687	38	1918	0	0	0	0	5748
Apprch %	1.3	91.9	6.9		88.2	2.7	9		10.1	88	2		0	0	0		
Total %	0.8	57.1	4.3	62.2	3.9	0.1	0.4	4.4	3.4	29.3	0.7	33.4	0	0	0	0	

	Vandegrift Boulevard Southbound				San Rafael Drive Westbound				Harbor Drive Northbound				I-5 Northbound On Ramp Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	6	429	30	465	29	0	4	33	28	201	2	231	0	0	0	0	729
04:30 PM	8	455	38	501	27	1	5	33	30	210	4	244	0	0	0	0	778
04:45 PM	7	447	39	493	24	0	5	29	23	210	4	237	0	0	0	0	759
05:00 PM	5	447	22	474	29	0	1	30	17	230	4	251	0	0	0	0	755
Total Volume	26	1778	129	1933	109	1	15	125	98	851	14	963	0	0	0	0	3021
% App. Total	1.3	92	6.7		87.2	0.8	12		10.2	88.4	1.5		0	0	0		
PHF	.813	.977	.827	.965	.940	.250	.750	.947	.817	.925	.875	.959	.000	.000	.000	.000	.971

County of San Diego
N/S: Vandegrift Boulevard/Harbor Drive
E/W: I-5 NB On Ramp/San Rafael Drive
Weather: Clear

File Name : 01_CSD_Vandegrift_Harbor_5N On_San Rafael PM
Site Code :
Start Date : 3/13/2018
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:45 PM				04:00 PM			
+0 mins.	6	419	49	474	37	2	1	40	23	210	4	237	0	0	0	0
+15 mins.	6	429	30	465	29	0	4	33	17	230	4	251	0	0	0	0
+30 mins.	8	455	38	501	27	1	5	33	20	232	6	258	0	0	0	0
+45 mins.	7	447	39	493	24	0	5	29	22	227	8	257	0	0	0	0
Total Volume	27	1750	156	1933	117	3	15	135	82	899	22	1003	0	0	0	0
% App. Total	1.4	90.5	8.1		86.7	2.2	11.1		8.2	89.6	2.2		0	0	0	
PHF	.844	.962	.796	.965	.791	.375	.750	.844	.891	.969	.688	.972	.000	.000	.000	.000

City of Oceanside
N/S: I-5 Southbound Ramps
E/W: SR-76
Weather: Clear

File Name : 02_OCS_5S_CA-76 AM
Site Code :
Start Date : 3/13/2018
Page No : 1

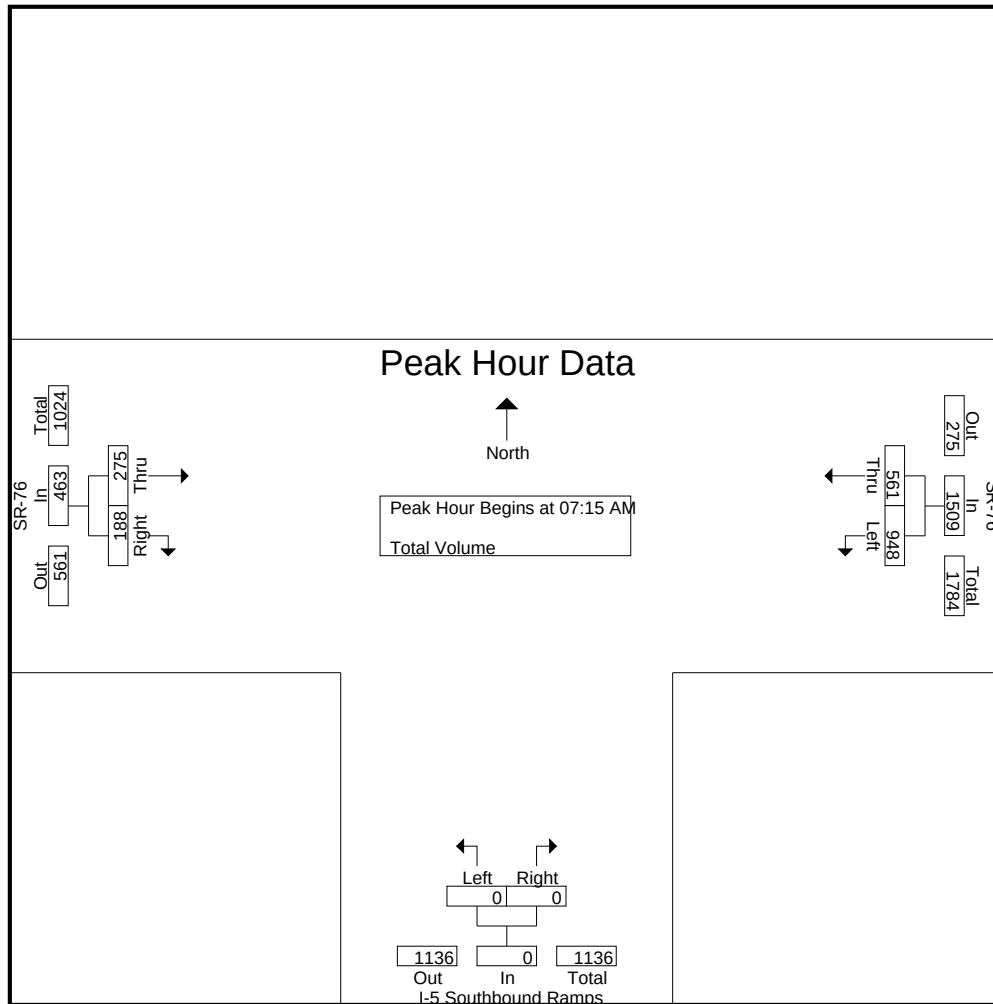
Groups Printed- Total Volume

	SR-76 Westbound			I-5 Southbound Ramps Northbound			SR-76 Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	207	141	348	0	0	0	54	34	88	436
07:15 AM	240	161	401	0	0	0	55	35	90	491
07:30 AM	264	147	411	0	0	0	68	45	113	524
07:45 AM	231	153	384	0	0	0	80	47	127	511
Total	942	602	1544	0	0	0	257	161	418	1962
08:00 AM	213	100	313	0	0	0	72	61	133	446
08:15 AM	234	108	342	0	0	0	44	56	100	442
08:30 AM	254	104	358	0	0	0	69	47	116	474
08:45 AM	227	125	352	0	0	0	57	51	108	460
Total	928	437	1365	0	0	0	242	215	457	1822
Grand Total	1870	1039	2909	0	0	0	499	376	875	3784
Apprch %	64.3	35.7		0	0		57	43		
Total %	49.4	27.5	76.9	0	0	0	13.2	9.9	23.1	

	SR-76 Westbound			I-5 Southbound Ramps Northbound			SR-76 Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:15 AM										
07:15 AM	240	161	401	0	0	0	55	35	90	491
07:30 AM	264	147	411	0	0	0	68	45	113	524
07:45 AM	231	153	384	0	0	0	80	47	127	511
08:00 AM	213	100	313	0	0	0	72	61	133	446
Total Volume	948	561	1509	0	0	0	275	188	463	1972
% App. Total	62.8	37.2		0	0		59.4	40.6		
PHF	.898	.871	.918	.000	.000	.000	.859	.770	.870	.941

City of Oceanside
N/S: I-5 Southbound Ramps
E/W: SR-76
Weather: Clear

File Name : 02_OCS_5S_CA-76 AM
Site Code :
Start Date : 3/13/2018
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			07:00 AM			07:45 AM		
+0 mins.	207	141	348	0	0	0	80	47	127
+15 mins.	240	161	401	0	0	0	72	61	133
+30 mins.	264	147	411	0	0	0	44	56	100
+45 mins.	231	153	384	0	0	0	69	47	116
Total Volume	942	602	1544	0	0	0	265	211	476
% App. Total	61	39		0	0		55.7	44.3	
PHF	.892	.935	.939	.000	.000	.000	.828	.865	.895

City of Oceanside
N/S: I-5 Southbound Ramps
E/W: SR-76
Weather: Clear

File Name : 02_OCS_5S_CA-76 PM
Site Code :
Start Date : 3/13/2018
Page No : 1

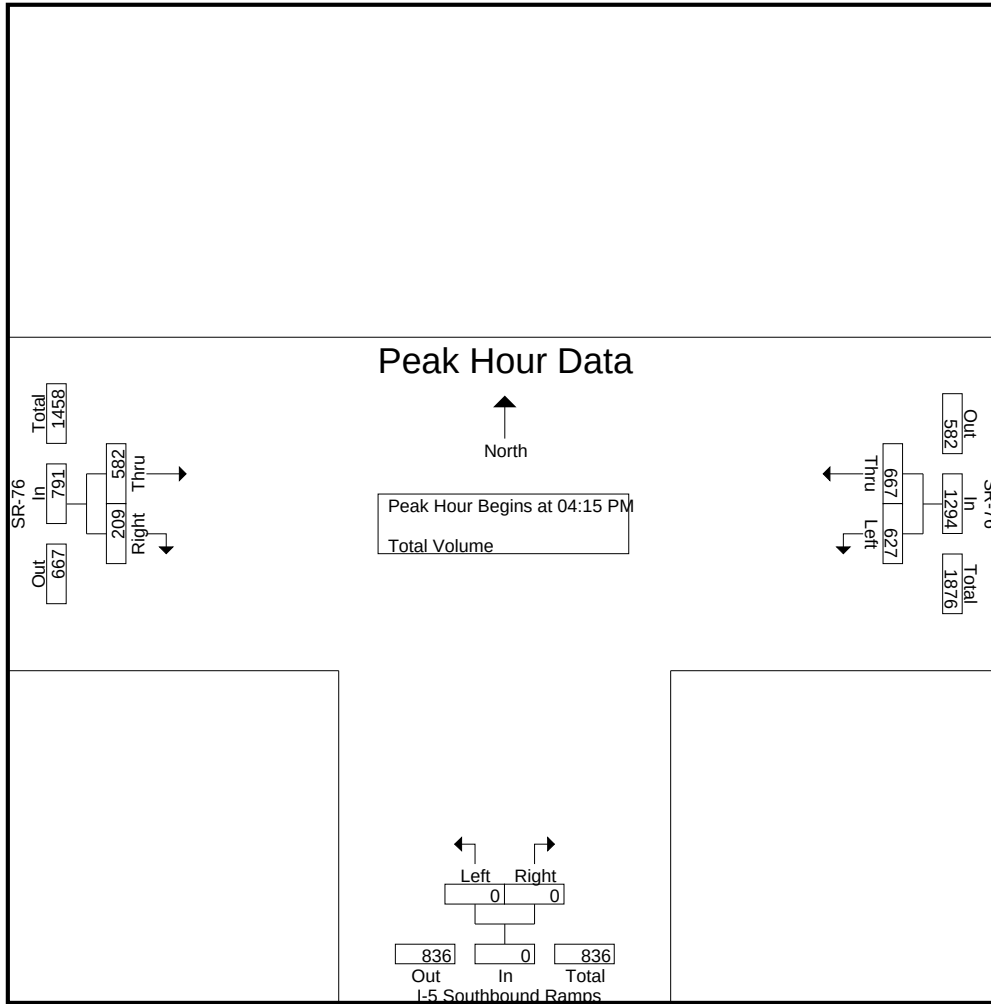
Groups Printed- Total Volume

	SR-76 Westbound			I-5 Southbound Ramps Northbound			SR-76 Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	134	167	301	0	0	0	162	61	223	524
04:15 PM	152	173	325	0	0	0	116	43	159	484
04:30 PM	149	148	297	0	0	0	148	52	200	497
04:45 PM	162	168	330	0	0	0	127	44	171	501
Total	597	656	1253	0	0	0	553	200	753	2006
05:00 PM	164	178	342	0	0	0	191	70	261	603
05:15 PM	140	162	302	0	0	0	102	48	150	452
05:30 PM	156	160	316	0	0	0	110	55	165	481
05:45 PM	130	140	270	0	0	0	111	60	171	441
Total	590	640	1230	0	0	0	514	233	747	1977
Grand Total	1187	1296	2483	0	0	0	1067	433	1500	3983
Apprch %	47.8	52.2		0	0		71.1	28.9		
Total %	29.8	32.5	62.3	0	0	0	26.8	10.9	37.7	

	SR-76 Westbound			I-5 Southbound Ramps Northbound			SR-76 Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	152	173	325	0	0	0	116	43	159	484
04:30 PM	149	148	297	0	0	0	148	52	200	497
04:45 PM	162	168	330	0	0	0	127	44	171	501
05:00 PM	164	178	342	0	0	0	191	70	261	603
Total Volume	627	667	1294	0	0	0	582	209	791	2085
% App. Total	48.5	51.5		0	0		73.6	26.4		
PHF	.956	.937	.946	.000	.000	.000	.762	.746	.758	.864

City of Oceanside
N/S: I-5 Southbound Ramps
E/W: SR-76
Weather: Clear

File Name : 02_OCS_5S_CA-76 PM
Site Code :
Start Date : 3/13/2018
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM			04:00 PM			04:15 PM		
+0 mins.	152	173	325	0	0	0	116	43	159
+15 mins.	149	148	297	0	0	0	148	52	200
+30 mins.	162	168	330	0	0	0	127	44	171
+45 mins.	164	178	342	0	0	0	191	70	261
Total Volume	627	667	1294	0	0	0	582	209	791
% App. Total	48.5	51.5		0	0		73.6	26.4	
PHF	.956	.937	.946	.000	.000	.000	.762	.746	.758

City of Oceanside
N/S: I-5 Northbound Ramps
E/W: SR-76
Weather: Clear

File Name : 03_OCS_5N_CA-76 AM
Site Code :
Start Date : 3/13/2018
Page No : 1

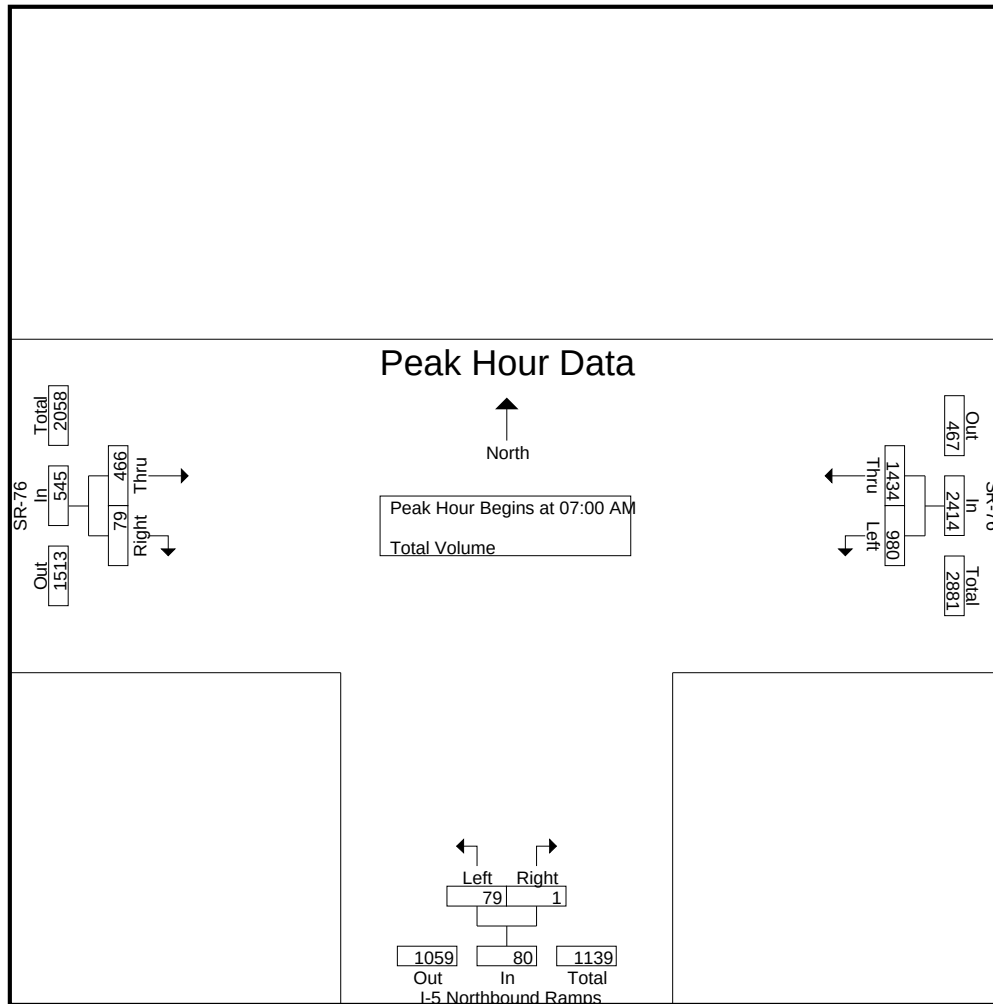
Groups Printed- Total Volume

	SR-76 Westbound			I-5 Northbound Ramps Northbound			SR-76 Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	250	314	564	15	0	15	112	20	132	711
07:15 AM	250	358	608	25	1	26	111	16	127	761
07:30 AM	255	390	645	16	0	16	116	23	139	800
07:45 AM	225	372	597	23	0	23	127	20	147	767
Total	980	1434	2414	79	1	80	466	79	545	3039
08:00 AM	180	293	473	21	0	21	145	15	160	654
08:15 AM	177	338	515	16	0	16	147	17	164	695
08:30 AM	172	325	497	22	0	22	131	22	153	672
08:45 AM	163	317	480	38	0	38	131	14	145	663
Total	692	1273	1965	97	0	97	554	68	622	2684
Grand Total	1672	2707	4379	176	1	177	1020	147	1167	5723
Apprch %	38.2	61.8		99.4	0.6		87.4	12.6		
Total %	29.2	47.3	76.5	3.1	0	3.1	17.8	2.6	20.4	

	SR-76 Westbound			I-5 Northbound Ramps Northbound			SR-76 Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:00 AM										
07:00 AM	250	314	564	15	0	15	112	20	132	711
07:15 AM	250	358	608	25	1	26	111	16	127	761
07:30 AM	255	390	645	16	0	16	116	23	139	800
07:45 AM	225	372	597	23	0	23	127	20	147	767
Total Volume	980	1434	2414	79	1	80	466	79	545	3039
% App. Total	40.6	59.4		98.8	1.2		85.5	14.5		
PHF	.961	.919	.936	.790	.250	.769	.917	.859	.927	.950

City of Oceanside
N/S: I-5 Northbound Ramps
E/W: SR-76
Weather: Clear

File Name : 03_OCS_5N_CA-76 AM
Site Code :
Start Date : 3/13/2018
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM			08:00 AM			07:45 AM		
+0 mins.	250	314	564	21	0	21	127	20	147
+15 mins.	250	358	608	16	0	16	145	15	160
+30 mins.	255	390	645	22	0	22	147	17	164
+45 mins.	225	372	597	38	0	38	131	22	153
Total Volume	980	1434	2414	97	0	97	550	74	624
% App. Total	40.6	59.4		100	0		88.1	11.9	
PHF	.961	.919	.936	.638	.000	.638	.935	.841	.951

City of Oceanside
N/S: I-5 Northbound Ramps
E/W: SR-76
Weather: Clear

File Name : 03_OCS_5N_CA-76 PM
Site Code :
Start Date : 3/13/2018
Page No : 1

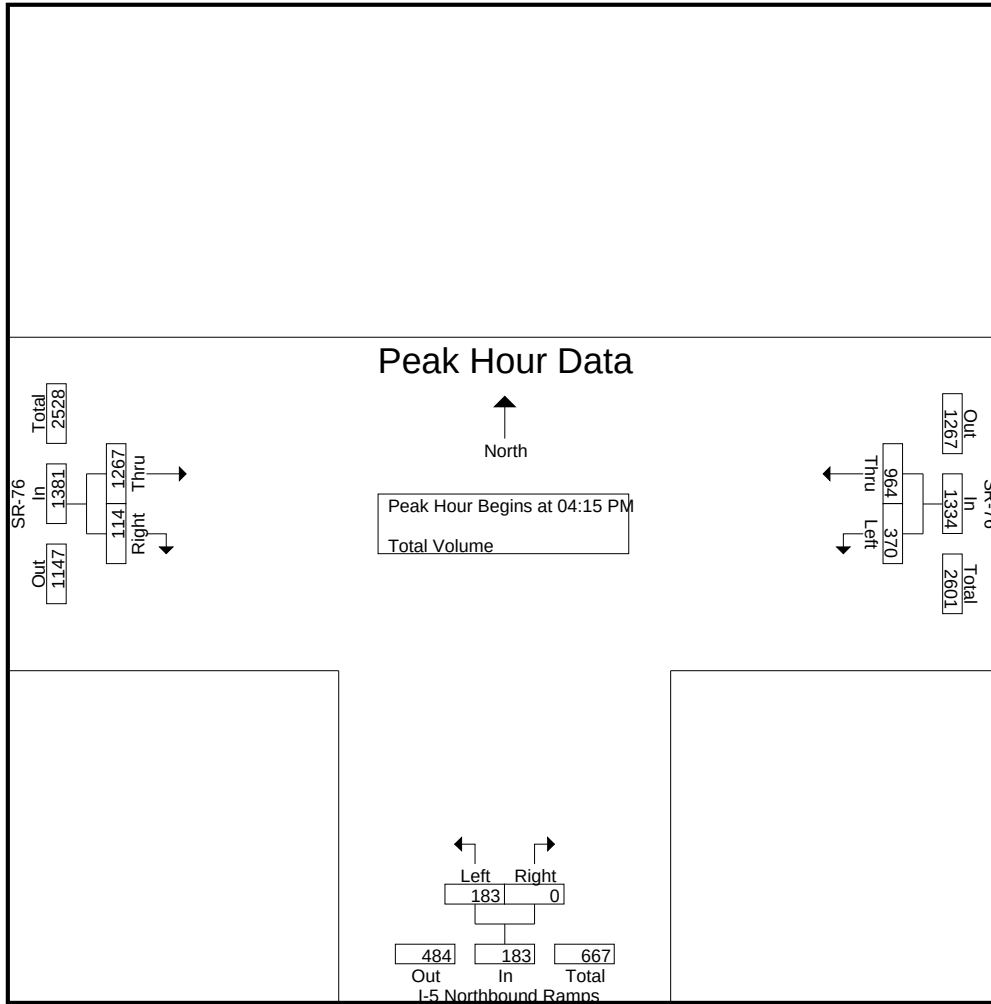
Groups Printed- Total Volume

	SR-76 Westbound			I-5 Northbound Ramps Northbound			SR-76 Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	90	196	286	65	0	65	346	27	373	724
04:15 PM	102	250	352	36	0	36	322	19	341	729
04:30 PM	88	246	334	46	0	46	315	37	352	732
04:45 PM	86	226	312	50	0	50	328	20	348	710
Total	366	918	1284	197	0	197	1311	103	1414	2895
05:00 PM	94	242	336	51	0	51	302	38	340	727
05:15 PM	81	242	323	52	0	52	268	34	302	677
05:30 PM	70	234	304	55	0	55	258	28	286	645
05:45 PM	82	231	313	45	0	45	308	33	341	699
Total	327	949	1276	203	0	203	1136	133	1269	2748
Grand Total	693	1867	2560	400	0	400	2447	236	2683	5643
Apprch %	27.1	72.9		100	0		91.2	8.8		
Total %	12.3	33.1	45.4	7.1	0	7.1	43.4	4.2	47.5	

	SR-76 Westbound			I-5 Northbound Ramps Northbound			SR-76 Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:15 PM										
04:15 PM	102	250	352	36	0	36	322	19	341	729
04:30 PM	88	246	334	46	0	46	315	37	352	732
04:45 PM	86	226	312	50	0	50	328	20	348	710
05:00 PM	94	242	336	51	0	51	302	38	340	727
Total Volume	370	964	1334	183	0	183	1267	114	1381	2898
% App. Total	27.7	72.3		100	0		91.7	8.3		
PHF	.907	.964	.947	.897	.000	.897	.966	.750	.981	.990

City of Oceanside
N/S: I-5 Northbound Ramps
E/W: SR-76
Weather: Clear

File Name : 03_OCS_5N_CA-76 PM
Site Code :
Start Date : 3/13/2018
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM			04:45 PM			04:00 PM		
+0 mins.	102	250	352	50	0	50	346	27	373
+15 mins.	88	246	334	51	0	51	322	19	341
+30 mins.	86	226	312	52	0	52	315	37	352
+45 mins.	94	242	336	55	0	55	328	20	348
Total Volume	370	964	1334	208	0	208	1311	103	1414
% App. Total	27.7	72.3		100	0		92.7	7.3	
PHF	.907	.964	.947	.945	.000	.945	.947	.696	.948

City of Oceanside
N/S: I-5 SB Off Ramp/Pirates Cove
E/W: Mission Avenue
Weather: Clear

File Name : 04_OCS_5S Off_Pirates Cove_Mission AM
Site Code :
Start Date : 3/13/2018
Page No : 1

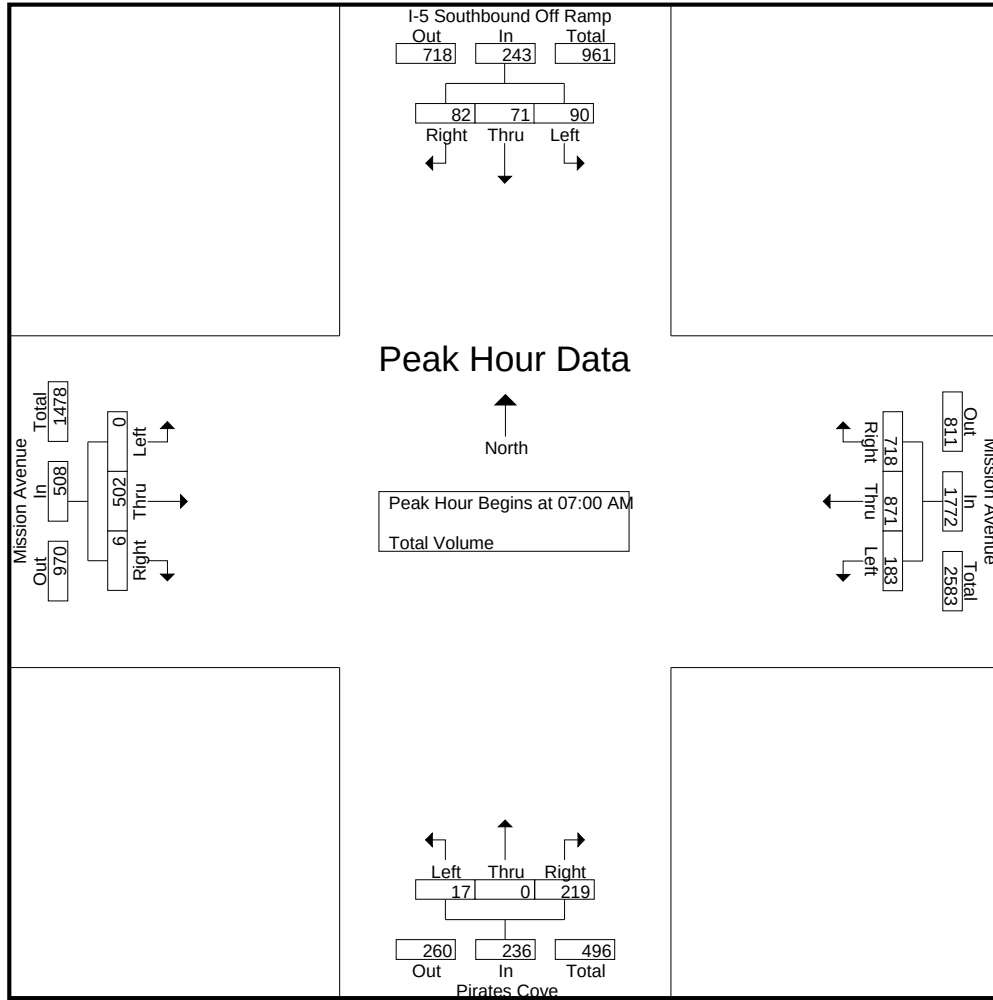
Groups Printed- Total Volume

	I-5 Southbound Off Ramp Southbound				Mission Avenue Westbound				Pirates Cove Northbound				Mission Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	20	19	19	58	81	185	132	398	4	0	69	73	0	106	2	108	637
07:15 AM	20	45	28	93	71	268	176	515	9	0	105	114	0	172	4	176	898
07:30 AM	19	7	12	38	19	183	213	415	4	0	36	40	0	129	0	129	622
07:45 AM	31	0	23	54	12	235	197	444	0	0	9	9	0	95	0	95	602
Total	90	71	82	243	183	871	718	1772	17	0	219	236	0	502	6	508	2759
08:00 AM	18	1	12	31	14	190	176	380	1	0	6	7	0	119	1	120	538
08:15 AM	25	2	10	37	15	159	161	335	0	0	11	11	0	116	2	118	501
08:30 AM	28	2	11	41	10	191	155	356	3	0	9	12	0	142	1	143	552
08:45 AM	19	1	16	36	7	221	143	371	0	0	2	2	0	133	1	134	543
Total	90	6	49	145	46	761	635	1442	4	0	28	32	0	510	5	515	2134
Grand Total	180	77	131	388	229	1632	1353	3214	21	0	247	268	0	1012	11	1023	4893
Apprch %	46.4	19.8	33.8		7.1	50.8	42.1		7.8	0	92.2		0	98.9	1.1		
Total %	3.7	1.6	2.7	7.9	4.7	33.4	27.7	65.7	0.4	0	5	5.5	0	20.7	0.2	20.9	

	I-5 Southbound Off Ramp Southbound				Mission Avenue Westbound				Pirates Cove Northbound				Mission Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	20	19	19	58	81	185	132	398	4	0	69	73	0	106	2	108	637
07:15 AM	20	45	28	93	71	268	176	515	9	0	105	114	0	172	4	176	898
07:30 AM	19	7	12	38	19	183	213	415	4	0	36	40	0	129	0	129	622
07:45 AM	31	0	23	54	12	235	197	444	0	0	9	9	0	95	0	95	602
Total Volume	90	71	82	243	183	871	718	1772	17	0	219	236	0	502	6	508	2759
% App. Total	37	29.2	33.7		10.3	49.2	40.5		7.2	0	92.8		0	98.8	1.2		
PHF	.726	.394	.732	.653	.565	.813	.843	.860	.472	.000	.521	.518	.000	.730	.375	.722	.768

City of Oceanside
N/S: I-5 SB Off Ramp/Pirates Cove
E/W: Mission Avenue
Weather: Clear

File Name : 04_OCS_5S Off_Pirates Cove_Mission AM
Site Code :
Start Date : 3/13/2018
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:00 AM				07:15 AM			
+0 mins.	20	19	19	58	81	185	132	398	4	0	69	73	0	172	4	176
+15 mins.	20	45	28	93	71	268	176	515	9	0	105	114	0	129	0	129
+30 mins.	19	7	12	38	19	183	213	415	4	0	36	40	0	95	0	95
+45 mins.	31	0	23	54	12	235	197	444	0	0	9	9	0	119	1	120
Total Volume	90	71	82	243	183	871	718	1772	17	0	219	236	0	515	5	520
% App. Total	37	29.2	33.7		10.3	49.2	40.5		7.2	0	92.8		0	99	1	
PHF	.726	.394	.732	.653	.565	.813	.843	.860	.472	.000	.521	.518	.000	.749	.313	.739

City of Oceanside
N/S: I-5 SB Off Ramp/Pirates Cove
E/W: Mission Avenue
Weather: Clear

File Name : 04_OCS_5S Off_Pirates Cove_Mission PM
Site Code :
Start Date : 3/13/2018
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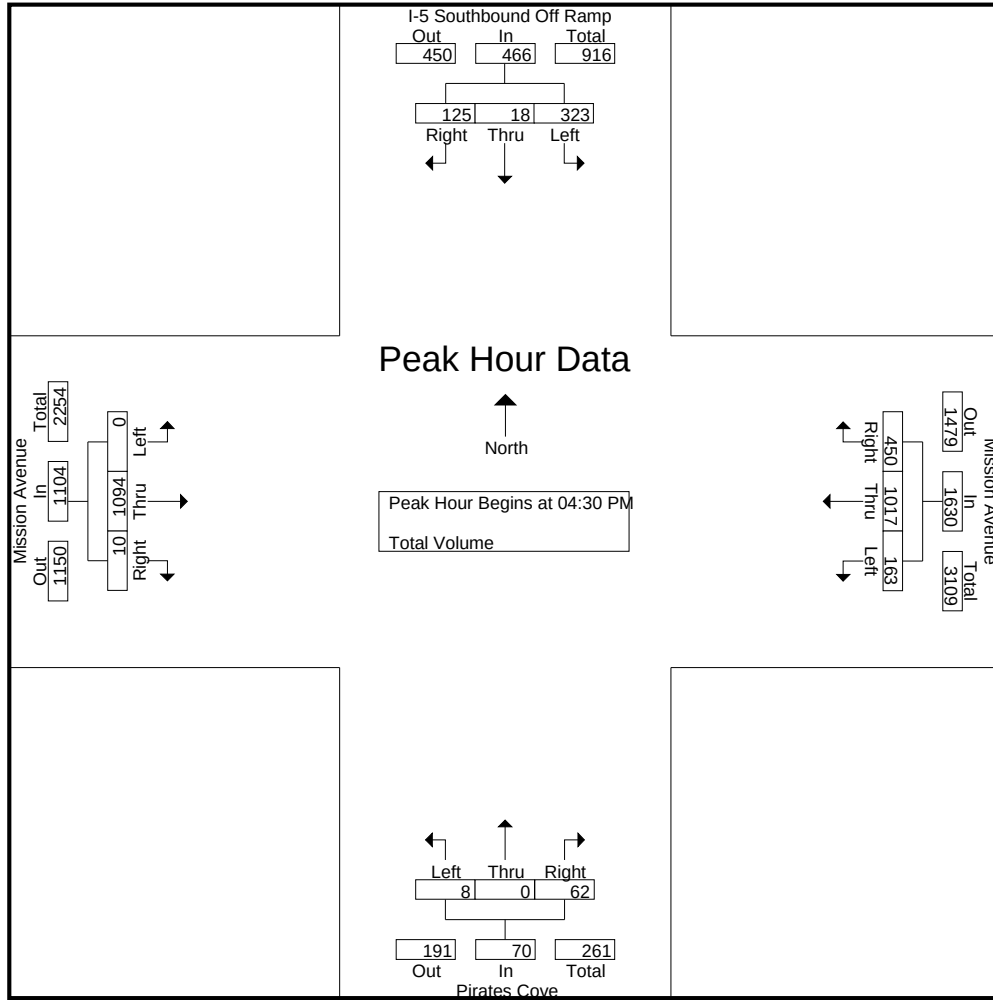
Groups Printed- Total Volume

	I-5 Southbound Off Ramp Southbound				Mission Avenue Westbound				Pirates Cove Northbound				Mission Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	61	4	27	92	20	236	157	413	4	0	20	24	0	233	2	235	764
04:15 PM	82	8	28	118	18	225	115	358	4	0	17	21	0	211	1	212	709
04:30 PM	86	4	27	117	24	272	115	411	1	0	21	22	0	253	3	256	806
04:45 PM	79	4	31	114	40	260	117	417	1	0	9	10	0	250	3	253	794
Total	308	20	113	441	102	993	504	1599	10	0	67	77	0	947	9	956	3073
05:00 PM	91	5	35	131	48	247	116	411	3	0	24	27	0	304	1	305	874
05:15 PM	67	5	32	104	51	238	102	391	3	0	8	11	0	287	3	290	796
05:30 PM	63	6	37	106	21	227	105	353	14	0	29	43	0	260	7	267	769
05:45 PM	51	3	32	86	21	258	116	395	11	0	36	47	0	201	3	204	732
Total	272	19	136	427	141	970	439	1550	31	0	97	128	0	1052	14	1066	3171
Grand Total	580	39	249	868	243	1963	943	3149	41	0	164	205	0	1999	23	2022	6244
Apprch %	66.8	4.5	28.7		7.7	62.3	29.9		20	0	80		0	98.9	1.1		
Total %	9.3	0.6	4	13.9	3.9	31.4	15.1	50.4	0.7	0	2.6	3.3	0	32	0.4	32.4	

	I-5 Southbound Off Ramp Southbound				Mission Avenue Westbound				Pirates Cove Northbound				Mission Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	86	4	27	117	24	272	115	411	1	0	21	22	0	253	3	256	806
04:45 PM	79	4	31	114	40	260	117	417	1	0	9	10	0	250	3	253	794
05:00 PM	91	5	35	131	48	247	116	411	3	0	24	27	0	304	1	305	874
05:15 PM	67	5	32	104	51	238	102	391	3	0	8	11	0	287	3	290	796
Total Volume	323	18	125	466	163	1017	450	1630	8	0	62	70	0	1094	10	1104	3270
% App. Total	69.3	3.9	26.8		10	62.4	27.6		11.4	0	88.6		0	99.1	0.9		
PHF	.887	.900	.893	.889	.799	.935	.962	.977	.667	.000	.646	.648	.000	.900	.833	.905	.935

City of Oceanside
N/S: I-5 SB Off Ramp/Pirates Cove
E/W: Mission Avenue
Weather: Clear

File Name : 04_OCS_5S Off_Pirates Cove_Mission PM
Site Code :
Start Date : 3/13/2018
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:30 PM				05:00 PM				04:45 PM			
+0 mins.	82	8	28	118	24	272	115	411	3	0	24	27	0	250	3	253
+15 mins.	86	4	27	117	40	260	117	417	3	0	8	11	0	304	1	305
+30 mins.	79	4	31	114	48	247	116	411	14	0	29	43	0	287	3	290
+45 mins.	91	5	35	131	51	238	102	391	11	0	36	47	0	260	7	267
Total Volume	338	21	121	480	163	1017	450	1630	31	0	97	128	0	1101	14	1115
% App. Total	70.4	4.4	25.2		10	62.4	27.6		24.2	0	75.8		0	98.7	1.3	
PHF	.929	.656	.864	.916	.799	.935	.962	.977	.554	.000	.674	.681	.000	.905	.500	.914

City of Oceanside
N/S: I-5 Northbound Ramps
E/W: Mission Avenue
Weather: Clear

File Name : 05_OCS_5N On_Mission AM
Site Code :
Start Date : 3/13/2018
Page No : 1

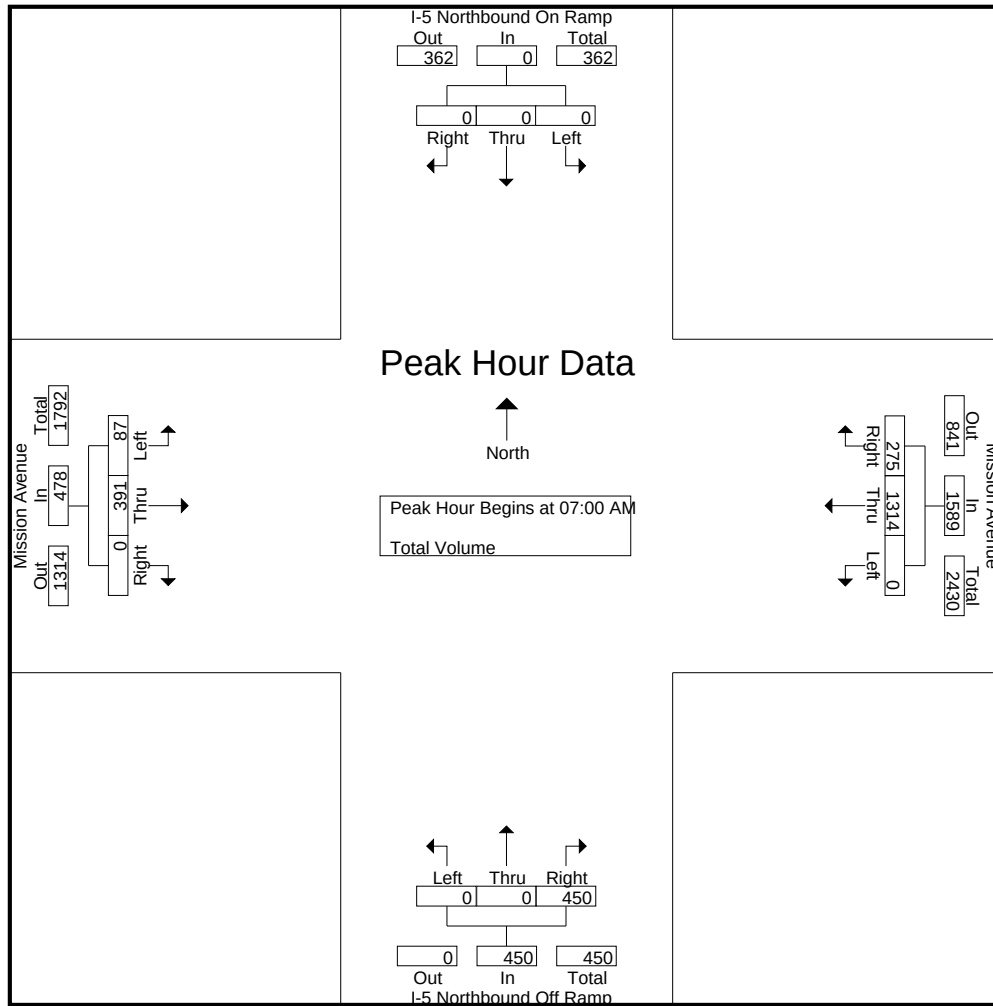
Groups Printed- Total Volume

	I-5 Northbound On Ramp Southbound				Mission Avenue Westbound				I-5 Northbound Off Ramp Northbound				Mission Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	0	305	56	361	0	0	103	103	20	93	0	113	577
07:15 AM	0	0	0	0	0	355	78	433	0	0	125	125	31	142	0	173	731
07:30 AM	0	0	0	0	0	333	82	415	0	0	112	112	25	87	0	112	639
07:45 AM	0	0	0	0	0	321	59	380	0	0	110	110	11	69	0	80	570
Total	0	0	0	0	0	1314	275	1589	0	0	450	450	87	391	0	478	2517
08:00 AM	0	0	0	0	0	282	40	322	0	0	129	129	16	63	0	79	530
08:15 AM	0	0	0	0	0	252	42	294	0	0	154	154	17	69	0	86	534
08:30 AM	0	0	0	0	0	246	38	284	0	0	126	126	23	73	0	96	506
08:45 AM	0	0	0	0	0	250	36	286	0	0	101	101	14	62	0	76	463
Total	0	0	0	0	0	1030	156	1186	0	0	510	510	70	267	0	337	2033
Grand Total	0	0	0	0	0	2344	431	2775	0	0	960	960	157	658	0	815	4550
Apprch %	0	0	0		0	84.5	15.5		0	0	100		19.3	80.7	0		
Total %	0	0	0	0	0	51.5	9.5	61	0	0	21.1	21.1	3.5	14.5	0	17.9	

	I-5 Northbound On Ramp Southbound				Mission Avenue Westbound				I-5 Northbound Off Ramp Northbound				Mission Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	0	305	56	361	0	0	103	103	20	93	0	113	577
07:15 AM	0	0	0	0	0	355	78	433	0	0	125	125	31	142	0	173	731
07:30 AM	0	0	0	0	0	333	82	415	0	0	112	112	25	87	0	112	639
07:45 AM	0	0	0	0	0	321	59	380	0	0	110	110	11	69	0	80	570
Total Volume	0	0	0	0	0	1314	275	1589	0	0	450	450	87	391	0	478	2517
% App. Total	0	0	0		0	82.7	17.3		0	0	100		18.2	81.8	0		
PHF	.000	.000	.000	.000	.000	.925	.838	.917	.000	.000	.900	.900	.702	.688	.000	.691	.861

City of Oceanside
N/S: I-5 Northbound Ramps
E/W: Mission Avenue
Weather: Clear

File Name : 05_OCS_5N On_Mission AM
Site Code :
Start Date : 3/13/2018
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				07:45 AM				07:00 AM			
+0 mins.	0	0	0	0	0	305	56	361	0	0	110	110	20	93	0	113
+15 mins.	0	0	0	0	0	355	78	433	0	0	129	129	31	142	0	173
+30 mins.	0	0	0	0	0	333	82	415	0	0	154	154	25	87	0	112
+45 mins.	0	0	0	0	0	321	59	380	0	0	126	126	11	69	0	80
Total Volume	0	0	0	0	0	1314	275	1589	0	0	519	519	87	391	0	478
% App. Total	0	0	0	0	0	82.7	17.3		0	0	100		18.2	81.8	0	
PHF	.000	.000	.000	.000	.000	.925	.838	.917	.000	.000	.843	.843	.702	.688	.000	.691

City of Oceanside
N/S: I-5 Northbound Ramps
E/W: Mission Avenue
Weather: Clear

File Name : 05_OCS_5N On_Mission PM
Site Code :
Start Date : 3/13/2018
Page No : 1

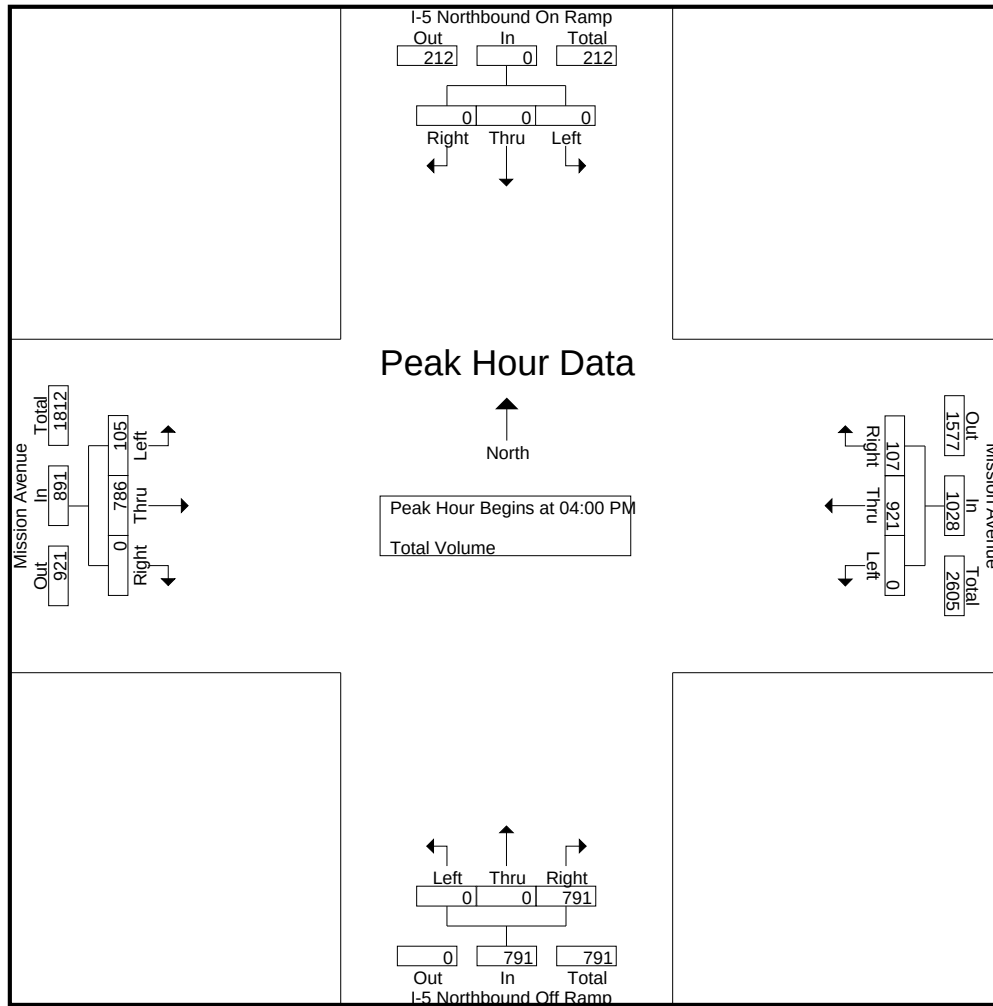
Groups Printed- Total Volume

	I-5 Northbound On Ramp Southbound				Mission Avenue Westbound				I-5 Northbound Off Ramp Northbound				Mission Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	0	266	29	295	0	0	216	216	22	161	0	183	694
04:15 PM	0	0	0	0	0	224	31	255	0	0	220	220	13	188	0	201	676
04:30 PM	0	0	0	0	0	222	21	243	0	0	183	183	38	208	0	246	672
04:45 PM	0	0	0	0	0	209	26	235	0	0	172	172	32	229	0	261	668
Total	0	0	0	0	0	921	107	1028	0	0	791	791	105	786	0	891	2710
05:00 PM	0	0	0	0	0	217	30	247	0	0	169	169	35	234	0	269	685
05:15 PM	0	0	0	0	0	195	27	222	0	0	185	185	23	225	0	248	655
05:30 PM	0	0	0	0	0	187	27	214	0	0	211	211	30	195	0	225	650
05:45 PM	0	0	0	0	0	221	20	241	0	0	199	199	32	166	0	198	638
Total	0	0	0	0	0	820	104	924	0	0	764	764	120	820	0	940	2628
Grand Total	0	0	0	0	0	1741	211	1952	0	0	1555	1555	225	1606	0	1831	5338
Apprch %	0	0	0		0	89.2	10.8		0	0	100		12.3	87.7	0		
Total %	0	0	0	0	0	32.6	4	36.6	0	0	29.1	29.1	4.2	30.1	0	34.3	

	I-5 Northbound On Ramp Southbound				Mission Avenue Westbound				I-5 Northbound Off Ramp Northbound				Mission Avenue Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	0	0	0	0	0	266	29	295	0	0	216	216	22	161	0	183	694
04:15 PM	0	0	0	0	0	224	31	255	0	0	220	220	13	188	0	201	676
04:30 PM	0	0	0	0	0	222	21	243	0	0	183	183	38	208	0	246	672
04:45 PM	0	0	0	0	0	209	26	235	0	0	172	172	32	229	0	261	668
Total Volume	0	0	0	0	0	921	107	1028	0	0	791	791	105	786	0	891	2710
% App. Total	0	0	0		0	89.6	10.4		0	0	100		11.8	88.2	0		
PHF	.000	.000	.000	.000	.000	.866	.863	.871	.000	.000	.899	.899	.691	.858	.000	.853	.976

City of Oceanside
N/S: I-5 Northbound Ramps
E/W: Mission Avenue
Weather: Clear

File Name : 05_OCS_5N On_Mission PM
Site Code :
Start Date : 3/13/2018
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:00 PM				04:00 PM				04:00 PM				04:30 PM			
+0 mins.	0	0	0	0	0	266	29	295	0	0	216	216	38	208	0	246
+15 mins.	0	0	0	0	0	224	31	255	0	0	220	220	32	229	0	261
+30 mins.	0	0	0	0	0	222	21	243	0	0	183	183	35	234	0	269
+45 mins.	0	0	0	0	0	209	26	235	0	0	172	172	23	225	0	248
Total Volume	0	0	0	0	0	921	107	1028	0	0	791	791	128	896	0	1024
% App. Total	0	0	0	0	0	89.6	10.4		0	0	100		12.5	87.5	0	
PHF	.000	.000	.000	.000	.000	.866	.863	.871	.000	.000	.899	.899	.842	.957	.000	.952

City of Oceanside
N/S: I-5 SB Ramps/Parkwood Lane
E/W: Oceanside Boulevard
Weather: Clear

File Name : 06_OCS_5S_Parkwood_Oceanside AM
Site Code :
Start Date : 3/13/2018
Page No : 1

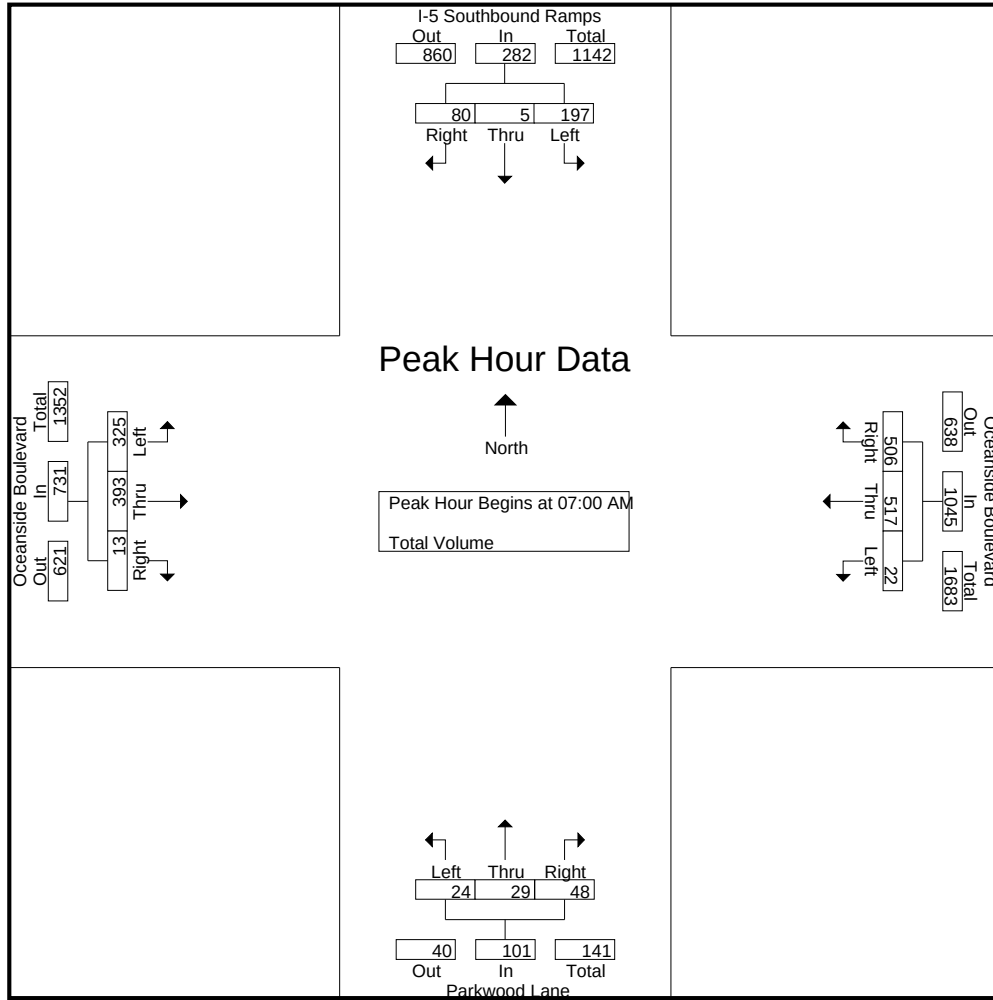
Groups Printed- Total Volume

	I-5 Southbound Ramps Southbound				Oceanside Boulevard Westbound				Parkwood Lane Northbound				Oceanside Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	58	4	41	103	3	132	98	233	10	5	12	27	77	103	2	182	545
07:15 AM	44	0	8	52	3	141	103	247	8	6	16	30	77	110	5	192	521
07:30 AM	44	1	14	59	11	114	170	295	3	8	7	18	79	85	5	169	541
07:45 AM	51	0	17	68	5	130	135	270	3	10	13	26	92	95	1	188	552
Total	197	5	80	282	22	517	506	1045	24	29	48	101	325	393	13	731	2159
08:00 AM	63	3	15	81	5	120	109	234	3	9	7	19	79	95	4	178	512
08:15 AM	53	2	14	69	4	132	138	274	1	3	8	12	69	89	3	161	516
08:30 AM	55	3	10	68	10	126	129	265	2	11	10	23	76	93	5	174	530
08:45 AM	45	1	18	64	6	128	114	248	1	7	4	12	77	93	2	172	496
Total	216	9	57	282	25	506	490	1021	7	30	29	66	301	370	14	685	2054
Grand Total	413	14	137	564	47	1023	996	2066	31	59	77	167	626	763	27	1416	4213
Apprch %	73.2	2.5	24.3		2.3	49.5	48.2		18.6	35.3	46.1		44.2	53.9	1.9		
Total %	9.8	0.3	3.3	13.4	1.1	24.3	23.6	49	0.7	1.4	1.8	4	14.9	18.1	0.6	33.6	

	I-5 Southbound Ramps Southbound				Oceanside Boulevard Westbound				Parkwood Lane Northbound				Oceanside Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	58	4	41	103	3	132	98	233	10	5	12	27	77	103	2	182	545
07:15 AM	44	0	8	52	3	141	103	247	8	6	16	30	77	110	5	192	521
07:30 AM	44	1	14	59	11	114	170	295	3	8	7	18	79	85	5	169	541
07:45 AM	51	0	17	68	5	130	135	270	3	10	13	26	92	95	1	188	552
Total Volume	197	5	80	282	22	517	506	1045	24	29	48	101	325	393	13	731	2159
% App. Total	69.9	1.8	28.4		2.1	49.5	48.4		23.8	28.7	47.5		44.5	53.8	1.8		
PHF	.849	.313	.488	.684	.500	.917	.744	.886	.600	.725	.750	.842	.883	.893	.650	.952	.978

City of Oceanside
N/S: I-5 SB Ramps/Parkwood Lane
E/W: Oceanside Boulevard
Weather: Clear

File Name : 06_OCS_5S_Parkwood_Oceanside AM
Site Code :
Start Date : 3/13/2018
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:45 AM				07:30 AM				07:00 AM				07:00 AM			
+0 mins.	51	0	17	68	11	114	170	295	10	5	12	27	77	103	2	182
+15 mins.	63	3	15	81	5	130	135	270	8	6	16	30	77	110	5	192
+30 mins.	53	2	14	69	5	120	109	234	3	8	7	18	79	85	5	169
+45 mins.	55	3	10	68	4	132	138	274	3	10	13	26	92	95	1	188
Total Volume	222	8	56	286	25	496	552	1073	24	29	48	101	325	393	13	731
% App. Total	77.6	2.8	19.6		2.3	46.2	51.4		23.8	28.7	47.5		44.5	53.8	1.8	
PHF	.881	.667	.824	.883	.568	.939	.812	.909	.600	.725	.750	.842	.883	.893	.650	.952

City of Oceanside
N/S: I-5 SB Ramps/Parkwood Lane
E/W: Oceanside Boulevard
Weather: Clear

File Name : 06_OCS_5S_Parkwood_Oceanside PM
Site Code :
Start Date : 3/13/2018
Page No : 1

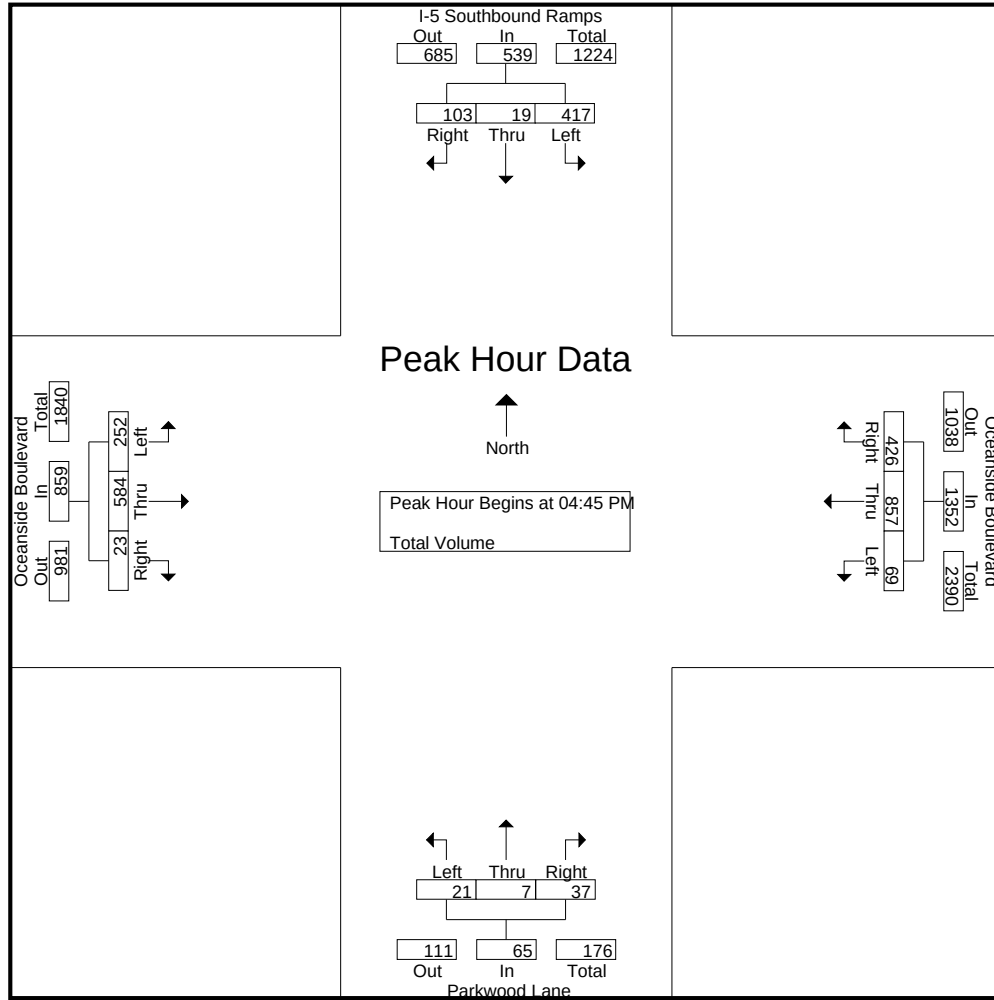
Groups Printed- Total Volume

	I-5 Southbound Ramps Southbound				Oceanside Boulevard Westbound				Parkwood Lane Northbound				Oceanside Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	82	2	24	108	17	222	124	363	6	3	14	23	76	139	4	219	713
04:15 PM	89	3	28	120	14	216	86	316	6	0	9	15	76	134	7	217	668
04:30 PM	88	4	34	126	15	185	87	287	3	6	16	25	65	133	7	205	643
04:45 PM	115	3	33	151	11	247	109	367	3	0	12	15	64	147	3	214	747
Total	374	12	119	505	57	870	406	1333	18	9	51	78	281	553	21	855	2771
05:00 PM	105	4	23	132	21	220	131	372	7	2	6	15	57	166	7	230	749
05:15 PM	97	9	19	125	23	191	105	319	9	3	10	22	59	142	8	209	675
05:30 PM	100	3	28	131	14	199	81	294	2	2	9	13	72	129	5	206	644
05:45 PM	84	3	19	106	22	247	68	337	4	2	8	14	65	132	10	207	664
Total	386	19	89	494	80	857	385	1322	22	9	33	64	253	569	30	852	2732
Grand Total	760	31	208	999	137	1727	791	2655	40	18	84	142	534	1122	51	1707	5503
Apprch %	76.1	3.1	20.8		5.2	65	29.8		28.2	12.7	59.2		31.3	65.7	3		
Total %	13.8	0.6	3.8	18.2	2.5	31.4	14.4	48.2	0.7	0.3	1.5	2.6	9.7	20.4	0.9	31	

	I-5 Southbound Ramps Southbound				Oceanside Boulevard Westbound				Parkwood Lane Northbound				Oceanside Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	115	3	33	151	11	247	109	367	3	0	12	15	64	147	3	214	747
05:00 PM	105	4	23	132	21	220	131	372	7	2	6	15	57	166	7	230	749
05:15 PM	97	9	19	125	23	191	105	319	9	3	10	22	59	142	8	209	675
05:30 PM	100	3	28	131	14	199	81	294	2	2	9	13	72	129	5	206	644
Total Volume	417	19	103	539	69	857	426	1352	21	7	37	65	252	584	23	859	2815
% App. Total	77.4	3.5	19.1		5.1	63.4	31.5		32.3	10.8	56.9		29.3	68	2.7		
PHF	.907	.528	.780	.892	.750	.867	.813	.909	.583	.583	.771	.739	.875	.880	.719	.934	.940

City of Oceanside
N/S: I-5 SB Ramps/Parkwood Lane
E/W: Oceanside Boulevard
Weather: Clear

File Name : 06_OCS_5S_Parkwood_Oceanside PM
Site Code :
Start Date : 3/13/2018
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				04:00 PM				04:15 PM			
+0 mins.	115	3	33	151	11	247	109	367	6	3	14	23	76	134	7	217
+15 mins.	105	4	23	132	21	220	131	372	6	0	9	15	65	133	7	205
+30 mins.	97	9	19	125	23	191	105	319	3	6	16	25	64	147	3	214
+45 mins.	100	3	28	131	14	199	81	294	3	0	12	15	57	166	7	230
Total Volume	417	19	103	539	69	857	426	1352	18	9	51	78	262	580	24	866
% App. Total	77.4	3.5	19.1		5.1	63.4	31.5		23.1	11.5	65.4		30.3	67	2.8	
PHF	.907	.528	.780	.892	.750	.867	.813	.909	.750	.375	.797	.780	.862	.873	.857	.941

City of Oceanside
N/S: I-5 NB Ramps/Commerce Street
E/W: Oceanside Boulevard
Weather: Clear

File Name : 07_OCS_5N_Commerce_Oceanside AM
Site Code :
Start Date : 3/13/2018
Page No : 1

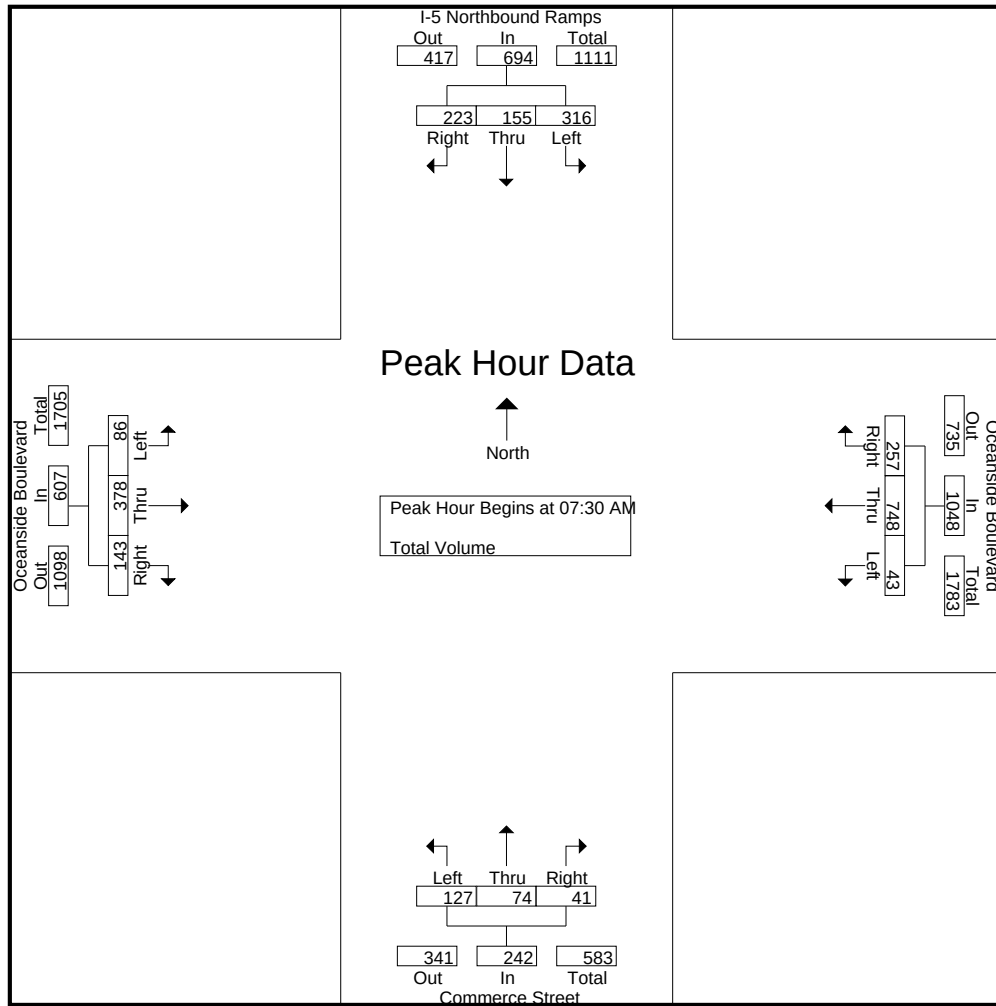
Groups Printed- Total Volume

	I-5 Northbound Ramps Southbound				Oceanside Boulevard Westbound				Commerce Street Northbound				Oceanside Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	49	25	48	122	11	166	78	255	18	20	9	47	31	121	26	178	602
07:15 AM	49	32	59	140	15	164	90	269	23	15	6	44	37	111	25	173	626
07:30 AM	66	28	52	146	6	226	74	306	33	25	7	65	17	85	33	135	652
07:45 AM	95	42	51	188	10	194	62	266	27	14	11	52	21	114	31	166	672
Total	259	127	210	596	42	750	304	1096	101	74	33	208	106	431	115	652	2552
08:00 AM	74	47	48	169	12	157	58	227	28	12	7	47	22	102	41	165	608
08:15 AM	81	38	72	191	15	171	63	249	39	23	16	78	26	77	38	141	659
08:30 AM	81	40	43	164	13	166	50	229	26	16	8	50	23	109	24	156	599
08:45 AM	94	34	62	190	17	158	50	225	42	23	7	72	17	102	29	148	635
Total	330	159	225	714	57	652	221	930	135	74	38	247	88	390	132	610	2501
Grand Total	589	286	435	1310	99	1402	525	2026	236	148	71	455	194	821	247	1262	5053
Apprch %	45	21.8	33.2		4.9	69.2	25.9		51.9	32.5	15.6		15.4	65.1	19.6		
Total %	11.7	5.7	8.6	25.9	2	27.7	10.4	40.1	4.7	2.9	1.4	9	3.8	16.2	4.9	25	

	I-5 Northbound Ramps Southbound				Oceanside Boulevard Westbound				Commerce Street Northbound				Oceanside Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	66	28	52	146	6	226	74	306	33	25	7	65	17	85	33	135	652
07:45 AM	95	42	51	188	10	194	62	266	27	14	11	52	21	114	31	166	672
08:00 AM	74	47	48	169	12	157	58	227	28	12	7	47	22	102	41	165	608
08:15 AM	81	38	72	191	15	171	63	249	39	23	16	78	26	77	38	141	659
Total Volume	316	155	223	694	43	748	257	1048	127	74	41	242	86	378	143	607	2591
% App. Total	45.5	22.3	32.1		4.1	71.4	24.5		52.5	30.6	16.9		14.2	62.3	23.6		
PHF	.832	.824	.774	.908	.717	.827	.868	.856	.814	.740	.641	.776	.827	.829	.872	.914	.964

City of Oceanside
N/S: I-5 NB Ramps/Commerce Street
E/W: Oceanside Boulevard
Weather: Clear

File Name : 07_OCS_5N_Commerce_Oceanside AM
Site Code :
Start Date : 3/13/2018
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Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				07:00 AM				08:00 AM				07:00 AM			
+0 mins.	74	47	48	169	11	166	78	255	28	12	7	47	31	121	26	178
+15 mins.	81	38	72	191	15	164	90	269	39	23	16	78	37	111	25	173
+30 mins.	81	40	43	164	6	226	74	306	26	16	8	50	17	85	33	135
+45 mins.	94	34	62	190	10	194	62	266	42	23	7	72	21	114	31	166
Total Volume	330	159	225	714	42	750	304	1096	135	74	38	247	106	431	115	652
% App. Total	46.2	22.3	31.5		3.8	68.4	27.7		54.7	30	15.4		16.3	66.1	17.6	
PHF	.878	.846	.781	.935	.700	.830	.844	.895	.804	.804	.594	.792	.716	.890	.871	.916

City of Oceanside
N/S: I-5 NB Ramps/Commerce Street
E/W: Oceanside Boulevard
Weather: Clear

File Name : 07_OCS_5N_Commerce_Oceanside PM
Site Code :
Start Date : 3/13/2018
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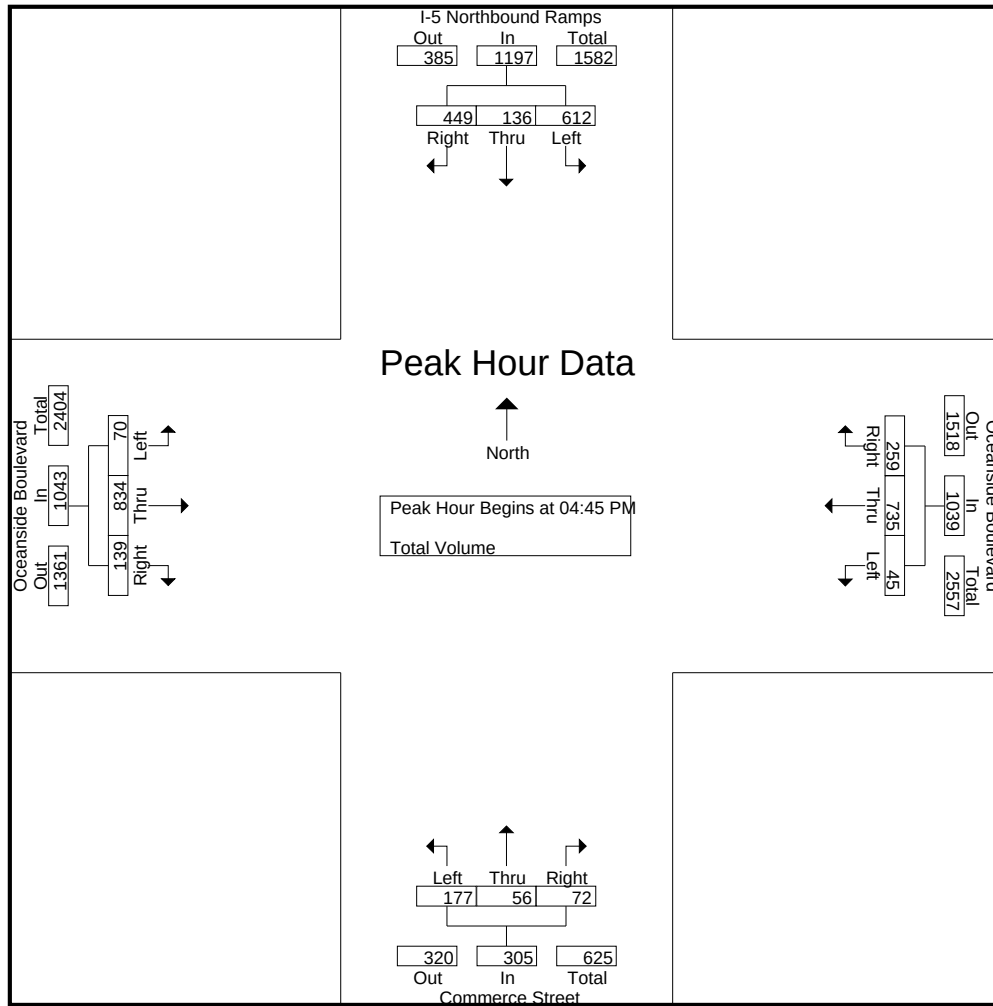
Groups Printed- Total Volume

	I-5 Northbound Ramps Southbound				Oceanside Boulevard Westbound				Commerce Street Northbound				Oceanside Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	137	26	110	273	6	196	62	264	44	20	14	78	18	188	28	234	849
04:15 PM	136	33	127	296	8	153	54	215	39	14	17	70	14	182	36	232	813
04:30 PM	144	26	108	278	6	140	44	190	46	8	14	68	17	204	17	238	774
04:45 PM	151	31	127	309	9	213	69	291	35	11	13	59	23	212	32	267	926
Total	568	116	472	1156	29	702	229	960	164	53	58	275	72	786	113	971	3362
05:00 PM	146	38	109	293	15	183	61	259	66	15	17	98	21	220	35	276	926
05:15 PM	168	31	114	313	10	172	60	242	45	20	19	84	15	204	37	256	895
05:30 PM	147	36	99	282	11	167	69	247	31	10	23	64	11	198	35	244	837
05:45 PM	121	26	126	273	11	152	64	227	40	24	20	84	21	194	28	243	827
Total	582	131	448	1161	47	674	254	975	182	69	79	330	68	816	135	1019	3485
Grand Total	1150	247	920	2317	76	1376	483	1935	346	122	137	605	140	1602	248	1990	6847
Apprch %	49.6	10.7	39.7		3.9	71.1	25		57.2	20.2	22.6		7	80.5	12.5		
Total %	16.8	3.6	13.4	33.8	1.1	20.1	7.1	28.3	5.1	1.8	2	8.8	2	23.4	3.6	29.1	

	I-5 Northbound Ramps Southbound				Oceanside Boulevard Westbound				Commerce Street Northbound				Oceanside Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	151	31	127	309	9	213	69	291	35	11	13	59	23	212	32	267	926
05:00 PM	146	38	109	293	15	183	61	259	66	15	17	98	21	220	35	276	926
05:15 PM	168	31	114	313	10	172	60	242	45	20	19	84	15	204	37	256	895
05:30 PM	147	36	99	282	11	167	69	247	31	10	23	64	11	198	35	244	837
Total Volume	612	136	449	1197	45	735	259	1039	177	56	72	305	70	834	139	1043	3584
% App. Total	51.1	11.4	37.5		4.3	70.7	24.9		58	18.4	23.6		6.7	80	13.3		
PHF	.911	.895	.884	.956	.750	.863	.938	.893	.670	.700	.783	.778	.761	.948	.939	.945	.968

City of Oceanside
N/S: I-5 NB Ramps/Commerce Street
E/W: Oceanside Boulevard
Weather: Clear

File Name : 07_OCS_5N_Commerce_Oceanside PM
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Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:45 PM				04:45 PM				05:00 PM				04:45 PM			
+0 mins.	151	31	127	309	9	213	69	291	66	15	17	98	23	212	32	267
+15 mins.	146	38	109	293	15	183	61	259	45	20	19	84	21	220	35	276
+30 mins.	168	31	114	313	10	172	60	242	31	10	23	64	15	204	37	256
+45 mins.	147	36	99	282	11	167	69	247	40	24	20	84	11	198	35	244
Total Volume	612	136	449	1197	45	735	259	1039	182	69	79	330	70	834	139	1043
% App. Total	51.1	11.4	37.5		4.3	70.7	24.9		55.2	20.9	23.9		6.7	80	13.3	
PHF	.911	.895	.884	.956	.750	.863	.938	.893	.689	.719	.859	.842	.761	.948	.939	.945

City of Oceanside
N/S: I-5 NB On Ramp/Soto Street
E/W: California Street
Weather: Clear

File Name : 08_OCS_5N_California AM
Site Code :
Start Date : 3/13/2018
Page No : 1

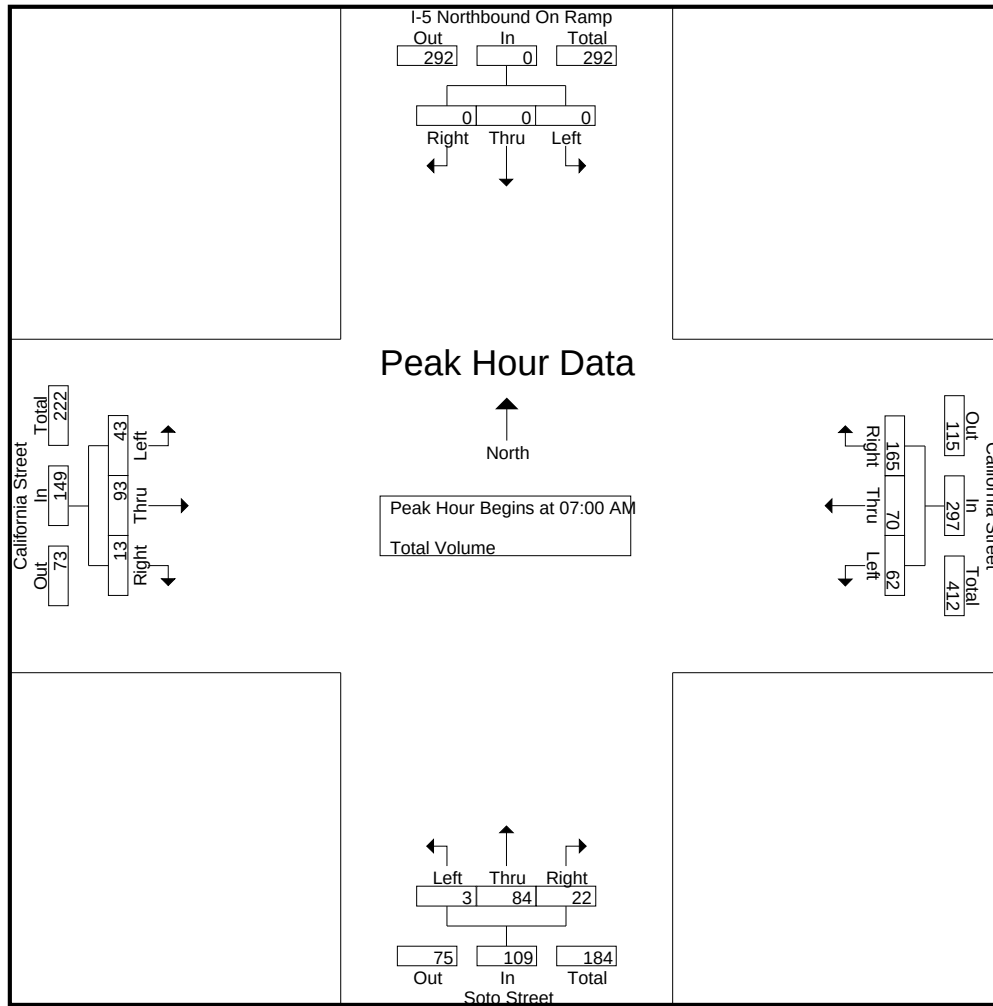
Groups Printed- Total Volume

	I-5 Northbound On Ramp Southbound				California Street Westbound				Soto Street Northbound				California Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	0	0	11	17	51	79	0	28	4	32	10	34	3	47	158
07:15 AM	0	0	0	0	23	31	70	124	2	16	8	26	8	36	5	49	199
07:30 AM	0	0	0	0	19	16	23	58	1	22	4	27	9	11	2	22	107
07:45 AM	0	0	0	0	9	6	21	36	0	18	6	24	16	12	3	31	91
Total	0	0	0	0	62	70	165	297	3	84	22	109	43	93	13	149	555
08:00 AM	0	0	0	0	18	16	23	57	0	22	6	28	12	21	6	39	124
08:15 AM	0	0	0	0	11	25	18	54	2	33	3	38	14	8	4	26	118
08:30 AM	0	0	0	0	6	15	15	36	0	37	3	40	22	6	2	30	106
08:45 AM	0	0	0	0	7	22	7	36	2	34	5	41	31	20	2	53	130
Total	0	0	0	0	42	78	63	183	4	126	17	147	79	55	14	148	478
Grand Total	0	0	0	0	104	148	228	480	7	210	39	256	122	148	27	297	1033
Apprch %	0	0	0		21.7	30.8	47.5		2.7	82	15.2		41.1	49.8	9.1		
Total %	0	0	0		10.1	14.3	22.1	46.5	0.7	20.3	3.8	24.8	11.8	14.3	2.6	28.8	

	I-5 Northbound On Ramp Southbound				California Street Westbound				Soto Street Northbound				California Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:00 AM																	
07:00 AM	0	0	0	0	11	17	51	79	0	28	4	32	10	34	3	47	158
07:15 AM	0	0	0	0	23	31	70	124	2	16	8	26	8	36	5	49	199
07:30 AM	0	0	0	0	19	16	23	58	1	22	4	27	9	11	2	22	107
07:45 AM	0	0	0	0	9	6	21	36	0	18	6	24	16	12	3	31	91
Total Volume	0	0	0	0	62	70	165	297	3	84	22	109	43	93	13	149	555
% App. Total	0	0	0		20.9	23.6	55.6		2.8	77.1	20.2		28.9	62.4	8.7		
PHF	.000	.000	.000	.000	.674	.565	.589	.599	.375	.750	.688	.852	.672	.646	.650	.760	.697

City of Oceanside
N/S: I-5 NB On Ramp/Soto Street
E/W: California Street
Weather: Clear

File Name : 08_OCS_5N_California AM
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Start Date : 3/13/2018
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Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	07:00 AM				07:00 AM				08:00 AM				07:00 AM			
+0 mins.	0	0	0	0	11	17	51	79	0	22	6	28	10	34	3	47
+15 mins.	0	0	0	0	23	31	70	124	2	33	3	38	8	36	5	49
+30 mins.	0	0	0	0	19	16	23	58	0	37	3	40	9	11	2	22
+45 mins.	0	0	0	0	9	6	21	36	2	34	5	41	16	12	3	31
Total Volume	0	0	0	0	62	70	165	297	4	126	17	147	43	93	13	149
% App. Total	0	0	0	0	20.9	23.6	55.6		2.7	85.7	11.6		28.9	62.4	8.7	
PHF	.000	.000	.000	.000	.674	.565	.589	.599	.500	.851	.708	.896	.672	.646	.650	.760

City of Oceanside
N/S: I-5 NB On Ramp/Soto Street
E/W: California Street
Weather: Clear

File Name : 08_OCS_5N_California PM
Site Code :
Start Date : 3/13/2018
Page No : 1

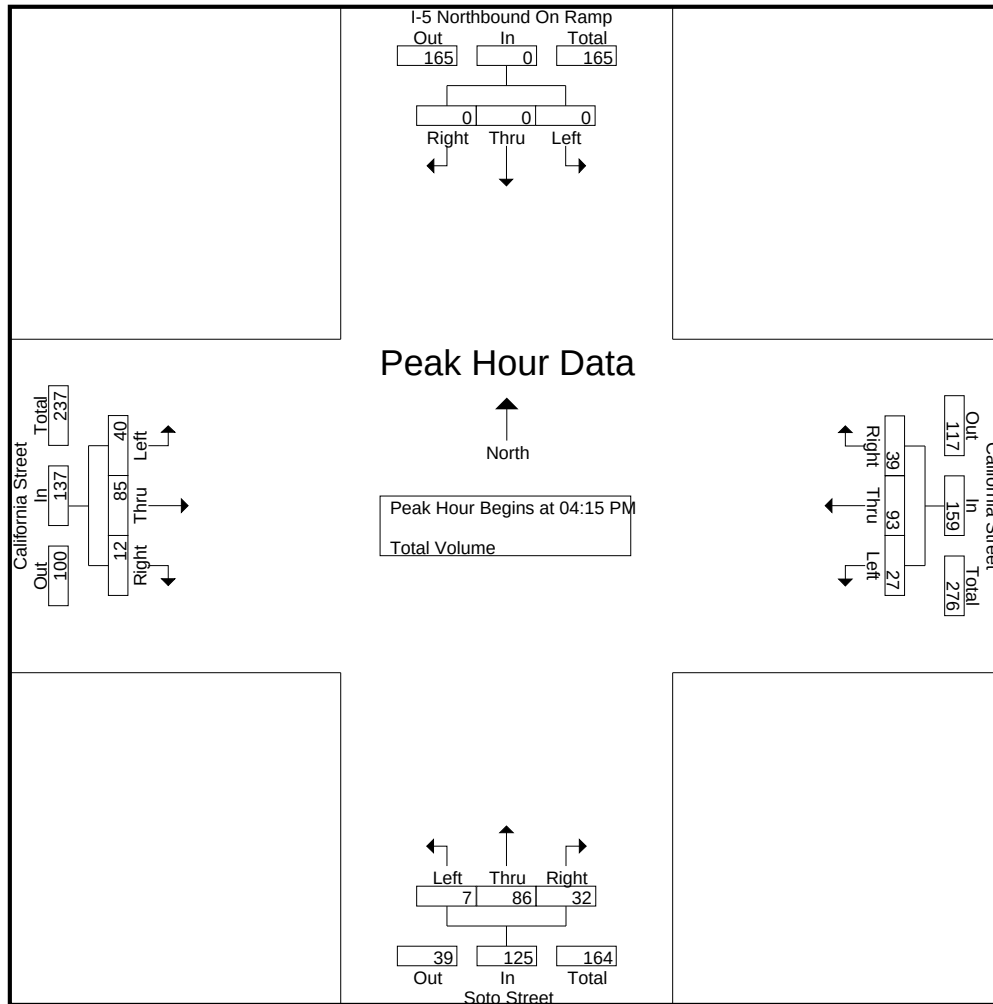
Groups Printed- Total Volume

	I-5 Northbound On Ramp Southbound				California Street Westbound				Soto Street Northbound				California Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	0	0	0	0	5	21	6	32	1	19	12	32	15	19	4	38	102
04:15 PM	0	0	0	0	9	32	11	52	0	21	9	30	10	24	3	37	119
04:30 PM	0	0	0	0	4	24	9	37	2	26	11	39	6	19	1	26	102
04:45 PM	0	0	0	0	5	18	8	31	1	21	6	28	14	19	5	38	97
Total	0	0	0	0	23	95	34	152	4	87	38	129	45	81	13	139	420
05:00 PM	0	0	0	0	9	19	11	39	4	18	6	28	10	23	3	36	103
05:15 PM	0	0	0	0	9	14	5	28	1	23	12	36	13	23	5	41	105
05:30 PM	0	0	0	0	9	19	21	49	2	18	12	32	7	24	3	34	115
05:45 PM	0	0	0	0	8	19	6	33	2	20	9	31	12	15	2	29	93
Total	0	0	0	0	35	71	43	149	9	79	39	127	42	85	13	140	416
Grand Total	0	0	0	0	58	166	77	301	13	166	77	256	87	166	26	279	836
Apprch %	0	0	0		19.3	55.1	25.6		5.1	64.8	30.1		31.2	59.5	9.3		
Total %	0	0	0	0	6.9	19.9	9.2	36	1.6	19.9	9.2	30.6	10.4	19.9	3.1	33.4	

	I-5 Northbound On Ramp Southbound				California Street Westbound				Soto Street Northbound				California Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	0	0	0	0	9	32	11	52	0	21	9	30	10	24	3	37	119
04:30 PM	0	0	0	0	4	24	9	37	2	26	11	39	6	19	1	26	102
04:45 PM	0	0	0	0	5	18	8	31	1	21	6	28	14	19	5	38	97
05:00 PM	0	0	0	0	9	19	11	39	4	18	6	28	10	23	3	36	103
Total Volume	0	0	0	0	27	93	39	159	7	86	32	125	40	85	12	137	421
% App. Total	0	0	0		17	58.5	24.5		5.6	68.8	25.6		29.2	62	8.8		
PHF	.000	.000	.000	.000	.750	.727	.886	.764	.438	.827	.727	.801	.714	.885	.600	.901	.884

City of Oceanside
N/S: I-5 NB On Ramp/Soto Street
E/W: California Street
Weather: Clear

File Name : 08_OCS_5N_California PM
Site Code :
Start Date : 3/13/2018
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Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1

Peak Hour for Each Approach Begins at:

	04:00 PM				04:15 PM				04:30 PM				04:45 PM			
+0 mins.	0	0	0	0	9	32	11	52	2	26	11	39	14	19	5	38
+15 mins.	0	0	0	0	4	24	9	37	1	21	6	28	10	23	3	36
+30 mins.	0	0	0	0	5	18	8	31	4	18	6	28	13	23	5	41
+45 mins.	0	0	0	0	9	19	11	39	1	23	12	36	7	24	3	34
Total Volume	0	0	0	0	27	93	39	159	8	88	35	131	44	89	16	149
% App. Total	0	0	0	0	17	58.5	24.5		6.1	67.2	26.7		29.5	59.7	10.7	
PHF	.000	.000	.000	.000	.750	.727	.886	.764	.500	.846	.729	.840	.786	.927	.800	.909

City of Oceanside
N/S: I-5 Southbound Ramps
E/W: Cassidy Street
Weather: Clear

File Name : 09_OCS_5S_Cassidy AM
Site Code :
Start Date : 3/13/2018
Page No : 1

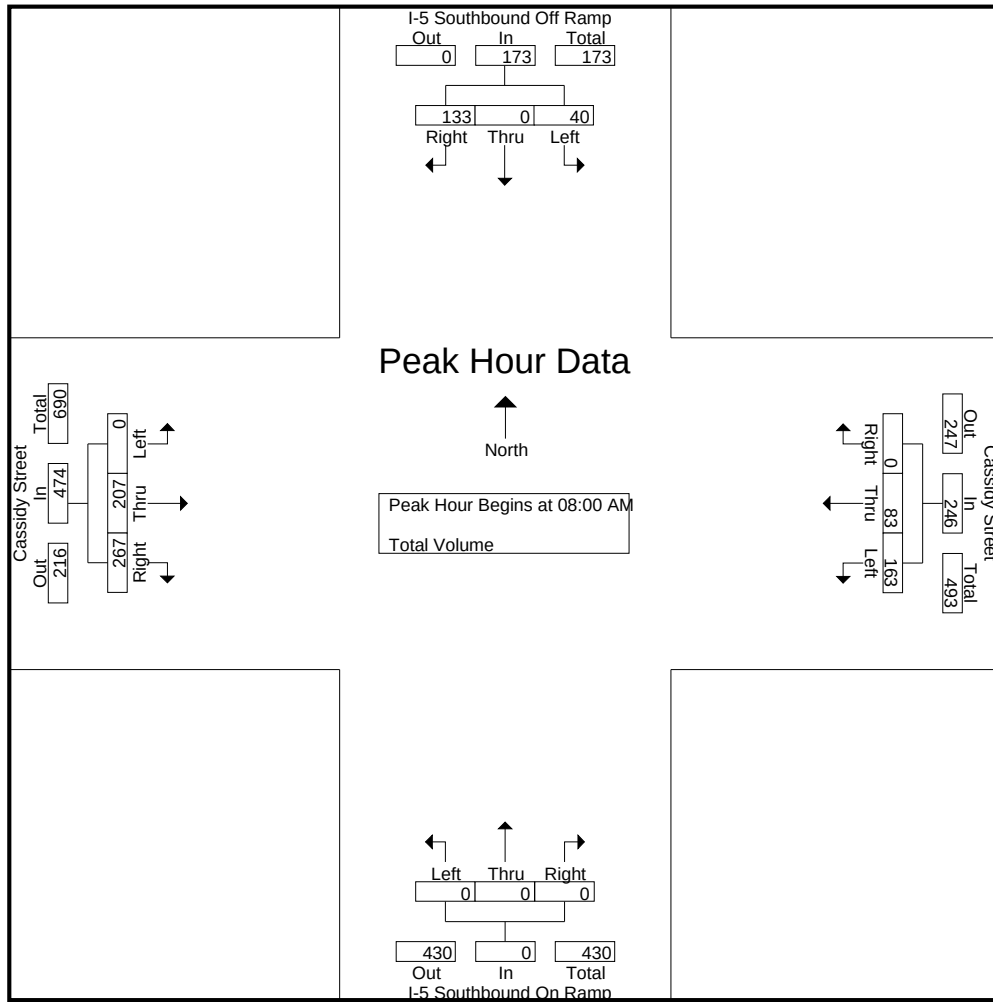
Groups Printed- Total Volume

	I-5 Southbound Off Ramp Southbound				Cassidy Street Westbound				I-5 Southbound On Ramp Northbound				Cassidy Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	9	0	19	28	57	22	0	79	0	0	0	0	0	45	53	98	205
07:15 AM	33	0	14	47	66	21	0	87	0	0	0	0	0	45	55	100	234
07:30 AM	12	0	14	26	78	12	0	90	0	0	0	0	0	40	69	109	225
07:45 AM	13	0	19	32	50	11	0	61	0	0	0	0	0	34	67	101	194
Total	67	0	66	133	251	66	0	317	0	0	0	0	0	164	244	408	858
08:00 AM	12	0	20	32	46	12	0	58	0	0	0	0	0	49	59	108	198
08:15 AM	14	0	24	38	56	25	0	81	0	0	0	0	0	48	71	119	238
08:30 AM	13	0	37	50	37	23	0	60	0	0	0	0	0	51	62	113	223
08:45 AM	1	0	52	53	24	23	0	47	0	0	0	0	0	59	75	134	234
Total	40	0	133	173	163	83	0	246	0	0	0	0	0	207	267	474	893
Grand Total	107	0	199	306	414	149	0	563	0	0	0	0	0	371	511	882	1751
Apprch %	35	0	65		73.5	26.5	0		0	0	0		0	42.1	57.9		
Total %	6.1	0	11.4	17.5	23.6	8.5	0	32.2	0	0	0	0	0	21.2	29.2	50.4	

	I-5 Southbound Off Ramp Southbound				Cassidy Street Westbound				I-5 Southbound On Ramp Northbound				Cassidy Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	12	0	20	32	46	12	0	58	0	0	0	0	0	49	59	108	198
08:15 AM	14	0	24	38	56	25	0	81	0	0	0	0	0	48	71	119	238
08:30 AM	13	0	37	50	37	23	0	60	0	0	0	0	0	51	62	113	223
08:45 AM	1	0	52	53	24	23	0	47	0	0	0	0	0	59	75	134	234
Total Volume	40	0	133	173	163	83	0	246	0	0	0	0	0	207	267	474	893
% App. Total	23.1	0	76.9		66.3	33.7	0		0	0	0		0	43.7	56.3		
PHF	.714	.000	.639	.816	.728	.830	.000	.759	.000	.000	.000	.000	.000	.877	.890	.884	.938

City of Oceanside
N/S: I-5 Southbound Ramps
E/W: Cassidy Street
Weather: Clear

File Name : 09_OCS_5S_Cassidy AM
Site Code :
Start Date : 3/13/2018
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Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM				07:00 AM				07:00 AM				08:00 AM			
+0 mins.	12	0	20	32	57	22	0	79	0	0	0	0	0	49	59	108
+15 mins.	14	0	24	38	66	21	0	87	0	0	0	0	0	48	71	119
+30 mins.	13	0	37	50	78	12	0	90	0	0	0	0	0	51	62	113
+45 mins.	1	0	52	53	50	11	0	61	0	0	0	0	0	59	75	134
Total Volume	40	0	133	173	251	66	0	317	0	0	0	0	0	207	267	474
% App. Total	23.1	0	76.9		79.2	20.8	0		0	0	0		0	43.7	56.3	
PHF	.714	.000	.639	.816	.804	.750	.000	.881	.000	.000	.000	.000	.000	.877	.890	.884

City of Oceanside
N/S: I-5 Southbound Ramps
E/W: Cassidy Street
Weather: Clear

File Name : 09_OCS_5S_Cassidy PM
Site Code :
Start Date : 3/13/2018
Page No : 1

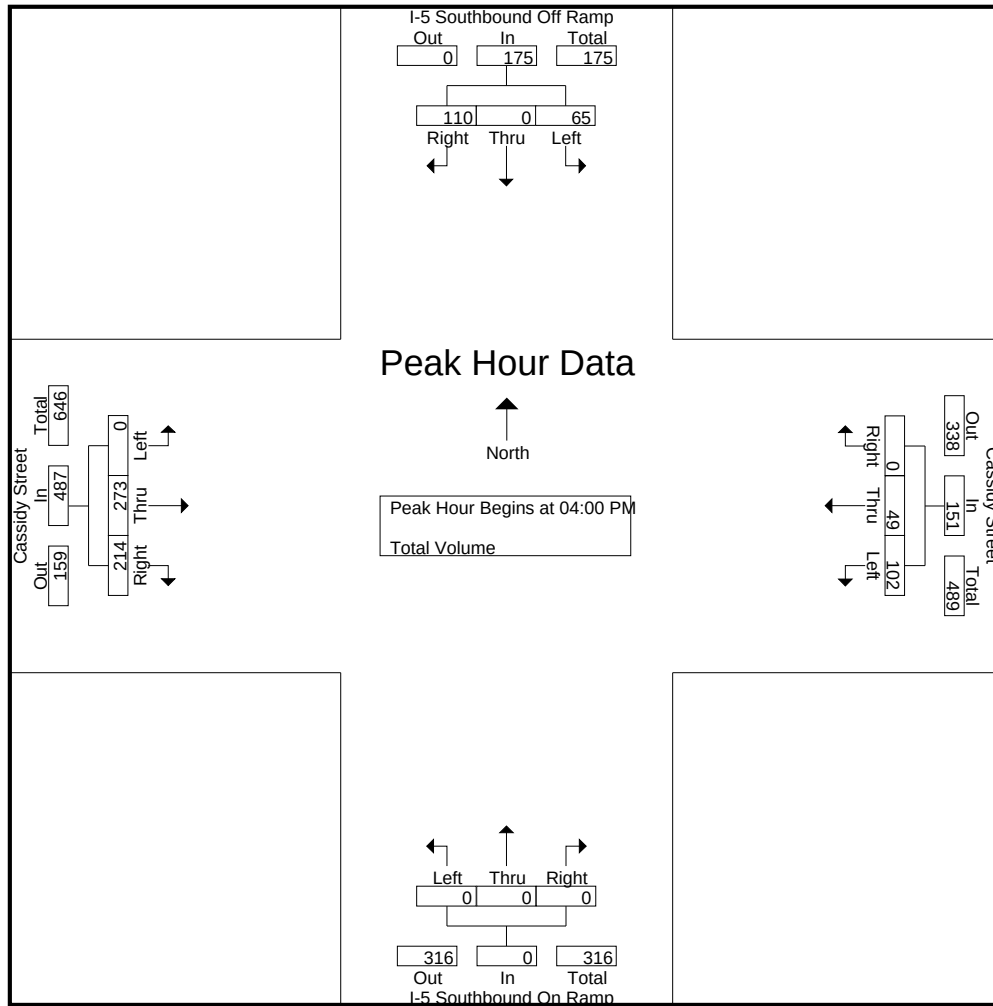
Groups Printed- Total Volume

	I-5 Southbound Off Ramp Southbound				Cassidy Street Westbound				I-5 Southbound On Ramp Northbound				Cassidy Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	15	0	22	37	26	9	0	35	0	0	0	0	0	68	57	125	197
04:15 PM	12	0	38	50	25	14	0	39	0	0	0	0	0	71	57	128	217
04:30 PM	23	0	25	48	28	12	0	40	0	0	0	0	0	70	42	112	200
04:45 PM	15	0	25	40	23	14	0	37	0	0	0	0	0	64	58	122	199
Total	65	0	110	175	102	49	0	151	0	0	0	0	0	273	214	487	813
05:00 PM	15	0	34	49	22	14	0	36	0	0	0	0	0	62	48	110	195
05:15 PM	10	0	30	40	28	15	0	43	0	0	0	0	0	78	56	134	217
05:30 PM	18	0	25	43	23	17	0	40	0	0	0	0	0	66	47	113	196
05:45 PM	14	0	27	41	15	16	0	31	0	0	0	0	0	50	47	97	169
Total	57	0	116	173	88	62	0	150	0	0	0	0	0	256	198	454	777
Grand Total	122	0	226	348	190	111	0	301	0	0	0	0	0	529	412	941	1590
Apprch %	35.1	0	64.9		63.1	36.9	0		0	0	0		0	56.2	43.8		
Total %	7.7	0	14.2	21.9	11.9	7	0	18.9	0	0	0	0	0	33.3	25.9	59.2	

	I-5 Southbound Off Ramp Southbound				Cassidy Street Westbound				I-5 Southbound On Ramp Northbound				Cassidy Street Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:00 PM																	
04:00 PM	15	0	22	37	26	9	0	35	0	0	0	0	0	68	57	125	197
04:15 PM	12	0	38	50	25	14	0	39	0	0	0	0	0	71	57	128	217
04:30 PM	23	0	25	48	28	12	0	40	0	0	0	0	0	70	42	112	200
04:45 PM	15	0	25	40	23	14	0	37	0	0	0	0	0	64	58	122	199
Total Volume	65	0	110	175	102	49	0	151	0	0	0	0	0	273	214	487	813
% App. Total	37.1	0	62.9		67.5	32.5	0		0	0	0		0	56.1	43.9		
PHF	.707	.000	.724	.875	.911	.875	.000	.944	.000	.000	.000	.000	.000	.961	.922	.951	.937

City of Oceanside
N/S: I-5 Southbound Ramps
E/W: Cassidy Street
Weather: Clear

File Name : 09_OCS_5S_Cassidy PM
Site Code :
Start Date : 3/13/2018
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:15 PM				04:30 PM				04:00 PM				04:00 PM			
+0 mins.	12	0	38	50	28	12	0	40	0	0	0	0	0	68	57	125
+15 mins.	23	0	25	48	23	14	0	37	0	0	0	0	0	71	57	128
+30 mins.	15	0	25	40	22	14	0	36	0	0	0	0	0	70	42	112
+45 mins.	15	0	34	49	28	15	0	43	0	0	0	0	0	64	58	122
Total Volume	65	0	122	187	101	55	0	156	0	0	0	0	0	273	214	487
% App. Total	34.8	0	65.2		64.7	35.3	0		0	0	0		0	56.1	43.9	
PHF	.707	.000	.803	.935	.902	.917	.000	.907	.000	.000	.000	.000	.000	.961	.922	.951

City of Oceanside
N/S: I-5 Southbound Ramps
E/W: Vista Way/Ronald Packard Pkwy(SR78)
Weather: Clear

File Name : 10_OCS_5S_Vista Way_SR-78 AM
Site Code :
Start Date : 3/13/2018
Page No : 1

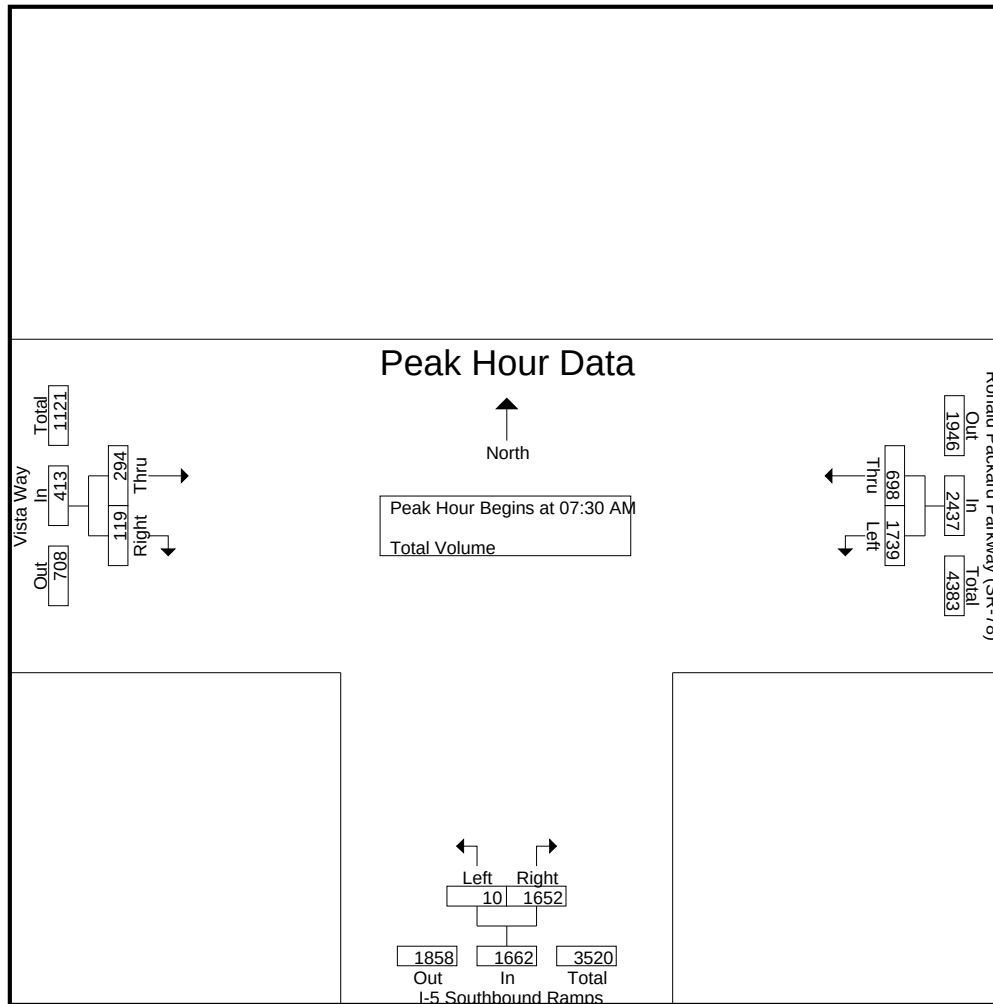
Groups Printed- Total Volume

	Ronald Packard Parkway (SR-78) Westbound			I-5 Southbound Ramps Northbound			Vista Way Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
07:00 AM	324	178	502	4	362	366	49	30	79	947
07:15 AM	366	148	514	3	477	480	78	16	94	1088
07:30 AM	408	169	577	1	445	446	96	23	119	1142
07:45 AM	429	171	600	3	437	440	63	27	90	1130
Total	1527	666	2193	11	1721	1732	286	96	382	4307
08:00 AM	432	183	615	4	381	385	72	38	110	1110
08:15 AM	470	175	645	2	389	391	63	31	94	1130
08:30 AM	412	166	578	2	400	402	78	28	106	1086
08:45 AM	425	177	602	6	361	367	71	29	100	1069
Total	1739	701	2440	14	1531	1545	284	126	410	4395
Grand Total	3266	1367	4633	25	3252	3277	570	222	792	8702
Apprch %	70.5	29.5		0.8	99.2		72	28		
Total %	37.5	15.7	53.2	0.3	37.4	37.7	6.6	2.6	9.1	

	Ronald Packard Parkway (SR-78) Westbound			I-5 Southbound Ramps Northbound			Vista Way Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 07:30 AM										
07:30 AM	408	169	577	1	445	446	96	23	119	1142
07:45 AM	429	171	600	3	437	440	63	27	90	1130
08:00 AM	432	183	615	4	381	385	72	38	110	1110
08:15 AM	470	175	645	2	389	391	63	31	94	1130
Total Volume	1739	698	2437	10	1652	1662	294	119	413	4512
% App. Total	71.4	28.6		0.6	99.4		71.2	28.8		
PHF	.925	.954	.945	.625	.928	.932	.766	.783	.868	.988

City of Oceanside
N/S: I-5 Southbound Ramps
E/W: Vista Way/Ronald Packard Pkwy(SR78)
Weather: Clear

File Name : 10_OCS_5S_Vista Way_SR-78 AM
Site Code :
Start Date : 3/13/2018
Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	08:00 AM			07:15 AM			07:15 AM		
+0 mins.	432	183	615	3	477	480	78	16	94
+15 mins.	470	175	645	1	445	446	96	23	119
+30 mins.	412	166	578	3	437	440	63	27	90
+45 mins.	425	177	602	4	381	385	72	38	110
Total Volume	1739	701	2440	11	1740	1751	309	104	413
% App. Total	71.3	28.7		0.6	99.4		74.8	25.2	
PHF	.925	.958	.946	.688	.912	.912	.805	.684	.868

City of Oceanside
N/S: I-5 Southbound Ramps
E/W: Vista Way/Ronald Packard Pkwy(SR78)
Weather: Clear

File Name : 10_OCS_5S_Vista Way_SR-78 PM
Site Code :
Start Date : 3/13/2018
Page No : 1

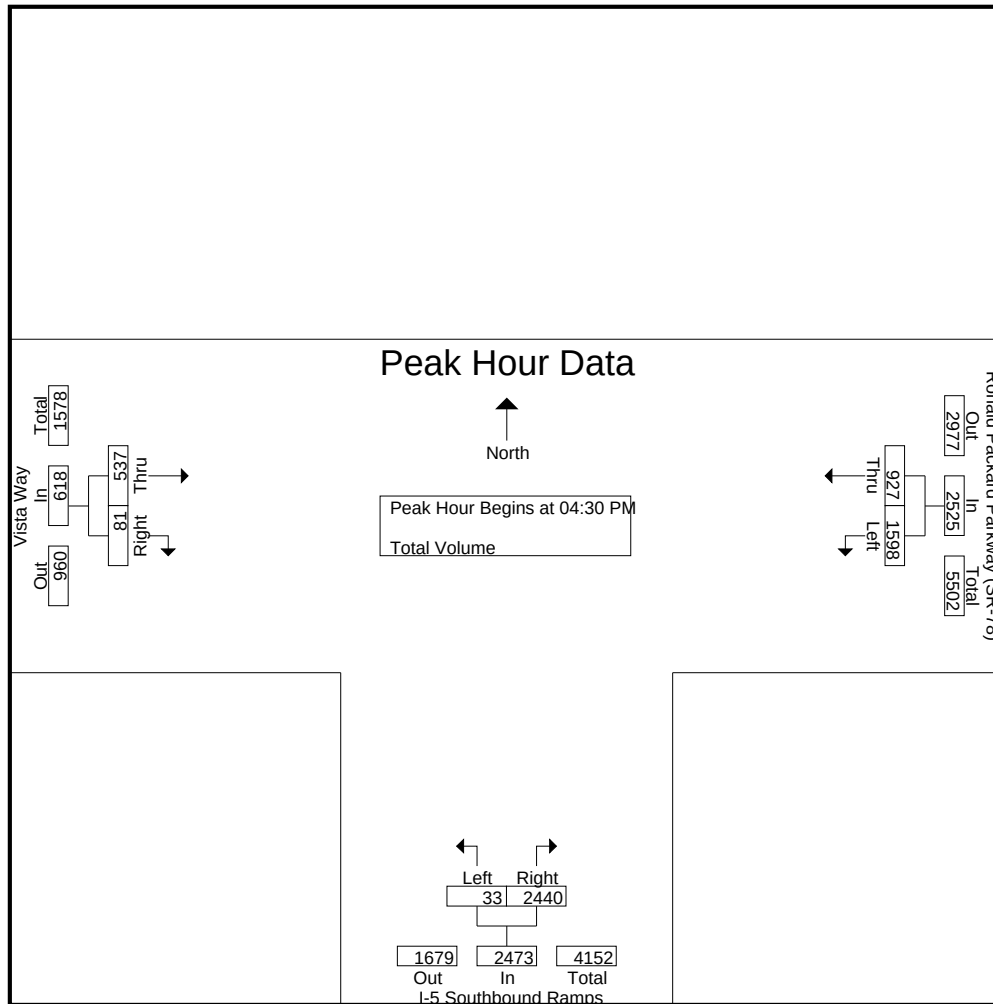
Groups Printed- Total Volume

	Ronald Packard Parkway (SR-78) Westbound			I-5 Southbound Ramps Northbound			Vista Way Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
04:00 PM	385	208	593	7	574	581	127	21	148	1322
04:15 PM	399	228	627	4	571	575	147	29	176	1378
04:30 PM	391	232	623	11	597	608	144	28	172	1403
04:45 PM	419	237	656	7	581	588	117	14	131	1375
Total	1594	905	2499	29	2323	2352	535	92	627	5478
05:00 PM	390	225	615	6	655	661	128	18	146	1422
05:15 PM	398	233	631	9	607	616	148	21	169	1416
05:30 PM	369	233	602	5	515	520	132	28	160	1282
05:45 PM	283	197	480	4	457	461	121	23	144	1085
Total	1440	888	2328	24	2234	2258	529	90	619	5205
Grand Total	3034	1793	4827	53	4557	4610	1064	182	1246	10683
Apprch %	62.9	37.1		1.1	98.9		85.4	14.6		
Total %	28.4	16.8	45.2	0.5	42.7	43.2	10	1.7	11.7	

	Ronald Packard Parkway (SR-78) Westbound			I-5 Southbound Ramps Northbound			Vista Way Eastbound			
Start Time	Left	Thru	App. Total	Left	Right	App. Total	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1										
Peak Hour for Entire Intersection Begins at 04:30 PM										
04:30 PM	391	232	623	11	597	608	144	28	172	1403
04:45 PM	419	237	656	7	581	588	117	14	131	1375
05:00 PM	390	225	615	6	655	661	128	18	146	1422
05:15 PM	398	233	631	9	607	616	148	21	169	1416
Total Volume	1598	927	2525	33	2440	2473	537	81	618	5616
% App. Total	63.3	36.7		1.3	98.7		86.9	13.1		
PHF	.953	.978	.962	.750	.931	.935	.907	.723	.898	.987

City of Oceanside
N/S: I-5 Southbound Ramps
E/W: Vista Way/Ronald Packard Pkwy(SR78)
Weather: Clear

File Name : 10_OCS_5S_Vista Way_SR-78 PM
Site Code :
Start Date : 3/13/2018
Page No : 2



Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1
Peak Hour for Each Approach Begins at:

	04:30 PM			04:30 PM			04:00 PM		
+0 mins.	391	232	623	11	597	608	127	21	148
+15 mins.	419	237	656	7	581	588	147	29	176
+30 mins.	390	225	615	6	655	661	144	28	172
+45 mins.	398	233	631	9	607	616	117	14	131
Total Volume	1598	927	2525	33	2440	2473	535	92	627
% App. Total	63.3	36.7		1.3	98.7		85.3	14.7	
PHF	.953	.978	.962	.750	.931	.935	.910	.793	.891

Prepared by NDS/ATD

VOLUME

Coast Highway btwn Sportfisher Dr & Civic Center Dr

Day: Tuesday
Date: 8/6/2013City: Oceanside
Project #: CA13_4290_002

DAILY TOTALS					NB	SB					Total
					7,252	8,198					15,450
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL
00:00	23	21			44	12:00	120	144			264
00:15	12	17			29	12:15	115	127			242
00:30	19	12			31	12:30	117	151			268
00:45	13	67	6	56	119	12:45	139	491	136	558	1224
01:00	11	11			22	13:00	128	161			289
01:15	10	4			14	13:15	128	123			251
01:30	10	14			24	13:30	123	129			252
01:45	8	39	8	37	16	13:45	145	524	131	544	1244
02:00	11	5			16	14:00	129	145			274
02:15	7	10			17	14:15	133	158			291
02:30	3	6			9	14:30	121	136			257
02:45	4	25	1	22	5	14:45	139	522	134	573	1244
03:00	9	5			14	15:00	121	134			255
03:15	7	6			13	15:15	127	153			280
03:30	6	5			11	15:30	137	160			297
03:45	5	27	7	23	12	15:45	120	505	204	651	1280
04:00	5	6			11	16:00	165	141			306
04:15	3	4			7	16:15	116	156			272
04:30	7	9			16	16:30	151	176			327
04:45	15	30	26	45	41	16:45	145	577	143	616	1280
05:00	16	31			47	17:00	137	137			274
05:15	16	17			33	17:15	163	176			339
05:30	23	39			62	17:30	158	161			319
05:45	28	83	52	139	80	17:45	144	602	165	639	1344
06:00	50	31			81	18:00	143	164			307
06:15	30	60			90	18:15	123	150			273
06:30	50	59			109	18:30	136	157			293
06:45	56	186	74	224	130	18:45	147	549	160	631	1387
07:00	36	67			103	19:00	130	143			273
07:15	49	91			140	19:15	116	149			265
07:30	67	75			142	19:30	133	108			241
07:45	51	203	93	326	144	19:45	119	498	112	512	1229
08:00	45	62			107	20:00	109	101			210
08:15	60	68			128	20:15	104	96			200
08:30	58	74			132	20:30	76	71			147
08:45	71	234	97	301	168	20:45	72	361	87	355	1166
09:00	56	83			139	21:00	122	72			194
09:15	60	108			168	21:15	78	55			133
09:30	66	108			174	21:30	60	58			118
09:45	76	258	112	411	188	21:45	73	333	56	241	1260
10:00	86	124			210	22:00	57	48			105
10:15	94	114			208	22:15	58	43			101
10:30	89	118			207	22:30	40	40			80
10:45	96	365	127	483	223	22:45	34	189	36	167	70
11:00	102	124			226	23:00	40	32			72
11:15	116	158			274	23:15	33	23			56
11:30	114	128			242	23:30	27	24			51
11:45	117	449	135	545	252	23:45	35	135	20	99	55
TOTALS	1966	2612			4578	TOTALS	5286	5586			10872
SPLIT %	42.9%	57.1%			29.6%	SPLIT %	48.6%	51.4%			70.4%

DAILY TOTALS					NB	SB					Total
					7,252	8,198					15,450
AM Peak Hour	11:45	11:15			11:15	PM Peak Hour	17:15	15:45			17:15
AM Pk Volume	469	565			1032	PM Pk Volume	608	677			1274
Pk Hr Factor	0.977	0.894			0.942	Pk Hr Factor	0.933	0.830			0.940
7 - 9 Volume	437	627	0	0	1064	4 - 6 Volume	1179	1255	0	0	2434
7 - 9 Peak Hour	08:00	07:00			08:00	4 - 6 Peak Hour	16:45	17:00			17:00
7 - 9 Pk Volume	234	326	0	0	535	4 - 6 Pk Volume	603	639	0	0	1241
Pk Hr Factor	0.824	0.876	0.000	0.000	0.796	Pk Hr Factor	0.925	0.908	0.000	0.000	0.915

VOLUME

Coast Highway btwn Sportfisher Dr & Civic Center Dr

Day: Wednesday
Date: 8/7/2013City: Oceanside
Project #: CA13_4290_002

DAILY TOTALS					NB	SB	EB					WB	Total
					7,574	8,240						0	0
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL		
00:00	29	10			39	12:00	121	152			273		
00:15	20	14			34	12:15	141	163			304		
00:30	28	12			40	12:30	134	146			280		
00:45	15	92	16	52	31 144	12:45	146	542	136	597	282 1139		
01:00	20	7			27	13:00	127	157			284		
01:15	18	11			29	13:15	115	115			230		
01:30	8	6			14	13:30	114	141			255		
01:45	21	67	15	39	36 106	13:45	108	464	135	548	243 1012		
02:00	9	4			13	14:00	106	131			237		
02:15	5	5			10	14:15	120	138			258		
02:30	3	3			6	14:30	124	144			268		
02:45	5	22	1	13	6 35	14:45	103	453	111	524	214 977		
03:00	3	6			9	15:00	128	131			259		
03:15	3	4			7	15:15	131	140			271		
03:30	3	4			7	15:30	141	134			275		
03:45	3	12	7	21	10 33	15:45	118	518	148	553	266 1071		
04:00	2	8			10	16:00	144	138			282		
04:15	12	4			16	16:15	122	168			290		
04:30	12	17			29	16:30	146	171			317		
04:45	9	35	28	57	37 92	16:45	142	554	145	622	287 1176		
05:00	13	42			55	17:00	104	182			286		
05:15	12	19			31	17:15	131	162			293		
05:30	29	31			60	17:30	157	174			331		
05:45	29	83	62	154	91 237	17:45	156	548	177	695	333 1243		
06:00	39	33			72	18:00	169	140			309		
06:15	41	59			100	18:15	161	158			319		
06:30	53	72			125	18:30	137	158			295		
06:45	58	191	66	230	124 421	18:45	185	652	140	596	325 1248		
07:00	53	64			117	19:00	152	133			285		
07:15	46	66			112	19:15	150	143			293		
07:30	60	75			135	19:30	127	124			251		
07:45	67	226	65	270	132 496	19:45	142	571	102	502	244 1073		
08:00	61	95			156	20:00	115	118			233		
08:15	56	84			140	20:15	137	88			225		
08:30	56	64			120	20:30	116	112			228		
08:45	82	255	95	338	177 593	20:45	102	470	60	378	162 848		
09:00	70	106			176	21:00	122	72			194		
09:15	59	101			160	21:15	86	74			160		
09:30	65	102			167	21:30	81	53			134		
09:45	94	288	124	433	218 721	21:45	94	383	54	253	148 636		
10:00	88	108			196	22:00	65	48			113		
10:15	83	133			216	22:15	54	52			106		
10:30	95	143			238	22:30	31	56			87		
10:45	94	360	122	506	216 866	22:45	43	193	34	190	77 383		
11:00	102	136			238	23:00	37	34			71		
11:15	89	130			219	23:15	46	24			70		
11:30	128	120			248	23:30	38	24			62		
11:45	119	438	172	558	291 996	23:45	36	157	29	111	65 268		
TOTALS	2069	2671			4740	TOTALS	5505	5569			11074		
SPLIT %	43.6%	56.4%			30.0%	SPLIT %	49.7%	50.3%			70.0%		

DAILY TOTALS					NB	SB	EB	WB	Total
					7,574	8,240	0	0	15,814
AM Peak Hour	11:45	11:45			11:45	PM Peak Hour	18:00	17:00	17:30
AM Pk Volume	515	633			1148	PM Pk Volume	652	695	1292
Pk Hr Factor	0.913	0.920			0.944	Pk Hr Factor	0.881	0.955	0.970
7 - 9 Volume	481	608	0	0	1089	4 - 6 Volume	1102	1317	2419
7 - 9 Peak Hour	08:00	08:00			08:00	4 - 6 Peak Hour	16:00	17:00	17:00
7 - 9 Pk Volume	255	338	0	0	593	4 - 6 Pk Volume	554	695	1243
Pk Hr Factor	0.777	0.889	0.000	0.000	0.838	Pk Hr Factor	0.949	0.955	0.933

VOLUME

Coast Highway btwn Mission Ave & Seagaze Dr

Day: Tuesday
Date: 8/6/2013City: Oceanside
Project #: CA13_4290_003

DAILY TOTALS					NB	SB						Total
					8,442	8,046						0
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL	
00:00	33	14			47	12:00	157	145			302	
00:15	28	16			44	12:15	148	125			273	
00:30	14	14			28	12:30	143	128			271	
00:45	9	84	9	53	18 137	12:45	145	593	143	541	288 1134	
01:00	4	7			11	13:00	149	157			306	
01:15	11	5			16	13:15	148	139			287	
01:30	10	13			23	13:30	142	123			265	
01:45	8	33	13	38	21 71	13:45	131	570	135	554	266 1124	
02:00	3	8			11	14:00	141	142			283	
02:15	7	7			14	14:15	157	159			316	
02:30	5	4			9	14:30	146	161			307	
02:45	2	17	2	21	4 38	14:45	162	606	133	595	295 1201	
03:00	6	7			13	15:00	144	152			296	
03:15	8	5			13	15:15	149	143			292	
03:30	4	6			10	15:30	148	157			305	
03:45	6	24	11	29	17 53	15:45	153	594	150	602	303 1196	
04:00	3	14			17	16:00	155	141			296	
04:15	11	16			27	16:15	144	137			281	
04:30	14	22			36	16:30	143	163			306	
04:45	12	40	41	93	53 133	16:45	202	644	146	587	348 1231	
05:00	22	51			73	17:00	187	130			317	
05:15	20	23			43	17:15	154	161			315	
05:30	23	61			84	17:30	199	135			334	
05:45	24	89	73	208	97 297	17:45	160	700	145	571	305 1271	
06:00	33	45			78	18:00	194	139			333	
06:15	39	88			127	18:15	161	132			293	
06:30	43	84			127	18:30	193	126			319	
06:45	53	168	93	310	146 478	18:45	186	734	127	524	313 1258	
07:00	47	81			128	19:00	212	142			354	
07:15	52	86			138	19:15	126	110			236	
07:30	92	71			163	19:30	136	97			233	
07:45	53	244	97	335	150 579	19:45	133	607	106	455	239 1062	
08:00	62	77			139	20:00	160	106			266	
08:15	67	73			140	20:15	112	99			211	
08:30	60	81			141	20:30	91	60			151	
08:45	75	264	86	317	161 581	20:45	100	463	74	339	174 802	
09:00	86	93			179	21:00	87	73			160	
09:15	79	107			186	21:15	90	70			160	
09:30	89	113			202	21:30	93	49			142	
09:45	108	362	119	432	227 794	21:45	67	337	55	247	122 584	
10:00	94	115			209	22:00	53	44			97	
10:15	125	120			245	22:15	46	35			81	
10:30	125	115			240	22:30	49	29			78	
10:45	111	455	115	465	226 920	22:45	35	183	33	141	68 324	
11:00	129	118			247	23:00	27	33			60	
11:15	120	113			233	23:15	32	25			57	
11:30	130	122			252	23:30	30	26			56	
11:45	140	519	125	478	265 997	23:45	23	112	27	111	50 223	
TOTALS	2299	2779			5078	TOTALS	6143	5267			11410	
SPLIT %	45.3%	54.7%			30.8%	SPLIT %	53.8%	46.2%			69.2%	

DAILY TOTALS					NB	SB	EB	WB	Total
					8,442	8,046	0	0	16,488
AM Peak Hour	11:45	11:45			11:45	PM Peak Hour	18:15	14:15	16:45
AM Pk Volume	588	523			1111	PM Pk Volume	752	605	1314
Pk Hr Factor	0.936	0.902			0.920	Pk Hr Factor	0.887	0.939	0.944
7 - 9 Volume	508	652	0	0	1160	4 - 6 Volume	1344	1158	2502
7 - 9 Peak Hour	07:30	07:00			07:30	4 - 6 Peak Hour	16:45	16:30	16:45
7 - 9 Pk Volume	274	335	0	0	592	4 - 6 Pk Volume	742	600	1314
Pk Hr Factor	0.745	0.863	0.000	0.000	0.908	Pk Hr Factor	0.918	0.920	0.944

Prepared by NDS/ATD

VOLUME

Coast Highway btwn Mission Ave & Seagaze Dr

Day: Wednesday
Date: 8/7/2013City: Oceanside
Project #: CA13_4290_003

DAILY TOTALS					NB	SB	EB					WB	Total
					8,541	7,957						0	0
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL		
00:00	32	11			43	12:00	182	171			353		
00:15	28	20			48	12:15	146	143			289		
00:30	16	13			29	12:30	141	142			283		
00:45	6	82	12	56	18 138	12:45	164	633	136	592	300 1225		
01:00	8	8			16	13:00	137	139			276		
01:15	5	5			10	13:15	145	123			268		
01:30	7	9			16	13:30	140	143			283		
01:45	6	26	15	37	21 63	13:45	141	563	129	534	270 1097		
02:00	3	4			7	14:00	150	148			298		
02:15	5	7			12	14:15	161	131			292		
02:30	11	8			19	14:30	160	135			295		
02:45	3	22	2	21	5 43	14:45	146	617	132	546	278 1163		
03:00	6	6			12	15:00	144	140			284		
03:15	4	5			9	15:15	158	141			299		
03:30	7	2			9	15:30	165	142			307		
03:45	10	27	10	23	20 50	15:45	148	615	130	553	278 1168		
04:00	4	9			13	16:00	163	129			292		
04:15	9	12			21	16:15	161	145			306		
04:30	12	24			36	16:30	163	167			330		
04:45	13	38	41	86	54 124	16:45	185	672	147	588	332 1260		
05:00	20	63			83	17:00	158	164			322		
05:15	17	26			43	17:15	149	143			292		
05:30	22	50			72	17:30	217	133			350		
05:45	32	91	83	222	115 313	17:45	171	695	154	594	325 1289		
06:00	31	41			72	18:00	202	114			316		
06:15	41	76			117	18:15	165	136			301		
06:30	43	90			133	18:30	182	121			303		
06:45	57	172	84	291	141 463	18:45	177	726	125	496	302 1222		
07:00	54	66			120	19:00	199	124			323		
07:15	52	80			132	19:15	126	117			243		
07:30	66	76			142	19:30	148	97			245		
07:45	79	251	75	297	154 548	19:45	158	631	95	433	253 1064		
08:00	72	91			163	20:00	119	104			223		
08:15	82	94			176	20:15	125	89			214		
08:30	54	55			109	20:30	109	105			214		
08:45	63	271	98	338	161 609	20:45	105	458	57	355	162 813		
09:00	78	106			184	21:00	100	67			167		
09:15	78	97			175	21:15	104	86			190		
09:30	93	89			182	21:30	75	51			126		
09:45	86	335	119	411	205 746	21:45	71	350	48	252	119 602		
10:00	95	108			203	22:00	60	41			101		
10:15	101	110			211	22:15	52	37			89		
10:30	115	128			243	22:30	31	36			67		
10:45	126	437	118	464	244 901	22:45	34	177	23	137	57 314		
11:00	141	123			264	23:00	31	35			66		
11:15	120	118			238	23:15	39	23			62		
11:30	115	134			249	23:30	29	29			58		
11:45	154	530	145	520	299 1050	23:45	23	122	24	111	47 233		
TOTALS	2282	2766			5048	TOTALS	6259	5191			11450		
SPLIT %	45.2%	54.8%			30.6%	SPLIT %	54.7%	45.3%			69.4%		

DAILY TOTALS					NB	SB	EB	WB	Total
					8,541	7,957	0	0	16,498
AM Peak Hour	11:45	11:45			11:45	PM Peak Hour	17:30	16:15	16:45
AM Pk Volume	623	601			1224	PM Pk Volume	755	623	1296
Pk Hr Factor	0.856	0.879			0.867	Pk Hr Factor	0.870	0.933	0.926
7 - 9 Volume	522	635	0	0	1157	4 - 6 Volume	1367	1182	2549
7 - 9 Peak Hour	07:30	08:00			07:30	4 - 6 Peak Hour	16:45	16:15	16:45
7 - 9 Pk Volume	299	338	0	0	635	4 - 6 Pk Volume	709	623	1296
Pk Hr Factor	0.912	0.862	0.000	0.000	0.902	Pk Hr Factor	0.817	0.933	0.926

Prepared by NDS/ATD

VOLUME

Coast Highway btwn Missouri Ave & Washington Ave

Day: Tuesday
Date: 8/6/2013City: Oceanside
Project #: CA13_4290_004

DAILY TOTALS					NB	SB					EB	WB	Total
					7,910	7,682					0	0	15,592
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL		
00:00	15	25			40	12:00	150	136			286		
00:15	26	13			39	12:15	168	126			294		
00:30	13	8			21	12:30	164	147			311		
00:45	9	63	10	56	19 119	12:45	134	616	141	550	275 1166		
01:00	3	5			8	13:00	141	152			293		
01:15	11	3			14	13:15	153	140			293		
01:30	6	11			17	13:30	158	133			291		
01:45	9	29	14	33	23 62	13:45	145	597	135	560	280 1157		
02:00	2	5			7	14:00	137	142			279		
02:15	6	3			9	14:15	141	167			308		
02:30	2	4			6	14:30	150	148			298		
02:45	3	13	4	16	7 29	14:45	152	580	145	602	297 1182		
03:00	4	4			8	15:00	143	157			300		
03:15	6	5			11	15:15	154	140			294		
03:30	9	3			12	15:30	163	169			332		
03:45	4	23	7	19	11 42	15:45	64	524	136	602	200 1126		
04:00	3	4			7	16:00	121	151			272		
04:15	9	2			11	16:15	163	131			294		
04:30	12	7			19	16:30	168	170			338		
04:45	18	42	7	20	25 62	16:45	164	616	173	625	337 1241		
05:00	10	10			20	17:00	191	139			330		
05:15	13	6			19	17:15	160	164			324		
05:30	22	16			38	17:30	144	150			294		
05:45	29	74	21	53	50 127	17:45	168	663	143	596	311 1259		
06:00	30	21			51	18:00	129	168			297		
06:15	41	25			66	18:15	171	126			297		
06:30	46	34			80	18:30	163	148			311		
06:45	49	166	50	130	99 296	18:45	141	604	132	574	273 1178		
07:00	51	50			101	19:00	159	163			322		
07:15	58	53			111	19:15	123	123			246		
07:30	70	62			132	19:30	105	108			213		
07:45	56	235	85	250	141 485	19:45	111	498	101	495	212 993		
08:00	69	90			159	20:00	119	98			217		
08:15	79	79			158	20:15	104	98			202		
08:30	56	59			115	20:30	71	65			136		
08:45	89	293	76	304	165 597	20:45	83	377	68	329	151 706		
09:00	83	86			169	21:00	79	70			149		
09:15	82	95			177	21:15	76	87			163		
09:30	89	99			188	21:30	70	66			136		
09:45	126	380	111	391	237 771	21:45	60	285	59	282	119 567		
10:00	91	104			195	22:00	36	49			85		
10:15	90	104			194	22:15	41	36			77		
10:30	120	123			243	22:30	39	32			71		
10:45	132	433	110	441	242 874	22:45	30	146	34	151	64 297		
11:00	123	116			239	23:00	31	36			67		
11:15	137	113			250	23:15	28	29			57		
11:30	144	126			270	23:30	28	27			55		
11:45	146	550	134	489	280 1039	23:45	16	103	22	114	38 217		
TOTALS	2301	2202			4503	TOTALS	5609	5480			11089		
SPLIT %	51.1%	48.9%			28.9%	SPLIT %	50.6%	49.4%			71.1%		

DAILY TOTALS					NB	SB					EB	WB	Total
					7,910	7,682					0	0	15,592
AM Peak Hour	11:45	11:45			11:45	PM Peak Hour	16:15	16:30			16:30		
AM Pk Volume	628	543			1171	PM Pk Volume	686	646			1329		
Pk Hr Factor	0.935	0.923			0.941	Pk Hr Factor	0.898	0.934			0.983		
7 - 9 Volume	528	554	0	0	1082	4 - 6 Volume	1279	1221	0	0	2500		
7 - 9 Peak Hour	08:00	07:30			08:00	4 - 6 Peak Hour	16:15	16:30			16:30		
7 - 9 Pk Volume	293	316	0	0	597	4 - 6 Pk Volume	686	646	0	0	1329		
Pk Hr Factor	0.823	0.878	0.000	0.000	0.905	Pk Hr Factor	0.898	0.934	0.000	0.000	0.983		

VOLUME

Coast Highway btwn Missouri Ave & Washington Ave

Day: Wednesday
Date: 8/7/2013City: Oceanside
Project #: CA13_4290_004

DAILY TOTALS					NB	SB						Total	
					8,240	7,658						0	0
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL		
00:00	19	20			39	12:00	170	180			350		
00:15	13	28			41	12:15	142	133			275		
00:30	10	17			27	12:30	133	145			278		
00:45	5	47	16	81	21 128	12:45	179	624	133	591	312 1215		
01:00	11	13			24	13:00	124	121			245		
01:15	5	5			10	13:15	151	144			295		
01:30	7	8			15	13:30	151	127			278		
01:45	5	28	6	32	11 60	13:45	145	571	126	518	271 1089		
02:00	3	4			7	14:00	154	146			300		
02:15	4	4			8	14:15	172	141			313		
02:30	8	8			16	14:30	139	145			284		
02:45	1	16	0	16	1 32	14:45	159	624	136	568	295 1192		
03:00	2	4			6	15:00	158	152			310		
03:15	5	4			9	15:15	154	143			297		
03:30	6	3			9	15:30	155	160			315		
03:45	10	23	2	13	12 36	15:45	154	621	130	585	284 1206		
04:00	3	3			6	16:00	174	134			308		
04:15	11	4			15	16:15	162	130			292		
04:30	6	8			14	16:30	192	162			354		
04:45	14	34	13	28	27 62	16:45	165	693	196	622	361 1315		
05:00	11	13			24	17:00	153	171			324		
05:15	17	9			26	17:15	157	157			314		
05:30	22	14			36	17:30	155	154			309		
05:45	25	75	21	57	46 132	17:45	194	659	157	639	351 1298		
06:00	35	19			54	18:00	167	157			324		
06:15	48	31			79	18:15	168	132			300		
06:30	43	48			91	18:30	158	128			286		
06:45	60	186	55	153	115 339	18:45	160	653	143	560	303 1213		
07:00	57	49			106	19:00	145	134			279		
07:15	57	59			116	19:15	128	110			238		
07:30	60	66			126	19:30	125	95			220		
07:45	72	246	67	241	139 487	19:45	128	526	109	448	237 974		
08:00	63	82			145	20:00	118	108			226		
08:15	78	91			169	20:15	122	94			216		
08:30	69	50			119	20:30	87	100			187		
08:45	78	288	81	304	159 592	20:45	96	423	77	379	173 802		
09:00	80	90			170	21:00	86	72			158		
09:15	78	92			170	21:15	74	97			171		
09:30	93	92			185	21:30	66	60			126		
09:45	94	345	103	377	197 722	21:45	60	286	68	297	128 583		
10:00	94	94			188	22:00	51	40			91		
10:15	108	105			213	22:15	56	31			87		
10:30	118	114			232	22:30	37	26			63		
10:45	127	447	102	415	229 862	22:45	31	175	26	123	57 298		
11:00	147	108			255	23:00	25	32			57		
11:15	115	123			238	23:15	25	27			52		
11:30	131	123			254	23:30	26	17			43		
11:45	159	552	150	504	309 1056	23:45	22	98	31	107	53 205		
TOTALS	2287	2221			4508	TOTALS	5953	5437			11390		
SPLIT %	50.7%	49.3%			28.4%	SPLIT %	52.3%	47.7%			71.6%		

DAILY TOTALS				NB	SB	EB		WB		Total	
				8,240	7,658	0		0		15,898	
AM Peak Hour	11:45	11:45		11:45	PM Peak Hour	16:00	16:30		16:30		
AM Pk Volume	604	608		1212	PM Pk Volume	693	686		1353		
Pk Hr Factor	0.888	0.844		0.866	Pk Hr Factor	0.902	0.875		0.937		
7 - 9 Volume	534	545	0	0	1079	4 - 6 Volume	1352	1261	0	0	2613
7 - 9 Peak Hour	08:00	07:30		08:00	4 - 6 Peak Hour	16:00	16:30			16:30	
7 - 9 Pk Volume	288	306	0	0	592	4 - 6 Pk Volume	693	686	0	0	1353
Pk Hr Factor	0.923	0.841	0.000	0.000	0.876	Pk Hr Factor	0.902	0.875	0.000	0.000	0.937

Prepared by NDS/ATD

VOLUME

Coast Highway btwn Stanley St & Eucalyptus St

Day: Tuesday
Date: 8/6/2013City: Oceanside
Project #: CA13_4290_005

DAILY TOTALS					NB	SB						Total
					9,206	9,264						0
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL	
00:00	13	21			34	12:00	160	162			322	
00:15	21	16			37	12:15	173	161			334	
00:30	19	10			29	12:30	181	180			361	
00:45	6	59	10	57	16 116	12:45	152	666	154	657	306 1323	
01:00	2	4			6	13:00	177	184			361	
01:15	11	10			21	13:15	164	171			335	
01:30	10	14			24	13:30	184	160			344	
01:45	9	32	15	43	24 75	13:45	172	697	171	686	343 1383	
02:00	3	5			8	14:00	171	179			350	
02:15	8	4			12	14:15	168	177			345	
02:30	2	7			9	14:30	155	176			331	
02:45	2	15	3	19	5 34	14:45	170	664	175	707	345 1371	
03:00	2	1			3	15:00	158	179			337	
03:15	7	5			12	15:15	183	182			365	
03:30	10	5			15	15:30	169	198			367	
03:45	4	23	6	17	10 40	15:45	174	684	164	723	338 1407	
04:00	4	7			11	16:00	188	179			367	
04:15	9	6			15	16:15	191	162			353	
04:30	9	7			16	16:30	182	180			362	
04:45	13	35	7	27	20 62	16:45	192	753	200	721	392 1474	
05:00	12	9			21	17:00	208	169			377	
05:15	16	18			34	17:15	198	172			370	
05:30	24	16			40	17:30	198	176			374	
05:45	22	74	26	69	48 143	17:45	169	773	157	674	326 1447	
06:00	31	34			65	18:00	173	178			351	
06:15	45	34			79	18:15	198	151			349	
06:30	42	55			97	18:30	175	188			363	
06:45	55	173	67	190	122 363	18:45	174	720	158	675	332 1395	
07:00	61	71			132	19:00	172	153			325	
07:15	62	69			131	19:15	131	144			275	
07:30	64	82			146	19:30	122	139			261	
07:45	65	252	99	321	164 573	19:45	135	560	125	561	260 1121	
08:00	78	107			185	20:00	133	129			262	
08:15	75	110			185	20:15	105	125			230	
08:30	77	97			174	20:30	89	82			171	
08:45	98	328	100	414	198 742	20:45	87	414	80	416	167 830	
09:00	103	106			209	21:00	69	80			149	
09:15	110	119			229	21:15	107	93			200	
09:30	116	123			239	21:30	71	82			153	
09:45	131	460	137	485	268 945	21:45	65	312	68	323	133 635	
10:00	113	121			234	22:00	51	47			98	
10:15	145	144			289	22:15	54	48			102	
10:30	138	168			306	22:30	45	41			86	
10:45	155	551	153	586	308 1137	22:45	40	190	37	173	77 363	
11:00	144	143			287	23:00	31	39			70	
11:15	149	151			300	23:15	33	26			59	
11:30	169	139			308	23:30	32	33			65	
11:45	195	657	167	600	362 1257	23:45	18	114	22	120	40 234	
TOTALS	2659	2828			5487	TOTALS	6547	6436			12983	
SPLIT %	48.5%	51.5%			29.7%	SPLIT %	50.4%	49.6%			70.3%	

DAILY TOTALS					NB	SB	EB		WB	Total
					9,206	9,264	0		0	18,470
AM Peak Hour	11:45	11:45			11:45	PM Peak Hour	16:45	14:45		16:45
AM Pk Volume	709	670			1379	PM Pk Volume	796	734		1513
Pk Hr Factor	0.909	0.931			0.952	Pk Hr Factor	0.957	0.927		0.965
7 - 9 Volume	580	735	0	0	1315	4 - 6 Volume	1526	1395	0	2921
7 - 9 Peak Hour	08:00	08:00			08:00	4 - 6 Peak Hour	16:45	16:00		16:45
7 - 9 Pk Volume	328	414	0	0	742	4 - 6 Pk Volume	796	721	0	1513
Pk Hr Factor	0.837	0.941	0.000	0.000	0.937	Pk Hr Factor	0.957	0.901	0.000	0.965

VOLUME

Coast Highway btwn Stanley St & Eucalyptus St

Day: Wednesday
Date: 8/7/2013City: Oceanside
Project #: CA13_4290_005

DAILY TOTALS					NB	SB	EB					WB	Total
					9,554	9,122						0	0
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL		
00:00	22	25			47	12:00	187	212			399		
00:15	16	32			48	12:15	163	170			333		
00:30	9	18			27	12:30	155	177			332		
00:45	5	52	14	89	19 141	12:45	194	699	147	706	341 1405		
01:00	15	15			30	13:00	156	163			319		
01:15	7	6			13	13:15	159	172			331		
01:30	10	10			20	13:30	188	177			365		
01:45	6	38	6	37	12 75	13:45	181	684	158	670	339 1354		
02:00	2	9			11	14:00	175	173			348		
02:15	8	3			11	14:15	180	182			362		
02:30	6	11			17	14:30	178	163			341		
02:45	2	18	0	23	2 41	14:45	166	699	177	695	343 1394		
03:00	1	2			3	15:00	177	164			341		
03:15	7	5			12	15:15	183	192			375		
03:30	5	5			10	15:30	191	177			368		
03:45	7	20	2	14	9 34	15:45	181	732	183	716	364 1448		
04:00	3	7			10	16:00	193	162			355		
04:15	10	3			13	16:15	196	175			371		
04:30	6	7			13	16:30	228	186			414		
04:45	12	31	12	29	24 60	16:45	189	806	221	744	410 1550		
05:00	19	16			35	17:00	188	188			376		
05:15	20	19			39	17:15	201	174			375		
05:30	21	22			43	17:30	226	165			391		
05:45	20	80	30	87	50 167	17:45	219	834	167	694	386 1528		
06:00	34	21			55	18:00	190	188			378		
06:15	51	43			94	18:15	206	168			374		
06:30	45	65			110	18:30	181	152			333		
06:45	66	196	79	208	145 404	18:45	199	776	159	667	358 1443		
07:00	61	64			125	19:00	171	134			305		
07:15	65	82			147	19:15	140	125			265		
07:30	53	87			140	19:30	143	118			261		
07:45	88	267	79	312	167 579	19:45	144	598	134	511	278 1109		
08:00	75	98			173	20:00	138	110			248		
08:15	100	105			205	20:15	136	97			233		
08:30	81	84			165	20:30	94	115			209		
08:45	98	354	91	378	189 732	20:45	105	473	81	403	186 876		
09:00	92	112			204	21:00	90	89			179		
09:15	95	106			201	21:15	81	101			182		
09:30	103	119			222	21:30	64	66			130		
09:45	123	413	115	452	238 865	21:45	61	296	80	336	141 632		
10:00	124	101			225	22:00	56	45			101		
10:15	118	123			241	22:15	60	29			89		
10:30	143	149			292	22:30	45	34			79		
10:45	158	543	121	494	279 1037	22:45	34	195	29	137	63 332		
11:00	152	142			294	23:00	27	39			66		
11:15	155	127			282	23:15	32	30			62		
11:30	144	159			303	23:30	28	23			51		
11:45	187	638	171	599	358 1237	23:45	25	112	29	121	54 233		
TOTALS	2650		2722		5372	TOTALS	6904		6400		13304		
SPLIT %	49.3%		50.7%		28.8%	SPLIT %	51.9%		48.1%		71.2%		

DAILY TOTALS					NB	SB	EB		WB	Total
					9,554	9,122	0		0	18,676
AM Peak Hour	11:45	11:45			11:45	PM Peak Hour	17:30	16:15		16:30
AM Pk Volume	692	730			1422	PM Pk Volume	841	770		1575
Pk Hr Factor	0.925	0.861			0.891	Pk Hr Factor	0.930	0.871		0.951
7 - 9 Volume	621	690	0	0	1311	4 - 6 Volume	1640	1438	0	3078
7 - 9 Peak Hour	08:00	08:00			08:00	4 - 6 Peak Hour	17:00	16:15		16:30
7 - 9 Pk Volume	354	378	0	0	732	4 - 6 Pk Volume	834	770	0	1575
Pk Hr Factor	0.885	0.900	0.000	0.000	0.893	Pk Hr Factor	0.923	0.871	0.000	0.951

VOLUME

Coast Highway btwn Sprinter RR Tracks & Morse St

Day: Tuesday
Date: 8/6/2013City: Oceanside
Project #: CA13_4290_006

DAILY TOTALS					NB	SB					EB	WB	Total
					9,429	9,670					0	0	19,099
AM Period	NB	SB	EB	WB	TOTAL		PM Period	NB	SB	EB	WB	TOTAL	
00:00	11	18			29		12:00	176	179			355	
00:15	14	21			35		12:15	175	147			322	
00:30	14	11			25		12:30	170	180			350	
00:45	7	46	12	62	19	108	12:45	171	692	173	679	344	1371
01:00	8	10			18		13:00	182	185			367	
01:15	10	3			13		13:15	193	190			383	
01:30	9	10			19		13:30	187	171			358	
01:45	7	34	16	39	23	73	13:45	169	731	175	721	344	1452
02:00	5	7			12		14:00	175	202			377	
02:15	8	5			13		14:15	167	169			336	
02:30	2	4			6		14:30	167	168			335	
02:45	4	19	3	19	7	38	14:45	190	699	167	706	357	1405
03:00	4	1			5		15:00	176	172			348	
03:15	9	6			15		15:15	187	195			382	
03:30	5	5			10		15:30	191	219			410	
03:45	7	25	7	19	14	44	15:45	197	751	186	772	383	1523
04:00	8	3			11		16:00	205	186			391	
04:15	7	4			11		16:15	198	196			394	
04:30	2	9			11		16:30	190	173			363	
04:45	10	27	16	32	26	59	16:45	179	772	213	768	392	1540
05:00	12	14			26		17:00	205	190			395	
05:15	12	20			32		17:15	182	174			356	
05:30	19	17			36		17:30	223	190			413	
05:45	18	61	25	76	43	137	17:45	203	813	176	730	379	1543
06:00	27	47			74		18:00	174	192			366	
06:15	34	44			78		18:15	176	163			339	
06:30	45	72			117		18:30	176	180			356	
06:45	52	158	63	226	115	384	18:45	149	675	142	677	291	1352
07:00	49	77			126		19:00	169	147			316	
07:15	67	82			149		19:15	152	170			322	
07:30	57	118			175		19:30	138	123			261	
07:45	68	241	125	402	193	643	19:45	133	592	136	576	269	1168
08:00	68	105			173		20:00	122	133			255	
08:15	91	116			207		20:15	113	110			223	
08:30	93	116			209		20:30	92	75			167	
08:45	118	370	112	449	230	819	20:45	78	405	76	394	154	799
09:00	99	95			194		21:00	86	69			155	
09:15	113	129			242		21:15	94	96			190	
09:30	132	144			276		21:30	81	71			152	
09:45	127	471	130	498	257	969	21:45	57	318	56	292	113	610
10:00	111	118			229		22:00	47	48			95	
10:15	135	136			271		22:15	43	42			85	
10:30	149	173			322		22:30	48	40			88	
10:45	164	559	165	592	329	1151	22:45	34	172	39	169	73	341
11:00	161	149			310		23:00	29	38			67	
11:15	173	158			331		23:15	34	30			64	
11:30	171	168			339		23:30	25	26			51	
11:45	185	690	176	651	361	1341	23:45	20	108	27	121	47	229
TOTALS	2701	3065			5766		TOTALS	6728	6605			13333	
SPLIT %	46.8%	53.2%			30.2%		SPLIT %	50.5%	49.5%			69.8%	

DAILY TOTALS					NB	SB					EB	WB	Total
					9,429	9,670					0	0	19,099
AM Peak Hour	11:30	11:45			11:45		PM Peak Hour	17:00	15:30			15:30	
AM Pk Volume	707	682			1388		PM Pk Volume	813	787			1578	
Pk Hr Factor	0.955	0.947			0.961		Pk Hr Factor	0.911	0.898			0.962	
7 - 9 Volume	611	851	0	0	1462		4 - 6 Volume	1585	1498	0	0	3083	
7 - 9 Peak Hour	08:00	07:30			08:00		4 - 6 Peak Hour	17:00	16:15			16:45	
7 - 9 Pk Volume	370	464	0	0	819		4 - 6 Pk Volume	813	772	0	0	1556	
Pk Hr Factor	0.784	0.928	0.000	0.000	0.890		Pk Hr Factor	0.911	0.906	0.000	0.000	0.942	

VOLUME

Coast Highway btwn Sprinter RR Tracks & Morse St

Day: Wednesday
Date: 8/7/2013City: Oceanside
Project #: CA13_4290_006

DAILY TOTALS					NB	SB	EB					WB	Total
					9,492	9,512						0	0
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL		
00:00	17	29			46	12:00	152	211			363		
00:15	10	23			33	12:15	155	185			340		
00:30	7	20			27	12:30	162	175			337		
00:45	3	37	17	89	20	12:45	168	637	164	735	332	1372	
01:00	11	9			20	13:00	168	169			337		
01:15	11	7			18	13:15	168	163			331		
01:30	9	12			21	13:30	174	168			342		
01:45	1	32	9	37	10	13:45	155	665	162	662	317	1327	
02:00	2	4			6	14:00	172	180			352		
02:15	2	4			6	14:15	188	176			364		
02:30	5	11			16	14:30	170	167			337		
02:45	2	11	1	20	3	14:45	163	693	167	690	330	1383	
03:00	4	3			7	15:00	181	194			375		
03:15	6	6			12	15:15	202	180			382		
03:30	5	4			9	15:30	179	168			347		
03:45	6	21	2	15	8	15:45	176	738	184	726	360	1464	
04:00	3	6			9	16:00	214	190			404		
04:15	3	6			9	16:15	196	185			381		
04:30	4	13			17	16:30	226	181			407		
04:45	10	20	12	37	22	16:45	226	862	207	763	433	1625	
05:00	15	17			32	17:00	199	185			384		
05:15	18	21			39	17:15	215	184			399		
05:30	22	26			48	17:30	207	209			416		
05:45	21	76	31	95	52	17:45	250	871	184	762	434	1633	
06:00	31	36			67	18:00	202	194			396		
06:15	44	46			90	18:15	214	169			383		
06:30	48	58			106	18:30	184	163			347		
06:45	57	180	87	227	144	18:45	174	774	157	683	331	1457	
07:00	57	77			134	19:00	170	139			309		
07:15	68	92			160	19:15	160	120			280		
07:30	50	99			149	19:30	167	126			293		
07:45	80	255	105	373	185	19:45	142	639	120	505	262	1144	
08:00	84	93			177	20:00	134	118			252		
08:15	107	102			209	20:15	131	89			220		
08:30	94	109			203	20:30	86	102			188		
08:45	85	370	99	403	184	20:45	96	447	77	386	173	833	
09:00	100	115			215	21:00	92	83			175		
09:15	106	106			212	21:15	88	110			198		
09:30	106	145			251	21:30	68	71			139		
09:45	125	437	142	508	267	21:45	57	305	93	357	150	662	
10:00	123	127			250	22:00	47	48			95		
10:15	114	132			246	22:15	56	29			85		
10:30	126	139			265	22:30	47	32			79		
10:45	147	510	159	557	306	22:45	38	188	30	139	68	327	
11:00	168	150			318	23:00	23	39			62		
11:15	145	146			291	23:15	25	26			51		
11:30	147	168			315	23:30	23	19			42		
11:45	170	630	172	636	342	23:45	23	94	23	107	46	201	
TOTALS	2579	2997			5576	TOTALS	6913	6515			13428		
SPLIT %	46.3%	53.7%			29.3%	SPLIT %	51.5%	48.5%			70.7%		

DAILY TOTALS					NB	SB	EB	WB	Total
					9,492	9,512	0	0	19,004
AM Peak Hour	11:45	11:45			11:45	PM Peak Hour	17:15	16:45	17:15
AM Pk Volume	639	743			1382	PM Pk Volume	874	785	1645
Pk Hr Factor	0.940	0.880			0.952	Pk Hr Factor	0.874	0.939	0.948
7 - 9 Volume	625	776	0	0	1401	4 - 6 Volume	1733	1525	0 0 3258
7 - 9 Peak Hour	08:00	07:45			07:45	4 - 6 Peak Hour	17:00	16:45	17:00
7 - 9 Pk Volume	370	409	0	0	774	4 - 6 Pk Volume	871	785	0 0 1633
Pk Hr Factor	0.864	0.938	0.000	0.000	0.926	Pk Hr Factor	0.871	0.939	0.000 0.000 0.941

Prepared by NDS/ATD

VOLUME

Coast Highway btwn Whaley St & Cassidy St

Day: Tuesday
Date: 8/6/2013City: Oceanside
Project #: CA13_4290_007

DAILY TOTALS					NB	SB	EB					WB	Total
					8,185	8,733						0	0
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL		
00:00	14	15			29	12:00	149	159			308		
00:15	11	23			34	12:15	159	144			303		
00:30	15	13			28	12:30	153	156			309		
00:45	7	47	13	64	20 111	12:45	142	603	148	607	290 1210		
01:00	4	8			12	13:00	168	162			330		
01:15	8	4			12	13:15	178	172			350		
01:30	11	7			18	13:30	154	174			328		
01:45	5	28	17	36	22 64	13:45	155	655	168	676	323 1331		
02:00	5	8			13	14:00	164	194			358		
02:15	8	3			11	14:15	135	171			306		
02:30	2	3			5	14:30	159	144			303		
02:45	1	16	2	16	3 32	14:45	157	615	139	648	296 1263		
03:00	4	1			5	15:00	153	154			307		
03:15	9	4			13	15:15	177	165			342		
03:30	3	4			7	15:30	166	188			354		
03:45	4	20	5	14	9 34	15:45	147	643	163	670	310 1313		
04:00	7	3			10	16:00	176	172			348		
04:15	6	4			10	16:15	170	165			335		
04:30	3	8			11	16:30	161	166			327		
04:45	8	24	16	31	24 55	16:45	160	667	185	688	345 1355		
05:00	7	16			23	17:00	186	184			370		
05:15	7	25			32	17:15	152	142			294		
05:30	16	18			34	17:30	174	165			339		
05:45	19	49	33	92	52 141	17:45	178	690	163	654	341 1344		
06:00	24	45			69	18:00	155	153			308		
06:15	24	46			70	18:15	164	156			320		
06:30	47	71			118	18:30	138	165			303		
06:45	43	138	60	222	103 360	18:45	133	590	117	591	250 1181		
07:00	38	75			113	19:00	118	125			243		
07:15	56	86			142	19:15	140	149			289		
07:30	55	103			158	19:30	116	102			218		
07:45	61	210	108	372	169 582	19:45	128	502	134	510	262 1012		
08:00	66	105			171	20:00	105	108			213		
08:15	74	99			173	20:15	98	88			186		
08:30	80	107			187	20:30	76	75			151		
08:45	104	324	103	414	207 738	20:45	70	349	67	338	137 687		
09:00	94	93			187	21:00	68	60			128		
09:15	108	110			218	21:15	82	89			171		
09:30	97	126			223	21:30	69	62			131		
09:45	108	407	128	457	236 864	21:45	49	268	49	260	98 528		
10:00	89	103			192	22:00	48	44			92		
10:15	119	124			243	22:15	28	40			68		
10:30	137	136			273	22:30	44	35			79		
10:45	140	485	175	538	315 1023	22:45	27	147	40	159	67 306		
11:00	141	122			263	23:00	30	37			67		
11:15	148	148			296	23:15	29	21			50		
11:30	161	144			305	23:30	21	21			42		
11:45	161	611	163	577	324 1188	23:45	17	97	20	99	37 196		
TOTALS	2359	2833			5192	TOTALS	5826	5900			11726		
SPLIT %	45.4%	54.6%			30.7%	SPLIT %	49.7%	50.3%			69.3%		

DAILY TOTALS					NB	SB	EB	WB	Total
					8,185	8,733	0	0	16,918
AM Peak Hour	11:30	11:45		11:45					16:15
AM Pk Volume	630	622		1244					1377
Pk Hr Factor	0.978	0.954		0.960					0.930
7 - 9 Volume	534	786	0	1320					2699
7 - 9 Peak Hour	08:00	07:45		08:00					16:15
7 - 9 Pk Volume	324	419	0	738					1377
Pk Hr Factor	0.779	0.970	0.000	0.891					0.930
PM Peak Hour	17:00	13:15							
PM Pk Volume	690	708							
Pk Hr Factor	0.927	0.912							
4 - 6 Volume	1357	1342	0						
4 - 6 Peak Hour	17:00	16:15							
4 - 6 Pk Volume	690	700	0						
Pk Hr Factor	0.927	0.946	0.000						

VOLUME

Coast Highway btwn Whaley St & Cassidy St

Day: Wednesday
Date: 8/7/2013City: Oceanside
Project #: CA13_4290_007

DAILY TOTALS					NB	SB	EBWB					Total
					8,465	8,438						0
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL	
00:00	16	24			40	12:00	136	181			317	
00:15	9	23			32	12:15	150	137			287	
00:30	8	18			26	12:30	142	150			292	
00:45	6	39	13	78	19	12:45	147	575	156	624	303	
01:00	9	12			21	13:00	171	161			332	
01:15	10	5			15	13:15	152	157			309	
01:30	7	12			19	13:30	142	157			299	
01:45	1	27	10	39	11	13:45	157	622	141	616	298	
02:00	1	4			5	14:00	160	161			321	
02:15	2	4			6	14:15	169	179			348	
02:30	5	10			15	14:30	156	138			294	
02:45	2	10	1	19	3	14:45	167	652	157	635	324	
03:00	5	4			9	15:00	163	134			297	
03:15	1	3			4	15:15	184	144			328	
03:30	5	6			11	15:30	166	137			303	
03:45	5	16	3	16	8	15:45	154	667	158	573	312	
04:00	4	5			9	16:00	199	176			375	
04:15	2	6			8	16:15	175	159			334	
04:30	4	12			16	16:30	188	163			351	
04:45	7	17	11	34	18	16:45	196	758	169	667	365	
05:00	9	22			31	17:00	188	177			365	
05:15	17	20			37	17:15	191	155			346	
05:30	14	31			45	17:30	195	164			359	
05:45	19	59	31	104	50	17:45	215	789	178	674	393	
06:00	28	39			67	18:00	182	162			344	
06:15	33	48			81	18:15	168	151			319	
06:30	46	59			105	18:30	163	139			302	
06:45	49	156	84	230	133	18:45	162	675	141	593	303	
07:00	42	76			118	19:00	149	110			259	
07:15	62	99			161	19:15	138	102			240	
07:30	58	92			150	19:30	144	106			250	
07:45	71	233	90	357	161	19:45	128	559	112	430	240	
08:00	76	79			155	20:00	113	104			217	
08:15	91	84			175	20:15	106	84			190	
08:30	70	99			169	20:30	72	92			164	
08:45	71	308	77	339	148	20:45	84	375	60	340	144	
09:00	90	91			181	21:00	90	74			164	
09:15	99	94			193	21:15	73	94			167	
09:30	91	119			210	21:30	57	60			117	
09:45	118	398	118	422	236	21:45	51	271	81	309	132	
10:00	100	112			212	22:00	39	49			88	
10:15	111	122			233	22:15	52	28			80	
10:30	111	121			232	22:30	36	27			63	
10:45	145	467	139	494	284	22:45	34	161	25	129	59	
11:00	144	159			303	23:00	21	34			55	
11:15	137	136			273	23:15	21	27			48	
11:30	122	152			274	23:30	18	17			35	
11:45	147	550	170	617	317	23:45	21	81	21	99	42	
TOTALS	2280	2749			5029	TOTALS	6185	5689			11874	
SPLIT %	45.3%	54.7%			29.8%	SPLIT %	52.1%	47.9%			70.2%	

DAILY TOTALS					NB	SB	EB	WB	Total
					8,465	8,438	0	0	16,903
AM Peak Hour	11:45	11:30			11:45	PM Peak Hour	17:00	17:00	17:00
AM Pk Volume	575	640			1213	PM Pk Volume	789	674	1463
Pk Hr Factor	0.958	0.884			0.957	Pk Hr Factor	0.917	0.947	0.931
7 - 9 Volume	541	696	0	0	1237	4 - 6 Volume	1547	1341	2888
7 - 9 Peak Hour	07:45	07:15			07:45	4 - 6 Peak Hour	17:00	17:00	17:00
7 - 9 Pk Volume	308	360	0	0	660	4 - 6 Pk Volume	789	674	1463
Pk Hr Factor	0.846	0.909	0.000	0.000	0.943	Pk Hr Factor	0.917	0.947	0.931

VOLUME

Coast Highway btwn Kelly St & Vista Way

Day: Tuesday
Date: 8/6/2013City: Oceanside
Project #: CA13_4290_008

DAILY TOTALS					NB	SB					Total
					9,510	8,906					18,416
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL
00:00	14	11			25	12:00	183	162			345
00:15	14	24			38	12:15	193	145			338
00:30	12	17			29	12:30	196	180			376
00:45	7	47	12	64	19 111	12:45	127	699	146	633	273 1332
01:00	8	10			18	13:00	203	165			368
01:15	8	4			12	13:15	192	184			376
01:30	9	10			19	13:30	181	175			356
01:45	7	32	15	39	22 71	13:45	171	747	176	700	347 1447
02:00	8	8			16	14:00	189	200			389
02:15	8	5			13	14:15	144	166			310
02:30	6	4			10	14:30	172	165			337
02:45	3	25	2	19	5 44	14:45	184	689	156	687	340 1376
03:00	6	3			9	15:00	189	176			365
03:15	9	2			11	15:15	183	159			342
03:30	3	2			5	15:30	176	188			364
03:45	1	19	7	14	8 33	15:45	186	734	159	682	345 1416
04:00	9	2			11	16:00	191	162			353
04:15	5	5			10	16:15	201	163			364
04:30	6	10			16	16:30	221	172			393
04:45	8	28	15	32	23 60	16:45	219	832	166	663	385 1495
05:00	5	17			22	17:00	235	187			422
05:15	9	27			36	17:15	193	162			355
05:30	15	26			41	17:30	236	156			392
05:45	21	50	36	106	57 156	17:45	208	872	149	654	357 1526
06:00	27	44			71	18:00	194	154			348
06:15	30	50			80	18:15	189	147			336
06:30	52	69			121	18:30	155	172			327
06:45	50	159	65	228	115 387	18:45	149	687	120	593	269 1280
07:00	60	78			138	19:00	175	122			297
07:15	58	88			146	19:15	151	146			297
07:30	72	107			179	19:30	123	80			203
07:45	81	271	102	375	183 646	19:45	130	579	121	469	251 1048
08:00	94	104			198	20:00	110	119			229
08:15	83	107			190	20:15	108	94			202
08:30	96	108			204	20:30	85	78			163
08:45	115	388	107	426	222 814	20:45	74	377	76	367	150 744
09:00	106	99			205	21:00	66	60			126
09:15	119	119			238	21:15	75	89			164
09:30	120	128			248	21:30	64	65			129
09:45	136	481	128	474	264 955	21:45	53	258	50	264	103 522
10:00	121	116			237	22:00	50	45			95
10:15	125	144			269	22:15	38	42			80
10:30	179	138			317	22:30	42	45			87
10:45	161	586	145	543	306 1129	22:45	28	158	36	168	64 326
11:00	177	140			317	23:00	36	29			65
11:15	161	146			307	23:15	26	28			54
11:30	181	166			347	23:30	20	20			40
11:45	167	686	150	602	317 1288	23:45	24	106	27	104	51 210
TOTALS	2772	2922			5694	TOTALS	6738	5984			12722
SPLIT %	48.7%	51.3%			30.9%	SPLIT %	53.0%	47.0%			69.1%

DAILY TOTALS					NB	SB					Total
					9,510	8,906					18,416
AM Peak Hour	11:45	11:45			11:45	PM Peak Hour	16:45	13:15			16:15
AM Pk Volume	739	637			1376	PM Pk Volume	883	735			1564
Pk Hr Factor	0.943	0.885			0.915	Pk Hr Factor	0.935	0.919			0.927
7 - 9 Volume	659	801	0	0	1460	4 - 6 Volume	1704	1317	0	0	3021
7 - 9 Peak Hour	08:00	08:00			08:00	4 - 6 Peak Hour	16:45	16:15			16:15
7 - 9 Pk Volume	388	426	0	0	814	4 - 6 Pk Volume	883	688	0	0	1564
Pk Hr Factor	0.843	0.986	0.000	0.000	0.917	Pk Hr Factor	0.935	0.920	0.000	0.000	0.927

VOLUME

Coast Highway btwn Kelly St & Vista Way

Day: Wednesday
Date: 8/7/2013City: Oceanside
Project #: CA13_4290_008

DAILY TOTALS					NB	SB					EB	WB	Total
					9,540	8,768					0	0	18,308
AM Period	NB	SB	EB	WB	TOTAL		PM Period	NB	SB	EB	WB	TOTAL	
00:00	17	19			36		12:00	134	178			312	
00:15	10	25			35		12:15	174	148			322	
00:30	11	19			30		12:30	170	176			346	
00:45	10	48	18	81	28	129	12:45	176	654	150	652	326	1306
01:00	9	14			23		13:00	205	166			371	
01:15	9	4			13		13:15	164	165			329	
01:30	10	10			20		13:30	173	178			351	
01:45	5	33	13	41	18	74	13:45	173	715	149	658	322	1373
02:00	2	5			7		14:00	192	171			363	
02:15	5	4			9		14:15	182	185			367	
02:30	6	10			16		14:30	159	159			318	
02:45	3	16	5	24	8	40	14:45	175	708	173	688	348	1396
03:00	4	2			6		15:00	197	171			368	
03:15	4	4			8		15:15	195	160			355	
03:30	5	5			10		15:30	183	175			358	
03:45	4	17	1	12	5	29	15:45	183	758	157	663	340	1421
04:00	4	6			10		16:00	223	155			378	
04:15	4	10			14		16:15	204	152			356	
04:30	6	11			17		16:30	187	156			343	
04:45	8	22	12	39	20	61	16:45	230	844	171	634	401	1478
05:00	10	21			31		17:00	201	194			395	
05:15	14	19			33		17:15	244	160			404	
05:30	16	33			49		17:30	215	172			387	
05:45	18	58	36	109	54	167	17:45	249	909	156	682	405	1591
06:00	30	49			79		18:00	215	166			381	
06:15	45	57			102		18:15	193	146			339	
06:30	56	66			122		18:30	177	136			313	
06:45	63	194	91	263	154	457	18:45	177	762	129	577	306	1339
07:00	46	81			127		19:00	162	117			279	
07:15	65	106			171		19:15	153	114			267	
07:30	68	119			187		19:30	152	102			254	
07:45	88	267	85	391	173	658	19:45	135	602	105	438	240	1040
08:00	95	83			178		20:00	124	100			224	
08:15	95	97			192		20:15	112	88			200	
08:30	82	110			192		20:30	86	96			182	
08:45	92	364	84	374	176	738	20:45	89	411	59	343	148	754
09:00	116	105			221		21:00	89	68			157	
09:15	108	112			220		21:15	75	90			165	
09:30	123	127			250		21:30	65	63			128	
09:45	143	490	103	447	246	937	21:45	59	288	73	294	132	582
10:00	119	120			239		22:00	48	53			101	
10:15	107	134			241		22:15	61	31			92	
10:30	117	115			232		22:30	42	24			66	
10:45	155	498	136	505	291	1003	22:45	36	187	26	134	62	321
11:00	136	157			293		23:00	29	32			61	
11:15	147	164			311		23:15	24	27			51	
11:30	136	162			298		23:30	23	14			37	
11:45	175	594	146	629	321	1223	23:45	25	101	17	90	42	191
TOTALS	2601	2915			5516		TOTALS	6939	5853			12792	
SPLIT %	47.2%	52.8%			30.1%		SPLIT %	54.2%	45.8%			69.9%	

DAILY TOTALS					NB	SB					EB	WB	Total
					9,540	8,768					0	0	18,308
AM Peak Hour	11:45	11:15			11:45		PM Peak Hour	17:15	16:45			17:00	
AM Pk Volume	653	650			1301		PM Pk Volume	923	697			1591	
Pk Hr Factor	0.933	0.913			0.940		Pk Hr Factor	0.927	0.898			0.982	
7 - 9 Volume	631	765	0	0	1396		4 - 6 Volume	1753	1316	0	0	3069	
7 - 9 Peak Hour	08:00	07:15			08:00		4 - 6 Peak Hour	17:00	16:45			17:00	
7 - 9 Pk Volume	364	393	0	0	738		4 - 6 Pk Volume	909	697	0	0	1591	
Pk Hr Factor	0.958	0.826	0.000	0.000	0.961		Pk Hr Factor	0.913	0.898	0.000	0.000	0.982	

VOLUME

Coast Highway btwn Vista Way & Eaton St

Day: Tuesday
Date: 8/6/2013City: Oceanside
Project #: CA13_4290_009

DAILY TOTALS					NB	SB	EB					WB	Total
					8,137	8,525						0	0
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL		
00:00	11	5			16	12:00	139	140			279		
00:15	10	7			17	12:15	141	144			285		
00:30	10	8			18	12:30	136	175			311		
00:45	6	37	11	31	17 68	12:45	138	554	155	614	293 1168		
01:00	9	4			13	13:00	162	172			334		
01:15	11	4			15	13:15	138	173			311		
01:30	14	7			21	13:30	142	158			300		
01:45	13	47	12	27	25 74	13:45	127	569	188	691	315 1260		
02:00	5	5			10	14:00	148	151			299		
02:15	6	2			8	14:15	146	151			297		
02:30	2	1			3	14:30	170	169			339		
02:45	3	16	2	10	5 26	14:45	177	641	146	617	323 1258		
03:00	4	1			5	15:00	173	163			336		
03:15	5	1			6	15:15	176	132			308		
03:30	2	2			4	15:30	187	164			351		
03:45	5	16	2	6	7 22	15:45	176	712	143	602	319 1314		
04:00	1	3			4	16:00	183	154			337		
04:15	3	4			7	16:15	169	145			314		
04:30	3	8			11	16:30	204	166			370		
04:45	3	10	9	24	12 34	16:45	201	757	149	614	350 1371		
05:00	4	22			26	17:00	219	138			357		
05:15	8	22			30	17:15	182	143			325		
05:30	12	25			37	17:30	231	142			373		
05:45	17	41	54	123	71 164	17:45	187	819	127	550	314 1369		
06:00	19	43			62	18:00	159	118			277		
06:15	23	73			96	18:15	163	134			297		
06:30	36	109			145	18:30	144	124			268		
06:45	33	111	99	324	132 435	18:45	139	605	110	486	249 1091		
07:00	51	116			167	19:00	125	103			228		
07:15	45	158			203	19:15	113	137			250		
07:30	52	147			199	19:30	140	65			205		
07:45	75	223	142	563	217 786	19:45	112	490	97	402	209 892		
08:00	72	159			231	20:00	108	76			184		
08:15	54	131			185	20:15	96	69			165		
08:30	68	124			192	20:30	90	57			147		
08:45	82	276	145	559	227 835	20:45	95	389	58	260	153 649		
09:00	79	112			191	21:00	55	41			96		
09:15	105	120			225	21:15	58	58			116		
09:30	87	108			195	21:30	58	43			101		
09:45	99	370	129	469	228 839	21:45	44	215	33	175	77 390		
10:00	98	133			231	22:00	43	33			76		
10:15	111	131			242	22:15	26	32			58		
10:30	145	146			291	22:30	42	20			62		
10:45	130	484	141	551	271 1035	22:45	25	136	24	109	49 245		
11:00	135	146			281	23:00	28	20			48		
11:15	117	162			279	23:15	21	17			38		
11:30	147	184			331	23:30	23	14			37		
11:45	127	526	164	656	291 1182	23:45	21	93	11	62	32 155		
TOTALS	2157	3343			5500	TOTALS	5980	5182			11162		
SPLIT %	39.2%	60.8%			33.0%	SPLIT %	53.6%	46.4%			67.0%		

DAILY TOTALS					NB	SB	EB	WB	Total
					8,137	8,525	0	0	16,662
AM Peak Hour	11:30	11:00			11:30	PM Peak Hour	16:45	13:00	16:45
AM Pk Volume	554	656			1186	PM Pk Volume	833	691	1405
Pk Hr Factor	0.942	0.891			0.896	Pk Hr Factor	0.902	0.919	0.942
7 - 9 Volume	499	1122	0	0	1621	4 - 6 Volume	1576	1164	2740
7 - 9 Peak Hour	08:00	07:15			07:15	4 - 6 Peak Hour	16:45	16:00	16:45
7 - 9 Pk Volume	276	606	0	0	850	4 - 6 Pk Volume	833	614	1405
Pk Hr Factor	0.841	0.953	0.000	0.000	0.920	Pk Hr Factor	0.902	0.925	0.942

VOLUME

Coast Highway btwn Vista Way & Eaton St

Day: Wednesday
Date: 8/7/2013City: Oceanside
Project #: CA13_4290_009

DAILY TOTALS					NB	SB					EB	WB	Total
					8,608	8,359					0	0	16,967
AM Period	NB	SB	EB	WB	TOTAL	PM Period	NB	SB	EB	WB	TOTAL		
00:00	16	10			26	12:00	144	184			328		
00:15	12	14			26	12:15	144	177			321		
00:30	13	8			21	12:30	129	169			298		
00:45	7	48	7	39	14 87	12:45	147	564	175	705	322 1269		
01:00	7	9			16	13:00	162	155			317		
01:15	6	1			7	13:15	136	160			296		
01:30	11	3			14	13:30	169	149			318		
01:45	11	35	4	17	15 52	13:45	150	617	165	629	315 1246		
02:00	3	3			6	14:00	150	147			297		
02:15	7	2			9	14:15	161	163			324		
02:30	3	1			4	14:30	151	174			325		
02:45	2	15	3	9	5 24	14:45	165	627	141	625	306 1252		
03:00	2	1			3	15:00	164	154			318		
03:15	1	4			5	15:15	196	138			334		
03:30	5	2			7	15:30	192	136			328		
03:45	3	11	0	7	3 18	15:45	184	736	146	574	330 1310		
04:00	4	3			7	16:00	198	171			369		
04:15	0	9			9	16:15	163	139			302		
04:30	5	1			6	16:30	229	167			396		
04:45	4	13	14	27	18 40	16:45	246	836	169	646	415 1482		
05:00	3	26			29	17:00	218	166			384		
05:15	11	18			29	17:15	231	158			389		
05:30	17	25			42	17:30	216	175			391		
05:45	18	49	57	126	75 175	17:45	244	909	149	648	393 1557		
06:00	22	49			71	18:00	191	136			327		
06:15	29	84			113	18:15	164	138			302		
06:30	39	104			143	18:30	165	116			281		
06:45	38	128	107	344	145 472	18:45	158	678	115	505	273 1183		
07:00	48	113			161	19:00	160	110			270		
07:15	64	119			183	19:15	152	108			260		
07:30	61	122			183	19:30	147	92			239		
07:45	79	252	131	485	210 737	19:45	148	607	94	404	242 1011		
08:00	59	112			171	20:00	131	82			213		
08:15	90	118			208	20:15	114	59			173		
08:30	60	96			156	20:30	81	55			136		
08:45	90	299	96	422	186 721	20:45	83	409	42	238	125 647		
09:00	97	115			212	21:00	80	47			127		
09:15	91	106			197	21:15	69	56			125		
09:30	100	113			213	21:30	58	36			94		
09:45	114	402	131	465	245 867	21:45	45	252	46	185	91 437		
10:00	88	123			211	22:00	52	45			97		
10:15	100	118			218	22:15	50	21			71		
10:30	94	119			213	22:30	24	20			44		
10:45	126	408	130	490	256 898	22:45	26	152	17	103	43 255		
11:00	110	139			249	23:00	27	25			52		
11:15	133	137			270	23:15	11	17			28		
11:30	122	159			281	23:30	17	9			26		
11:45	129	494	167	602	296 1096	23:45	12	67	13	64	25 131		
TOTALS	2154	3033			5187	TOTALS	6454	5326			11780		
SPLIT %	41.5%	58.5%			30.6%	SPLIT %	54.8%	45.2%			69.4%		

DAILY TOTALS					NB	SB					EB	WB	Total
					8,608	8,359					0	0	16,967
AM Peak Hour	11:45	11:45			11:45	PM Peak Hour	16:30	12:00			16:30		
AM Pk Volume	546	697			1243	PM Pk Volume	924	705			1584		
Pk Hr Factor	0.948	0.947			0.947	Pk Hr Factor	0.939	0.958			0.954		
7 - 9 Volume	551	907			1458	4 - 6 Volume	1745	1294			3039		
7 - 9 Peak Hour	08:00	07:00			07:30	4 - 6 Peak Hour	16:30	16:45			16:30		
7 - 9 Pk Volume	299	485			772	4 - 6 Pk Volume	924	668			1584		
Pk Hr Factor	0.831	0.926	0.000	0.000	0.919	Pk Hr Factor	0.939	0.954	0.000	0.000	0.954		

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	78	51	71	290	486	142	14	107	71	18	66
Future Volume (vph)	85	78	51	71	290	486	142	14	107	71	18	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3158	1441		1782	1583		1792	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3158	1441		1782	1583		1792	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	85	55	77	315	528	154	15	116	77	20	72
RTOR Reduction (vph)	0	0	48	0	205	216	0	0	83	0	0	56
Lane Group Flow (vph)	92	85	7	77	374	48	0	169	33	0	97	16
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	5.4	9.5	9.5	5.4	13.1	13.1		20.3	20.3		16.1	16.1
Effective Green, g (s)	5.4	9.5	9.5	5.4	13.1	13.1		20.3	20.3		16.1	16.1
Actuated g/C Ratio	0.07	0.13	0.13	0.07	0.18	0.18		0.28	0.28		0.22	0.22
Clearance Time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	132	245	208	132	573	261		501	445		400	353
v/s Ratio Prot	c0.05	0.05		0.04	c0.12			c0.09			c0.05	
v/s Ratio Perm			0.00			0.03			0.02			0.01
v/c Ratio	0.70	0.35	0.03	0.58	0.65	0.18		0.34	0.07		0.24	0.05
Uniform Delay, d1	32.6	28.5	27.3	32.3	27.4	25.0		20.6	19.0		23.0	22.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	14.8	0.3	0.0	6.4	2.0	0.1		1.8	0.3		1.4	0.2
Delay (s)	47.4	28.8	27.3	38.7	29.4	25.1		22.4	19.3		24.4	22.2
Level of Service	D	C	C	D	C	C		C	B		C	C
Approach Delay (s)		35.8			29.0			21.1			23.5	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			28.0				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			72.1				Sum of lost time (s)		20.8			
Intersection Capacity Utilization			44.7%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Coast Hwy & Driveway/SR-76 ramps

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔		↔	↔		↔	
Traffic Volume (vph)	0	0	2	325	0	239	1	113	369	76	105	0
Future Volume (vph)	0	0	2	325	0	239	1	113	369	76	105	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6		4.6	4.6	4.0		4.6	4.0		4.6	
Lane Util. Factor		1.00		0.95	0.95	1.00		0.95	1.00		0.95	
Frt		0.86		1.00	1.00	0.85		1.00	0.85		1.00	
Flt Protected		1.00		0.95	0.95	1.00		1.00	1.00		0.98	
Satd. Flow (prot)		1611		1681	1681	1583		3538	1583		3466	
Flt Permitted		1.00		0.95	0.95	1.00		1.00	1.00		0.98	
Satd. Flow (perm)		1611		1681	1681	1583		3538	1583		3466	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	2	353	0	260	1	123	401	83	114	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	176	177	260	0	124	401	0	197	0
Turn Type		NA		Split	NA	Free	Split	NA	Free	Split	NA	
Protected Phases		4		8	8		2	2		6	6	
Permitted Phases	4					Free			Free			
Actuated Green, G (s)		1.0		9.9	9.9	65.5		18.1	65.5		18.1	
Effective Green, g (s)		1.0		9.9	9.9	65.5		18.1	65.5		18.1	
Actuated g/C Ratio		0.02		0.15	0.15	1.00		0.28	1.00		0.28	
Clearance Time (s)		4.6		4.6	4.6			4.6			4.6	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		24		254	254	1583		977	1583		957	
v/s Ratio Prot		0.00		0.10	c0.11			0.04			0.06	
v/s Ratio Perm						0.16			c0.25			
v/c Ratio		0.00		0.69	0.70	0.16		0.13	0.25		0.21	
Uniform Delay, d1		31.8		26.4	26.4	0.0		17.8	0.0		18.2	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		0.0		7.9	8.1	0.2		0.3	0.4		0.5	
Delay (s)		31.8		34.3	34.4	0.2		18.0	0.4		18.7	
Level of Service		C		C	C	A		B	A		B	
Approach Delay (s)		31.8			19.9			4.6			18.7	
Approach LOS		C			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			13.7				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.42									
Actuated Cycle Length (s)			65.5				Sum of lost time (s)			18.4		
Intersection Capacity Utilization			34.2%				ICU Level of Service			A		
Analysis Period (min)			15									
Description: SR-76 & Coast Hwy												
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	39	9	29	50	53	28	43	42	79	59	12
Future Volume (vph)	4	39	9	29	50	53	28	43	42	79	59	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	42	10	32	54	58	30	47	46	86	64	13
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	56	144	123	163								
Volume Left (vph)	4	32	30	86								
Volume Right (vph)	10	58	46	13								
Hadj (s)	-0.06	-0.16	-0.14	0.09								
Departure Headway (s)	4.7	4.5	4.4	4.6								
Degree Utilization, x	0.07	0.18	0.15	0.21								
Capacity (veh/h)	704	748	767	738								
Control Delay (s)	8.1	8.5	8.2	8.8								
Approach Delay (s)	8.1	8.5	8.2	8.8								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.5									
Level of Service			A									
Intersection Capacity Utilization			35.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	112	11	31	6	21	43	29	218	13	17	299	64
Future Volume (vph)	112	11	31	6	21	43	29	218	13	17	299	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.92		1.00	0.99		1.00	0.97	
Flt Protected		0.96	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1782	1583		1702		1770	3510		1770	3445	
Flt Permitted		0.74	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1374	1583		1679		1770	3510		1770	3445	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	122	12	34	7	23	47	32	237	14	18	325	70
RTOR Reduction (vph)	0	0	25	0	35	0	0	6	0	0	16	0
Lane Group Flow (vph)	0	134	9	0	42	0	32	245	0	18	379	0
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		10.6	10.6		10.6		1.6	8.9		11.6	23.7	
Effective Green, g (s)		10.6	10.6		10.6		1.6	8.9		11.6	23.7	
Actuated g/C Ratio		0.25	0.25		0.25		0.04	0.21		0.28	0.57	
Clearance Time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		3.0	7.0	
Lane Grp Cap (vph)		347	400		424		67	745		490	1948	
v/s Ratio Prot							c0.02	c0.07		0.01	c0.11	
v/s Ratio Perm		c0.10	0.01		0.02							
v/c Ratio		0.39	0.02		0.10		0.48	0.33		0.04	0.19	
Uniform Delay, d1		13.0	11.8		12.0		19.7	14.0		11.1	4.4	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.5	0.1		0.4		5.3	0.3		0.0	0.2	
Delay (s)		15.5	11.8		12.4		25.0	14.2		11.1	4.6	
Level of Service		B	B		B		C	B		B	A	
Approach Delay (s)		14.7			12.4			15.5			4.9	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			10.4									
HCM 2000 Volume to Capacity ratio			0.30									
Actuated Cycle Length (s)			41.9									
Intersection Capacity Utilization			40.4%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Coast Hwy & Civic Center Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	7	6	18	10	18	5	210	22	52	250	9
Future Volume (vph)	9	7	6	18	10	18	5	210	22	52	250	9
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2			4.6			4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.93		1.00	0.90			0.99			1.00	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	1732		1770	1682			3486			3494	
Flt Permitted	0.74	1.00		0.75	1.00			0.95			0.85	
Satd. Flow (perm)	1373	1732		1393	1682			3300			3011	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	8	7	20	11	20	5	228	24	57	272	10
RTOR Reduction (vph)	0	3	0	0	9	0	0	17	0	0	5	0
Lane Group Flow (vph)	10	12	0	20	22	0	0	240	0	0	334	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	25.8	25.8		25.8	25.8			11.3			11.3	
Effective Green, g (s)	25.8	25.8		25.8	25.8			11.3			11.3	
Actuated g/C Ratio	0.56	0.56		0.56	0.56			0.25			0.25	
Clearance Time (s)	4.2	4.2		4.2	4.2			4.6			4.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	
Lane Grp Cap (vph)	771	973		782	945			812			741	
v/s Ratio Prot		0.01			0.01							
v/s Ratio Perm	0.01			c0.01				0.07			c0.11	
v/c Ratio	0.01	0.01		0.03	0.02			0.30			0.45	
Uniform Delay, d1	4.4	4.4		4.5	4.5			14.1			14.7	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.0		0.1	0.0			0.3			0.6	
Delay (s)	4.5	4.5		4.5	4.5			14.3			15.3	
Level of Service	A	A		A	A			B			B	
Approach Delay (s)		4.5			4.5			14.3			15.3	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			13.7			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.16									
Actuated Cycle Length (s)			45.9			Sum of lost time (s)			8.8			
Intersection Capacity Utilization			35.9%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

6: Coast Hwy & Pier View Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	9	9	10	14	15	7	217	11	11	236	18
Future Volume (vph)	6	9	9	10	14	15	7	217	11	11	236	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		5.0	5.0			5.0			4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	0.99	1.00		0.99	1.00			1.00			1.00	
Frt	1.00	0.93		1.00	0.92			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1745	1704		1754	1695			3503			3485	
Flt Permitted	0.74	1.00		0.74	1.00			0.94			0.93	
Satd. Flow (perm)	1354	1704		1374	1695			3290			3264	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	10	10	11	15	16	8	236	12	12	257	20
RTOR Reduction (vph)	0	4	0	0	6	0	0	7	0	0	10	0
Lane Group Flow (vph)	7	16	0	11	25	0	0	249	0	0	279	0
Confl. Peds. (#/hr)	16		11	11		16	10		17	17		10
Confl. Bikes (#/hr)			2			2						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	31.8	31.8		31.0	31.0			9.4			9.9	
Effective Green, g (s)	31.8	31.8		31.0	31.0			9.4			9.9	
Actuated g/C Ratio	0.63	0.63		0.62	0.62			0.19			0.20	
Clearance Time (s)	4.2	4.2		5.0	5.0			5.0			4.5	
Vehicle Extension (s)	3.0	3.0		3.5	3.5			3.0			3.5	
Lane Grp Cap (vph)	854	1075		845	1042			613			641	
v/s Ratio Prot		0.01			c0.01							
v/s Ratio Perm	0.01			0.01				0.08			c0.09	
v/c Ratio	0.01	0.02		0.01	0.02			0.41			0.43	
Uniform Delay, d1	3.4	3.5		3.8	3.8			18.0			17.8	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.0	0.0		0.0	0.0			0.4			0.6	
Delay (s)	3.5	3.5		3.8	3.8			18.5			18.4	
Level of Service	A	A		A	A			B			B	
Approach Delay (s)		3.5			3.8			18.5			18.4	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		16.8			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.12										
Actuated Cycle Length (s)		50.4			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		37.6%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

9/1/2016

																			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR							
Lane Configurations																			
Sign Control		Stop			Stop			Stop			Stop								
Traffic Volume (vph)	2	5	19	17	9	5	88	137	6	7	94	6							
Future Volume (vph)	2	5	19	17	9	5	88	137	6	7	94	6							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92							
Hourly flow rate (vph)	2	5	21	18	10	5	96	149	7	8	102	7							
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1														
Volume Total (vph)	7	21	33	252	117														
Volume Left (vph)	2	0	18	96	8														
Volume Right (vph)	0	21	5	7	7														
Hadj (s)	0.18	-0.67	0.05	0.09	0.01														
Departure Headway (s)	5.5	4.7	4.9	4.3	4.3														
Degree Utilization, x	0.01	0.03	0.05	0.30	0.14														
Capacity (veh/h)	599	704	670	824	801														
Control Delay (s)	7.4	6.6	8.2	9.1	8.0														
Approach Delay (s)	6.8		8.2	9.1	8.0														
Approach LOS	A		A	A	A														
Intersection Summary																			
Delay			8.6																
Level of Service			A																
Intersection Capacity Utilization			34.2%	ICU Level of Service					A										
Analysis Period (min)			15																

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	80	46	74	56	27	65
Future Volume (vph)	80	46	74	56	27	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	50	80	61	29	71
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	87	50	141	100		
Volume Left (vph)	87	0	0	29		
Volume Right (vph)	0	50	61	0		
Hadj (s)	0.53	-0.67	-0.23	0.09		
Departure Headway (s)	5.6	4.4	4.1	4.5		
Degree Utilization, x	0.13	0.06	0.16	0.12		
Capacity (veh/h)	612	779	835	763		
Control Delay (s)	8.2	6.5	7.9	8.1		
Approach Delay (s)	7.6		7.9	8.1		
Approach LOS	A		A	A		
Intersection Summary						
Delay			7.9			
Level of Service			A			
Intersection Capacity Utilization			26.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Existing Year 2013 No Project

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #9 Cleveland Street and Mission Avenue

Cycle (sec): 100 Critical Vol./Cap.(X): 0.093
 Loss Time (sec): 0 Average Delay (sec/veh): 8.1
 Optimal Cycle: 0 Level Of Service: A

Street Name:	Cleveland Street						Mission Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1	0	0	0	1	1	0	1	1	0	1

Volume Module:	Cleveland Street NB			Cleveland Street SB			Mission Avenue EB			Mission Avenue WB		
Base Vol:	10	10	14	10	13	25	11	91	7	39	111	23
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	10	14	10	13	25	11	91	7	39	111	23
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	10	10	14	10	13	25	11	91	7	39	111	23
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	10	10	14	10	13	25	11	91	7	39	111	23
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	10	10	14	10	13	25	11	91	7	39	111	23

Saturation Flow Module:	Cleveland Street NB			Cleveland Street SB			Mission Avenue EB			Mission Avenue WB		
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.50	0.50	1.00	0.21	0.27	0.52	1.00	1.86	0.14	1.00	1.66	0.34
Final Sat.:	315	315	755	145	189	363	628	1290	100	646	1199	256

Capacity Analysis Module:	Cleveland Street NB			Cleveland Street SB			Mission Avenue EB			Mission Avenue WB		
Vol/Sat:	0.03	0.03	0.02	0.07	0.07	0.07	0.02	0.07	0.07	0.06	0.09	0.09
Crit Moves:	****			****			****			****		
Delay/Veh:	8.3	8.3	7.3	8.3	8.3	8.3	8.4	8.1	8.0	8.5	8.0	7.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	8.3	8.3	7.3	8.3	8.3	8.3	8.4	8.1	8.0	8.5	8.0	7.9
LOS by Move:	A	A	A	A	A	A	A	A	A	A	A	A
ApproachDel:	7.9			8.3			8.1			8.1		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	7.9			8.3			8.1			8.1		
LOS by Appr:	A			A			A			A		
AllWayAvgQ:	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1

Note: Queue reported is the number of cars per lane.

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	23	124	189	64	14	172	0	0	194	15
Future Volume (vph)	11	0	23	124	189	64	14	172	0	0	194	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	
Lane Util. Factor	1.00		1.00	1.00	0.95		1.00	0.95			0.95	
Frpb, ped/bikes	1.00		0.98	1.00	0.99		1.00	1.00			1.00	
Flpb, ped/bikes	0.99		1.00	0.99	1.00		1.00	1.00			1.00	
Frt	1.00		0.85	1.00	0.96		1.00	1.00			0.99	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1757		1546	1750	3385		1770	3539			3494	
Flt Permitted	0.58		1.00	0.95	1.00		0.61	1.00			1.00	
Satd. Flow (perm)	1078		1546	1750	3385		1137	3539			3494	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	0	25	135	205	70	15	187	0	0	211	16
RTOR Reduction (vph)	0	0	8	0	23	0	0	0	0	0	9	0
Lane Group Flow (vph)	12	0	17	135	252	0	15	187	0	0	218	0
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type	Perm		Perm	Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4		4	8			2					
Actuated Green, G (s)	41.0		41.0	41.0	41.0		10.6	10.6			10.6	
Effective Green, g (s)	41.0		41.0	41.0	41.0		10.6	10.6			10.6	
Actuated g/C Ratio	0.67		0.67	0.67	0.67		0.17	0.17			0.17	
Clearance Time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0		4.0	4.0			4.0	
Lane Grp Cap (vph)	717		1028	1164	2253		195	608			601	
v/s Ratio Prot					0.07			0.05			c0.06	
v/s Ratio Perm	0.01		0.01	c0.08			0.01					
v/c Ratio	0.02		0.02	0.12	0.11		0.08	0.31			0.36	
Uniform Delay, d1	3.5		3.5	3.7	3.7		21.4	22.3			22.5	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.0		0.0	0.2	0.1		0.2	0.4			0.5	
Delay (s)	3.5		3.5	3.9	3.8		21.6	22.7			23.0	
Level of Service	A		A	A	A		C	C			C	
Approach Delay (s)		3.5			3.9			22.6			23.0	
Approach LOS		A			A			C			C	
Intersection Summary												
HCM 2000 Control Delay	13.1			HCM 2000 Level of Service					B			
HCM 2000 Volume to Capacity ratio	0.17											
Actuated Cycle Length (s)	61.6			Sum of lost time (s)					10.0			
Intersection Capacity Utilization	45.5%			ICU Level of Service					A			
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	132	2	50	462	194	3	14	202	132	10	7
Future Volume (vph)	5	132	2	50	462	194	3	14	202	132	10	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0	4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.86		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (prot)	1770	3532		1770	3539	1583	1770	1601		1681	1679	
Flt Permitted	0.47	1.00		0.66	1.00	1.00	0.70	1.00		0.61	0.68	
Satd. Flow (perm)	871	3532		1229	3539	1583	1308	1601		1084	1184	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	143	2	54	502	211	3	15	220	143	11	8
RTOR Reduction (vph)	0	1	0	0	0	133	0	147	0	0	3	0
Lane Group Flow (vph)	5	144	0	54	502	78	3	88	0	82	77	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	12.2	12.2		11.8	11.8	11.8	10.7	10.7		10.7	10.7	
Effective Green, g (s)	12.2	12.2		11.8	11.8	11.8	10.7	10.7		10.7	10.7	
Actuated g/C Ratio	0.38	0.38		0.37	0.37	0.37	0.33	0.33		0.33	0.33	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0	4.6	4.6		4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	331	1342		451	1300	581	436	533		361	394	
v/s Ratio Prot		0.04			c0.14			0.06				
v/s Ratio Perm	0.01			0.04		0.05	0.00			c0.08	0.06	
v/c Ratio	0.02	0.11		0.12	0.39	0.13	0.01	0.17		0.23	0.19	
Uniform Delay, d1	6.2	6.4		6.7	7.5	6.8	7.1	7.6		7.7	7.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.0		0.1	0.2	0.1	0.0	0.2		0.4	0.3	
Delay (s)	6.2	6.5		6.9	7.7	6.9	7.2	7.8		8.2	8.0	
Level of Service	A	A		A	A	A	A	A		A	A	
Approach Delay (s)		6.5			7.4			7.7			8.1	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay		7.4			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.31										
Actuated Cycle Length (s)		32.1			Sum of lost time (s)			9.6				
Intersection Capacity Utilization		53.3%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

9/1/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↙	
Traffic Volume (veh/h)	35	12	44	60	11	17
Future Volume (Veh/h)	35	12	44	60	11	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	13	48	65	12	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	248					
pX, platoon unblocked						
vC, conflicting volume				51	206	44
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol				51	206	44
tC, single (s)				4.1	6.4	6.2
tC, 2 stage (s)						
tF (s)				2.2	3.5	3.3
p0 queue free %				97	98	98
cM capacity (veh/h)				1555	759	1025
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	51	113	30			
Volume Left	0	48	12			
Volume Right	13	0	18			
cSH	1700	1555	899			
Volume to Capacity	0.03	0.03	0.03			
Queue Length 95th (ft)	0	2	3			
Control Delay (s)	0.0	3.3	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.3	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay				3.3		
Intersection Capacity Utilization				22.3%	ICU Level of Service	A
Analysis Period (min)				15		

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr/Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	115	21	0	0	0	23	230	99	37	261	39
Future Volume (vph)	16	115	21	0	0	0	23	230	99	37	261	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2					4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	1.00					1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00					1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00					1.00	1.00		1.00	1.00	
Frt	1.00	0.98					1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1811					1770	3359		1770	3453	
Flt Permitted	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1811					1770	3359		1770	3453	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	125	23	0	0	0	25	250	108	40	284	42
RTOR Reduction (vph)	0	11	0	0	0	0	0	84	0	0	26	0
Lane Group Flow (vph)	17	137	0	0	0	0	25	274	0	40	300	0
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA					Prot	NA		Prot	NA	
Protected Phases	4	4					5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	18.0	18.0					4.0	10.2		3.8	10.0	
Effective Green, g (s)	18.0	18.0					4.0	10.2		3.8	10.0	
Actuated g/C Ratio	0.40	0.40					0.09	0.23		0.08	0.22	
Clearance Time (s)	4.2	4.2					4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0					3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	708	724					157	761		149	767	
v/s Ratio Prot	0.01	c0.08					0.01	0.08		c0.02	c0.09	
v/s Ratio Perm												
v/c Ratio	0.02	0.19					0.16	0.36		0.27	0.39	
Uniform Delay, d1	8.2	8.8					18.9	14.7		19.3	14.9	
Progression Factor	1.00	1.00					1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	0.6					2.2	0.4		4.4	0.5	
Delay (s)	8.2	9.3					21.1	15.1		23.7	15.4	
Level of Service	A	A					C	B		C	B	
Approach Delay (s)		9.2			0.0			15.4			16.3	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		14.7			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.26										
Actuated Cycle Length (s)		45.0			Sum of lost time (s)			13.0				
Intersection Capacity Utilization		44.2%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	240	7	0	0	0	0	10	15	9	7	0
Future Volume (Veh/h)	5	240	7	0	0	0	0	10	15	9	7	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	261	8	0	0	0	0	11	16	10	8	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		255										
pX, platoon unblocked												
vC, conflicting volume	0			269			279	275	134	162	279	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			269			279	275	134	162	279	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	98	99	99	100
cM capacity (veh/h)	1622			1292			644	629	890	761	626	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	136	138	27	18								
Volume Left	5	0	0	10								
Volume Right	0	8	16	0								
cSH	1622	1700	761	695								
Volume to Capacity	0.00	0.08	0.04	0.03								
Queue Length 95th (ft)	0	0	3	2								
Control Delay (s)	0.3	0.0	9.9	10.3								
Lane LOS	A		A	B								
Approach Delay (s)	0.1		9.9	10.3								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			21.2%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	242	3	0	0	0	0	14	10	13	15	0
Future Volume (vph)	17	242	3	0	0	0	0	14	10	13	15	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	263	3	0	0	0	0	15	11	14	16	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	150	135	26	30								
Volume Left (vph)	18	0	0	14								
Volume Right (vph)	0	3	11	0								
Hadj (s)	0.09	0.02	-0.22	0.13								
Departure Headway (s)	4.7	4.7	4.4	4.7								
Degree Utilization, x	0.20	0.17	0.03	0.04								
Capacity (veh/h)	751	758	778	719								
Control Delay (s)	7.7	7.4	7.5	7.9								
Approach Delay (s)	7.6		7.5	7.9								
Approach LOS	A		A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			22.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Yield				Stop			Stop			Stop	
Traffic Volume (vph)	142	122	1	4	0	3	0	17	9	0	0	0
Future Volume (vph)	142	122	1	4	0	3	0	17	9	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	154	133	1	4	0	3	0	18	10	0	0	0
Direction, Lane #	EB 1	EB 2	WB 1	NB 1								
Volume Total (vph)	154	134	7	28								
Volume Left (vph)	154	0	4	0								
Volume Right (vph)	0	1	3	10								
Hadj (s)	0.53	0.03	-0.11	-0.18								
Departure Headway (s)	5.1	4.6	4.2	4.4								
Degree Utilization, x	0.22	0.17	0.01	0.03								
Capacity (veh/h)	698	769	833	773								
Control Delay (s)	8.3	7.3	7.3	7.5								
Approach Delay (s)	7.9		7.3	7.5								
Approach LOS	A		A	A								
Intersection Summary												
Delay			7.8									
Level of Service			A									
Intersection Capacity Utilization			22.3%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	1	13	12	3	11	13	263	7	5	272	6
Future Volume (Veh/h)	8	1	13	12	3	11	13	263	7	5	272	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	1	14	13	3	12	14	286	8	5	296	7
Pedestrians		7			7						1	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		1			1						0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								1261			440	
pX, platoon unblocked												
vC, conflicting volume	502	646	158	498	645	155	310			301		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	502	646	158	498	645	155	310			301		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	98	97	99	99	99			100		
cM capacity (veh/h)	431	379	854	436	379	857	1240			1250		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	24	28	157	151	153	155						
Volume Left	9	13	14	0	5	0						
Volume Right	14	12	0	8	0	7						
cSH	601	541	1240	1700	1250	1700						
Volume to Capacity	0.04	0.05	0.01	0.09	0.00	0.09						
Queue Length 95th (ft)	3	4	1	0	0	0						
Control Delay (s)	11.2	12.0	0.8	0.0	0.3	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s)	11.2	12.0	0.4		0.1							
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.2									
Intersection Capacity Utilization			27.5%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

18: Coast Hwy & Washington Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	1	7	3	0	3	5	278	8	2	290	5
Future Volume (Veh/h)	4	1	7	3	0	3	5	278	8	2	290	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	1	8	3	0	3	5	302	9	2	315	5
Pedestrians		11			7						12	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		1			1						1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								831			870	
pX, platoon unblocked												
vC, conflicting volume	508	660	171	494	658	174	331			318		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	508	660	171	494	658	174	331			318		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	100	99	99	100	100	100			100		
cM capacity (veh/h)	430	373	835	444	374	825	1214			1232		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	13	6	156	160	160	162						
Volume Left	4	3	5	0	2	0						
Volume Right	8	3	0	9	0	5						
cSH	603	577	1214	1700	1232	1700						
Volume to Capacity	0.02	0.01	0.00	0.09	0.00	0.10						
Queue Length 95th (ft)	2	1	0	0	0	0						
Control Delay (s)	11.1	11.3	0.3	0.0	0.1	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s)	11.1	11.3	0.1		0.1							
Approach LOS	B	B										
Intersection Summary												
Average Delay			0.4									
Intersection Capacity Utilization			25.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	25	33	29	13	4	34	5	69	20	40	47	1
Future Volume (vph)	25	33	29	13	4	34	5	69	20	40	47	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	36	32	14	4	37	5	75	22	43	51	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	95	55	102	95								
Volume Left (vph)	27	14	5	43								
Volume Right (vph)	32	37	22	1								
Hadj (s)	-0.11	-0.32	-0.09	0.12								
Departure Headway (s)	4.3	4.1	4.3	4.5								
Degree Utilization, x	0.11	0.06	0.12	0.12								
Capacity (veh/h)	797	813	807	765								
Control Delay (s)	7.8	7.4	7.8	8.1								
Approach Delay (s)	7.8	7.4	7.8	8.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.8									
Level of Service			A									
Intersection Capacity Utilization			24.9%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	126	10	2	58	10	5	12	13	14	17	7
Future Volume (Veh/h)	5	126	10	2	58	10	5	12	13	14	17	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	137	11	2	63	11	5	13	14	15	18	8
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked												
vC, conflicting volume	88			155			250	252	150	260	252	84
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	88			155			250	252	150	260	252	84
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	98	98	98	97	99
cM capacity (veh/h)	1490			1417			667	637	892	653	637	964
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	153	76	32	41								
Volume Left	5	2	5	15								
Volume Right	11	11	14	8								
cSH	1490	1417	734	689								
Volume to Capacity	0.00	0.00	0.04	0.06								
Queue Length 95th (ft)	0	0	3	5								
Control Delay (s)	0.3	0.2	10.1	10.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.2	10.1	10.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.7									
Intersection Capacity Utilization			21.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

21: Coast Hwy & Wisconsin Ave

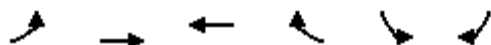
9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	26	92	42	14	13	45	257	30	8	283	12
Future Volume (vph)	36	26	92	42	14	13	45	257	30	8	283	12
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2			4.2		4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.88			0.97		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1644			1762		1770	3483		1770	3518	
Flt Permitted	0.91	1.00			0.74		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1693	1644			1342		1770	3483		1770	3518	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	28	100	46	15	14	49	279	33	9	308	13
RTOR Reduction (vph)	0	88	0	0	11	0	0	8	0	0	3	0
Lane Group Flow (vph)	39	40	0	0	64	0	49	304	0	9	318	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	4.4	4.4			4.4		2.3	17.7		0.9	16.3	
Effective Green, g (s)	4.4	4.4			4.4		2.3	17.7		0.9	16.3	
Actuated g/C Ratio	0.12	0.12			0.12		0.06	0.49		0.03	0.45	
Clearance Time (s)	4.2	4.2			4.2		4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	206	200			164		113	1712		44	1592	
v/s Ratio Prot		0.02					c0.03	0.09		0.01	c0.09	
v/s Ratio Perm	0.02				c0.05							
v/c Ratio	0.19	0.20			0.39		0.43	0.18		0.20	0.20	
Uniform Delay, d1	14.2	14.2			14.6		16.2	5.1		17.2	5.9	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	0.5			1.6		2.7	0.1		2.3	0.1	
Delay (s)	14.6	14.7			16.1		18.9	5.2		19.5	6.0	
Level of Service	B	B			B		B	A		B	A	
Approach Delay (s)		14.7			16.1			7.0			6.4	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			8.9				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.26									
Actuated Cycle Length (s)			36.0				Sum of lost time (s)			13.0		
Intersection Capacity Utilization			33.0%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

9/1/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	60	58	3	10	9
Future Volume (Veh/h)	5	60	58	3	10	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	65	63	3	11	10
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	74				148	74
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	74				148	74
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1515				834	981
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	70	66	21			
Volume Left	5	0	11			
Volume Right	0	3	10			
cSH	1515	1700	898			
Volume to Capacity	0.00	0.04	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.6	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	0.6	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay		1.5				
Intersection Capacity Utilization		17.6%		ICU Level of Service	A	
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	56	5	12	53	7	3	4	8	22	1	3
Future Volume (Veh/h)	4	56	5	12	53	7	3	4	8	22	1	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	61	5	13	58	8	3	4	9	24	1	3
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	68			66			165	166	64	172	164	66
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	68			66			165	166	64	172	164	66
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	99	99	97	100	100
cM capacity (veh/h)	1531			1536			787	718	1001	771	719	994
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	70	79	16	28								
Volume Left	4	13	3	24								
Volume Right	5	8	9	3								
cSH	1531	1536	871	788								
Volume to Capacity	0.00	0.01	0.02	0.04								
Queue Length 95th (ft)	0	1	1	3								
Control Delay (s)	0.4	1.3	9.2	9.7								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.4	1.3	9.2	9.7								
Approach LOS			A	A								
Intersection Summary												
Average Delay			2.9									
Intersection Capacity Utilization			19.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	33	52	20	42	0	28	0	10	0	2	0
Future Volume (vph)	0	33	52	20	42	0	28	0	10	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	36	57	22	46	0	30	0	11	0	2	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	93	68	41	2								
Volume Left (vph)	0	22	30	0								
Volume Right (vph)	57	0	11	0								
Hadj (s)	-0.33	0.10	0.02	0.03								
Departure Headway (s)	3.7	4.2	4.3	4.3								
Degree Utilization, x	0.10	0.08	0.05	0.00								
Capacity (veh/h)	945	846	808	798								
Control Delay (s)	7.1	7.5	7.5	7.3								
Approach Delay (s)	7.1	7.5	7.5	7.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.3								
Level of Service				A								
Intersection Capacity Utilization				25.8%	ICU Level of Service		A					
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	32	46	51	20	54	61
Future Volume (vph)	32	46	51	20	54	61
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	50	55	22	59	66
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	85	77	125			
Volume Left (vph)	35	0	59			
Volume Right (vph)	50	22	0			
Hadj (s)	-0.24	-0.14	0.13			
Departure Headway (s)	4.1	4.1	4.3			
Degree Utilization, x	0.10	0.09	0.15			
Capacity (veh/h)	834	851	818			
Control Delay (s)	7.5	7.5	8.0			
Approach Delay (s)	7.5	7.5	8.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			24.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	132	1	6	106	22	6	7	11	22	11	5
Future Volume (Veh/h)	4	132	1	6	106	22	6	7	11	22	11	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	143	1	7	115	24	7	8	12	24	12	5
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					253							
pX, platoon unblocked	0.95						0.95	0.95		0.95	0.95	0.95
vC, conflicting volume	142			155			318	318	162	320	307	134
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	69			155			255	255	162	256	243	61
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	99	99	96	98	99
cM capacity (veh/h)	1450			1412			632	604	868	630	613	948
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	148	146	27	41								
Volume Left	4	7	7	24								
Volume Right	1	24	12	5								
cSH	1450	1412	708	652								
Volume to Capacity	0.00	0.00	0.04	0.06								
Queue Length 95th (ft)	0	0	3	5								
Control Delay (s)	0.2	0.4	10.3	10.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.4	10.3	10.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			22.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	97	52	113	98	109	27	216	60	119	274	11
Future Volume (vph)	15	97	52	113	98	109	27	216	60	119	274	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.96	1.00	1.00	0.96	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.99	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1851	1526	1681	1761	1513	1770	3411		1770	3509	
Flt Permitted		0.99	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1851	1526	1681	1761	1513	1770	3411		1770	3509	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	105	57	123	107	118	29	235	65	129	298	12
RTOR Reduction (vph)	0	0	51	0	0	103	0	18	0	0	2	0
Lane Group Flow (vph)	0	121	6	111	119	15	29	282	0	129	308	0
Confl. Peds. (#/hr)	14		10	10		14			3			15
Confl. Bikes (#/hr)			4			5			3			3
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		10.9	10.9	12.5	12.5	12.5	4.3	46.2		11.6	53.5	
Effective Green, g (s)		10.9	10.9	12.5	12.5	12.5	4.3	46.2		11.6	53.5	
Actuated g/C Ratio		0.11	0.11	0.12	0.12	0.12	0.04	0.46		0.12	0.54	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)		201	166	210	220	189	76	1575		205	1877	
v/s Ratio Prot		c0.07		0.07	c0.07		0.02	c0.08		c0.07	0.09	
v/s Ratio Perm			0.00			0.01						
v/c Ratio		0.60	0.04	0.53	0.54	0.08	0.38	0.18		0.63	0.16	
Uniform Delay, d1		42.5	39.9	41.0	41.1	38.7	46.6	15.8		42.1	11.9	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.5	0.0	2.7	3.0	0.2	1.2	0.2		4.3	0.2	
Delay (s)		45.9	39.9	43.7	44.1	38.9	47.7	16.0		46.5	12.0	
Level of Service		D	D	D	D	D	D	B		D	B	
Approach Delay (s)		44.0			42.2			18.8			22.2	
Approach LOS		D			D			B			C	
Intersection Summary												
HCM 2000 Control Delay			29.7				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.36									
Actuated Cycle Length (s)			100.0				Sum of lost time (s)			18.8		
Intersection Capacity Utilization			49.8%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	274	0	16	353	28	8	5	34	86	8	16
Future Volume (vph)	4	274	0	16	353	28	8	5	34	86	8	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.96	1.00
Satd. Flow (prot)	1770	3539		1764	3497			3094			1781	1549
Flt Permitted	0.56	1.00		0.57	1.00			0.89			0.83	1.00
Satd. Flow (perm)	1049	3539		1058	3497			2773			1548	1549
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	298	0	17	384	30	9	5	37	93	9	17
RTOR Reduction (vph)	0	0	0	0	7	0	0	29	0	0	0	13
Lane Group Flow (vph)	4	298	0	17	407	0	0	22	0	0	102	4
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	7.1	7.1		7.1	7.1			4.6			4.6	4.6
Effective Green, g (s)	7.1	7.1		7.1	7.1			4.6			4.6	4.6
Actuated g/C Ratio	0.33	0.33		0.33	0.33			0.22			0.22	0.22
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	351	1185		354	1171			601			335	336
v/s Ratio Prot		0.08			c0.12							
v/s Ratio Perm	0.00			0.02				0.01			c0.07	0.00
v/c Ratio	0.01	0.25		0.05	0.35			0.04			0.30	0.01
Uniform Delay, d1	4.7	5.1		4.8	5.3			6.6			7.0	6.5
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.0	0.1		0.1	0.2			0.0			0.7	0.0
Delay (s)	4.7	5.2		4.8	5.5			6.6			7.7	6.5
Level of Service	A	A		A	A			A			A	A
Approach Delay (s)		5.2			5.5			6.6			7.5	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay		5.7			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.33										
Actuated Cycle Length (s)		21.2			Sum of lost time (s)			9.5				
Intersection Capacity Utilization		45.5%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (vph)	19	8	13	13	5	48	2	292	26	40	394	13
Future Volume (vph)	19	8	13	13	5	48	2	292	26	40	394	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.96			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1728			1794	1557	1770	3489		1770	3519	
Flt Permitted		1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1769			1860	1557	1770	3489		1770	3519	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	9	14	14	5	52	2	317	28	43	428	14
RTOR Reduction (vph)	0	13	0	0	0	48	0	5	0	0	2	0
Lane Group Flow (vph)	0	31	0	0	19	4	2	340	0	43	440	0
Confl. Peds. (#/hr)	10		4	4		10			3			4
Confl. Bikes (#/hr)			1						2			3
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		2.6			2.6	2.6	0.9	17.8		1.1	18.0	
Effective Green, g (s)		2.6			2.6	2.6	0.9	17.8		1.1	18.0	
Actuated g/C Ratio		0.07			0.07	0.07	0.03	0.51		0.03	0.51	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		130			137	115	45	1764		55	1799	
v/s Ratio Prot							0.00	0.10		c0.02	c0.13	
v/s Ratio Perm		c0.02			0.01	0.00						
v/c Ratio		0.24			0.14	0.03	0.04	0.19		0.78	0.24	
Uniform Delay, d1		15.4			15.3	15.1	16.7	4.8		16.9	4.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.2	0.0	0.4	0.1		50.5	0.1	
Delay (s)		15.7			15.4	15.2	17.1	4.8		67.4	4.9	
Level of Service		B			B	B	B	A		E	A	
Approach Delay (s)		15.7			15.2			4.9			10.4	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay		9.0			HCM 2000 Level of Service					A		
HCM 2000 Volume to Capacity ratio		0.27										
Actuated Cycle Length (s)		35.2			Sum of lost time (s)					13.7		
Intersection Capacity Utilization		38.1%			ICU Level of Service					A		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	60	7	11	52	0	6	0	9	0	0	0
Future Volume (Veh/h)	0	60	7	11	52	0	6	0	9	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	65	8	12	57	0	7	0	10	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		252										
pX, platoon unblocked												
vC, conflicting volume	57			73			150	150	69	160	154	57
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	57			73			150	150	69	160	154	57
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	100	99	100	100	100
cM capacity (veh/h)	1547			1527			813	736	994	793	732	1009
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	73	69	17	0								
Volume Left	0	12	7	0								
Volume Right	8	0	10	0								
cSH	1547	1527	910	1700								
Volume to Capacity	0.00	0.01	0.02	0.00								
Queue Length 95th (ft)	0	1	1	0								
Control Delay (s)	0.0	1.3	9.0	0.0								
Lane LOS		A	A	A								
Approach Delay (s)	0.0	1.3	9.0	0.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			20.0%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Dittmar St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	28	4	1	20	1	7	0	3	1	0	1
Future Volume (Veh/h)	1	28	4	1	20	1	7	0	3	1	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	30	4	1	22	1	8	0	3	1	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	23			34			60	59	32	62	60	22
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	23			34			60	59	32	62	60	22
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	100	100	100
cM capacity (veh/h)	1592			1578			935	831	1042	930	829	1054
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	35	24	11	2								
Volume Left	1	1	8	1								
Volume Right	4	1	3	1								
cSH	1592	1578	962	988								
Volume to Capacity	0.00	0.00	0.01	0.00								
Queue Length 95th (ft)	0	0	1	0								
Control Delay (s)	0.2	0.3	8.8	8.6								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.2	0.3	8.8	8.6								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			13.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	16	54	6	16	67	6
Future Volume (vph)	16	54	6	16	67	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	59	7	17	73	7
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	76	24	80			
Volume Left (vph)	17	0	73			
Volume Right (vph)	59	17	0			
Hadj (s)	-0.39	-0.39	0.22			
Departure Headway (s)	3.7	3.7	4.3			
Degree Utilization, x	0.08	0.02	0.10			
Capacity (veh/h)	933	927	820			
Control Delay (s)	7.1	6.8	7.7			
Approach Delay (s)	7.1	6.8	7.7			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.3			
Level of Service			A			
Intersection Capacity Utilization			21.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	101	45	8	67	2	34	5	8	9	6	3
Future Volume (Veh/h)	2	101	45	8	67	2	34	5	8	9	6	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	110	49	9	73	2	37	5	9	10	7	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	576											
pX, platoon unblocked												
vC, conflicting volume	75			159			237	232	134	242	255	74
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	75			159			237	232	134	242	255	74
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			95	99	99	99	99	100
cM capacity (veh/h)	1524			1420			705	663	914	697	644	988
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	161	84	51	20								
Volume Left	2	9	37	10								
Volume Right	49	2	9	3								
cSH	1524	1420	730	708								
Volume to Capacity	0.00	0.01	0.07	0.03								
Queue Length 95th (ft)	0	0	6	2								
Control Delay (s)	0.1	0.9	10.3	10.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.9	10.3	10.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.6									
Intersection Capacity Utilization			19.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	116	7	5	72	10	2	3	14	4	4	3
Future Volume (Veh/h)	0	116	7	5	72	10	2	3	14	4	4	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	126	8	5	78	11	2	3	15	4	4	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	249											
pX, platoon unblocked												
vC, conflicting volume	89			134			228	229	130	240	228	84
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			134			228	229	130	240	228	84
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	98	99	99	100
cM capacity (veh/h)	1506			1451			719	668	920	698	670	976
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	134	94	20	11								
Volume Left	0	5	2	4								
Volume Right	8	11	15	3								
cSH	1506	1451	848	744								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.0	0.4	9.3	9.9								
Lane LOS		A	A	A								
Approach Delay (s)	0.0	0.4	9.3	9.9								
Approach LOS			A	A								
Intersection Summary												
Average Delay				1.3								
Intersection Capacity Utilization				18.6%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	24	69	45	35	32	17	57	269	32	40	295	11
Future Volume (vph)	24	69	45	35	32	17	57	269	32	40	295	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.96			0.97		1.00	0.98		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1765			1776		1770	3482		1770	3520	
Flt Permitted		0.92			0.86		0.95	1.00		0.55	1.00	
Satd. Flow (perm)		1643			1560		1770	3482		1032	3520	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	75	49	38	35	18	62	292	35	43	321	12
RTOR Reduction (vph)	0	20	0	0	11	0	0	10	0	0	2	0
Lane Group Flow (vph)	0	130	0	0	80	0	62	317	0	43	331	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)		7.3			6.9		2.3	20.7		14.2	14.2	
Effective Green, g (s)		7.3			6.9		2.3	20.7		14.2	14.2	
Actuated g/C Ratio		0.19			0.18		0.06	0.55		0.38	0.38	
Clearance Time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.5		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		318			286		108	1916		389	1329	
v/s Ratio Prot							c0.04	0.09			c0.09	
v/s Ratio Perm		c0.08			0.05					0.04		
v/c Ratio		0.41			0.28		0.57	0.17		0.11	0.25	
Uniform Delay, d1		13.3			13.2		17.2	4.2		7.6	8.0	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.9			0.6		4.5	0.0		0.1	0.1	
Delay (s)		14.1			13.9		21.7	4.2		7.7	8.1	
Level of Service		B			B		C	A		A	A	
Approach Delay (s)		14.1			13.9			7.0			8.1	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.1									
HCM 2000 Volume to Capacity ratio			0.33									
Actuated Cycle Length (s)			37.6									
Intersection Capacity Utilization			38.9%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	136	5	6	77	5	2	6	5	4	5	7
Future Volume (Veh/h)	6	136	5	6	77	5	2	6	5	4	5	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	148	5	7	84	5	2	7	5	4	5	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		280										
pX, platoon unblocked												
vC, conflicting volume	89			153			276	268	150	274	268	86
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			153			276	268	150	274	268	86
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	99	99	99	99	99
cM capacity (veh/h)	1506			1428			662	632	896	665	632	972
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	160	96	14	17								
Volume Left	7	7	2	4								
Volume Right	5	5	5	8								
cSH	1506	1428	712	767								
Volume to Capacity	0.00	0.00	0.02	0.02								
Queue Length 95th (ft)	0	0	2	2								
Control Delay (s)	0.4	0.6	10.2	9.8								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.4	0.6	10.2	9.8								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			19.1%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	152	5	3	93	1	4	8	7	5	4	3
Future Volume (vph)	2	152	5	3	93	1	4	8	7	5	4	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	165	5	3	101	1	4	9	8	5	4	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	172	105	21	12								
Volume Left (vph)	2	3	4	5								
Volume Right (vph)	5	1	8	3								
Hadj (s)	0.02	0.03	-0.16	-0.03								
Departure Headway (s)	4.1	4.2	4.4	4.5								
Degree Utilization, x	0.20	0.12	0.03	0.01								
Capacity (veh/h)	864	846	770	741								
Control Delay (s)	8.1	7.8	7.5	7.6								
Approach Delay (s)	8.1	7.8	7.5	7.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.9								
Level of Service				A								
Intersection Capacity Utilization				19.1%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	173	4	21	79	12	4	33	88	93	6	5
Future Volume (vph)	5	173	4	21	79	12	4	33	88	93	6	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	188	4	23	86	13	4	36	96	101	7	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	197	122	136	113								
Volume Left (vph)	5	23	4	101								
Volume Right (vph)	4	13	96	5								
Hadj (s)	0.03	0.01	-0.38	0.19								
Departure Headway (s)	4.7	4.8	4.5	5.0								
Degree Utilization, x	0.26	0.16	0.17	0.16								
Capacity (veh/h)	719	702	748	660								
Control Delay (s)	9.3	8.7	8.4	9.0								
Approach Delay (s)	9.3	8.7	8.4	9.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.9								
Level of Service				A								
Intersection Capacity Utilization				38.9%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	4	23	14	6	32	28
Future Volume (vph)	4	23	14	6	32	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	25	15	7	35	30
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	29	22	65			
Volume Left (vph)	4	0	35			
Volume Right (vph)	25	7	0			
Hadj (s)	-0.46	-0.16	0.14			
Departure Headway (s)	3.6	3.9	4.1			
Degree Utilization, x	0.03	0.02	0.07			
Capacity (veh/h)	963	909	863			
Control Delay (s)	6.7	7.0	7.4			
Approach Delay (s)	6.7	7.0	7.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.2			
Level of Service			A			
Intersection Capacity Utilization			19.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	81	26	218	33	185	19	163	104	157	230	4
Future Volume (vph)	10	81	26	218	33	185	19	163	104	157	230	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.94		1.00	1.00	
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1533		1785	1583	1770	3287		1770	3529	
Flt Permitted	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1533		1785	1583	1770	3287		1770	3529	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	88	28	237	36	201	21	177	113	171	250	4
RTOR Reduction (vph)	0	0	26	0	0	167	0	89	0	0	1	0
Lane Group Flow (vph)	11	88	2	0	273	34	21	201	0	171	253	0
Confl. Peds. (#/hr)	7		2	2		7			5			8
Confl. Bikes (#/hr)						2			4			8
Turn Type	Split	NA	Perm	Split	NA	Over	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	5.2	5.2	5.2		15.0	10.8	1.6	13.8		10.8	23.0	
Effective Green, g (s)	5.2	5.2	5.2		15.0	10.8	1.6	13.8		10.8	23.0	
Actuated g/C Ratio	0.08	0.08	0.08		0.23	0.17	0.03	0.22		0.17	0.36	
Clearance Time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	144	151	124		419	267	44	709		299	1270	
v/s Ratio Prot	0.01	c0.05			c0.15	0.02	0.01	c0.06		c0.10	0.07	
v/s Ratio Perm			0.00									
v/c Ratio	0.08	0.58	0.02		0.65	0.13	0.48	0.28		0.57	0.20	
Uniform Delay, d1	27.1	28.3	27.0		22.1	22.5	30.7	20.9		24.4	14.1	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	3.7	0.0		3.6	0.1	3.0	0.2		1.6	0.1	
Delay (s)	27.2	32.0	27.0		25.7	22.6	33.7	21.1		26.1	14.2	
Level of Service	C	C	C		C	C	C	C		C	B	
Approach Delay (s)		30.5			24.4			22.0			19.0	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			22.7									
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			63.9									
Intersection Capacity Utilization			50.5%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	300	1	3	447	18	0	0	5	10	0	11
Future Volume (Veh/h)	3	300	1	3	447	18	0	0	5	10	0	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	326	1	3	486	20	0	0	5	11	0	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage (veh)					2							
Upstream signal (ft)		279										
pX, platoon unblocked				0.98			0.98	0.98	0.98	0.98	0.98	
vC, conflicting volume	506			327			846	844	326	840	835	496
vC1, stage 1 conf vol							332	332		502	502	
vC2, stage 2 conf vol							514	512		338	333	
vCu, unblocked vol	506			304			834	831	303	826	822	496
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	98	100	98
cM capacity (veh/h)	1059			1233			468	470	722	480	475	574
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	330	509	5	23								
Volume Left	3	3	0	11								
Volume Right	1	20	5	12								
cSH	1059	1233	722	525								
Volume to Capacity	0.00	0.00	0.01	0.04								
Queue Length 95th (ft)	0	0	1	3								
Control Delay (s)	0.1	0.1	10.0	12.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	10.0	12.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			41.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	315	2	6	496	10	2	1	13	12	1	6
Future Volume (Veh/h)	4	315	2	6	496	10	2	1	13	12	1	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	342	2	7	539	11	2	1	14	13	1	7
Pedestrians		1						1				
Lane Width (ft)		12.0						12.0				
Walking Speed (ft/s)		4.0						4.0				
Percent Blockage		0						0				
Right turn flare (veh)												
Median type		TWLT			TWLT							
Median storage veh)		2			2							
Upstream signal (ft)		687										
pX, platoon unblocked												
vC, conflicting volume	550			345			919	916	344	924	912	546
vC1, stage 1 conf vol							352	352		558	558	
vC2, stage 2 conf vol							567	564		366	353	
vCu, unblocked vol	550			345			919	916	344	924	912	546
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	98	97	100	99
cM capacity (veh/h)	1020			1213			438	444	698	441	446	537
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	348	557	17	21								
Volume Left	4	7	2	13								
Volume Right	2	11	14	7								
cSH	1020	1213	633	469								
Volume to Capacity	0.00	0.01	0.03	0.04								
Queue Length 95th (ft)	0	0	2	4								
Control Delay (s)	0.1	0.2	10.8	13.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	10.8	13.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			40.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	386	1	6	498	66	0	0	5	1	0	10
Future Volume (Veh/h)	14	386	1	6	498	66	0	0	5	1	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	420	1	7	541	72	0	0	5	1	0	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLT			TWLT							
Median storage veh		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	613			421			1016	1078	420	1046	1042	577
vC1, stage 1 conf vol							450	450		591	591	
vC2, stage 2 conf vol							566	627		456	451	
vCu, unblocked vol	613			421			1016	1078	420	1046	1042	577
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			100	100	99	100	100	98
cM capacity (veh/h)	966			1138			406	394	633	405	411	516
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total	436	7	613	5	12							
Volume Left	15	7	0	0	1							
Volume Right	1	0	72	5	11							
cSH	966	1138	1700	633	505							
Volume to Capacity	0.02	0.01	0.36	0.01	0.02							
Queue Length 95th (ft)	1	0	0	1	2							
Control Delay (s)	0.5	8.2	0.0	10.7	12.3							
Lane LOS	A	A		B	B							
Approach Delay (s)	0.5	0.1		10.7	12.3							
Approach LOS				B	B							
Intersection Summary												
Average Delay			0.4									
Intersection Capacity Utilization			Err%		ICU Level of Service				H			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

9/1/2016

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Traffic Volume (veh/h)	0	0	33	5	0	5	14	222	4	7	502	5								
Future Volume (Veh/h)	0	0	33	5	0	5	14	222	4	7	502	5								
Sign Control	Stop				Stop				Free											
Grade	0%				0%				0%											
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	0	0	36	5	0	5	15	241	4	8	546	5								
Pedestrians																				
Lane Width (ft)																				
Walking Speed (ft/s)																				
Percent Blockage																				
Right turn flare (veh)																				
Median type							TWLTL		TWLTL											
Median storage (veh)							2		2											
Upstream signal (ft)									621											
pX, platoon unblocked	0.92	0.92	0.92	0.92	0.92		0.92													
vC, conflicting volume	720	840	548	871	840	122	551	245												
vC1, stage 1 conf vol	564	564		273	273															
vC2, stage 2 conf vol	156	275		598	567															
vCu, unblocked vol	656	786	471	820	786	122	474	245												
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1	4.1												
tC, 2 stage (s)	6.5	5.5		6.5	5.5															
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2												
p0 queue free %	100	100	93	99	100	99	99	99												
cM capacity (veh/h)	462	456	499	386	447	906	1003	1318												
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2													
Volume Total	36	10	15	161	84	8	551													
Volume Left	0	5	15	0	0	8	0													
Volume Right	36	5	0	0	4	0	5													
cSH	499	541	1003	1700	1700	1318	1700													
Volume to Capacity	0.07	0.02	0.01	0.09	0.05	0.01	0.32													
Queue Length 95th (ft)	6	1	1	0	0	0	0													
Control Delay (s)	12.8	11.8	8.6	0.0	0.0	7.7	0.0													
Lane LOS	B	B	A					A												
Approach Delay (s)	12.8	11.8	0.5					0.1												
Approach LOS	B	B																		
Intersection Summary																				
Average Delay	0.9																			
Intersection Capacity Utilization	43.4%			ICU Level of Service					A											
Analysis Period (min)	15																			

HCM Signalized Intersection Capacity Analysis

45: Coast Hwy & Michigan Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	48	7	23	30	9	5	14	301	4	4	295	17
Future Volume (vph)	48	7	23	30	9	5	14	301	4	4	295	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		0.95			0.95	
Frt		1.00	0.85		1.00	0.85		1.00			0.99	
Flt Protected		0.96	1.00		0.96	1.00		1.00			1.00	
Satd. Flow (prot)		1785	1583		1794	1583		3525			3509	
Flt Permitted		0.72	1.00		0.74	1.00		0.94			0.95	
Satd. Flow (perm)		1349	1583		1372	1583		3315			3345	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	52	8	25	33	10	5	15	327	4	4	321	18
RTOR Reduction (vph)	0	0	23	0	0	5	0	0	0	0	2	0
Lane Group Flow (vph)	0	60	2	0	43	0	0	346	0	0	341	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		7.6	7.6		7.6	7.6		64.4			64.4	
Effective Green, g (s)		7.6	7.6		7.6	7.6		64.4			64.4	
Actuated g/C Ratio		0.09	0.09		0.09	0.09		0.81			0.81	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		128	150		130	150		2668			2692	
v/s Ratio Prot												
v/s Ratio Perm		c0.04	0.00		0.03	0.00		c0.10			0.10	
v/c Ratio		0.47	0.02		0.33	0.00		0.13			0.13	
Uniform Delay, d1		34.3	32.8		33.8	32.8		1.7			1.7	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		2.7	0.0		1.5	0.0		0.1			0.1	
Delay (s)		37.0	32.9		35.3	32.8		1.8			1.8	
Level of Service		D	C		D	C		A			A	
Approach Delay (s)		35.8			35.1			1.8			1.8	
Approach LOS		D			D			A			A	
Intersection Summary												
HCM 2000 Control Delay		7.3			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.17										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		35.1%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	258	103	163	362	295	1429	180	29	136	103	57	74
Future Volume (vph)	258	103	163	362	295	1429	180	29	136	103	57	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3030	1441		1786	1583		1805	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3030	1441		1786	1583		1805	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	280	112	177	393	321	1553	196	32	148	112	62	80
RTOR Reduction (vph)	0	0	150	0	500	573	0	0	114	0	0	65
Lane Group Flow (vph)	280	112	27	393	598	203	0	228	34	0	174	15
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.0	13.3	13.3	17.0	19.9	19.9		20.2	20.2		16.0	16.0
Effective Green, g (s)	14.0	13.3	13.3	17.0	19.9	19.9		20.2	20.2		16.0	16.0
Actuated g/C Ratio	0.16	0.15	0.15	0.19	0.23	0.23		0.23	0.23		0.18	0.18
Clearance Time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	283	283	241	344	690	328		413	366		330	290
v/s Ratio Prot	0.16	0.06		c0.22	c0.20			c0.13			c0.10	
v/s Ratio Perm			0.02			0.14			0.02			0.01
v/c Ratio	0.99	0.40	0.11	1.14	0.87	0.62		0.55	0.09		0.53	0.05
Uniform Delay, d1	36.6	33.4	31.9	35.1	32.4	30.3		29.6	26.4		32.2	29.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	50.0	0.3	0.1	93.0	10.7	2.4		5.2	0.5		5.9	0.3
Delay (s)	86.6	33.7	32.0	128.2	43.1	32.7		34.8	26.9		38.2	29.7
Level of Service	F	C	C	F	D	C		C	C		D	C
Approach Delay (s)		59.2			54.3			31.7			35.5	
Approach LOS		E			D			C			D	
Intersection Summary												
HCM 2000 Control Delay			51.3				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			87.3				Sum of lost time (s)		20.8			
Intersection Capacity Utilization			96.1%				ICU Level of Service		F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/07/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑↑				
Traffic Volume (veh/h)	275	188	948	561	0	0		
Future Volume (veh/h)	275	188	948	561	0	0		
Number	4	14	3	8				
Initial Q (Qb), veh	0	0	0	0				
Ped-Bike Adj(A_pbT)		1.00	1.00					
Parking Bus, Adj	1.00	1.00	1.00	1.00				
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863				
Adj Flow Rate, veh/h	299	204	1030	610				
Adj No. of Lanes	2	1	2	2				
Peak Hour Factor	0.92	0.92	0.92	0.92				
Percent Heavy Veh, %	2	2	2	2				
Cap, veh/h	1416	633	1377	3185				
Arrive On Green	0.40	0.40	0.40	0.90				
Sat Flow, veh/h	3632	1583	3442	3632				
Grp Volume(v), veh/h	299	204	1030	610				
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1770				
Q Serve(g_s), s	2.2	3.5	10.3	0.8				
Cycle Q Clear(g_c), s	2.2	3.5	10.3	0.8				
Prop In Lane		1.00	1.00					
Lane Grp Cap(c), veh/h	1416	633	1377	3185				
V/C Ratio(X)	0.21	0.32	0.75	0.19				
Avail Cap(c_a), veh/h	1416	633	1377	3185				
HCM Platoon Ratio	1.00	1.00	1.00	1.00				
Upstream Filter(I)	1.00	1.00	1.00	1.00				
Uniform Delay (d), s/veh	7.9	8.3	10.3	0.2				
Incr Delay (d2), s/veh	0.3	1.3	3.8	0.1				
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0				
%ile BackOfQ(50%),veh/ln	1.1	1.8	5.4	0.4				
LnGrp Delay(d),s/veh	8.2	9.6	14.0	0.4				
LnGrp LOS	A	A	B	A				
Approach Vol, veh/h	503			1640				
Approach Delay, s/veh	8.8			9.0				
Approach LOS	A			A				
Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4				8
Phs Duration (G+Y+Rc), s			20.0	20.0				40.0
Change Period (Y+Rc), s			4.0	4.0				4.0
Max Green Setting (Gmax), s			16.0	16.0				36.0
Max Q Clear Time (g_c+I1), s			12.3	5.5				2.8
Green Ext Time (p_c), s			1.6	1.9				4.7
Intersection Summary								
HCM 2010 Ctrl Delay			8.9					
HCM 2010 LOS			A					

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/07/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑↑	↑	↑		
Traffic Volume (veh/h)	466	79	980	1434	79	1		
Future Volume (veh/h)	466	79	980	1434	79	1		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	507	86	1065	1559	86	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	871	390	1112	2232	437	390		
Arrive On Green	0.25	0.25	0.32	0.63	0.25	0.00		
Sat Flow, veh/h	3632	1583	3442	3632	1774	1583		
Grp Volume(v), veh/h	507	86	1065	1559	86	0		
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1770	1774	1583		
Q Serve(g_s), s	8.2	2.8	19.7	18.9	2.5	0.0		
Cycle Q Clear(g_c), s	8.2	2.8	19.7	18.9	2.5	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	871	390	1112	2232	437	390		
V/C Ratio(X)	0.58	0.22	0.96	0.70	0.20	0.00		
Avail Cap(c_a), veh/h	871	390	1112	2232	437	390		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	21.6	19.5	21.6	7.9	19.4	0.0		
Incr Delay (d2), s/veh	2.8	1.3	18.6	1.8	1.0	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	4.4	1.4	12.2	9.7	1.3	0.0		
LnGrp Delay(d),s/veh	24.4	20.8	40.1	9.8	20.4	0.0		
LnGrp LOS	C	C	D	A	C			
Approach Vol, veh/h	593			2624	86			
Approach Delay, s/veh	23.9			22.1	20.4			
Approach LOS	C			C	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	25.0	20.0				45.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	21.0	16.0				41.0
Max Q Clear Time (g_c+I1), s		4.5	21.7	10.2				20.9
Green Ext Time (p_c), s		0.1	0.0	1.8				12.2
Intersection Summary								
HCM 2010 Ctrl Delay			22.4					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary

51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/08/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	502	6	183	871	718	17	0	219	90	71	82
Future Volume (veh/h)	0	502	6	183	871	718	17	0	219	90	71	82
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	1863	1863	0	1863	1863	1863	1863
Adj Flow Rate, veh/h	0	546	7	199	947	0	18	0	238	88	92	89
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1101	14	273	1906	853	0	0	0	546	573	487
Arrive On Green	0.00	0.31	0.31	0.15	0.54	0.00	0.00	0.00	0.00	0.31	0.31	0.31
Sat Flow, veh/h	0	3672	46	1774	3539	1583		0		1774	1863	1583
Grp Volume(v), veh/h	0	270	283	199	947	0		0.0		88	92	89
Grp Sat Flow(s),veh/h/ln	0	1770	1855	1774	1770	1583				1774	1863	1583
Q Serve(g_s), s	0.0	6.5	6.5	5.6	8.8	0.0				1.9	1.9	2.1
Cycle Q Clear(g_c), s	0.0	6.5	6.5	5.6	8.8	0.0				1.9	1.9	2.1
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	544	571	273	1906	853				546	573	487
V/C Ratio(X)	0.00	0.50	0.50	0.73	0.50	0.00				0.16	0.16	0.18
Avail Cap(c_a), veh/h	0	544	571	273	1906	853				546	573	487
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	14.7	14.7	21.0	7.6	0.0				13.1	13.1	13.2
Incr Delay (d2), s/veh	0.0	3.2	3.1	15.7	0.9	0.0				0.6	0.6	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.6	3.8	3.9	4.5	0.0				1.0	1.0	1.1
LnGrp Delay(d),s/veh	0.0	17.9	17.8	36.7	8.5	0.0				13.7	13.7	14.0
LnGrp LOS		B	B	D	A					B	B	B
Approach Vol, veh/h		553			1146						269	
Approach Delay, s/veh		17.8			13.4						13.8	
Approach LOS		B			B						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			12.0	20.0		20.0		32.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			8.0	16.0		16.0		28.0				
Max Q Clear Time (g_c+I1), s			7.6	8.5		4.1		10.8				
Green Ext Time (p_c), s			0.0	2.0		0.8		6.4				
Intersection Summary												
HCM 2010 Ctrl Delay			14.7									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/08/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	325	393	13	22	517	506	24	29	48	197	5	80
Future Volume (veh/h)	325	393	13	22	517	506	24	29	48	197	5	80
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	353	427	14	24	562	550	26	32	52	153	90	87
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	355	1180	39	111	708	633	163	201	317	355	174	169
Arrive On Green	0.20	0.34	0.34	0.06	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1774	3498	114	1774	3539	1583	817	1005	1583	1774	872	843
Grp Volume(v), veh/h	353	216	225	24	562	550	58	0	52	153	0	177
Grp Sat Flow(s),veh/h/ln	1774	1770	1843	1774	1770	1583	1822	0	1583	1774	0	1714
Q Serve(g_s), s	15.9	7.4	7.4	1.0	12.1	16.0	2.1	0.0	2.2	6.0	0.0	7.4
Cycle Q Clear(g_c), s	15.9	7.4	7.4	1.0	12.1	16.0	2.1	0.0	2.2	6.0	0.0	7.4
Prop In Lane	1.00		0.06	1.00		1.00	0.45		1.00	1.00		0.49
Lane Grp Cap(c), veh/h	355	597	622	111	708	633	364	0	317	355	0	343
V/C Ratio(X)	0.99	0.36	0.36	0.22	0.79	0.87	0.16	0.00	0.16	0.43	0.00	0.52
Avail Cap(c_a), veh/h	355	597	622	111	708	633	364	0	317	355	0	343
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.0	20.0	20.0	35.6	30.4	19.2	26.4	0.0	26.5	28.0	0.0	28.5
Incr Delay (d2), s/veh	46.5	1.7	1.6	4.4	8.9	15.0	0.9	0.0	1.1	3.8	0.0	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.3	3.9	4.0	0.6	6.7	14.7	1.2	0.0	1.1	3.3	0.0	4.0
LnGrp Delay(d),s/veh	78.5	21.7	21.6	40.1	39.4	34.2	27.4	0.0	27.6	31.8	0.0	34.0
LnGrp LOS	E	C	C	D	D	C	C		C	C		C
Approach Vol, veh/h		794			1136			110			330	
Approach Delay, s/veh		46.9			36.9			27.5			33.0	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	9.0	31.0		20.0	20.0	20.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	5.0	27.0		16.0	16.0	16.0				
Max Q Clear Time (g_c+I1), s		4.2	3.0	9.4		9.4	17.9	18.0				
Green Ext Time (p_c), s		0.3	0.0	2.4		0.8	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				39.3								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/07/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	378	143	43	748	257	127	74	41	316	155	223
Future Volume (veh/h)	86	378	143	43	748	257	127	74	41	316	155	223
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	93	411	155	47	813	279	109	121	45	256	290	242
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	101	613	229	101	860	385	431	452	385	405	426	362
Arrive On Green	0.06	0.24	0.24	0.06	0.24	0.24	0.24	0.24	0.24	0.23	0.23	0.23
Sat Flow, veh/h	1774	2525	942	1774	3539	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	93	287	279	47	813	279	109	121	45	256	290	242
Grp Sat Flow(s),veh/h/ln	1774	1770	1697	1774	1770	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	3.7	10.2	10.4	1.8	15.8	11.3	3.5	3.7	1.6	9.1	10.0	9.7
Cycle Q Clear(g_c), s	3.7	10.2	10.4	1.8	15.8	11.3	3.5	3.7	1.6	9.1	10.0	9.7
Prop In Lane	1.00		0.56	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	101	430	412	101	860	385	431	452	385	405	426	362
V/C Ratio(X)	0.92	0.67	0.68	0.46	0.95	0.73	0.25	0.27	0.12	0.63	0.68	0.67
Avail Cap(c_a), veh/h	101	430	412	101	860	385	431	452	385	405	426	362
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	23.9	24.0	32.0	26.0	24.4	21.4	21.5	20.7	24.3	24.7	24.6
Incr Delay (d2), s/veh	69.0	8.0	8.7	14.5	20.1	11.3	1.4	1.4	0.6	7.3	8.5	9.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	6.0	5.9	1.3	10.1	6.2	1.9	2.1	0.7	5.2	6.1	5.2
LnGrp Delay(d),s/veh	101.9	31.9	32.7	46.4	46.1	35.7	22.8	22.9	21.3	31.6	33.2	34.0
LnGrp LOS	F	C	C	D	D	D	C	C	C	C	C	C
Approach Vol, veh/h		659			1139			275			788	
Approach Delay, s/veh		42.1			43.6			22.6			32.9	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.0	8.0	21.0		20.0	8.0	21.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	4.0	17.0		16.0	4.0	17.0				
Max Q Clear Time (g_c+I1), s		5.7	3.8	12.4		12.0	5.7	17.8				
Green Ext Time (p_c), s		0.8	0.0	1.4		1.4	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				38.3								
HCM 2010 LOS				D								
Notes												

Intersection

Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	43	93	13	62	70	165	3	84	22	0	0	0
Future Vol, veh/h	43	93	13	62	70	165	3	84	22	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	47	101	14	67	76	179	3	91	24	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

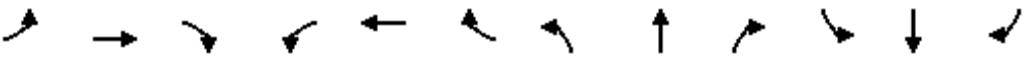
Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.8	9.5	8.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	3%	29%	21%
Vol Thru, %	77%	62%	24%
Vol Right, %	20%	9%	56%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	109	149	297
LT Vol	3	43	62
Through Vol	84	93	70
RT Vol	22	13	165
Lane Flow Rate	118	162	323
Geometry Grp	1	1	1
Degree of Util (X)	0.16	0.205	0.369
Departure Headway (Hd)	4.852	4.559	4.119
Convergence, Y/N	Yes	Yes	Yes
Cap	738	787	875
Service Time	2.887	2.588	2.141
HCM Lane V/C Ratio	0.16	0.206	0.369
HCM Control Delay	8.8	8.8	9.5
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	0.8	1.7

HCM Signalized Intersection Capacity Analysis

2: Coast Hwy & Driveway/SR-76 ramps

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔		↔	↔		↔	
Traffic Volume (vph)	0	0	5	526	0	205	5	280	536	353	359	2
Future Volume (vph)	0	0	5	526	0	205	5	280	536	353	359	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6		4.6	4.6	4.0		4.6	4.0		4.6	
Lane Util. Factor		1.00		0.95	0.95	1.00		0.95	1.00		0.95	
Frt		0.86		1.00	1.00	0.85		1.00	0.85		1.00	
Flt Protected		1.00		0.95	0.95	1.00		1.00	1.00		0.98	
Satd. Flow (prot)		1611		1681	1681	1583		3536	1583		3452	
Flt Permitted		1.00		0.95	0.95	1.00		1.00	1.00		0.98	
Satd. Flow (perm)		1611		1681	1681	1583		3536	1583		3452	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	5	572	0	223	5	304	583	384	390	2
RTOR Reduction (vph)	0	5	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	286	286	223	0	309	583	0	776	0
Turn Type		NA		Split	NA	Free	Split	NA	Free	Split	NA	
Protected Phases		4		8	8		2	2		6	6	
Permitted Phases	4					Free			Free			
Actuated Green, G (s)		1.0		10.4	10.4	66.0		18.1	66.0		18.1	
Effective Green, g (s)		1.0		10.4	10.4	66.0		18.1	66.0		18.1	
Actuated g/C Ratio		0.02		0.16	0.16	1.00		0.27	1.00		0.27	
Clearance Time (s)		4.6		4.6	4.6			4.6			4.6	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		24		264	264	1583		969	1583		946	
v/s Ratio Prot		0.00		c0.17	0.17			0.09			c0.22	
v/s Ratio Perm						0.14			c0.37			
v/c Ratio		0.00		1.08	1.08	0.14		0.32	0.37		0.82	
Uniform Delay, d1		32.0		27.8	27.8	0.0		19.0	0.0		22.4	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		0.1		79.4	79.4	0.2		0.9	0.7		7.9	
Delay (s)		32.1		107.2	107.2	0.2		19.9	0.7		30.3	
Level of Service		C		F	F	A		B	A		C	
Approach Delay (s)		32.1			77.2			7.3			30.3	
Approach LOS		C			E			A			C	
Intersection Summary												
HCM 2000 Control Delay			37.1				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			66.0				Sum of lost time (s)		18.4			
Intersection Capacity Utilization			60.9%				ICU Level of Service		B			
Analysis Period (min)			15									
Description: SR-76 & Coast Hwy												
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	38	26	62	65	100	41	78	65	115	106	25
Future Volume (vph)	1	38	26	62	65	100	41	78	65	115	106	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	41	28	67	71	109	45	85	71	125	115	27
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	70	247	201	267								
Volume Left (vph)	1	67	45	125								
Volume Right (vph)	28	109	71	27								
Hadj (s)	-0.20	-0.18	-0.13	0.07								
Departure Headway (s)	5.3	5.0	5.0	5.1								
Degree Utilization, x	0.10	0.35	0.28	0.38								
Capacity (veh/h)	592	658	668	662								
Control Delay (s)	8.9	10.7	9.9	11.2								
Approach Delay (s)	8.9	10.7	9.9	11.2								
Approach LOS	A	B	A	B								
Intersection Summary												
Delay				10.5								
Level of Service				B								
Intersection Capacity Utilization				52.2%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	162	50	68	11	44	27	48	554	17	43	560	117
Future Volume (vph)	162	50	68	11	44	27	48	554	17	43	560	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.96		1.00	1.00		1.00	0.97	
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1794	1583		1769		1770	3524		1770	3448	
Flt Permitted		0.79	1.00		0.97		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1474	1583		1720		1770	3524		1770	3448	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	176	54	74	12	48	29	52	602	18	47	609	127
RTOR Reduction (vph)	0	0	51	0	20	0	0	3	0	0	18	0
Lane Group Flow (vph)	0	230	23	0	69	0	52	617	0	47	718	0
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		17.6	17.6		17.6		5.4	17.3		10.2	26.9	
Effective Green, g (s)		17.6	17.6		17.6		5.4	17.3		10.2	26.9	
Actuated g/C Ratio		0.31	0.31		0.31		0.10	0.31		0.18	0.48	
Clearance Time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		3.0	7.0	
Lane Grp Cap (vph)		464	498		541		170	1090		322	1659	
v/s Ratio Prot							c0.03	c0.18		0.03	c0.21	
v/s Ratio Perm		c0.16	0.01		0.04							
v/c Ratio		0.50	0.05		0.13		0.31	0.57		0.15	0.43	
Uniform Delay, d1		15.5	13.3		13.7		23.5	16.2		19.2	9.5	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.9	0.1		0.4		1.0	0.7		0.2	0.6	
Delay (s)		18.5	13.5		14.1		24.5	16.8		19.4	10.1	
Level of Service		B	B		B		C	B		B	B	
Approach Delay (s)		17.3			14.1			17.4			10.7	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			14.4									
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			55.9									
Intersection Capacity Utilization			55.8%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Coast Hwy & Civic Center Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	26	29	23	29	34	65	19	548	53	36	572	22
Future Volume (vph)	26	29	23	29	34	65	19	548	53	36	572	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2			4.6			4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.93		1.00	0.90			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1740		1770	1679			3488			3511	
Flt Permitted	0.69	1.00		0.72	1.00			0.92			0.89	
Satd. Flow (perm)	1280	1740		1341	1679			3224			3123	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	28	32	25	32	37	71	21	596	58	39	622	24
RTOR Reduction (vph)	0	12	0	0	35	0	0	13	0	0	5	0
Lane Group Flow (vph)	28	45	0	32	73	0	0	662	0	0	680	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	25.9	25.9		25.9	25.9			16.8			16.8	
Effective Green, g (s)	25.9	25.9		25.9	25.9			16.8			16.8	
Actuated g/C Ratio	0.50	0.50		0.50	0.50			0.33			0.33	
Clearance Time (s)	4.2	4.2		4.2	4.2			4.6			4.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	
Lane Grp Cap (vph)	643	875		674	844			1051			1018	
v/s Ratio Prot		0.03			c0.04							
v/s Ratio Perm	0.02			0.02				0.21			c0.22	
v/c Ratio	0.04	0.05		0.05	0.09			0.63			0.67	
Uniform Delay, d1	6.5	6.5		6.5	6.7			14.7			14.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.1	0.1		0.1	0.2			1.4			1.8	
Delay (s)	6.6	6.6		6.7	6.9			16.1			16.8	
Level of Service	A	A		A	A			B			B	
Approach Delay (s)		6.6			6.8			16.1			16.8	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		15.1			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.31										
Actuated Cycle Length (s)		51.5			Sum of lost time (s)			8.8				
Intersection Capacity Utilization		54.4%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

6: Coast Hwy & Pier View Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	30	42	18	30	51	32	531	42	23	531	72
Future Volume (vph)	38	30	42	18	30	51	32	531	42	23	531	72
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		5.0	5.0			5.0			4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98			1.00			1.00	
Flpb, ped/bikes	0.99	1.00		0.99	1.00			1.00			1.00	
Frt	1.00	0.91		1.00	0.91			0.99			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1746	1678		1754	1659			3485			3457	
Flt Permitted	0.70	1.00		0.71	1.00			0.88			0.92	
Satd. Flow (perm)	1286	1678		1303	1659			3072			3174	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	33	46	20	33	55	35	577	46	25	577	78
RTOR Reduction (vph)	0	22	0	0	27	0	0	10	0	0	19	0
Lane Group Flow (vph)	41	57	0	20	61	0	0	648	0	0	661	0
Confl. Peds. (#/hr)	16		11	11		16	10		17	17		10
Confl. Bikes (#/hr)			2			2						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	27.9	27.9		27.1	27.1			16.0			16.5	
Effective Green, g (s)	27.9	27.9		27.1	27.1			16.0			16.5	
Actuated g/C Ratio	0.53	0.53		0.51	0.51			0.30			0.31	
Clearance Time (s)	4.2	4.2		5.0	5.0			5.0			4.5	
Vehicle Extension (s)	3.0	3.0		3.5	3.5			3.0			3.5	
Lane Grp Cap (vph)	675	881		664	846			925			986	
v/s Ratio Prot		0.03			c0.04							
v/s Ratio Perm	0.03			0.02				c0.21			0.21	
v/c Ratio	0.06	0.06		0.03	0.07			0.70			0.67	
Uniform Delay, d1	6.2	6.2		6.5	6.6			16.4			15.9	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	0.1		0.1	0.2			2.4			1.9	
Delay (s)	6.3	6.3		6.5	6.8			18.8			17.8	
Level of Service	A	A		A	A			B			B	
Approach Delay (s)		6.3			6.7			18.8			17.8	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.31									
Actuated Cycle Length (s)			53.1			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			61.2%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

9/1/2016

																			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR							
Lane Configurations																			
Sign Control		Stop			Stop			Stop			Stop								
Traffic Volume (vph)	32	13	116	107	13	18	40	250	50	18	225	10							
Future Volume (vph)	32	13	116	107	13	18	40	250	50	18	225	10							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92							
Hourly flow rate (vph)	35	14	126	116	14	20	43	272	54	20	245	11							
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1														
Volume Total (vph)	49	126	150	369	276														
Volume Left (vph)	35	0	116	43	20														
Volume Right (vph)	0	126	20	54	11														
Hadj (s)	0.39	-0.67	0.11	-0.03	0.02														
Departure Headway (s)	6.9	5.9	6.2	5.3	5.5														
Degree Utilization, x	0.09	0.21	0.26	0.54	0.42														
Capacity (veh/h)	464	543	511	640	612														
Control Delay (s)	9.5	9.2	11.4	14.5	12.5														
Approach Delay (s)	9.3		11.4	14.5	12.5														
Approach LOS	A		B	B	B														
Intersection Summary																			
Delay			12.5																
Level of Service			B																
Intersection Capacity Utilization			49.1%	ICU Level of Service					A										
Analysis Period (min)			15																

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	181	81	106	126	59	124
Future Volume (vph)	181	81	106	126	59	124
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	197	88	115	137	64	135
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	197	88	252	199		
Volume Left (vph)	197	0	0	64		
Volume Right (vph)	0	88	137	0		
Hadj (s)	0.53	-0.67	-0.29	0.10		
Departure Headway (s)	6.1	4.9	4.7	5.1		
Degree Utilization, x	0.34	0.12	0.33	0.28		
Capacity (veh/h)	555	684	732	665		
Control Delay (s)	11.0	7.4	9.9	10.1		
Approach Delay (s)	9.9		9.9	10.1		
Approach LOS	A		A	B		
Intersection Summary						
Delay			10.0			
Level of Service			A			
Intersection Capacity Utilization			43.1%	ICU Level of Service	A	
Analysis Period (min)			15			

Existing Year 2013 No Project

Level Of Service Computation Report
 2000 HCM 4-Way Stop Method (Base Volume Alternative)

 Intersection #9 Cleveland Street and Mission Avenue

Cycle (sec): 100 Critical Vol./Cap.(X): 0.292
 Loss Time (sec): 0 Average Delay (sec/veh): 10.6
 Optimal Cycle: 0 Level Of Service: B

Street Name:	Cleveland Street						Mission Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1	0	0	1	0	1	0	1	1	0	1

Volume Module:	Cleveland Street NB			Cleveland Street SB			Mission Avenue EB			Mission Avenue WB		
Base Vol:	43	38	58	72	29	59	28	224	33	93	204	63
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	43	38	58	72	29	59	28	224	33	93	204	63
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	43	38	58	72	29	59	28	224	33	93	204	63
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	43	38	58	72	29	59	28	224	33	93	204	63
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	43	38	58	72	29	59	28	224	33	93	204	63

Saturation Flow Module:	Cleveland Street NB			Cleveland Street SB			Mission Avenue EB			Mission Avenue WB		
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.53	0.47	1.00	0.45	0.18	0.37	1.00	1.74	0.26	1.00	1.53	0.47
Final Sat.:	268	237	584	247	99	202	504	961	144	519	872	279

Capacity Analysis Module:	Cleveland Street NB			Cleveland Street SB			Mission Avenue EB			Mission Avenue WB		
Vol/Sat:	0.16	0.16	0.10	0.29	0.29	0.29	0.06	0.23	0.23	0.18	0.23	0.23
Crit Moves:	****			****			****			****		
Delay/Veh:	10.6	10.6	9.0	11.6	11.6	11.6	9.9	10.7	10.5	10.7	10.5	10.1
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	10.6	10.6	9.0	11.6	11.6	11.6	9.9	10.7	10.5	10.7	10.5	10.1
LOS by Move:	B	B	A	B	B	B	A	B	B	B	B	B
ApproachDel:	9.9			11.6			10.6			10.5		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	9.9			11.6			10.6			10.5		
LOS by Appr:	A			B			B			B		
AllWayAvgQ:	0.2	0.2	0.1	0.4	0.4	0.4	0.1	0.3	0.3	0.2	0.3	0.3

Note: Queue reported is the number of cars per lane.

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	0	65	137	380	121	53	507	0	0	426	61
Future Volume (vph)	43	0	65	137	380	121	53	507	0	0	426	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	
Lane Util. Factor	1.00		1.00	1.00	0.95		1.00	0.95			0.95	
Frpb, ped/bikes	1.00		0.98	1.00	0.99		1.00	1.00			1.00	
Flpb, ped/bikes	1.00		1.00	0.99	1.00		1.00	1.00			1.00	
Frt	1.00		0.85	1.00	0.96		1.00	1.00			0.98	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)	1761		1547	1751	3393		1770	3539			3460	
Flt Permitted	0.45		1.00	0.95	1.00		0.38	1.00			1.00	
Satd. Flow (perm)	831		1547	1751	3393		710	3539			3460	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	0	71	149	413	132	58	551	0	0	463	66
RTOR Reduction (vph)	0	0	32	0	26	0	0	0	0	0	19	0
Lane Group Flow (vph)	47	0	39	149	519	0	58	551	0	0	510	0
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type	Perm		Perm	Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases	4		4	8			2					
Actuated Green, G (s)	32.1		32.1	32.1	32.1		16.6	16.6			16.6	
Effective Green, g (s)	32.1		32.1	32.1	32.1		16.6	16.6			16.6	
Actuated g/C Ratio	0.55		0.55	0.55	0.55		0.28	0.28			0.28	
Clearance Time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0		4.0	4.0			4.0	
Lane Grp Cap (vph)	454		845	957	1855		200	1000			978	
v/s Ratio Prot					c0.15			c0.16			0.15	
v/s Ratio Perm	0.06		0.03	0.09			0.08					
v/c Ratio	0.10		0.05	0.16	0.28		0.29	0.55			0.52	
Uniform Delay, d1	6.4		6.2	6.6	7.1		16.4	17.9			17.7	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00			1.00	
Incremental Delay, d2	0.5		0.1	0.3	0.4		1.1	0.8			0.7	
Delay (s)	6.8		6.3	6.9	7.5		17.5	18.7			18.4	
Level of Service	A		A	A	A		B	B			B	
Approach Delay (s)		6.5			7.4			18.6			18.4	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			13.8				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.37									
Actuated Cycle Length (s)			58.7				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			57.7%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	351	3	142	638	268	5	44	477	365	51	25
Future Volume (vph)	15	351	3	142	638	268	5	44	477	365	51	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0	4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.86		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.97	
Satd. Flow (prot)	1770	3535		1770	3539	1583	1770	1607		1681	1684	
Flt Permitted	0.24	1.00		0.47	1.00	1.00	0.59	1.00		0.34	0.44	
Satd. Flow (perm)	455	3535		880	3539	1583	1099	1607		610	765	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	382	3	154	693	291	5	48	518	397	55	27
RTOR Reduction (vph)	0	1	0	0	0	203	0	188	0	0	3	0
Lane Group Flow (vph)	16	384	0	154	693	88	5	378	0	238	238	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	24.4	24.4		24.0	24.0	24.0	45.6	45.6		45.6	45.6	
Effective Green, g (s)	24.4	24.4		24.0	24.0	24.0	45.6	45.6		45.6	45.6	
Actuated g/C Ratio	0.31	0.31		0.30	0.30	0.30	0.58	0.58		0.58	0.58	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0	4.6	4.6		4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	140	1089		266	1072	479	632	925		351	440	
v/s Ratio Prot		0.11			c0.20			0.24				
v/s Ratio Perm	0.04			0.17		0.06	0.00			c0.39	0.31	
v/c Ratio	0.11	0.35		0.58	0.65	0.18	0.01	0.41		0.68	0.54	
Uniform Delay, d1	19.7	21.3		23.3	23.9	20.4	7.2	9.3		11.7	10.4	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.3		3.3	1.4	0.2	0.0	0.4		5.6	1.7	
Delay (s)	20.1	21.5		26.6	25.3	20.6	7.2	9.7		17.3	12.1	
Level of Service	C	C		C	C	C	A	A		B	B	
Approach Delay (s)		21.5			24.3			9.7			14.7	
Approach LOS		C			C			A			B	
Intersection Summary												
HCM 2000 Control Delay			18.9									
HCM 2000 Volume to Capacity ratio			0.67									
Actuated Cycle Length (s)			79.2									
Intersection Capacity Utilization			80.6%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

9/1/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (veh/h)	177	32	50	126	50	63
Future Volume (Veh/h)	177	32	50	126	50	63
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	192	35	54	137	54	68
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				248		
pX, platoon unblocked						
vC, conflicting volume			227		454	210
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			227		454	210
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		90	92
cM capacity (veh/h)			1341		541	831
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	227	191	122			
Volume Left	0	54	54			
Volume Right	35	0	68			
cSH	1700	1341	671			
Volume to Capacity	0.13	0.04	0.18			
Queue Length 95th (ft)	0	3	16			
Control Delay (s)	0.0	2.4	11.5			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.4	11.5			
Approach LOS			B			
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			37.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr/Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	365	67	0	0	0	58	651	245	113	479	62
Future Volume (vph)	70	365	67	0	0	0	58	651	245	113	479	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2					4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	1.00					1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00					1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00					1.00	1.00		1.00	1.00	
Frt	1.00	0.98					1.00	0.96		1.00	0.98	
Flt Protected	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1811					1770	3377		1770	3463	
Flt Permitted	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1811					1770	3377		1770	3463	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	397	73	0	0	0	63	708	266	123	521	67
RTOR Reduction (vph)	0	12	0	0	0	0	0	76	0	0	19	0
Lane Group Flow (vph)	76	458	0	0	0	0	63	898	0	123	569	0
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA					Prot	NA		Prot	NA	
Protected Phases	4	4					5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	18.1	18.1					4.0	15.8		3.8	15.6	
Effective Green, g (s)	18.1	18.1					4.0	15.8		3.8	15.6	
Actuated g/C Ratio	0.36	0.36					0.08	0.31		0.07	0.31	
Clearance Time (s)	4.2	4.2					4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0					3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	631	646					139	1052		132	1065	
v/s Ratio Prot	0.04	c0.25					0.04	c0.27		c0.07	0.16	
v/s Ratio Perm												
v/c Ratio	0.12	0.71					0.45	0.85		0.93	0.53	
Uniform Delay, d1	11.0	14.0					22.3	16.4		23.3	14.5	
Progression Factor	1.00	1.00					1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.4	6.5					10.3	7.1		61.8	0.7	
Delay (s)	11.3	20.5					32.6	23.5		85.1	15.2	
Level of Service	B	C					C	C		F	B	
Approach Delay (s)		19.2			0.0			24.0			27.3	
Approach LOS		B			A			C			C	
Intersection Summary												
HCM 2000 Control Delay		23.9			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.79										
Actuated Cycle Length (s)		50.7			Sum of lost time (s)			13.0				
Intersection Capacity Utilization		66.7%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	677	14	0	0	0	0	8	33	24	18	0
Future Volume (Veh/h)	15	677	14	0	0	0	0	8	33	24	18	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	736	15	0	0	0	0	9	36	26	20	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	255											
pX, platoon unblocked												
vC, conflicting volume	0			751			786	776	376	440	783	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			751			786	776	376	440	783	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	97	94	94	94	100
cM capacity (veh/h)	1622			854			267	324	622	458	321	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	384	383	45	46								
Volume Left	16	0	0	26								
Volume Right	0	15	36	0								
cSH	1622	1700	525	386								
Volume to Capacity	0.01	0.23	0.09	0.12								
Queue Length 95th (ft)	1	0	7	10								
Control Delay (s)	0.4	0.0	12.5	15.6								
Lane LOS	A		B	C								
Approach Delay (s)	0.2		12.5	15.6								
Approach LOS			B	C								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			35.2%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	26	692	16	0	0	0	0	20	34	33	42	0
Future Volume (vph)	26	692	16	0	0	0	0	20	34	33	42	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	752	17	0	0	0	0	22	37	36	46	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	404	393	59	82								
Volume Left (vph)	28	0	0	36								
Volume Right (vph)	0	17	37	0								
Hadj (s)	0.07	0.00	-0.34	0.12								
Departure Headway (s)	5.0	4.9	5.2	5.6								
Degree Utilization, x	0.56	0.54	0.09	0.13								
Capacity (veh/h)	708	724	646	598								
Control Delay (s)	12.9	12.2	8.7	9.5								
Approach Delay (s)	12.5		8.7	9.5								
Approach LOS	B		A	A								
Intersection Summary												
Delay			12.0									
Level of Service			B									
Intersection Capacity Utilization			37.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

9/1/2016

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	377	405	19	6	0	4	0	7	7	0	0	0								
Future Volume (vph)	377	405	19	6	0	4	0	7	7	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	410	440	21	7	0	4	0	8	8	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	410	461	11	16																
Volume Left (vph)	410	0	7	0																
Volume Right (vph)	0	21	4	8																
Hadj (s)	0.53	0.00	-0.06	-0.27																
Departure Headway (s)	5.1	4.6	4.7	5.2																
Degree Utilization, x	0.58	0.58	0.01	0.02																
Capacity (veh/h)	704	785	753	652																
Control Delay (s)	13.7	12.5	7.7	8.3																
Approach Delay (s)	13.1		7.7	8.3																
Approach LOS	B		A	A																
Intersection Summary																				
Delay			12.9																	
Level of Service			B																	
Intersection Capacity Utilization			37.6%	ICU Level of Service					A											
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	2	37	11	5	11	16	644	16	8	589	17
Future Volume (Veh/h)	11	2	37	11	5	11	16	644	16	8	589	17
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	2	40	12	5	12	17	700	17	9	640	18
Pedestrians		7			7						1	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		1			1						0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								1261			400	
pX, platoon unblocked	0.96	0.96	0.96	0.96	0.96		0.96					
vC, conflicting volume	1074	1432	336	1128	1432	366	665			724		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	989	1363	219	1046	1363	366	562			724		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	93	99	95	92	96	98	98			99		
cM capacity (veh/h)	177	135	748	158	135	626	957			869		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	54	29	367	367	329	338						
Volume Left	12	12	17	0	9	0						
Volume Right	40	12	0	17	0	18						
cSH	397	219	957	1700	869	1700						
Volume to Capacity	0.14	0.13	0.02	0.22	0.01	0.20						
Queue Length 95th (ft)	12	11	1	0	1	0						
Control Delay (s)	15.5	23.9	0.6	0.0	0.4	0.0						
Lane LOS	C	C	A		A							
Approach Delay (s)	15.5	23.9	0.3		0.2							
Approach LOS	C	C										
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			40.2%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

18: Coast Hwy & Washington Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	0	20	10	0	9	13	665	14	18	604	17
Future Volume (Veh/h)	4	0	20	10	0	9	13	665	14	18	604	17
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	0	22	11	0	10	14	723	15	20	657	18
Pedestrians		11			7						12	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		1			1						1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								831			830	
pX, platoon unblocked	0.98	0.98		0.98	0.98	0.98				0.98		
vC, conflicting volume	1128	1490	348	1156	1492	388	686			745		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1084	1454	348	1112	1455	325	686			691		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	97	93	100	98	98			98		
cM capacity (veh/h)	155	119	642	147	119	644	895			874		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	26	21	376	376	348	346						
Volume Left	4	11	14	0	20	0						
Volume Right	22	10	0	15	0	18						
cSH	433	233	895	1700	874	1700						
Volume to Capacity	0.06	0.09	0.02	0.22	0.02	0.20						
Queue Length 95th (ft)	5	7	1	0	2	0						
Control Delay (s)	13.8	22.0	0.5	0.0	0.8	0.0						
Lane LOS	B	C	A		A							
Approach Delay (s)	13.8	22.0	0.3		0.4							
Approach LOS	B	C										
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			43.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	57	85	49	45	7	58	7	130	36	69	80	3
Future Volume (vph)	57	85	49	45	7	58	7	130	36	69	80	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	62	92	53	49	8	63	8	141	39	75	87	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	207	120	188	165								
Volume Left (vph)	62	49	8	75								
Volume Right (vph)	53	63	39	3								
Hadj (s)	-0.06	-0.20	-0.08	0.11								
Departure Headway (s)	4.9	4.9	4.9	5.1								
Degree Utilization, x	0.28	0.16	0.26	0.23								
Capacity (veh/h)	679	666	684	651								
Control Delay (s)	9.8	8.9	9.5	9.7								
Approach Delay (s)	9.8	8.9	9.5	9.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.5									
Level of Service			A									
Intersection Capacity Utilization			40.1%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	207	20	9	144	24	19	33	31	19	44	9
Future Volume (Veh/h)	8	207	20	9	144	24	19	33	31	19	44	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	225	22	10	157	26	21	36	34	21	48	10
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked												
vC, conflicting volume	197			254			486	478	243	510	476	185
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	197			254			486	478	243	510	476	185
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			95	92	96	95	90	99
cM capacity (veh/h)	1360			1303			435	471	791	412	472	847
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	256	193	91	79								
Volume Left	9	10	21	21								
Volume Right	22	26	34	10								
cSH	1360	1303	543	481								
Volume to Capacity	0.01	0.01	0.17	0.16								
Queue Length 95th (ft)	0	1	15	15								
Control Delay (s)	0.3	0.5	13.0	14.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.5	13.0	14.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.0									
Intersection Capacity Utilization			27.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

21: Coast Hwy & Wisconsin Ave

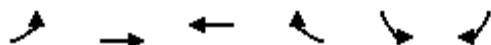
9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	69	61	123	57	49	10	108	582	62	11	582	34
Future Volume (vph)	69	61	123	57	49	10	108	582	62	11	582	34
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2			4.2		4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.90			0.99		1.00	0.99		1.00	0.99	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1676			1797		1770	3488		1770	3510	
Flt Permitted	0.75	1.00			0.75		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1398	1676			1377		1770	3488		1770	3510	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	75	66	134	62	53	11	117	633	67	12	633	37
RTOR Reduction (vph)	0	81	0	0	4	0	0	8	0	0	4	0
Lane Group Flow (vph)	75	119	0	0	122	0	117	692	0	12	666	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	10.4	10.4			10.4		7.2	25.5		0.8	19.1	
Effective Green, g (s)	10.4	10.4			10.4		7.2	25.5		0.8	19.1	
Actuated g/C Ratio	0.21	0.21			0.21		0.14	0.51		0.02	0.38	
Clearance Time (s)	4.2	4.2			4.2		4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	292	350			288		256	1789		28	1348	
v/s Ratio Prot		0.07					c0.07	0.20		0.01	c0.19	
v/s Ratio Perm	0.05				c0.09							
v/c Ratio	0.26	0.34			0.42		0.46	0.39		0.43	0.49	
Uniform Delay, d1	16.4	16.7			17.1		19.5	7.3		24.2	11.6	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.6			1.0		1.3	0.2		10.2	0.4	
Delay (s)	16.9	17.3			18.1		20.8	7.5		34.4	12.0	
Level of Service	B	B			B		C	A		C	B	
Approach Delay (s)		17.2			18.1			9.4			12.4	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			12.2				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			49.7				Sum of lost time (s)			13.0		
Intersection Capacity Utilization			54.6%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

9/1/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	125	93	14	21	22
Future Volume (Veh/h)	5	125	93	14	21	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	136	101	15	23	24
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	124				264	118
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	124				264	118
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	97
cM capacity (veh/h)	1453				718	927
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	141	116	47			
Volume Left	5	0	23			
Volume Right	0	15	24			
cSH	1453	1700	811			
Volume to Capacity	0.00	0.07	0.06			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.3	0.0	9.7			
Lane LOS	A		A			
Approach Delay (s)	0.3	0.0	9.7			
Approach LOS			A			
Intersection Summary						
Average Delay		1.6				
Intersection Capacity Utilization		21.0%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	129	2	1	86	18	1	1	2	27	0	19
Future Volume (Veh/h)	14	129	2	1	86	18	1	1	2	27	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	140	2	1	93	20	1	1	2	29	0	21
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	115			142			299	288	141	280	279	107
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	115			142			299	288	141	280	279	107
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	96	100	98
cM capacity (veh/h)	1471			1441			632	614	907	662	621	944
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	157	114	4	50								
Volume Left	15	1	1	29								
Volume Right	2	20	2	21								
cSH	1471	1441	738	757								
Volume to Capacity	0.01	0.00	0.01	0.07								
Queue Length 95th (ft)	1	0	0	5								
Control Delay (s)	0.8	0.1	9.9	10.1								
Lane LOS	A	A	A	B								
Approach Delay (s)	0.8	0.1	9.9	10.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			27.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	79	79	23	57	1	47	1	32	0	1	0
Future Volume (vph)	1	79	79	23	57	1	47	1	32	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	86	86	25	62	1	51	1	35	0	1	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	173	88	87	1								
Volume Left (vph)	1	25	51	0								
Volume Right (vph)	86	1	35	0								
Hadj (s)	-0.26	0.08	-0.09	0.03								
Departure Headway (s)	3.9	4.4	4.4	4.6								
Degree Utilization, x	0.19	0.11	0.11	0.00								
Capacity (veh/h)	890	802	775	723								
Control Delay (s)	7.9	7.9	7.9	7.6								
Approach Delay (s)	7.9	7.9	7.9	7.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.9								
Level of Service				A								
Intersection Capacity Utilization				37.1%	ICU Level of Service		A					
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	43	90	111	63	65	108
Future Volume (vph)	43	90	111	63	65	108
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	98	121	68	71	117
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	145	189	188			
Volume Left (vph)	47	0	71			
Volume Right (vph)	98	68	0			
Hadj (s)	-0.31	-0.18	0.11			
Departure Headway (s)	4.4	4.3	4.6			
Degree Utilization, x	0.18	0.22	0.24			
Capacity (veh/h)	747	805	753			
Control Delay (s)	8.4	8.5	9.0			
Approach Delay (s)	8.4	8.5	9.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.7			
Level of Service			A			
Intersection Capacity Utilization			36.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

9/1/2016

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (veh/h)	8	201	18	19	166	42	25	31	37	46	19	12		
Future Volume (Veh/h)	8	201	18	19	166	42	25	31	37	46	19	12		
Sign Control		Free			Free			Stop			Stop			
Grade		0%			0%			0%			0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	9	218	20	21	180	46	27	34	40	50	21	13		
Pedestrians		4			8			11			3			
Lane Width (ft)		12.0			12.0			12.0			12.0			
Walking Speed (ft/s)		4.0			4.0			4.0			4.0			
Percent Blockage		0			1			1			0			
Right turn flare (veh)														
Median type		None			None									
Median storage (veh)														
Upstream signal (ft)	253													
pX, platoon unblocked	0.91						0.91	0.91				0.91	0.91	0.91
vC, conflicting volume	229				249			530	528	247	559	515	210	
vC1, stage 1 conf vol														
vC2, stage 2 conf vol														
vCu, unblocked vol	96				249			428	426	247	460	412	75	
tC, single (s)	4.1				4.1			7.1	6.5	6.2	7.1	6.5	6.2	
tC, 2 stage (s)														
tF (s)	2.2				2.2			3.5	4.0	3.3	3.5	4.0	3.3	
p0 queue free %	99				98			94	93	95	87	95	99	
cM capacity (veh/h)	1352				1305			445	455	779	400	464	888	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1										
Volume Total	247	247	101	84										
Volume Left	9	21	27	50										
Volume Right	20	46	40	13										
cSH	1352	1305	541	454										
Volume to Capacity	0.01	0.02	0.19	0.19										
Queue Length 95th (ft)	1	1	17	17										
Control Delay (s)	0.3	0.8	13.2	14.7										
Lane LOS	A	A	B	B										
Approach Delay (s)	0.3	0.8	13.2	14.7										
Approach LOS			B	B										
Intersection Summary														
Average Delay	4.2													
Intersection Capacity Utilization	35.5%			ICU Level of Service					A					
Analysis Period (min)	15													

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↰	↰	↱		↰	↱	
Traffic Volume (vph)	40	160	60	263	155	235	63	618	169	242	525	21
Future Volume (vph)	40	160	60	263	155	235	63	618	169	242	525	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.97	1.00	1.00	0.96	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.99	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1844	1529	1681	1746	1516	1770	3412		1770	3509	
Flt Permitted		0.99	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1844	1529	1681	1746	1516	1770	3412		1770	3509	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	174	65	286	168	255	68	672	184	263	571	23
RTOR Reduction (vph)	0	0	55	0	0	213	0	24	0	0	3	0
Lane Group Flow (vph)	0	217	10	223	231	42	68	832	0	263	591	0
Confl. Peds. (#/hr)	14		10	10		14			3			15
Confl. Bikes (#/hr)			4			5			3			3
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		15.1	15.1	16.6	16.6	16.6	6.5	32.6		16.9	43.0	
Effective Green, g (s)		15.1	15.1	16.6	16.6	16.6	6.5	32.6		16.9	43.0	
Actuated g/C Ratio		0.15	0.15	0.17	0.17	0.17	0.06	0.33		0.17	0.43	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)		278	230	279	289	251	115	1112		299	1508	
v/s Ratio Prot		c0.12		c0.13	0.13		0.04	c0.24		c0.15	0.17	
v/s Ratio Perm			0.01			0.03						
v/c Ratio		0.78	0.04	0.80	0.80	0.17	0.59	0.75		0.88	0.39	
Uniform Delay, d1		40.9	36.3	40.1	40.1	35.8	45.5	30.0		40.6	19.5	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		12.3	0.0	15.1	14.6	0.4	5.3	4.6		23.5	0.8	
Delay (s)		53.1	36.3	55.2	54.7	36.2	50.8	34.7		64.1	20.3	
Level of Service		D	D	E	D	D	D	C		E	C	
Approach Delay (s)		49.3			48.2			35.9			33.7	
Approach LOS		D			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			39.7									
HCM 2000 Volume to Capacity ratio			0.79									
Actuated Cycle Length (s)			100.0									
Intersection Capacity Utilization			75.9%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	513	6	22	570	63	9	10	57	118	8	30
Future Volume (vph)	15	513	6	22	570	63	9	10	57	118	8	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.96	1.00
Satd. Flow (prot)	1770	3531		1764	3482			3091			1779	1542
Flt Permitted	0.39	1.00		0.44	1.00			0.91			0.68	1.00
Satd. Flow (perm)	727	3531		817	3482			2835			1261	1542
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	558	7	24	620	68	10	11	62	128	9	33
RTOR Reduction (vph)	0	1	0	0	9	0	0	46	0	0	0	24
Lane Group Flow (vph)	16	564	0	24	679	0	0	37	0	0	137	9
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	13.5	13.5		13.5	13.5			8.1			8.1	8.1
Effective Green, g (s)	13.5	13.5		13.5	13.5			8.1			8.1	8.1
Actuated g/C Ratio	0.43	0.43		0.43	0.43			0.26			0.26	0.26
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	315	1532		354	1511			738			328	401
v/s Ratio Prot		0.16			c0.19							
v/s Ratio Perm	0.02			0.03				0.01			c0.11	0.01
v/c Ratio	0.05	0.37		0.07	0.45			0.05			0.42	0.02
Uniform Delay, d1	5.1	5.9		5.1	6.2			8.6			9.5	8.6
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.1	0.2		0.1	0.2			0.0			1.2	0.0
Delay (s)	5.2	6.1		5.2	6.4			8.7			10.7	8.6
Level of Service	A	A		A	A			A			B	A
Approach Delay (s)		6.1			6.4			8.7			10.3	
Approach LOS		A			A			A			B	
Intersection Summary												
HCM 2000 Control Delay		6.8			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.44										
Actuated Cycle Length (s)		31.1			Sum of lost time (s)			9.5				
Intersection Capacity Utilization		52.6%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	10	12	24	10	80	16	653	44	102	680	15
Future Volume (vph)	33	10	12	24	10	80	16	653	44	102	680	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.97			0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1743			1797	1555	1770	3500		1770	3526	
Flt Permitted		0.79			0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1427			1401	1555	1770	3500		1770	3526	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	11	13	26	11	87	17	710	48	111	739	16
RTOR Reduction (vph)	0	11	0	0	0	76	0	5	0	0	1	0
Lane Group Flow (vph)	0	49	0	0	37	11	17	753	0	111	754	0
Confl. Peds. (#/hr)	10		4	4		10			3			4
Confl. Bikes (#/hr)			1						2			3
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1		6
Permitted Phases	4			8		8						
Actuated Green, G (s)		5.6			5.6	5.6	0.9	19.4		6.9	25.4	
Effective Green, g (s)		5.6			5.6	5.6	0.9	19.4		6.9	25.4	
Actuated g/C Ratio		0.12			0.12	0.12	0.02	0.43		0.15	0.56	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		175			172	190	34	1489		267	1964	
v/s Ratio Prot							0.01	c0.22		c0.06	0.21	
v/s Ratio Perm		c0.03			0.03	0.01						
v/c Ratio		0.28			0.22	0.06	0.50	0.51		0.42	0.38	
Uniform Delay, d1		18.2			18.0	17.7	22.1	9.6		17.5	5.7	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.2	0.0	11.1	0.3		1.1	0.1	
Delay (s)		18.5			18.2	17.7	33.2	9.9		18.6	5.8	
Level of Service		B			B	B	C	A		B	A	
Approach Delay (s)		18.5			17.9			10.4			7.5	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay		9.8										
HCM 2000 Volume to Capacity ratio		0.45										
Actuated Cycle Length (s)		45.6										
Intersection Capacity Utilization		48.1%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	135	10	11	82	0	22	0	19	0	0	0
Future Volume (Veh/h)	2	135	10	11	82	0	22	0	19	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	147	11	12	89	0	24	0	21	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		252										
pX, platoon unblocked												
vC, conflicting volume	89			158			270	270	152	290	275	89
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			158			270	270	152	290	275	89
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			96	100	98	100	100	100
cM capacity (veh/h)	1506			1422			678	631	894	641	626	969
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	160	101	45	0								
Volume Left	2	12	24	0								
Volume Right	11	0	21	0								
cSH	1506	1422	764	1700								
Volume to Capacity	0.00	0.01	0.06	0.00								
Queue Length 95th (ft)	0	1	5	0								
Control Delay (s)	0.1	1.0	10.0	0.0								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.1	1.0	10.0	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			21.1%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	75	16	0	29	0	16	1	5	0	0	0
Future Volume (Veh/h)	0	75	16	0	29	0	16	1	5	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	82	17	0	32	0	17	1	5	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	32			99			122	122	90	128	131	32
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	32			99			122	122	90	128	131	32
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	99	100	100	100
cM capacity (veh/h)	1580			1494			852	768	967	840	760	1042
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	99	32	23	0								
Volume Left	0	0	17	0								
Volume Right	17	0	5	0								
cSH	1580	1494	871	1700								
Volume to Capacity	0.00	0.00	0.03	0.00								
Queue Length 95th (ft)	0	0	2	0								
Control Delay (s)	0.0	0.0	9.2	0.0								
Lane LOS			A	A								
Approach Delay (s)	0.0	0.0	9.2	0.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			14.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	37	154	11	21	184	11
Future Volume (vph)	37	154	11	21	184	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	167	12	23	200	12
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	207	35	212			
Volume Left (vph)	40	0	200			
Volume Right (vph)	167	23	0			
Hadj (s)	-0.41	-0.36	0.22			
Departure Headway (s)	4.1	4.2	4.6			
Degree Utilization, x	0.23	0.04	0.27			
Capacity (veh/h)	830	791	742			
Control Delay (s)	8.3	7.4	9.3			
Approach Delay (s)	8.3	7.4	9.3			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.7			
Level of Service			A			
Intersection Capacity Utilization			35.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	203	61	9	159	10	83	11	12	3	8	15
Future Volume (Veh/h)	6	203	61	9	159	10	83	11	12	3	8	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	221	66	10	173	11	90	12	13	3	9	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	576											
pX, platoon unblocked												
vC, conflicting volume	184			287			487	472	254	486	500	178
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	184			287			487	472	254	486	500	178
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			81	98	98	99	98	98
cM capacity (veh/h)	1391			1275			470	484	785	470	467	864
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	294	194	115	28								
Volume Left	7	10	90	3								
Volume Right	66	11	13	16								
cSH	1391	1275	494	634								
Volume to Capacity	0.01	0.01	0.23	0.04								
Queue Length 95th (ft)	0	1	22	3								
Control Delay (s)	0.2	0.5	14.5	10.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.5	14.5	10.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			35.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	208	5	15	173	26	3	7	14	12	3	3
Future Volume (Veh/h)	3	208	5	15	173	26	3	7	14	12	3	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	226	5	16	188	28	3	8	15	13	3	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					249							
pX, platoon unblocked												
vC, conflicting volume	216			231			473	482	228	488	471	202
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	216			231			473	482	228	488	471	202
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	98	98	97	99	100
cM capacity (veh/h)	1354			1337			492	477	811	470	484	839
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	234	232	26	19								
Volume Left	3	16	3	13								
Volume Right	5	28	15	3								
cSH	1354	1337	628	508								
Volume to Capacity	0.00	0.01	0.04	0.04								
Queue Length 95th (ft)	0	1	3	3								
Control Delay (s)	0.1	0.6	11.0	12.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.6	11.0	12.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			30.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	118	106	51	68	23	117	696	74	92	552	41
Future Volume (vph)	53	118	106	51	68	23	117	696	74	92	552	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			5.0			4.2	5.0		5.0	5.0
Lane Util. Factor		1.00			1.00			1.00	0.95		1.00	0.95
Frt		0.95			0.98			1.00	0.99		1.00	0.99
Flt Protected		0.99			0.98			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1750			1790			1770	3488		1770	3502
Flt Permitted		0.91			0.80			0.95	1.00		0.34	1.00
Satd. Flow (perm)		1610			1450			1770	3488		627	3502
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	128	115	55	74	25	127	757	80	100	600	45
RTOR Reduction (vph)	0	23	0	0	7	0	0	9	0	0	6	0
Lane Group Flow (vph)	0	278	0	0	147	0	127	828	0	100	639	0
Turn Type	Perm	NA		Perm		NA		Prot	NA		Perm	NA
Protected Phases		4			8			5	2		6	
Permitted Phases	4				8						6	
Actuated Green, G (s)		16.5			16.1			7.5	30.2		18.5	18.5
Effective Green, g (s)		16.5			16.1			7.5	30.2		18.5	18.5
Actuated g/C Ratio		0.29			0.29			0.13	0.54		0.33	0.33
Clearance Time (s)		4.6			5.0			4.2	5.0		5.0	5.0
Vehicle Extension (s)		3.0			3.5			2.0	3.0		3.0	3.0
Lane Grp Cap (vph)		471			414			235	1871		206	1150
v/s Ratio Prot								0.07	c0.24		c0.18	
v/s Ratio Perm		c0.17			0.10						0.16	
v/c Ratio		0.59			0.35			0.54	0.44		0.49	0.56
Uniform Delay, d1		17.0			16.0			22.8	7.9		15.1	15.5
Progression Factor		1.00			1.00			1.00	1.00		1.00	1.00
Incremental Delay, d2		2.0			0.6			1.4	0.2		1.8	0.6
Delay (s)		19.0			16.6			24.2	8.1		16.9	16.1
Level of Service		B			B			C	A		B	B
Approach Delay (s)		19.0			16.6			10.2			16.2	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay	14.0			HCM 2000 Level of Service					B			
HCM 2000 Volume to Capacity ratio	0.57											
Actuated Cycle Length (s)	56.3			Sum of lost time (s)					14.2			
Intersection Capacity Utilization	59.5%			ICU Level of Service					B			
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

9/1/2016

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	9	260	13	13	117	5	15	18	6	8	7	9	
Future Volume (Veh/h)	9	260	13	13	117	5	15	18	6	8	7	9	
Sign Control		Free			Free			Stop			Stop		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	10	283	14	14	127	5	16	20	7	9	8	10	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	None			None									
Median storage (veh)													
Upstream signal (ft)	280												
pX, platoon unblocked				0.99				0.99	0.99	0.99	0.99	0.99	
vC, conflicting volume	132			297				482	470	290	484	474	130
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	132			284				470	459	277	473	463	130
tC, single (s)	4.1			4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)													
tF (s)	2.2			2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99				97	96	99	98	98	99
cM capacity (veh/h)	1453			1265				480	485	754	469	482	920
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	307	146	43	27									
Volume Left	10	14	16	9									
Volume Right	14	5	7	10									
cSH	1453	1265	512	579									
Volume to Capacity	0.01	0.01	0.08	0.05									
Queue Length 95th (ft)	1	1	7	4									
Control Delay (s)	0.3	0.8	12.7	11.5									
Lane LOS	A	A	B	B									
Approach Delay (s)	0.3	0.8	12.7	11.5									
Approach LOS				B	B								
Intersection Summary													
Average Delay				2.1									
Intersection Capacity Utilization				26.4%	ICU Level of Service				A				
Analysis Period (min)				15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	251	9	11	119	3	12	23	11	4	10	6
Future Volume (vph)	9	251	9	11	119	3	12	23	11	4	10	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	273	10	12	129	3	13	25	12	4	11	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	293	144	50	22								
Volume Left (vph)	10	12	13	4								
Volume Right (vph)	10	3	12	7								
Hadj (s)	0.02	0.04	-0.06	-0.12								
Departure Headway (s)	4.3	4.4	4.8	4.8								
Degree Utilization, x	0.35	0.18	0.07	0.03								
Capacity (veh/h)	828	781	677	670								
Control Delay (s)	9.5	8.4	8.2	8.0								
Approach Delay (s)	9.5	8.4	8.2	8.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.0								
Level of Service				A								
Intersection Capacity Utilization				26.4%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	267	16	68	115	33	16	80	154	63	17	4
Future Volume (vph)	17	267	16	68	115	33	16	80	154	63	17	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	290	17	74	125	36	17	87	167	68	18	4
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	325	235	271	90								
Volume Left (vph)	18	74	17	68								
Volume Right (vph)	17	36	167	4								
Hadj (s)	0.01	0.01	-0.32	0.16								
Departure Headway (s)	5.3	5.5	5.3	6.1								
Degree Utilization, x	0.48	0.36	0.40	0.15								
Capacity (veh/h)	634	610	622	509								
Control Delay (s)	13.2	11.5	11.7	10.2								
Approach Delay (s)	13.2	11.5	11.7	10.2								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay				12.0								
Level of Service				B								
Intersection Capacity Utilization				60.3%	ICU Level of Service	B						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	5	57	58	4	41	22
Future Volume (vph)	5	57	58	4	41	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	62	63	4	45	24
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	67	67	69			
Volume Left (vph)	5	0	45			
Volume Right (vph)	62	4	0			
Hadj (s)	-0.51	0.00	0.16			
Departure Headway (s)	3.7	4.1	4.3			
Degree Utilization, x	0.07	0.08	0.08			
Capacity (veh/h)	938	851	826			
Control Delay (s)	7.0	7.4	7.6			
Approach Delay (s)	7.0	7.4	7.6			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.3			
Level of Service			A			
Intersection Capacity Utilization			20.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	103	33	203	82	350	37	569	269	293	478	18
Future Volume (vph)	15	103	33	203	82	350	37	569	269	293	478	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1532		1799	1583	1770	3330		1770	3514	
Flt Permitted	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1532		1799	1583	1770	3330		1770	3514	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	112	36	221	89	380	40	618	292	318	520	20
RTOR Reduction (vph)	0	0	33	0	0	305	0	53	0	0	2	0
Lane Group Flow (vph)	16	112	3	0	310	75	40	857	0	318	538	0
Confl. Peds. (#/hr)	7		2	2		7			5			8
Confl. Bikes (#/hr)						2			4			8
Turn Type	Split	NA	Perm	Split	NA	Over	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	7.2	7.2	7.2		18.9	18.0	3.3	27.6		18.0	42.3	
Effective Green, g (s)	7.2	7.2	7.2		18.9	18.0	3.3	27.6		18.0	42.3	
Actuated g/C Ratio	0.08	0.08	0.08		0.21	0.20	0.04	0.30		0.20	0.47	
Clearance Time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	140	147	121		374	313	64	1012		350	1637	
v/s Ratio Prot	0.01	c0.06			c0.17	0.05	0.02	c0.26		c0.18	0.15	
v/s Ratio Perm			0.00									
v/c Ratio	0.11	0.76	0.02		0.83	0.24	0.62	0.85		0.91	0.33	
Uniform Delay, d1	38.8	41.0	38.6		34.4	30.6	43.1	29.6		35.6	15.3	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	18.7	0.0		14.0	0.1	12.9	6.7		25.8	0.1	
Delay (s)	39.0	59.6	38.6		48.4	30.8	56.0	36.3		61.4	15.4	
Level of Service	D	E	D		D	C	E	D		E	B	
Approach Delay (s)		53.0			38.7			37.1			32.4	
Approach LOS		D			D			D			C	
Intersection Summary												
HCM 2000 Control Delay			37.0									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.85									
Actuated Cycle Length (s)			90.8									Sum of lost time (s) 19.1
Intersection Capacity Utilization			74.7%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St & Vista Way

9/1/2016

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	5	618	6	8	594	28	4	0	8	13	3	30	
Future Volume (Veh/h)	5	618	6	8	594	28	4	0	8	13	3	30	
Sign Control		Free			Free			Stop			Stop		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	5	672	7	9	646	30	4	0	9	14	3	33	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	None			TWLTL									
Median storage veh	2												
Upstream signal (ft)	279												
pX, platoon unblocked				0.95				0.95	0.95	0.95	0.95	0.95	
vC, conflicting volume	676			679				1399	1380	676	1374	1368	661
vC1, stage 1 conf vol							686	686			679	679	
vC2, stage 2 conf vol							714	694			694	689	
vCu, unblocked vol	676			635				1394	1373	631	1367	1361	661
tC, single (s)	4.1			4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5			6.1	5.5	
tF (s)	2.2			2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99				99	100	98	96	99	93
cM capacity (veh/h)	915			900				297	330	456	314	331	462
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	684	685	13	50									
Volume Left	5	9	4	14									
Volume Right	7	30	9	33									
cSH	915	900	392	400									
Volume to Capacity	0.01	0.01	0.03	0.13									
Queue Length 95th (ft)	0	1	3	11									
Control Delay (s)	0.1	0.3	14.5	15.3									
Lane LOS	A	A	B	C									
Approach Delay (s)	0.1	0.3	14.5	15.3									
Approach LOS				B	C								
Intersection Summary													
Average Delay				0.9									
Intersection Capacity Utilization				48.2%	ICU Level of Service				A				
Analysis Period (min)				15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	730	5	12	718	33	1	1	19	13	1	8
Future Volume (Veh/h)	5	730	5	12	718	33	1	1	19	13	1	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	793	5	13	780	36	1	1	21	14	1	9
Pedestrians		1						1				
Lane Width (ft)		12.0						12.0				
Walking Speed (ft/s)		4.0						4.0				
Percent Blockage		0						0				
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage (veh)		2			2							
Upstream signal (ft)		687										
pX, platoon unblocked				0.98			0.98	0.98	0.98	0.98	0.98	
vC, conflicting volume	816			799			1641	1648	796	1651	1633	799
vC1, stage 1 conf vol							806	806		824	824	
vC2, stage 2 conf vol							834	842		827	809	
vCu, unblocked vol	816			784			1644	1652	782	1654	1636	799
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			100	100	95	94	100	98
cM capacity (veh/h)	812			816			256	277	386	247	278	385
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	803	829	23	24								
Volume Left	5	13	1	14								
Volume Right	5	36	21	9								
cSH	812	816	371	287								
Volume to Capacity	0.01	0.02	0.06	0.08								
Queue Length 95th (ft)	0	1	5	7								
Control Delay (s)	0.2	0.4	15.3	18.7								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.2	0.4	15.3	18.7								
Approach LOS			C	C								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			61.5%	ICU Level of Service					B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	722	0	9	743	205	0	0	5	3	0	11
Future Volume (Veh/h)	8	722	0	9	743	205	0	0	5	3	0	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	785	0	10	808	223	0	0	5	3	0	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLT			TWLT							
Median storage veh		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1031			785			1643	1854	785	1748	1742	920
vC1, stage 1 conf vol							803	803		940	940	
vC2, stage 2 conf vol							840	1051		808	803	
vCu, unblocked vol	1031			785			1643	1854	785	1748	1742	920
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			100	100	99	99	100	96
cM capacity (veh/h)	674			834			253	237	393	237	260	329
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total	794	7	1034	5	15							
Volume Left	9	7	3	0	3							
Volume Right	0	0	223	5	12							
cSH	674	834	834	393	305							
Volume to Capacity	0.01	0.01	0.01	0.01	0.05							
Queue Length 95th (ft)	1	1	1	1	4							
Control Delay (s)	0.4	9.4	0.3	14.3	17.4							
Lane LOS	A	A	A	B	C							
Approach Delay (s)	0.4	0.4		14.3	17.4							
Approach LOS				B	C							
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			Err%		ICU Level of Service				H			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	41	5	0	13	43	721	4	18	578	4
Future Volume (Veh/h)	0	0	41	5	0	13	43	721	4	18	578	4
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	45	5	0	14	47	784	4	20	628	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL			TWLTL		
Median storage veh							2			2		
Upstream signal (ft)										621		
pX, platoon unblocked	0.87	0.87	0.87	0.87	0.87	0.87						
vC, conflicting volume	1170	1552	630	1593	1552	394	632	788				
vC1, stage 1 conf vol	670	670	880		880							
vC2, stage 2 conf vol	500	882	713		672							
vCu, unblocked vol	1119	1560	496	1607	1560	394	498	788				
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1	4.1				
tC, 2 stage (s)	6.5	5.5	6.5		5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	100	100	90	98	100	98	95	98				
cM capacity (veh/h)	327	267	450	210	266	605	920	827				
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	45	19	47	523	265	13	639					
Volume Left	0	5	47	0	0	13	7					
Volume Right	45	14	0	0	4	0	4					
cSH	450	405	920	1700	1700	827	827					
Volume to Capacity	0.10	0.05	0.05	0.31	0.16	0.02	0.02					
Queue Length 95th (ft)	8	4	4	0	0	2	2					
Control Delay (s)	13.9	14.3	9.1	0.0	0.0	9.5	0.5					
Lane LOS	B	B	A				A	A				
Approach Delay (s)	13.9	14.3	0.5				0.6					
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			45.7%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

45: Coast Hwy & Michigan Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	111	51	50	33	7	16	16	690	28	12	690	30
Future Volume (vph)	111	51	50	33	7	16	16	690	28	12	690	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Lane Util. Factor		1.00	1.00		1.00	1.00		0.95			0.95	
Frt		1.00	0.85		1.00	0.85		0.99			0.99	
Flt Protected		0.97	1.00		0.96	1.00		1.00			1.00	
Satd. Flow (prot)		1801	1583		1790	1583		3515			3514	
Flt Permitted		0.77	1.00		0.72	1.00		0.93			0.94	
Satd. Flow (perm)		1429	1583		1347	1583		3289			3310	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	121	55	54	36	8	17	17	750	30	13	750	33
RTOR Reduction (vph)	0	0	44	0	0	14	0	2	0	0	3	0
Lane Group Flow (vph)	0	176	10	0	44	3	0	795	0	0	793	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		15.0	15.0		15.0	15.0		57.0			57.0	
Effective Green, g (s)		15.0	15.0		15.0	15.0		57.0			57.0	
Actuated g/C Ratio		0.19	0.19		0.19	0.19		0.71			0.71	
Clearance Time (s)		4.0	4.0		4.0	4.0		4.0			4.0	
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		267	296		252	296		2343			2358	
v/s Ratio Prot												
v/s Ratio Perm		c0.12	0.01		0.03	0.00		c0.24			0.24	
v/c Ratio		0.66	0.03		0.17	0.01		0.34			0.34	
Uniform Delay, d1		30.1	26.6		27.3	26.5		4.4			4.3	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		5.8	0.0		0.3	0.0		0.4			0.4	
Delay (s)		35.9	26.6		27.6	26.5		4.8			4.7	
Level of Service		D	C		C	C		A			A	
Approach Delay (s)		33.7			27.3			4.8			4.7	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		9.0			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.41										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		53.6%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

Intersection

Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	85	12	27	93	39	7	86	32	0	0	0
Future Vol, veh/h	40	85	12	27	93	39	7	86	32	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	43	92	13	29	101	42	8	93	35	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.5	8.4	8.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	6%	29%	17%
Vol Thru, %	69%	62%	58%
Vol Right, %	26%	9%	25%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	125	137	159
LT Vol	7	40	27
Through Vol	86	85	93
RT Vol	32	12	39
Lane Flow Rate	136	149	173
Geometry Grp	1	1	1
Degree of Util (X)	0.17	0.184	0.207
Departure Headway (Hd)	4.505	4.444	4.304
Convergence, Y/N	Yes	Yes	Yes
Cap	798	809	835
Service Time	2.529	2.463	2.322
HCM Lane V/C Ratio	0.17	0.184	0.207
HCM Control Delay	8.5	8.5	8.4
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	0.7	0.8

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/07/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	834	139	45	735	259	177	56	72	612	136	449
Future Volume (veh/h)	70	834	139	45	735	259	177	56	72	612	136	449
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	76	907	151	49	799	282	126	153	78	771	0	488
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	118	945	157	79	1022	457	335	352	299	986	0	440
Arrive On Green	0.07	0.31	0.31	0.04	0.29	0.29	0.19	0.19	0.19	0.28	0.00	0.28
Sat Flow, veh/h	1774	3038	506	1774	3539	1583	1774	1863	1583	3548	0	1583
Grp Volume(v), veh/h	76	528	530	49	799	282	126	153	78	771	0	488
Grp Sat Flow(s),veh/h/ln	1774	1770	1774	1774	1770	1583	1774	1863	1583	1774	0	1583
Q Serve(g_s), s	3.8	26.4	26.4	2.4	18.7	13.9	5.6	6.5	3.8	18.0	0.0	25.0
Cycle Q Clear(g_c), s	3.8	26.4	26.4	2.4	18.7	13.9	5.6	6.5	3.8	18.0	0.0	25.0
Prop In Lane	1.00		0.29	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	118	551	552	79	1022	457	335	352	299	986	0	440
V/C Ratio(X)	0.64	0.96	0.96	0.62	0.78	0.62	0.38	0.43	0.26	0.78	0.00	1.11
Avail Cap(c_a), veh/h	118	551	552	79	1022	457	335	352	299	986	0	440
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.0	30.4	30.4	42.3	29.4	27.7	31.9	32.3	31.1	30.0	0.0	32.5
Incr Delay (d2), s/veh	23.8	29.6	29.6	31.6	5.9	6.1	3.2	3.9	2.1	6.2	0.0	76.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	17.3	17.3	1.9	9.9	6.8	3.0	3.7	1.8	9.6	0.0	20.2
LnGrp Delay(d),s/veh	64.8	60.0	60.0	73.9	35.3	33.8	35.1	36.1	33.2	36.2	0.0	108.6
LnGrp LOS	E	E	E	E	D	C	D	D	C	D		F
Approach Vol, veh/h	1134				1130				357		1259	
Approach Delay, s/veh	60.4				36.6				35.1		64.3	
Approach LOS	E				D				D		E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	21.0		8.0	32.0	29.0		10.0	30.0				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	17.0		4.0	28.0	25.0		6.0	26.0				
Max Q Clear Time (g_c+I1), s	8.5		4.4	28.4	27.0		5.8	20.7				
Green Ext Time (p_c), s	1.0		0.0	0.0	0.0		0.0	2.9				
Intersection Summary												
HCM 2010 Ctrl Delay			52.4									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/13/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	252	584	23	69	857	426	21	7	37	417	19	103
Future Volume (veh/h)	252	584	23	69	857	426	21	7	37	417	19	103
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	274	635	25	75	932	463	23	8	40	293	245	112
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	296	1157	46	177	944	422	267	93	317	335	229	105
Arrive On Green	0.17	0.33	0.33	0.10	0.27	0.27	0.20	0.20	0.20	0.19	0.19	0.19
Sat Flow, veh/h	1774	3472	137	1774	3539	1583	1333	464	1583	1774	1211	554
Grp Volume(v), veh/h	274	323	337	75	932	463	31	0	40	293	0	357
Grp Sat Flow(s),veh/h/ln	1774	1770	1839	1774	1770	1583	1796	0	1583	1774	0	1765
Q Serve(g_s), s	13.7	13.4	13.4	3.6	23.6	24.0	1.3	0.0	1.9	14.4	0.0	17.0
Cycle Q Clear(g_c), s	13.7	13.4	13.4	3.6	23.6	24.0	1.3	0.0	1.9	14.4	0.0	17.0
Prop In Lane	1.00		0.07	1.00		1.00	0.74		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	296	590	613	177	944	422	359	0	317	335	0	333
V/C Ratio(X)	0.93	0.55	0.55	0.42	0.99	1.10	0.09	0.00	0.13	0.87	0.00	1.07
Avail Cap(c_a), veh/h	296	590	613	177	944	422	359	0	317	335	0	333
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.0	24.5	24.5	38.1	32.9	33.0	29.3	0.0	29.5	35.5	0.0	36.5
Incr Delay (d2), s/veh	36.5	3.6	3.5	7.2	26.4	72.5	0.5	0.0	0.8	25.7	0.0	69.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	7.2	7.4	2.1	15.0	18.9	0.7	0.0	0.9	9.5	0.0	14.7
LnGrp Delay(d),s/veh	73.5	28.1	28.0	45.3	59.3	105.5	29.8	0.0	30.4	61.2	0.0	105.9
LnGrp LOS	E	C	C	D	E	F	C		C	E		F
Approach Vol, veh/h		934			1470			71			650	
Approach Delay, s/veh		41.4			73.1			30.1			85.7	
Approach LOS		D			E			C			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		22.0	13.0	34.0		21.0	19.0	28.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		18.0	9.0	30.0		17.0	15.0	24.0				
Max Q Clear Time (g_c+I1), s		3.9	5.6	15.4		19.0	15.7	26.0				
Green Ext Time (p_c), s		0.2	0.0	3.5		0.0	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			65.3									
HCM 2010 LOS			E									
Notes												

HCM 2010 Signalized Intersection Summary

51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/08/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1094	10	163	1017	450	8	0	62	323	18	125
Future Volume (veh/h)	0	1094	10	163	1017	450	8	0	62	323	18	125
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	1863	1863	0	1863	1863	1863	1863
Adj Flow Rate, veh/h	0	1189	11	177	1105	0	9	0	67	365	0	136
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1387	13	218	2049	917	0	0	0	996	0	444
Arrive On Green	0.00	0.39	0.39	0.12	0.58	0.00	0.00	0.00	0.00	0.28	0.00	0.28
Sat Flow, veh/h	0	3686	33	1774	3539	1583		0		3548	0	1583
Grp Volume(v), veh/h	0	586	614	177	1105	0		0.0		365	0	136
Grp Sat Flow(s),veh/h/ln	0	1770	1857	1774	1770	1583				1774	0	1583
Q Serve(g_s), s	0.0	17.3	17.3	5.5	10.9	0.0				4.7	0.0	3.9
Cycle Q Clear(g_c), s	0.0	17.3	17.3	5.5	10.9	0.0				4.7	0.0	3.9
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	683	717	218	2049	917				996	0	444
V/C Ratio(X)	0.00	0.86	0.86	0.81	0.54	0.00				0.37	0.00	0.31
Avail Cap(c_a), veh/h	0	683	717	218	2049	917				996	0	444
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	16.1	16.1	24.4	7.3	0.0				16.4	0.0	16.1
Incr Delay (d2), s/veh	0.0	13.1	12.6	27.1	1.0	0.0				1.0	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.8	11.2	4.3	5.5	0.0				2.4	0.0	1.9
LnGrp Delay(d),s/veh	0.0	29.2	28.7	51.5	8.4	0.0				17.5	0.0	17.9
LnGrp LOS		C	C	D	A					B		B
Approach Vol, veh/h		1200			1282						501	
Approach Delay, s/veh		28.9			14.3						17.6	
Approach LOS		C			B						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			11.0	26.0		20.0		37.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			7.0	22.0		16.0		33.0				
Max Q Clear Time (g_c+I1), s			7.5	19.3		6.7		12.9				
Green Ext Time (p_c), s			0.0	1.8		1.3		8.2				
Intersection Summary												
HCM 2010 Ctrl Delay			20.7									
HCM 2010 LOS			C									
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/13/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↗	↖↖	↑↑					
Traffic Volume (veh/h)	582	209	627	667	0	0			
Future Volume (veh/h)	582	209	627	667	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863					
Adj Flow Rate, veh/h	633	227	682	725					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	1593	712	1205	3185					
Arrive On Green	0.45	0.45	0.35	0.90					
Sat Flow, veh/h	3632	1583	3442	3632					
Grp Volume(v), veh/h	633	227	682	725					
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1770					
Q Serve(g_s), s	4.8	3.7	6.4	1.0					
Cycle Q Clear(g_c), s	4.8	3.7	6.4	1.0					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	1593	712	1205	3185					
V/C Ratio(X)	0.40	0.32	0.57	0.23					
Avail Cap(c_a), veh/h	1593	712	1205	3185					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	7.4	7.1	10.5	0.3					
Incr Delay (d2), s/veh	0.7	1.2	1.9	0.2					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	2.5	1.8	3.4	0.5					
LnGrp Delay(d),s/veh	8.1	8.2	12.5	0.4					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	860			1407					
Approach Delay, s/veh	8.1			6.3					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			18.0	22.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			14.0	18.0				36.0	
Max Q Clear Time (g_c+I1), s			8.4	6.8				3.0	
Green Ext Time (p_c), s			1.4	3.9				5.8	
Intersection Summary									
HCM 2010 Ctrl Delay			7.0						
HCM 2010 LOS			A						

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	78	51	71	290	486	142	14	107	71	18	66
Future Volume (vph)	85	78	51	71	290	486	142	14	107	71	18	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3158	1441		1782	1583		1792	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3158	1441		1782	1583		1792	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	85	55	77	315	528	154	15	116	77	20	72
RTOR Reduction (vph)	0	0	47	0	181	218	0	0	81	0	0	56
Lane Group Flow (vph)	92	85	8	77	398	46	0	169	35	0	97	16
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	7.2	11.0	11.0	6.6	14.0	14.0		24.6	24.6		17.6	17.6
Effective Green, g (s)	7.2	11.0	11.0	6.6	14.0	14.0		24.6	24.6		17.6	17.6
Actuated g/C Ratio	0.09	0.14	0.14	0.08	0.17	0.17		0.31	0.31		0.22	0.22
Clearance Time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	158	254	216	144	548	250		543	483		391	345
v/s Ratio Prot	c0.05	0.05		0.04	c0.13			c0.09			c0.05	
v/s Ratio Perm			0.00			0.03			0.02			0.01
v/c Ratio	0.58	0.33	0.03	0.53	0.73	0.18		0.31	0.07		0.25	0.05
Uniform Delay, d1	35.3	31.5	30.2	35.5	31.5	28.4		21.5	19.9		26.0	24.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	5.4	0.3	0.0	3.8	4.1	0.1		1.5	0.3		1.5	0.2
Delay (s)	40.6	31.8	30.2	39.3	35.5	28.6		23.0	20.2		27.5	25.1
Level of Service	D	C	C	D	D	C		C	C		C	C
Approach Delay (s)		34.9			33.8			21.9			26.5	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			31.1				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.43									
Actuated Cycle Length (s)			80.6				Sum of lost time (s)		20.8			
Intersection Capacity Utilization			44.7%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection		Coast Highway - SR-76 Ramps		
Agency or Co.	IBI Group				E/W Street Name		SR-76 Ramps		
Date Performed	07/22/2016				N/S Street Name		Coast Highway		
Analysis Year	2013				Analysis Time Period (hrs)		0.25		
Time Period	AM Peak Hour				Peak Hour Factor		0.92		
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment				LTR	LT		T					LT	L		TR	
Volume (V), veh/h	0	0	0	2	0	325	0	239	0	1	113	369	0	76	105	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	0	0	2	0	360	0	260	0	1	125	409	0	84	116	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (sec)		5.1929		4.2929	4.1129			4.1129		4.2929	4.1129		
Follow-Up Headway (sec)		3.1858		3.1858	3.1858			3.1858		3.1858	3.1858		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (Ve), pc/h		2		0	360	260		126	409	84	116		
Entry Volume veh/h		2		0	353	260		124	401	82	114		
Circulating Flow (Vc), pc/h	560			126			84			361			
Exiting Flow (Vex), pc/h	84			1			125			478			
Capacity (cPCE), pc/h		645		1028	1035			1065		862	878		
Capacity (c), veh/h		633		1008	1014			1045		845	860		
v/c Ratio (X)		0.00		0.00	0.35			0.12		0.10	0.13		

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.7		3.6	7.2	0.0		4.5	0.0	5.2	5.5	
Lane LOS		A		A	A	A		A	A	A	A	
95% Queue		0.0		0.0	1.6			0.4		0.3	0.5	
Approach Delay, s/veh	5.7			4.1			1.1			5.4		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	3.1						A					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	39	9	29	50	53	28	43	42	79	59	12
Future Volume (vph)	4	39	9	29	50	53	28	43	42	79	59	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	42	10	32	54	58	30	47	46	86	64	13
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	56	144	123	163								
Volume Left (vph)	4	32	30	86								
Volume Right (vph)	10	58	46	13								
Hadj (s)	-0.06	-0.16	-0.14	0.09								
Departure Headway (s)	4.7	4.5	4.4	4.6								
Degree Utilization, x	0.07	0.18	0.15	0.21								
Capacity (veh/h)	704	748	767	738								
Control Delay (s)	8.1	8.5	8.2	8.8								
Approach Delay (s)	8.1	8.5	8.2	8.8								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.5									
Level of Service			A									
Intersection Capacity Utilization			35.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection		Coast Highway - Surfrider Way		
Agency or Co.	IBI Group				E/W Street Name		Surfrider Way		
Date Performed	05/23/2016				N/S Street Name		Coast Highway		
Analysis Year	2013				Analysis Time Period (hrs)		0.25		
Time Period	AM Peak Hour				Peak Hour Factor		0.92		
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1
Lane Assignment				LTR				LTR				LTR	LT		R	
Volume (V), veh/h	0	112	11	31	0	6	21	43	0	29	218	13	0	17	299	64
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	124	12	34	0	7	23	48	0	32	242	14	0	19	332	71
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929		5.1929	5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858		3.1858	3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		170			78			288		351	71	
Entry Volume veh/h		167			76			282		344	70	
Circulating Flow (Vc), pc/h	358			398			155			62		
Exiting Flow (Vex), pc/h	45			126			414			373		
Capacity (cPCE), pc/h		790			759			968		1062	1062	
Capacity (c), veh/h		774			744			949		1041	1041	
v/c Ratio (X)		0.22			0.10			0.30		0.33	0.07	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.0			5.9			6.9		6.8	4.0	
Lane LOS		A			A			A		A	A	
95% Queue		0.8			0.3			1.3		1.5	0.2	
Approach Delay, s/veh	7.0			5.9			6.9			6.3		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	6.6						A					

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Civic Center Drive			
Agency or Co.	IBI Group				E/W Street Name	Civic Center Drive			
Date Performed	07/22/2016				N/S Street Name	Coast Highway			
Analysis Year	2013				Analysis Time Period (hrs)	0.25			
Time Period	AM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	9	7	6	0	18	10	18	0	5	210	22	0	52	250	9
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	10	8	7	0	20	11	20	0	6	233	24	0	58	277	10
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		25			51			263			345	
Entry Volume veh/h		25			50			258			338	
Circulating Flow (Vc), pc/h	355			249			76			37		
Exiting Flow (Vex), pc/h	90			27			263			304		
Capacity (cPCE), pc/h		792			881			1047			1089	
Capacity (c), veh/h		777			864			1027			1068	
v/c Ratio (X)		0.03			0.06			0.25			0.32	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.9			4.7			5.9			6.5	
Lane LOS		A			A			A			A	
95% Queue		0.1			0.2			1.0			1.4	
Approach Delay, s/veh	4.9			4.7			5.9			6.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	6.1						A					

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	7/11/2016
Analysis Year	2013
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Pier View Way
E/W Street Name	Pier View Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	6	9	9	0	10	14	15	0	7	217	11	0	11	236	18
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	7	10	10	0	11	16	17	0	8	241	12	0	12	262	20
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		27			44			261			294	
Entry Volume veh/h		26			43			256			288	
Circulating Flow (Vc), pc/h	285			256			29			35		
Exiting Flow (Vex), pc/h	34			44			265			283		
Capacity (cPCE), pc/h		850			875			1098			1091	
Capacity (c), veh/h		833			858			1076			1070	
v/c Ratio (X)		0.03			0.05			0.24			0.27	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.6			4.7			5.6			5.9	
Lane LOS		A			A			A			A	
95% Queue		0.1			0.2			0.9			1.1	
Approach Delay, s/veh	4.6			4.7			5.6			5.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	5.6						A					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

9/1/2016

																			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR							
Lane Configurations																			
Sign Control		Stop			Stop			Stop			Stop								
Traffic Volume (vph)	2	5	19	17	9	5	88	137	6	7	94	6							
Future Volume (vph)	2	5	19	17	9	5	88	137	6	7	94	6							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92							
Hourly flow rate (vph)	2	5	21	18	10	5	96	149	7	8	102	7							
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1														
Volume Total (vph)	7	21	33	252	117														
Volume Left (vph)	2	0	18	96	8														
Volume Right (vph)	0	21	5	7	7														
Hadj (s)	0.18	-0.67	0.05	0.09	0.01														
Departure Headway (s)	5.5	4.7	4.9	4.3	4.3														
Degree Utilization, x	0.01	0.03	0.05	0.30	0.14														
Capacity (veh/h)	599	704	670	824	801														
Control Delay (s)	7.4	6.6	8.2	9.1	8.0														
Approach Delay (s)	6.8		8.2	9.1	8.0														
Approach LOS	A		A	A	A														
Intersection Summary																			
Delay			8.6																
Level of Service			A																
Intersection Capacity Utilization			34.2%	ICU Level of Service					A										
Analysis Period (min)			15																

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	80	46	74	56	27	65
Future Volume (vph)	80	46	74	56	27	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	50	80	61	29	71
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	87	50	141	100		
Volume Left (vph)	87	0	0	29		
Volume Right (vph)	0	50	61	0		
Hadj (s)	0.53	-0.67	-0.23	0.09		
Departure Headway (s)	5.6	4.4	4.1	4.5		
Degree Utilization, x	0.13	0.06	0.16	0.12		
Capacity (veh/h)	612	779	835	763		
Control Delay (s)	8.2	6.5	7.9	8.1		
Approach Delay (s)	7.6		7.9	8.1		
Approach LOS	A		A	A		
Intersection Summary						
Delay			7.9			
Level of Service			A			
Intersection Capacity Utilization			26.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Existing Year 2013 No Project

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #9 Cleveland Street and Mission Avenue

Cycle (sec): 100 Critical Vol./Cap.(X): 0.093
Loss Time (sec): 0 Average Delay (sec/veh): 8.1
Optimal Cycle: 0 Level Of Service: A

Street Name:	Cleveland Street						Mission Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1	0	0	0	1	1	0	1	1	0	1

Volume Module:	Cleveland Street NB			Cleveland Street SB			Mission Avenue EB			Mission Avenue WB		
Base Vol:	10	10	14	10	13	25	11	91	7	39	111	23
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	10	14	10	13	25	11	91	7	39	111	23
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	10	10	14	10	13	25	11	91	7	39	111	23
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	10	10	14	10	13	25	11	91	7	39	111	23
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	10	10	14	10	13	25	11	91	7	39	111	23

Saturation Flow Module:	Cleveland Street NB			Cleveland Street SB			Mission Avenue EB			Mission Avenue WB		
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.50	0.50	1.00	0.21	0.27	0.52	1.00	1.86	0.14	1.00	1.66	0.34
Final Sat.:	315	315	755	145	189	363	628	1290	100	646	1199	256

Capacity Analysis Module:	Cleveland Street NB			Cleveland Street SB			Mission Avenue EB			Mission Avenue WB		
Vol/Sat:	0.03	0.03	0.02	0.07	0.07	0.07	0.02	0.07	0.07	0.06	0.09	0.09
Crit Moves:	****			****			****			****		
Delay/Veh:	8.3	8.3	7.3	8.3	8.3	8.3	8.4	8.1	8.0	8.5	8.0	7.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	8.3	8.3	7.3	8.3	8.3	8.3	8.4	8.1	8.0	8.5	8.0	7.9
LOS by Move:	A	A	A	A	A	A	A	A	A	A	A	A
ApproachDel:	7.9			8.3			8.1			8.1		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	7.9			8.3			8.1			8.1		
LOS by Appr:	A			A			A			A		
AllWayAvgQ:	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1

Note: Queue reported is the number of cars per lane.

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	23	124	189	64	14	172	0	0	194	15
Future Volume (vph)	11	0	23	124	189	64	14	172	0	0	194	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00		1.00	1.00	0.95		1.00	1.00			0.95	0.95
Frpb, ped/bikes	1.00		0.96	1.00	0.99		1.00	1.00			1.00	0.97
Flpb, ped/bikes	0.99		1.00	0.98	1.00		1.00	1.00			1.00	1.00
Frt	1.00		0.85	1.00	0.96		1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1753		1527	1743	3375		1770	1863			1767	1464
Flt Permitted	0.58		1.00	0.95	1.00		0.60	1.00			1.00	1.00
Satd. Flow (perm)	1075		1527	1743	3375		1124	1863			1767	1464
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	0	25	135	205	70	15	187	0	0	211	16
RTOR Reduction (vph)	0	0	11	0	32	0	0	0	0	0	1	10
Lane Group Flow (vph)	12	0	14	135	243	0	15	187	0	0	212	4
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type	Perm		Perm	Perm	NA		Perm	NA			NA	Perm
Protected Phases					8			2			6	
Permitted Phases	4		4	8			2					6
Actuated Green, G (s)	27.3		27.3	27.3	27.3		12.7	12.7			12.7	12.7
Effective Green, g (s)	27.3		27.3	27.3	27.3		12.7	12.7			12.7	12.7
Actuated g/C Ratio	0.55		0.55	0.55	0.55		0.25	0.25			0.25	0.25
Clearance Time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)	586		833	951	1842		285	473			448	371
v/s Ratio Prot					0.07			0.10			c0.12	
v/s Ratio Perm	0.01		0.01	c0.08			0.01					0.00
v/c Ratio	0.02		0.02	0.14	0.13		0.05	0.40			0.47	0.01
Uniform Delay, d1	5.2		5.2	5.6	5.6		14.1	15.5			15.8	13.9
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00			0.26	0.62
Incremental Delay, d2	0.1		0.0	0.3	0.1		0.1	0.7			1.0	0.0
Delay (s)	5.3		5.2	5.9	5.7		14.2	16.2			5.1	8.6
Level of Service	A		A	A	A		B	B			A	A
Approach Delay (s)		5.2			5.8			16.1			5.4	
Approach LOS		A			A			B			A	
Intersection Summary												
HCM 2000 Control Delay	8.0			HCM 2000 Level of Service					A			
HCM 2000 Volume to Capacity ratio	0.25											
Actuated Cycle Length (s)	50.0			Sum of lost time (s)					10.0			
Intersection Capacity Utilization	46.9%			ICU Level of Service					A			
Analysis Period (min)	15											
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	132	2	50	462	194	3	14	202	132	10	7
Future Volume (vph)	5	132	2	50	462	194	3	14	202	132	10	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0	4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.86		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (prot)	1770	3532		1770	3539	1583	1770	1601		1681	1679	
Flt Permitted	0.47	1.00		0.66	1.00	1.00	0.70	1.00		0.61	0.63	
Satd. Flow (perm)	871	3532		1229	3539	1583	1308	1601		1084	1103	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	143	2	54	502	211	3	15	220	143	11	8
RTOR Reduction (vph)	0	1	0	0	0	123	0	164	0	0	6	0
Lane Group Flow (vph)	5	144	0	54	502	88	3	71	0	82	74	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	12.6	12.6		12.2	12.2	12.2	7.5	7.5		7.5	7.5	
Effective Green, g (s)	12.6	12.6		12.2	12.2	12.2	7.5	7.5		7.5	7.5	
Actuated g/C Ratio	0.43	0.43		0.42	0.42	0.42	0.26	0.26		0.26	0.26	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0	4.6	4.6		4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	374	1518		511	1473	659	334	409		277	282	
v/s Ratio Prot		0.04			c0.14			0.04				
v/s Ratio Perm	0.01			0.04		0.06	0.00			c0.08	0.07	
v/c Ratio	0.01	0.09		0.11	0.34	0.13	0.01	0.17		0.30	0.26	
Uniform Delay, d1	4.8	5.0		5.2	5.8	5.3	8.1	8.5		8.8	8.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.0		0.1	0.2	0.1	0.0	0.3		0.8	0.7	
Delay (s)	4.8	5.0		5.3	6.0	5.4	8.1	8.8		9.6	9.4	
Level of Service	A	A		A	A	A	A	A		A	A	
Approach Delay (s)		5.0			5.8			8.8			9.5	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			6.7									
HCM 2000 Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			29.3									
Intersection Capacity Utilization			53.3%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

9/1/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	35	12	44	60	11	17
Future Volume (Veh/h)	35	12	44	60	11	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	13	48	65	12	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				248		
pX, platoon unblocked						
vC, conflicting volume			51		206	44
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			51		206	44
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		98	98
cM capacity (veh/h)			1555		759	1025
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	51	113	30			
Volume Left	0	48	12			
Volume Right	13	0	18			
cSH	1700	1555	899			
Volume to Capacity	0.03	0.03	0.03			
Queue Length 95th (ft)	0	2	3			
Control Delay (s)	0.0	3.3	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.3	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization			22.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr/Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	115	21	0	0	0	23	230	99	37	261	39
Future Volume (vph)	16	115	21	0	0	0	23	230	99	37	261	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2					4.2	4.6	4.6	4.2	4.6	4.6
Lane Util. Factor	1.00	1.00					1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99					1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00					1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98					1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1805					1770	1863	1553	1770	1863	1521
Flt Permitted	0.95	1.00					0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1805					1770	1863	1553	1770	1863	1521
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	125	23	0	0	0	25	250	108	40	284	42
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	82	0	0	31
Lane Group Flow (vph)	17	137	0	0	0	0	25	250	26	40	284	11
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA					Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4					5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	18.0	18.0					4.0	11.1	11.1	4.8	11.9	11.9
Effective Green, g (s)	18.0	18.0					4.0	11.1	11.1	4.8	11.9	11.9
Actuated g/C Ratio	0.38	0.38					0.09	0.24	0.24	0.10	0.25	0.25
Clearance Time (s)	4.2	4.2					4.2	4.6	4.6	4.2	4.6	4.6
Vehicle Extension (s)	3.0	3.0					3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	679	692					150	440	367	181	472	385
v/s Ratio Prot	0.01	c0.08					0.01	0.13		c0.02	c0.15	
v/s Ratio Perm									0.02			0.01
v/c Ratio	0.03	0.20					0.17	0.57	0.07	0.22	0.60	0.03
Uniform Delay, d1	9.0	9.6					19.9	15.8	13.9	19.3	15.4	13.2
Progression Factor	1.00	1.00					1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.6					2.4	2.0	0.1	2.8	2.5	0.0
Delay (s)	9.1	10.3					22.3	17.8	14.0	22.1	17.9	13.2
Level of Service	A	B					C	B	B	C	B	B
Approach Delay (s)		10.2			0.0			17.0			17.8	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		16.1					HCM 2000 Level of Service		B			
HCM 2000 Volume to Capacity ratio		0.35										
Actuated Cycle Length (s)		46.9					Sum of lost time (s)		13.0			
Intersection Capacity Utilization		44.2%					ICU Level of Service		A			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	240	7	0	0	0	0	10	15	9	7	0
Future Volume (Veh/h)	5	240	7	0	0	0	0	10	15	9	7	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	261	8	0	0	0	0	11	16	10	8	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		255										
pX, platoon unblocked												
vC, conflicting volume	0			269			279	275	134	162	279	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			269			279	275	134	162	279	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	98	99	99	100
cM capacity (veh/h)	1622			1292			644	629	890	761	626	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	136	138	27	18								
Volume Left	5	0	0	10								
Volume Right	0	8	16	0								
cSH	1622	1700	761	695								
Volume to Capacity	0.00	0.08	0.04	0.03								
Queue Length 95th (ft)	0	0	3	2								
Control Delay (s)	0.3	0.0	9.9	10.3								
Lane LOS	A		A	B								
Approach Delay (s)	0.1		9.9	10.3								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			21.2%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	242	3	0	0	0	0	14	10	13	15	0
Future Volume (vph)	17	242	3	0	0	0	0	14	10	13	15	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	263	3	0	0	0	0	15	11	14	16	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	150	135	26	30								
Volume Left (vph)	18	0	0	14								
Volume Right (vph)	0	3	11	0								
Hadj (s)	0.09	0.02	-0.22	0.13								
Departure Headway (s)	4.7	4.7	4.4	4.7								
Degree Utilization, x	0.20	0.17	0.03	0.04								
Capacity (veh/h)	751	758	778	719								
Control Delay (s)	7.7	7.4	7.5	7.9								
Approach Delay (s)	7.6		7.5	7.9								
Approach LOS	A		A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			22.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St/Clementine & Seagaze St

9/1/2016

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	142	122	1	4	0	3	0	17	9	0	0	0								
Future Volume (vph)	142	122	1	4	0	3	0	17	9	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	154	133	1	4	0	3	0	18	10	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	154	134	7	28																
Volume Left (vph)	154	0	4	0																
Volume Right (vph)	0	1	3	10																
Hadj (s)	0.53	0.03	-0.11	-0.18																
Departure Headway (s)	5.1	4.6	4.2	4.4																
Degree Utilization, x	0.22	0.17	0.01	0.03																
Capacity (veh/h)	698	769	833	773																
Control Delay (s)	8.3	7.3	7.3	7.5																
Approach Delay (s)	7.9		7.3	7.5																
Approach LOS	A		A	A																
Intersection Summary																				
Delay			7.8																	
Level of Service			A																	
Intersection Capacity Utilization			22.3%	ICU Level of Service					A											
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	13	0	0	11	13	263	7	5	272	6
Future Volume (Veh/h)	0	0	13	0	0	11	13	263	7	5	272	6
Sign Control	Stop			Stop				Free			Free	
Grade	0%			0%				0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	14	0	0	12	14	286	8	5	296	7
Pedestrians	7			7							1	
Lane Width (ft)	12.0			12.0							12.0	
Walking Speed (ft/s)	4.0			4.0							4.0	
Percent Blockage	1			1							0	
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			440		
pX, platoon unblocked												
vC, conflicting volume	644	646	306	645	645	298	310				301	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	644	646	306	645	645	298	310				301	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	98	100	100	98	99				100	
cM capacity (veh/h)	370	380	729	368	380	737	1243				1253	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	14	12	14	294	5	303						
Volume Left	0	0	14	0	5	0						
Volume Right	14	12	0	8	0	7						
cSH	729	737	1243	1700	1253	1700						
Volume to Capacity	0.02	0.02	0.01	0.17	0.00	0.18						
Queue Length 95th (ft)	1	1	1	0	0	0						
Control Delay (s)	10.0	10.0	7.9	0.0	7.9	0.0						
Lane LOS	B	A	A		A							
Approach Delay (s)	10.0	10.0	0.4		0.1							
Approach LOS	B	A										
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			24.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Washington Avenue			
Agency or Co.	IBI Group				E/W Street Name	Washington Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2013				Analysis Time Period (hrs)	0.25			
Time Period	AM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	4	1	7	0	15	3	3	0	5	278	8	0	2	290	5
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	4	1	8	0	17	3	3	0	6	308	9	0	2	322	6
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929		
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (Ve), pc/h		13			23			323			330		
Entry Volume veh/h		13			23			317			324		
Circulating Flow (Vc), pc/h	341			318			7			26			
Exiting Flow (Vex), pc/h	12			15			315			347			
Capacity (cPCE), pc/h		804			822			1122			1101		
Capacity (c), veh/h		788			806			1100			1079		
v/c Ratio (X)		0.02			0.03			0.29			0.30		

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.7			4.7			6.0			6.3	
Lane LOS		A			A			A			A	
95% Queue		0.0			0.1			1.2			1.3	
Approach Delay, s/veh	4.7			4.7			6.0			6.3		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	6.1						A					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	25	33	29	13	4	34	5	69	20	40	47	1
Future Volume (vph)	25	33	29	13	4	34	5	69	20	40	47	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	36	32	14	4	37	5	75	22	43	51	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	95	55	102	95								
Volume Left (vph)	27	14	5	43								
Volume Right (vph)	32	37	22	1								
Hadj (s)	-0.11	-0.32	-0.09	0.12								
Departure Headway (s)	4.3	4.1	4.3	4.5								
Degree Utilization, x	0.11	0.06	0.12	0.12								
Capacity (veh/h)	797	813	807	765								
Control Delay (s)	7.8	7.4	7.8	8.1								
Approach Delay (s)	7.8	7.4	7.8	8.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.8									
Level of Service			A									
Intersection Capacity Utilization			24.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	126	10	2	58	10	5	12	13	14	17	7
Future Volume (Veh/h)	5	126	10	2	58	10	5	12	13	14	17	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	137	11	2	63	11	5	13	14	15	18	8
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked												
vC, conflicting volume	88			155			250	252	150	260	252	84
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	88			155			250	252	150	260	252	84
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	98	98	98	97	99
cM capacity (veh/h)	1490			1417			667	637	892	653	637	964
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	153	76	32	41								
Volume Left	5	2	5	15								
Volume Right	11	11	14	8								
cSH	1490	1417	734	689								
Volume to Capacity	0.00	0.00	0.04	0.06								
Queue Length 95th (ft)	0	0	3	5								
Control Delay (s)	0.3	0.2	10.1	10.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.2	10.1	10.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.7									
Intersection Capacity Utilization			21.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Wisconsin Avenue			
Agency or Co.	IBI Group				E/W Street Name	Wisconsin Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2013				Analysis Time Period (hrs)	0.25			
Time Period	AM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	36	26	92	0	42	14	13	0	45	257	30	0	8	283	12
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	40	29	102	0	47	16	14	0	50	285	33	0	9	314	13
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		171			77			368			336	
Entry Volume veh/h		168			75			361			329	
Circulating Flow (Vc), pc/h	370			375			78			113		
Exiting Flow (Vex), pc/h	71			79			339			463		
Capacity (cPCE), pc/h		781			777			1045			1009	
Capacity (c), veh/h		765			761			1025			989	
v/c Ratio (X)		0.22			0.10			0.35			0.33	

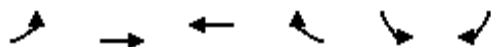
Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.1			5.7			7.2			7.1	
Lane LOS		A			A			A			A	
95% Queue		0.8			0.3			1.6			1.5	
Approach Delay, s/veh	7.1			5.7			7.2			7.1		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	7.0						A					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

9/1/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	60	58	3	10	9
Future Volume (Veh/h)	5	60	58	3	10	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	65	63	3	11	10
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	74				148	74
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	74				148	74
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1515				834	981
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	70	66	21			
Volume Left	5	0	11			
Volume Right	0	3	10			
cSH	1515	1700	898			
Volume to Capacity	0.00	0.04	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.6	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	0.6	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			17.6%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	56	5	12	53	7	3	4	8	22	1	3
Future Volume (Veh/h)	4	56	5	12	53	7	3	4	8	22	1	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	61	5	13	58	8	3	4	9	24	1	3
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	68			66			165	166	64	172	164	66
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	68			66			165	166	64	172	164	66
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	99	99	97	100	100
cM capacity (veh/h)	1531			1536			787	718	1001	771	719	994
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	70	79	16	28								
Volume Left	4	13	3	24								
Volume Right	5	8	9	3								
cSH	1531	1536	871	788								
Volume to Capacity	0.00	0.01	0.02	0.04								
Queue Length 95th (ft)	0	1	1	3								
Control Delay (s)	0.4	1.3	9.2	9.7								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.4	1.3	9.2	9.7								
Approach LOS			A	A								
Intersection Summary												
Average Delay			2.9									
Intersection Capacity Utilization			19.7%	ICU Level of Service				A				
Analysis Period (min)			15									

24: Wisconsin Ave & Ditmar St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	33	52	20	42	0	28	0	10	0	2	0
Future Volume (vph)	0	33	52	20	42	0	28	0	10	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	36	57	22	46	0	30	0	11	0	2	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	93	68	41	2								
Volume Left (vph)	0	22	30	0								
Volume Right (vph)	57	0	11	0								
Hadj (s)	-0.33	0.10	0.02	0.03								
Departure Headway (s)	3.7	4.2	4.3	4.3								
Degree Utilization, x	0.10	0.08	0.05	0.00								
Capacity (veh/h)	945	846	808	798								
Control Delay (s)	7.1	7.5	7.5	7.3								
Approach Delay (s)	7.1	7.5	7.5	7.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.3								
Level of Service				A								
Intersection Capacity Utilization				25.8%	ICU Level of Service		A					
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	32	46	51	20	54	61
Future Volume (vph)	32	46	51	20	54	61
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	50	55	22	59	66
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	85	77	125			
Volume Left (vph)	35	0	59			
Volume Right (vph)	50	22	0			
Hadj (s)	-0.24	-0.14	0.13			
Departure Headway (s)	4.1	4.1	4.3			
Degree Utilization, x	0.10	0.09	0.15			
Capacity (veh/h)	834	851	818			
Control Delay (s)	7.5	7.5	8.0			
Approach Delay (s)	7.5	7.5	8.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			24.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	132	1	6	106	22	6	7	11	22	11	5
Future Volume (Veh/h)	4	132	1	6	106	22	6	7	11	22	11	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	143	1	7	115	24	7	8	12	24	12	5
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					253							
pX, platoon unblocked	0.96						0.96	0.96		0.96	0.96	0.96
vC, conflicting volume	142			155			318	318	162	320	307	134
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	93			155			276	276	162	277	264	84
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	99	99	96	98	99
cM capacity (veh/h)	1446			1412			623	598	868	621	607	935
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	148	146	27	41								
Volume Left	4	7	7	24								
Volume Right	1	24	12	5								
cSH	1446	1412	702	643								
Volume to Capacity	0.00	0.00	0.04	0.06								
Queue Length 95th (ft)	0	0	3	5								
Control Delay (s)	0.2	0.4	10.3	11.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.4	10.3	11.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			22.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Oceanside Blvd			
Agency or Co.	IBI Group				E/W Street Name	Oceanside Boulevard			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2013				Analysis Time Period (hrs)	0.25			
Time Period	AM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	15	97	52	0	113	98	109	0	27	216	60	0	119	274	11
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	17	108	58	0	125	109	121	0	30	239	67	0	132	304	12
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		183			355			336			448	
Entry Volume veh/h		179			348			329			439	
Circulating Flow (Vc), pc/h	561			286			257			264		
Exiting Flow (Vex), pc/h	307			151			377			487		
Capacity (cPCE), pc/h		645			849			874			868	
Capacity (c), veh/h		632			832			857			851	
v/c Ratio (X)		0.28			0.42			0.38			0.52	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.4			9.5			8.7			11.2	
Lane LOS		A			A			A			B	
95% Queue		1.2			2.1			1.8			3.0	
Approach Delay, s/veh	9.4			9.5			8.7			11.2		
Approach LOS	A			A			A			B		
Intersection Delay, s/veh / LOS	9.9						A					

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	274	0	16	353	28	8	5	34	86	8	16
Future Volume (vph)	4	274	0	16	353	28	8	5	34	86	8	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.96	1.00
Satd. Flow (prot)	1770	3539		1765	3497			3095			1781	1551
Flt Permitted	0.82	1.00		0.82	1.00			0.94			1.00	1.00
Satd. Flow (perm)	1521	3539		1517	3497			2927			1862	1551
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	298	0	17	384	30	9	5	37	93	9	17
RTOR Reduction (vph)	0	0	0	0	13	0	0	31	0	0	0	14
Lane Group Flow (vph)	4	298	0	17	401	0	0	20	0	0	102	3
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	4.9	4.9		4.9	4.9			2.6			2.6	2.6
Effective Green, g (s)	4.9	4.9		4.9	4.9			2.6			2.6	2.6
Actuated g/C Ratio	0.29	0.29		0.29	0.29			0.15			0.15	0.15
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	438	1020		437	1007			447			284	237
v/s Ratio Prot		0.08			c0.11							
v/s Ratio Perm	0.00			0.01				0.01			c0.05	0.00
v/c Ratio	0.01	0.29		0.04	0.40			0.04			0.36	0.01
Uniform Delay, d1	4.3	4.7		4.4	4.9			6.1			6.5	6.1
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.0	0.2		0.0	0.3			0.1			1.1	0.0
Delay (s)	4.3	4.9		4.4	5.1			6.2			7.5	6.1
Level of Service	A	A		A	A			A			A	A
Approach Delay (s)		4.9			5.1			6.2			7.3	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay		5.4			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.38										
Actuated Cycle Length (s)		17.0			Sum of lost time (s)			9.5				
Intersection Capacity Utilization		45.5%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	8	13	13	5	48	2	292	26	40	394	13
Future Volume (vph)	19	8	13	13	5	48	2	292	26	40	394	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.96			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1728			1794	1557	1770	3489		1770	3519	
Flt Permitted		1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1769			1860	1557	1770	3489		1770	3519	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	9	14	14	5	52	2	317	28	43	428	14
RTOR Reduction (vph)	0	13	0	0	0	48	0	8	0	0	3	0
Lane Group Flow (vph)	0	31	0	0	19	4	2	337	0	43	439	0
Confl. Peds. (#/hr)	10		4	4		10			3			4
Confl. Bikes (#/hr)			1						2			3
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1		6
Permitted Phases	4			8		8						
Actuated Green, G (s)		2.6			2.6	2.6	0.6	17.4		0.6	17.4	
Effective Green, g (s)		2.6			2.6	2.6	0.6	17.4		0.6	17.4	
Actuated g/C Ratio		0.08			0.08	0.08	0.02	0.51		0.02	0.51	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		134			140	118	30	1769		30	1785	
v/s Ratio Prot							0.00	0.10		c0.02	c0.12	
v/s Ratio Perm		c0.02			0.01	0.00						
v/c Ratio		0.23			0.14	0.03	0.07	0.19		1.43	0.25	
Uniform Delay, d1		14.9			14.8	14.7	16.6	4.6		16.8	4.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.2	0.0	0.9	0.1		317.1	0.1	
Delay (s)		15.2			15.0	14.7	17.5	4.7		333.9	4.8	
Level of Service		B			B	B	B	A		F	A	
Approach Delay (s)		15.2			14.8			4.7			34.0	
Approach LOS		B			B			A			C	
Intersection Summary												
HCM 2000 Control Delay		21.0										
HCM 2000 Volume to Capacity ratio		0.28										
Actuated Cycle Length (s)		34.3										
Intersection Capacity Utilization		38.1%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	60	7	11	52	0	6	0	9	0	0	0
Future Volume (Veh/h)	0	60	7	11	52	0	6	0	9	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	65	8	12	57	0	7	0	10	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		252										
pX, platoon unblocked												
vC, conflicting volume	57			73			150	150	69	160	154	57
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	57			73			150	150	69	160	154	57
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	100	99	100	100	100
cM capacity (veh/h)	1547			1527			813	736	994	793	732	1009
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	73	69	17	0								
Volume Left	0	12	7	0								
Volume Right	8	0	10	0								
cSH	1547	1527	910	1700								
Volume to Capacity	0.00	0.01	0.02	0.00								
Queue Length 95th (ft)	0	1	1	0								
Control Delay (s)	0.0	1.3	9.0	0.0								
Lane LOS		A	A	A								
Approach Delay (s)	0.0	1.3	9.0	0.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			20.0%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Dittmar St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	28	4	1	20	1	7	0	3	1	0	1
Future Volume (Veh/h)	1	28	4	1	20	1	7	0	3	1	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	30	4	1	22	1	8	0	3	1	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	23			34			60	59	32	62	60	22
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	23			34			60	59	32	62	60	22
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	100	100	100
cM capacity (veh/h)	1592			1578			935	831	1042	930	829	1054
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	35	24	11	2								
Volume Left	1	1	8	1								
Volume Right	4	1	3	1								
cSH	1592	1578	962	988								
Volume to Capacity	0.00	0.00	0.01	0.00								
Queue Length 95th (ft)	0	0	1	0								
Control Delay (s)	0.2	0.3	8.8	8.6								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.2	0.3	8.8	8.6								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			13.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	16	54	6	16	67	6
Future Volume (vph)	16	54	6	16	67	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	59	7	17	73	7
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	76	24	80			
Volume Left (vph)	17	0	73			
Volume Right (vph)	59	17	0			
Hadj (s)	-0.39	-0.39	0.22			
Departure Headway (s)	3.7	3.7	4.3			
Degree Utilization, x	0.08	0.02	0.10			
Capacity (veh/h)	933	927	820			
Control Delay (s)	7.1	6.8	7.7			
Approach Delay (s)	7.1	6.8	7.7			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.3			
Level of Service			A			
Intersection Capacity Utilization			21.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	101	45	8	67	2	34	5	8	9	6	3
Future Volume (Veh/h)	2	101	45	8	67	2	34	5	8	9	6	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	110	49	9	73	2	37	5	9	10	7	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
576												
pX, platoon unblocked												
vC, conflicting volume	75			159			237	232	134	242	255	74
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	75			159			237	232	134	242	255	74
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			95	99	99	99	99	100
cM capacity (veh/h)	1524			1420			705	663	914	697	644	988
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	161	84	51	20								
Volume Left	2	9	37	10								
Volume Right	49	2	9	3								
cSH	1524	1420	730	708								
Volume to Capacity	0.00	0.01	0.07	0.03								
Queue Length 95th (ft)	0	0	6	2								
Control Delay (s)	0.1	0.9	10.3	10.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.9	10.3	10.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay												
2.6												
Intersection Capacity Utilization												
19.1%												
ICU Level of Service												
A												
Analysis Period (min)												
15												

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	116	7	5	72	10	2	3	14	4	4	3
Future Volume (Veh/h)	0	116	7	5	72	10	2	3	14	4	4	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	126	8	5	78	11	2	3	15	4	4	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	249											
pX, platoon unblocked												
vC, conflicting volume	89			134			228	229	130	240	228	84
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			134			228	229	130	240	228	84
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	98	99	99	100
cM capacity (veh/h)	1506			1451			719	668	920	698	670	976
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	134	94	20	11								
Volume Left	0	5	2	4								
Volume Right	8	11	15	3								
cSH	1506	1451	848	744								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.0	0.4	9.3	9.9								
Lane LOS		A	A	A								
Approach Delay (s)	0.0	0.4	9.3	9.9								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			18.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↕		↙	↕	
Traffic Volume (vph)	24	69	45	35	32	17	57	269	32	40	295	11
Future Volume (vph)	24	69	45	35	32	17	57	269	32	40	295	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.96			0.97		1.00	0.98		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1765			1776		1770	3482		1770	3520	
Flt Permitted		0.92			0.89		0.95	1.00		0.55	1.00	
Satd. Flow (perm)		1635			1621		1770	3482		1032	3520	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	75	49	38	35	18	62	292	35	43	321	12
RTOR Reduction (vph)	0	29	0	0	15	0	0	13	0	0	3	0
Lane Group Flow (vph)	0	121	0	0	76	0	62	314	0	43	330	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)		5.2			4.8		2.2	21.9		15.5	15.5	
Effective Green, g (s)		5.2			4.8		2.2	21.9		15.5	15.5	
Actuated g/C Ratio		0.14			0.13		0.06	0.60		0.42	0.42	
Clearance Time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.5		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		231			212		106	2077		435	1486	
v/s Ratio Prot							c0.04	0.09			c0.09	
v/s Ratio Perm		c0.07			0.05					0.04		
v/c Ratio		0.52			0.36		0.58	0.15		0.10	0.22	
Uniform Delay, d1		14.6			14.5		16.8	3.3		6.4	6.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.1			1.2		5.2	0.0		0.1	0.1	
Delay (s)		16.7			15.8		22.0	3.3		6.5	6.8	
Level of Service		B			B		C	A		A	A	
Approach Delay (s)		16.7			15.8			6.3			6.8	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		8.9			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.33										
Actuated Cycle Length (s)		36.7			Sum of lost time (s)			14.2				
Intersection Capacity Utilization		38.9%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	136	5	6	77	5	2	6	5	4	5	7
Future Volume (Veh/h)	6	136	5	6	77	5	2	6	5	4	5	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	148	5	7	84	5	2	7	5	4	5	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		280										
pX, platoon unblocked												
vC, conflicting volume	89			153			276	268	150	274	268	86
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			153			276	268	150	274	268	86
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	99	99	99	99	99
cM capacity (veh/h)	1506			1428			662	632	896	665	632	972
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	160	96	14	17								
Volume Left	7	7	2	4								
Volume Right	5	5	5	8								
cSH	1506	1428	712	767								
Volume to Capacity	0.00	0.00	0.02	0.02								
Queue Length 95th (ft)	0	0	2	2								
Control Delay (s)	0.4	0.6	10.2	9.8								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.4	0.6	10.2	9.8								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			19.1%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	152	5	3	93	1	4	8	7	5	4	3
Future Volume (vph)	2	152	5	3	93	1	4	8	7	5	4	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	165	5	3	101	1	4	9	8	5	4	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	172	105	21	12								
Volume Left (vph)	2	3	4	5								
Volume Right (vph)	5	1	8	3								
Hadj (s)	0.02	0.03	-0.16	-0.03								
Departure Headway (s)	4.1	4.2	4.4	4.5								
Degree Utilization, x	0.20	0.12	0.03	0.01								
Capacity (veh/h)	864	846	770	741								
Control Delay (s)	8.1	7.8	7.5	7.6								
Approach Delay (s)	8.1	7.8	7.5	7.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.9									
Level of Service			A									
Intersection Capacity Utilization			19.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	173	4	21	79	12	4	33	88	93	6	5
Future Volume (vph)	5	173	4	21	79	12	4	33	88	93	6	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	188	4	23	86	13	4	36	96	101	7	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	197	122	136	113								
Volume Left (vph)	5	23	4	101								
Volume Right (vph)	4	13	96	5								
Hadj (s)	0.03	0.01	-0.38	0.19								
Departure Headway (s)	4.7	4.8	4.5	5.0								
Degree Utilization, x	0.26	0.16	0.17	0.16								
Capacity (veh/h)	719	702	748	660								
Control Delay (s)	9.3	8.7	8.4	9.0								
Approach Delay (s)	9.3	8.7	8.4	9.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.9								
Level of Service				A								
Intersection Capacity Utilization				38.9%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	4	23	14	6	32	28
Future Volume (vph)	4	23	14	6	32	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	25	15	7	35	30
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	29	22	65			
Volume Left (vph)	4	0	35			
Volume Right (vph)	25	7	0			
Hadj (s)	-0.46	-0.16	0.14			
Departure Headway (s)	3.6	3.9	4.1			
Degree Utilization, x	0.03	0.02	0.07			
Capacity (veh/h)	963	909	863			
Control Delay (s)	6.7	7.0	7.4			
Approach Delay (s)	6.7	7.0	7.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.2			
Level of Service			A			
Intersection Capacity Utilization			19.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	81	26	218	33	185	19	163	104	157	230	4
Future Volume (vph)	10	81	26	218	33	185	19	163	104	157	230	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.94		1.00	1.00	
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1553		1785	1583	1770	3286		1770	3529	
Flt Permitted	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1553		1785	1583	1770	3286		1770	3529	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	88	28	237	36	201	21	177	113	171	250	4
RTOR Reduction (vph)	0	0	26	0	0	165	0	67	0	0	1	0
Lane Group Flow (vph)	11	88	2	0	273	36	21	223	0	171	253	0
Confl. Peds. (#/hr)	7		2	2		7			5			8
Confl. Bikes (#/hr)						2			4			8
Turn Type	Split	NA	Perm	Split	NA	Over	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	5.6	5.6	5.6		16.8	12.0	2.2	14.0		12.0	23.8	
Effective Green, g (s)	5.6	5.6	5.6		16.8	12.0	2.2	14.0		12.0	23.8	
Actuated g/C Ratio	0.08	0.08	0.08		0.25	0.18	0.03	0.21		0.18	0.35	
Clearance Time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	146	154	128		444	281	57	681		314	1244	
v/s Ratio Prot	0.01	c0.05			c0.15	0.02	0.01	c0.07		c0.10	0.07	
v/s Ratio Perm			0.00									
v/c Ratio	0.08	0.57	0.02		0.61	0.13	0.37	0.33		0.54	0.20	
Uniform Delay, d1	28.6	29.8	28.4		22.5	23.3	32.0	22.7		25.3	15.2	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	3.2	0.0		2.5	0.1	1.5	0.3		1.0	0.1	
Delay (s)	28.6	33.0	28.4		25.0	23.4	33.4	23.0		26.3	15.3	
Level of Service	C	C	C		C	C	C	C		C	B	
Approach Delay (s)		31.6			24.3			23.7			19.7	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			23.4									
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			67.5									
Intersection Capacity Utilization			50.5%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	300	1	3	447	18	0	0	5	10	0	11
Future Volume (Veh/h)	3	300	1	3	447	18	0	0	5	10	0	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	326	1	3	486	20	0	0	5	11	0	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage (veh)					2							
Upstream signal (ft)		279										
pX, platoon unblocked				0.98			0.98	0.98	0.98	0.98	0.98	
vC, conflicting volume	506			327			846	844	326	840	835	496
vC1, stage 1 conf vol							332	332		502	502	
vC2, stage 2 conf vol							514	512		338	333	
vCu, unblocked vol	506			301			832	830	300	825	820	496
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	98	100	98
cM capacity (veh/h)	1059			1233			468	470	723	480	475	574
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	330	509	5	23								
Volume Left	3	3	0	11								
Volume Right	1	20	5	12								
cSH	1059	1233	723	525								
Volume to Capacity	0.00	0.00	0.01	0.04								
Queue Length 95th (ft)	0	0	1	3								
Control Delay (s)	0.1	0.1	10.0	12.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	10.0	12.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			41.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	315	2	6	496	10	2	1	13	12	1	6
Future Volume (Veh/h)	4	315	2	6	496	10	2	1	13	12	1	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	342	2	7	539	11	2	1	14	13	1	7
Pedestrians		1						1				
Lane Width (ft)		12.0						12.0				
Walking Speed (ft/s)		4.0						4.0				
Percent Blockage		0						0				
Right turn flare (veh)												
Median type		TWLT			TWLT							
Median storage veh)		2			2							
Upstream signal (ft)		687										
pX, platoon unblocked												
vC, conflicting volume	550			345			919	916	344	924	912	546
vC1, stage 1 conf vol							352	352		558	558	
vC2, stage 2 conf vol							567	564		366	353	
vCu, unblocked vol	550			345			919	916	344	924	912	546
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	98	97	100	99
cM capacity (veh/h)	1020			1213			438	444	698	441	446	537
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	348	557	17	21								
Volume Left	4	7	2	13								
Volume Right	2	11	14	7								
cSH	1020	1213	633	469								
Volume to Capacity	0.00	0.01	0.03	0.04								
Queue Length 95th (ft)	0	0	2	4								
Control Delay (s)	0.1	0.2	10.8	13.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	10.8	13.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			40.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	386	1	6	498	66	0	0	5	1	0	10
Future Volume (Veh/h)	14	386	1	6	498	66	0	0	5	1	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	420	1	7	541	72	0	0	5	1	0	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLT			TWLT							
Median storage veh		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	613			421			1016	1078	420	1046	1042	577
vC1, stage 1 conf vol							450	450		591	591	
vC2, stage 2 conf vol							566	627		456	451	
vCu, unblocked vol	613			421			1016	1078	420	1046	1042	577
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			100	100	99	100	100	98
cM capacity (veh/h)	966			1138			406	394	633	405	411	516
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total	436	7	613	5	12							
Volume Left	15	7	0	0	1							
Volume Right	1	0	72	5	11							
cSH	966	1138	1700	633	505							
Volume to Capacity	0.02	0.01	0.36	0.01	0.02							
Queue Length 95th (ft)	1	0	0	1	2							
Control Delay (s)	0.5	8.2	0.0	10.7	12.3							
Lane LOS	A	A		B	B							
Approach Delay (s)	0.5	0.1		10.7	12.3							
Approach LOS				B	B							
Intersection Summary												
Average Delay			0.4									
Intersection Capacity Utilization			Err%		ICU Level of Service				H			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	33	5	0	5	14	222	4	7	502	5
Future Volume (Veh/h)	0	0	33	5	0	5	14	222	4	7	502	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	36	5	0	5	15	241	4	8	546	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh								2			2	
Upstream signal (ft)											621	
pX, platoon unblocked												
vC, conflicting volume	720	840	548	871	840	122	551			245		
vC1, stage 1 conf vol	564	564		273	273							
vC2, stage 2 conf vol	156	275		598	567							
vCu, unblocked vol	720	840	548	871	840	122	551			245		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	92	99	100	99	99			99		
cM capacity (veh/h)	451	457	480	378	448	906	1015			1318		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	36	10	15	161	84	8	551					
Volume Left	0	5	15	0	0	8	0					
Volume Right	36	5	0	0	4	0	5					
cSH	480	533	1015	1700	1700	1318	1700					
Volume to Capacity	0.08	0.02	0.01	0.09	0.05	0.01	0.32					
Queue Length 95th (ft)	6	1	1	0	0	0	0					
Control Delay (s)	13.1	11.9	8.6	0.0	0.0	7.7	0.0					
Lane LOS	B	B	A			A						
Approach Delay (s)	13.1	11.9	0.5			0.1						
Approach LOS	B	B										
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			Err%	ICU Level of Service						H		
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2013
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Michigan Avenue
E/W Street Name	Michigan Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	56	8	23	0	30	9	5	0	14	301	4	0	4	295	17
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	62	9	26	0	33	10	6	0	16	334	4	0	4	327	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		97			49			354			350	
Entry Volume veh/h		95			48			347			343	
Circulating Flow (Vc), pc/h	364			412			75			59		
Exiting Flow (Vex), pc/h	17			45			402			386		
Capacity (cPCE), pc/h		785			748			1048			1065	
Capacity (c), veh/h		770			734			1028			1044	
v/c Ratio (X)		0.12			0.07			0.34			0.33	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.0			5.6			7.0			6.8	
Lane LOS		A			A			A			A	
95% Queue		0.4			0.2			1.5			1.4	
Approach Delay, s/veh	6.0			5.6			7.0			6.8		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	6.7						A					

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/08/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↗	↖↖	↑↑					
Traffic Volume (veh/h)	275	188	948	561	0	0			
Future Volume (veh/h)	275	188	948	561	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863					
Adj Flow Rate, veh/h	299	204	1030	610					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	1416	633	1377	3185					
Arrive On Green	0.40	0.40	0.40	0.90					
Sat Flow, veh/h	3632	1583	3442	3632					
Grp Volume(v), veh/h	299	204	1030	610					
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1770					
Q Serve(g_s), s	2.2	3.5	10.3	0.8					
Cycle Q Clear(g_c), s	2.2	3.5	10.3	0.8					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	1416	633	1377	3185					
V/C Ratio(X)	0.21	0.32	0.75	0.19					
Avail Cap(c_a), veh/h	1416	633	1377	3185					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	7.9	8.3	10.3	0.2					
Incr Delay (d2), s/veh	0.3	1.3	3.8	0.1					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	1.1	1.8	5.4	0.4					
LnGrp Delay(d),s/veh	8.2	9.6	14.0	0.4					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	503			1640					
Approach Delay, s/veh	8.8			9.0					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			20.0	20.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			16.0	16.0				36.0	
Max Q Clear Time (g_c+I1), s			12.3	5.5				2.8	
Green Ext Time (p_c), s			1.6	1.9				4.7	
Intersection Summary									
HCM 2010 Ctrl Delay			8.9						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/08/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↖	↑↑	↖	↗		
Traffic Volume (veh/h)	466	79	980	1434	79	1		
Future Volume (veh/h)	466	79	980	1434	79	1		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	507	86	1065	1559	86	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	871	390	1112	2232	437	390		
Arrive On Green	0.25	0.25	0.32	0.63	0.25	0.00		
Sat Flow, veh/h	3632	1583	3442	3632	1774	1583		
Grp Volume(v), veh/h	507	86	1065	1559	86	0		
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1770	1774	1583		
Q Serve(g_s), s	8.2	2.8	19.7	18.9	2.5	0.0		
Cycle Q Clear(g_c), s	8.2	2.8	19.7	18.9	2.5	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	871	390	1112	2232	437	390		
V/C Ratio(X)	0.58	0.22	0.96	0.70	0.20	0.00		
Avail Cap(c_a), veh/h	871	390	1112	2232	437	390		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	21.6	19.5	21.6	7.9	19.4	0.0		
Incr Delay (d2), s/veh	2.8	1.3	18.6	1.8	1.0	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	4.4	1.4	12.2	9.7	1.3	0.0		
LnGrp Delay(d),s/veh	24.4	20.8	40.1	9.8	20.4	0.0		
LnGrp LOS	C	C	D	A	C			
Approach Vol, veh/h	593			2624	86			
Approach Delay, s/veh	23.9			22.1	20.4			
Approach LOS	C			C	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	25.0	20.0				45.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	21.0	16.0				41.0
Max Q Clear Time (g_c+I1), s		4.5	21.7	10.2				20.9
Green Ext Time (p_c), s		0.1	0.0	1.8				12.2
Intersection Summary								
HCM 2010 Ctrl Delay			22.4					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary
51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/08/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	502	6	183	871	718	17	0	219	90	71	82
Future Volume (veh/h)	0	502	6	183	871	718	17	0	219	90	71	82
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	1863	1863	0	1863	1863	1863	1863
Adj Flow Rate, veh/h	0	546	7	199	947	0	18	0	238	88	92	89
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1101	14	273	1906	853	0	0	0	546	573	487
Arrive On Green	0.00	0.31	0.31	0.15	0.54	0.00	0.00	0.00	0.00	0.31	0.31	0.31
Sat Flow, veh/h	0	3672	46	1774	3539	1583		0		1774	1863	1583
Grp Volume(v), veh/h	0	270	283	199	947	0		0.0		88	92	89
Grp Sat Flow(s),veh/h/ln	0	1770	1855	1774	1770	1583				1774	1863	1583
Q Serve(g_s), s	0.0	6.5	6.5	5.6	8.8	0.0				1.9	1.9	2.1
Cycle Q Clear(g_c), s	0.0	6.5	6.5	5.6	8.8	0.0				1.9	1.9	2.1
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	544	571	273	1906	853				546	573	487
V/C Ratio(X)	0.00	0.50	0.50	0.73	0.50	0.00				0.16	0.16	0.18
Avail Cap(c_a), veh/h	0	544	571	273	1906	853				546	573	487
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	14.7	14.7	21.0	7.6	0.0				13.1	13.1	13.2
Incr Delay (d2), s/veh	0.0	3.2	3.1	15.7	0.9	0.0				0.6	0.6	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.6	3.8	3.9	4.5	0.0				1.0	1.0	1.1
LnGrp Delay(d),s/veh	0.0	17.9	17.8	36.7	8.5	0.0				13.7	13.7	14.0
LnGrp LOS		B	B	D	A					B	B	B
Approach Vol, veh/h		553			1146						269	
Approach Delay, s/veh		17.8			13.4						13.8	
Approach LOS		B			B						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			12.0	20.0		20.0		32.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			8.0	16.0		16.0		28.0				
Max Q Clear Time (g_c+I1), s			7.6	8.5		4.1		10.8				
Green Ext Time (p_c), s			0.0	2.0		0.8		6.4				
Intersection Summary												
HCM 2010 Ctrl Delay			14.7									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/25/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	325	393	13	22	517	506	24	29	48	197	5	80
Future Volume (veh/h)	325	393	13	22	517	506	24	29	48	197	5	80
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	353	427	14	24	562	550	26	32	52	153	90	87
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	355	1180	39	111	708	633	163	201	317	355	174	169
Arrive On Green	0.20	0.34	0.34	0.06	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1774	3498	114	1774	3539	1583	817	1005	1583	1774	872	843
Grp Volume(v), veh/h	353	216	225	24	562	550	58	0	52	153	0	177
Grp Sat Flow(s),veh/h/ln	1774	1770	1843	1774	1770	1583	1822	0	1583	1774	0	1714
Q Serve(g_s), s	15.9	7.4	7.4	1.0	12.1	16.0	2.1	0.0	2.2	6.0	0.0	7.4
Cycle Q Clear(g_c), s	15.9	7.4	7.4	1.0	12.1	16.0	2.1	0.0	2.2	6.0	0.0	7.4
Prop In Lane	1.00		0.06	1.00		1.00	0.45		1.00	1.00		0.49
Lane Grp Cap(c), veh/h	355	597	622	111	708	633	364	0	317	355	0	343
V/C Ratio(X)	0.99	0.36	0.36	0.22	0.79	0.87	0.16	0.00	0.16	0.43	0.00	0.52
Avail Cap(c_a), veh/h	355	597	622	111	708	633	364	0	317	355	0	343
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.0	20.0	20.0	35.6	30.4	19.2	26.4	0.0	26.5	28.0	0.0	28.5
Incr Delay (d2), s/veh	46.5	1.7	1.6	4.4	8.9	15.0	0.9	0.0	1.1	3.8	0.0	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.3	3.9	4.0	0.6	6.7	14.7	1.2	0.0	1.1	3.3	0.0	4.0
LnGrp Delay(d),s/veh	78.5	21.7	21.6	40.1	39.4	34.2	27.4	0.0	27.6	31.8	0.0	34.0
LnGrp LOS	E	C	C	D	D	C	C		C	C		C
Approach Vol, veh/h		794			1136			110			330	
Approach Delay, s/veh		46.9			36.9			27.5			33.0	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	9.0	31.0		20.0	20.0	20.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	5.0	27.0		16.0	16.0	16.0				
Max Q Clear Time (g_c+I1), s		4.2	3.0	9.4		9.4	17.9	18.0				
Green Ext Time (p_c), s		0.3	0.0	2.4		0.8	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				39.3								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/08/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	378	143	43	748	257	127	74	41	316	155	223
Future Volume (veh/h)	86	378	143	43	748	257	127	74	41	316	155	223
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	93	411	155	47	813	279	109	121	45	256	290	242
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	101	613	229	101	860	385	431	452	385	405	426	362
Arrive On Green	0.06	0.24	0.24	0.06	0.24	0.24	0.24	0.24	0.24	0.23	0.23	0.23
Sat Flow, veh/h	1774	2525	942	1774	3539	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	93	287	279	47	813	279	109	121	45	256	290	242
Grp Sat Flow(s),veh/h/ln	1774	1770	1697	1774	1770	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	3.7	10.2	10.4	1.8	15.8	11.3	3.5	3.7	1.6	9.1	10.0	9.7
Cycle Q Clear(g_c), s	3.7	10.2	10.4	1.8	15.8	11.3	3.5	3.7	1.6	9.1	10.0	9.7
Prop In Lane	1.00		0.56	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	101	430	412	101	860	385	431	452	385	405	426	362
V/C Ratio(X)	0.92	0.67	0.68	0.46	0.95	0.73	0.25	0.27	0.12	0.63	0.68	0.67
Avail Cap(c_a), veh/h	101	430	412	101	860	385	431	452	385	405	426	362
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	23.9	24.0	32.0	26.0	24.4	21.4	21.5	20.7	24.3	24.7	24.6
Incr Delay (d2), s/veh	69.0	8.0	8.7	14.5	20.1	11.3	1.4	1.4	0.6	7.3	8.5	9.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	6.0	5.9	1.3	10.1	6.2	1.9	2.1	0.7	5.2	6.1	5.2
LnGrp Delay(d),s/veh	101.9	31.9	32.7	46.4	46.1	35.7	22.8	22.9	21.3	31.6	33.2	34.0
LnGrp LOS	F	C	C	D	D	D	C	C	C	C	C	C
Approach Vol, veh/h		659			1139			275			788	
Approach Delay, s/veh		42.1			43.6			22.6			32.9	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.0	8.0	21.0		20.0	8.0	21.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	4.0	17.0		16.0	4.0	17.0				
Max Q Clear Time (g_c+I1), s		5.7	3.8	12.4		12.0	5.7	17.8				
Green Ext Time (p_c), s		0.8	0.0	1.4		1.4	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			38.3									
HCM 2010 LOS			D									
Notes												

Intersection

Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	43	93	13	62	70	165	3	84	22	0	0	0
Future Vol, veh/h	43	93	13	62	70	165	3	84	22	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	47	101	14	67	76	179	3	91	24	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.8	9.5	8.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	3%	29%	21%
Vol Thru, %	77%	62%	24%
Vol Right, %	20%	9%	56%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	109	149	297
LT Vol	3	43	62
Through Vol	84	93	70
RT Vol	22	13	165
Lane Flow Rate	118	162	323
Geometry Grp	1	1	1
Degree of Util (X)	0.16	0.205	0.369
Departure Headway (Hd)	4.852	4.559	4.119
Convergence, Y/N	Yes	Yes	Yes
Cap	738	787	875
Service Time	2.887	2.588	2.141
HCM Lane V/C Ratio	0.16	0.206	0.369
HCM Control Delay	8.8	8.8	9.5
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	0.8	1.7

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	258	103	163	362	295	1429	180	29	136	103	57	74
Future Volume (vph)	258	103	163	362	295	1429	180	29	136	103	57	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3030	1441		1786	1583		1805	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3030	1441		1786	1583		1805	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	280	112	177	393	321	1553	196	32	148	112	62	80
RTOR Reduction (vph)	0	0	150	0	500	573	0	0	114	0	0	65
Lane Group Flow (vph)	280	112	27	393	598	203	0	228	34	0	174	15
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.0	13.3	13.3	17.0	19.9	19.9		20.2	20.2		16.0	16.0
Effective Green, g (s)	14.0	13.3	13.3	17.0	19.9	19.9		20.2	20.2		16.0	16.0
Actuated g/C Ratio	0.16	0.15	0.15	0.19	0.23	0.23		0.23	0.23		0.18	0.18
Clearance Time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	283	283	241	344	690	328		413	366		330	290
v/s Ratio Prot	0.16	0.06		c0.22	c0.20			c0.13			c0.10	
v/s Ratio Perm			0.02			0.14			0.02			0.01
v/c Ratio	0.99	0.40	0.11	1.14	0.87	0.62		0.55	0.09		0.53	0.05
Uniform Delay, d1	36.6	33.4	31.9	35.1	32.4	30.3		29.6	26.4		32.2	29.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	50.0	0.3	0.1	93.0	10.7	2.4		5.2	0.5		5.9	0.3
Delay (s)	86.6	33.7	32.0	128.2	43.1	32.7		34.8	26.9		38.2	29.7
Level of Service	F	C	C	F	D	C		C	C		D	C
Approach Delay (s)		59.2			54.3			31.7			35.5	
Approach LOS		E			D			C			D	
Intersection Summary												
HCM 2000 Control Delay			51.3				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			87.3				Sum of lost time (s)		20.8			
Intersection Capacity Utilization			96.1%				ICU Level of Service		F			
Analysis Period (min)			15									
c Critical Lane Group												

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2013
Time Period	PM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				T				L			
Volume (V), veh/h	0	0	0	5	0	526	0	205	0	5	280	536	0	353	359	2
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	0	0	6	0	583	0	223	0	6	310	594	0	391	398	2
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929		4.2929	4.1129			4.1129		4.2929	4.1129	
Follow-Up Headway (sec)		3.1858		3.1858	3.1858			3.1858		3.1858	3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		6		0	583	223		316	594	391	400	
Entry Volume veh/h		6		0	572	223		310	582	383	392	
Circulating Flow (Vc), pc/h	1372			316			391			589		
Exiting Flow (Vex), pc/h	391			8			310			987		
Capacity (cPCE), pc/h		287		892	906			859		726	748	
Capacity (c), veh/h		281		874	888			843		712	734	
v/c Ratio (X)		0.02		0.00	0.64			0.37		0.54	0.53	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		13.2		4.1	14.3	0.0		8.6	0.0	13.5	13.1	
Lane LOS		B		A	B	A		A	A	B	B	
95% Queue		0.1		0.0	4.8			1.7		3.2	3.2	
Approach Delay, s/veh	13.2			10.3			3.0			13.3		
Approach LOS	B			B			A			B		
Intersection Delay, s/veh / LOS	8.6						A					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	38	26	62	65	100	41	78	65	115	106	25
Future Volume (vph)	1	38	26	62	65	100	41	78	65	115	106	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	41	28	67	71	109	45	85	71	125	115	27
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	70	247	201	267								
Volume Left (vph)	1	67	45	125								
Volume Right (vph)	28	109	71	27								
Hadj (s)	-0.20	-0.18	-0.13	0.07								
Departure Headway (s)	5.3	5.0	5.0	5.1								
Degree Utilization, x	0.10	0.35	0.28	0.38								
Capacity (veh/h)	592	658	668	662								
Control Delay (s)	8.9	10.7	9.9	11.2								
Approach Delay (s)	8.9	10.7	9.9	11.2								
Approach LOS	A	B	A	B								
Intersection Summary												
Delay			10.5									
Level of Service			B									
Intersection Capacity Utilization			52.2%	ICU Level of Service		A						
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection		Coast Highway - Surfrider Way		
Agency or Co.	IBI Group				E/W Street Name		Surfrider Way		
Date Performed	05/23/2016				N/S Street Name		Coast Highway		
Analysis Year	2016				Analysis Time Period (hrs)		0.25		
Time Period	PM Peak Hour				Peak Hour Factor		0.92		
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1
Lane Assignment			LTR				LTR				LTR		LT		R	
Volume (V), veh/h	0	162	50	68	0	11	44	27	0	48	554	17	0	43	560	117
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	180	55	75	0	12	49	30	0	53	614	19	0	48	621	130
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929		5.1929	5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858		3.1858	3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		310			91			686		669	130	
Entry Volume veh/h		304			89			673		656	127	
Circulating Flow (Vc), pc/h	681			847			283			114		
Exiting Flow (Vex), pc/h	122			232			824			708		
Capacity (cPCE), pc/h		572			484			851		1008	1008	
Capacity (c), veh/h		561			475			835		988	988	
v/c Ratio (X)		0.54			0.19			0.81		0.66	0.13	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		16.5			10.3			23.6		13.8	4.8	
Lane LOS		C			B			C		B	A	
95% Queue		3.2			0.7			8.7		5.3	0.4	
Approach Delay, s/veh	16.5			10.3			23.6			12.4		
Approach LOS	C			B			C			B		
Intersection Delay, s/veh / LOS	17.0						C					

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Civic Center Drive			
Agency or Co.	IBI Group				E/W Street Name	Civic Center Drive			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	26	29	23	0	29	34	65	0	19	548	53	0	36	572	22
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	29	32	26	0	32	38	72	0	21	608	59	0	40	634	24
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		87			142			688			698	
Entry Volume veh/h		85			139			675			684	
Circulating Flow (Vc), pc/h	706			658			101			91		
Exiting Flow (Vex), pc/h	131			83			709			692		
Capacity (cPCE), pc/h		558			585			1021			1032	
Capacity (c), veh/h		547			574			1001			1011	
v/c Ratio (X)		0.16			0.24			0.67			0.68	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		8.6			9.5			14.0			14.0	
Lane LOS		A			A			B			B	
95% Queue		0.5			0.9			5.5			5.5	
Approach Delay, s/veh	8.6			9.5			14.0			14.0		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh / LOS	13.3						B					

HCS 2010 Roundabout Report

General Information

Analyst		Intersection	Coast Highway - Pier View Way
Agency or Co.	IBI Group	E/W Street Name	Pier View Way
Date Performed	7/12/2016	N/S Street Name	Coast Highway
Analysis Year	2016	Analysis Time Period (hrs)	0.25
Time Period	PM Peak Hour	Peak Hour Factor	0.92
Project Description	35130 - Coast Highway	Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	38	30	42	0	18	30	51	0	32	531	42	0	23	531	72
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	42	33	47	0	20	33	57	0	35	589	47	0	26	589	80
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		122			110			671			695	
Entry Volume veh/h		120			108			658			681	
Circulating Flow (Vc), pc/h	635			666			101			88		
Exiting Flow (Vex), pc/h	106			148			688			656		
Capacity (cPCE), pc/h		599			581			1021			1035	
Capacity (c), veh/h		587			569			1001			1015	
v/c Ratio (X)		0.20			0.19			0.66			0.67	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		8.7			8.7			13.5			13.8	
Lane LOS		A			A			B			B	
95% Queue		0.8			0.7			5.1			5.4	
Approach Delay, s/veh	8.7			8.7			13.5			13.8		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh / LOS	12.9						B					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

9/1/2016

																			
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR							
Lane Configurations																			
Sign Control		Stop			Stop			Stop			Stop								
Traffic Volume (vph)	32	13	116	107	13	18	40	250	50	18	225	10							
Future Volume (vph)	32	13	116	107	13	18	40	250	50	18	225	10							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92							
Hourly flow rate (vph)	35	14	126	116	14	20	43	272	54	20	245	11							
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	SB 1														
Volume Total (vph)	49	126	150	369	276														
Volume Left (vph)	35	0	116	43	20														
Volume Right (vph)	0	126	20	54	11														
Hadj (s)	0.39	-0.67	0.11	-0.03	0.02														
Departure Headway (s)	6.9	5.9	6.2	5.3	5.5														
Degree Utilization, x	0.09	0.21	0.26	0.54	0.42														
Capacity (veh/h)	464	543	511	640	612														
Control Delay (s)	9.5	9.2	11.4	14.5	12.5														
Approach Delay (s)	9.3		11.4	14.5	12.5														
Approach LOS	A		B	B	B														
Intersection Summary																			
Delay			12.5																
Level of Service			B																
Intersection Capacity Utilization			49.1%	ICU Level of Service					A										
Analysis Period (min)			15																

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	181	81	106	126	59	124
Future Volume (vph)	181	81	106	126	59	124
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	197	88	115	137	64	135
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	197	88	252	199		
Volume Left (vph)	197	0	0	64		
Volume Right (vph)	0	88	137	0		
Hadj (s)	0.53	-0.67	-0.29	0.10		
Departure Headway (s)	6.1	4.9	4.7	5.1		
Degree Utilization, x	0.34	0.12	0.33	0.28		
Capacity (veh/h)	555	684	732	665		
Control Delay (s)	11.0	7.4	9.9	10.1		
Approach Delay (s)	9.9		9.9	10.1		
Approach LOS	A		A	B		
Intersection Summary						
Delay			10.0			
Level of Service			A			
Intersection Capacity Utilization			43.1%	ICU Level of Service	A	
Analysis Period (min)			15			

Existing Year 2013 No Project

Level Of Service Computation Report
 2000 HCM 4-Way Stop Method (Base Volume Alternative)

 Intersection #9 Cleveland Street and Mission Avenue

Cycle (sec): 100 Critical Vol./Cap.(X): 0.292
 Loss Time (sec): 0 Average Delay (sec/veh): 10.6
 Optimal Cycle: 0 Level Of Service: B

Street Name:	Cleveland Street						Mission Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1	0	0	1	0	1	0	1	1	0	1

Volume Module:	Cleveland Street			Cleveland Street			Mission Avenue			Mission Avenue		
Base Vol:	43	38	58	72	29	59	28	224	33	93	204	63
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	43	38	58	72	29	59	28	224	33	93	204	63
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	43	38	58	72	29	59	28	224	33	93	204	63
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	43	38	58	72	29	59	28	224	33	93	204	63
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	43	38	58	72	29	59	28	224	33	93	204	63

Saturation Flow Module:	Cleveland Street			Cleveland Street			Mission Avenue			Mission Avenue		
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.53	0.47	1.00	0.45	0.18	0.37	1.00	1.74	0.26	1.00	1.53	0.47
Final Sat.:	268	237	584	247	99	202	504	961	144	519	872	279

Capacity Analysis Module:	Cleveland Street			Cleveland Street			Mission Avenue			Mission Avenue		
Vol/Sat:	0.16	0.16	0.10	0.29	0.29	0.29	0.06	0.23	0.23	0.18	0.23	0.23
Crit Moves:	****			****			****			****		
Delay/Veh:	10.6	10.6	9.0	11.6	11.6	11.6	9.9	10.7	10.5	10.7	10.5	10.1
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	10.6	10.6	9.0	11.6	11.6	11.6	9.9	10.7	10.5	10.7	10.5	10.1
LOS by Move:	B	B	A	B	B	B	A	B	B	B	B	B
ApproachDel:	9.9			11.6			10.6			10.5		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	9.9			11.6			10.6			10.5		
LOS by Appr:	A			B			B			B		
AllWayAvgQ:	0.2	0.2	0.1	0.4	0.4	0.4	0.1	0.3	0.3	0.2	0.3	0.3

Note: Queue reported is the number of cars per lane.

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	0	65	137	380	121	53	507	0	0	426	61
Future Volume (vph)	43	0	65	137	380	121	53	507	0	0	426	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00		1.00	1.00	0.95		1.00	1.00			0.95	0.95
Frpb, ped/bikes	1.00		0.96	1.00	0.99		1.00	1.00			1.00	0.97
Flpb, ped/bikes	0.99		1.00	0.98	1.00		1.00	1.00			1.00	1.00
Frt	1.00		0.85	1.00	0.96		1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1756		1522	1737	3381		1770	1863			1765	1461
Flt Permitted	0.42		1.00	0.95	1.00		0.32	1.00			1.00	1.00
Satd. Flow (perm)	779		1522	1737	3381		589	1863			1765	1461
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	0	71	149	413	132	58	551	0	0	463	66
RTOR Reduction (vph)	0	0	41	0	44	0	0	0	0	0	1	31
Lane Group Flow (vph)	47	0	30	149	501	0	58	551	0	0	469	28
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type	Perm		Perm	Perm	NA		Perm	NA			NA	Perm
Protected Phases					8			2			6	
Permitted Phases	4		4	8			2					6
Actuated Green, G (s)	25.5		25.5	25.5	25.5		24.5	24.5			24.5	24.5
Effective Green, g (s)	25.5		25.5	25.5	25.5		24.5	24.5			24.5	24.5
Actuated g/C Ratio	0.42		0.42	0.42	0.42		0.41	0.41			0.41	0.41
Clearance Time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)	331		646	738	1436		240	760			720	596
v/s Ratio Prot					c0.15			c0.30			0.27	
v/s Ratio Perm	0.06		0.02	0.09			0.10					0.02
v/c Ratio	0.14		0.05	0.20	0.35		0.24	0.72			0.65	0.05
Uniform Delay, d1	10.6		10.1	10.8	11.6		11.7	14.9			14.3	10.7
Progression Factor	1.00		1.00	1.00	1.00		0.20	0.21			1.36	2.11
Incremental Delay, d2	0.9		0.1	0.6	0.7		0.3	1.8			1.8	0.0
Delay (s)	11.5		10.3	11.5	12.3		2.7	4.8			21.4	22.7
Level of Service	B		B	B	B		A	A			C	C
Approach Delay (s)		10.7			12.1			4.6			21.5	
Approach LOS		B			B			A			C	
Intersection Summary												
HCM 2000 Control Delay			12.2				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			67.1%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	351	3	142	638	268	5	44	477	365	51	25
Future Volume (vph)	15	351	3	142	638	268	5	44	477	365	51	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0	4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.86		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.97	
Satd. Flow (prot)	1770	3535		1770	3539	1583	1770	1607		1681	1684	
Flt Permitted	0.28	1.00		0.51	1.00	1.00	0.60	1.00		0.32	0.42	
Satd. Flow (perm)	529	3535		951	3539	1583	1116	1607		575	736	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	382	3	154	693	291	5	48	518	397	55	27
RTOR Reduction (vph)	0	1	0	0	0	197	0	145	0	0	7	0
Lane Group Flow (vph)	16	384	0	154	693	94	5	421	0	238	234	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	19.8	19.8		19.4	19.4	19.4	31.0	31.0		31.0	31.0	
Effective Green, g (s)	19.8	19.8		19.4	19.4	19.4	31.0	31.0		31.0	31.0	
Actuated g/C Ratio	0.33	0.33		0.32	0.32	0.32	0.52	0.52		0.52	0.52	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0	4.6	4.6		4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	174	1166		307	1144	511	576	830		297	380	
v/s Ratio Prot		0.11			c0.20			0.26				
v/s Ratio Perm	0.03			0.16		0.06	0.00			c0.41	0.32	
v/c Ratio	0.09	0.33		0.50	0.61	0.18	0.01	0.51		0.80	0.62	
Uniform Delay, d1	13.9	15.1		16.4	17.1	14.6	7.0	9.5		12.0	10.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.2		1.5	1.0	0.2	0.0	2.2		20.0	7.3	
Delay (s)	14.2	15.3		17.9	18.0	14.8	7.1	11.7		31.9	17.6	
Level of Service	B	B		B	B	B	A	B		C	B	
Approach Delay (s)		15.3			17.2			11.7			24.7	
Approach LOS		B			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			17.1									
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			60.0									
Intersection Capacity Utilization			80.6%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

9/1/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (veh/h)	177	32	50	126	50	63
Future Volume (Veh/h)	177	32	50	126	50	63
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	192	35	54	137	54	68
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				248		
pX, platoon unblocked						
vC, conflicting volume			227		454	210
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			227		454	210
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		90	92
cM capacity (veh/h)			1341		541	831
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	227	191	122			
Volume Left	0	54	54			
Volume Right	35	0	68			
cSH	1700	1341	671			
Volume to Capacity	0.13	0.04	0.18			
Queue Length 95th (ft)	0	3	16			
Control Delay (s)	0.0	2.4	11.5			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.4	11.5			
Approach LOS			B			
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			37.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr/Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	365	67	0	0	0	58	651	245	113	479	62
Future Volume (vph)	70	365	67	0	0	0	58	651	245	113	479	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2					4.2	4.6	4.6	4.2	4.6	4.6
Lane Util. Factor	1.00	1.00					1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99					1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00					1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98					1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1803					1770	1863	1552	1770	1863	1515
Flt Permitted	0.95	1.00					0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1803					1770	1863	1552	1770	1863	1515
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	397	73	0	0	0	63	708	266	123	521	67
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	94	0	0	40
Lane Group Flow (vph)	76	459	0	0	0	0	63	708	172	123	521	27
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA					Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4					5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	18.0	18.0					4.4	23.7	23.7	5.3	24.6	24.6
Effective Green, g (s)	18.0	18.0					4.4	23.7	23.7	5.3	24.6	24.6
Actuated g/C Ratio	0.30	0.30					0.07	0.39	0.39	0.09	0.41	0.41
Clearance Time (s)	4.2	4.2					4.2	4.6	4.6	4.2	4.6	4.6
Vehicle Extension (s)	3.0	3.0					3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	531	540					129	735	613	156	763	621
v/s Ratio Prot	0.04	c0.25					0.04	c0.38		0.07	c0.28	
v/s Ratio Perm									0.11			0.02
v/c Ratio	0.14	0.85					0.49	0.96	0.28	0.79	0.68	0.04
Uniform Delay, d1	15.4	19.7					26.7	17.7	12.4	26.8	14.5	10.6
Progression Factor	1.00	1.00					0.95	0.85	0.58	0.74	0.53	0.72
Incremental Delay, d2	0.6	15.4					10.9	23.1	1.0	30.4	4.6	0.1
Delay (s)	15.9	35.1					36.3	38.2	8.1	50.4	12.2	7.8
Level of Service	B	D					D	D	A	D	B	A
Approach Delay (s)		32.4			0.0			30.3			18.4	
Approach LOS		C			A			C			B	
Intersection Summary												
HCM 2000 Control Delay		27.1			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.92										
Actuated Cycle Length (s)		60.0			Sum of lost time (s)			13.0				
Intersection Capacity Utilization		75.0%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	677	14	0	0	0	0	8	33	24	18	0
Future Volume (Veh/h)	15	677	14	0	0	0	0	8	33	24	18	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	736	15	0	0	0	0	9	36	26	20	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	255											
pX, platoon unblocked												
vC, conflicting volume	0			751			786	776	376	440	783	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			751			786	776	376	440	783	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	97	94	94	94	100
cM capacity (veh/h)	1622			854			267	324	622	458	321	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	384	383	45	46								
Volume Left	16	0	0	26								
Volume Right	0	15	36	0								
cSH	1622	1700	525	386								
Volume to Capacity	0.01	0.23	0.09	0.12								
Queue Length 95th (ft)	1	0	7	10								
Control Delay (s)	0.4	0.0	12.5	15.6								
Lane LOS	A		B	C								
Approach Delay (s)	0.2		12.5	15.6								
Approach LOS			B	C								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			35.2%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	26	692	16	0	0	0	0	20	34	33	42	0
Future Volume (vph)	26	692	16	0	0	0	0	20	34	33	42	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	752	17	0	0	0	0	22	37	36	46	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	404	393	59	82								
Volume Left (vph)	28	0	0	36								
Volume Right (vph)	0	17	37	0								
Hadj (s)	0.07	0.00	-0.34	0.12								
Departure Headway (s)	5.0	4.9	5.2	5.6								
Degree Utilization, x	0.56	0.54	0.09	0.13								
Capacity (veh/h)	708	724	646	598								
Control Delay (s)	12.9	12.2	8.7	9.5								
Approach Delay (s)	12.5		8.7	9.5								
Approach LOS	B		A	A								
Intersection Summary												
Delay			12.0									
Level of Service			B									
Intersection Capacity Utilization			37.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Yield				Stop			Stop			Stop	
Traffic Volume (vph)	377	405	19	6	0	4	0	7	7	0	0	0
Future Volume (vph)	377	405	19	6	0	4	0	7	7	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	410	440	21	7	0	4	0	8	8	0	0	0
Direction, Lane #	EB 1	EB 2	WB 1	NB 1								
Volume Total (vph)	410	461	11	16								
Volume Left (vph)	410	0	7	0								
Volume Right (vph)	0	21	4	8								
Hadj (s)	0.53	0.00	-0.06	-0.27								
Departure Headway (s)	5.1	4.6	4.7	5.2								
Degree Utilization, x	0.58	0.58	0.01	0.02								
Capacity (veh/h)	704	785	753	652								
Control Delay (s)	13.7	12.5	7.7	8.3								
Approach Delay (s)	13.1		7.7	8.3								
Approach LOS	B		A	A								
Intersection Summary												
Delay			12.9									
Level of Service			B									
Intersection Capacity Utilization			37.6%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	37	0	0	11	16	644	16	8	589	17
Future Volume (Veh/h)	0	0	37	0	0	11	16	644	16	8	589	17
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	40	0	0	12	17	700	17	9	640	18
Pedestrians	7				7						1	
Lane Width (ft)	12.0				12.0						12.0	
Walking Speed (ft/s)	4.0				4.0						4.0	
Percent Blockage	1				1						0	
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			440		
pX, platoon unblocked	0.87	0.87	0.78	0.87	0.87	0.83	0.78				0.83	
vC, conflicting volume	1421	1432	656	1448	1432	716	665				724	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	967	980	422	998	981	556	434				565	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	92	100	100	97	98				99	
cM capacity (veh/h)	190	208	492	171	208	437	877				831	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	40	12	17	717	9	658						
Volume Left	0	0	17	0	9	0						
Volume Right	40	12	0	17	0	18						
cSH	492	437	877	1700	831	1700						
Volume to Capacity	0.08	0.03	0.02	0.42	0.01	0.39						
Queue Length 95th (ft)	7	2	1	0	1	0						
Control Delay (s)	13.0	13.5	9.2	0.0	9.4	0.0						
Lane LOS	B	B	A			A						
Approach Delay (s)	13.0	13.5	0.2			0.1						
Approach LOS	B	B										
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			45.2%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Washington Avenue			
Agency or Co.	IBI Group				E/W Street Name	Washington Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	4	0	20	0	21	5	9	0	13	665	14	0	18	604	17
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	4	0	22	0	23	6	10	0	14	737	16	0	20	670	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		26			39			767			709	
Entry Volume veh/h		25			38			752			695	
Circulating Flow (Vc), pc/h	713			755			24			43		
Exiting Flow (Vex), pc/h	36			39			751			715		
Capacity (cPCE), pc/h		554			531			1103			1082	
Capacity (c), veh/h		543			521			1082			1061	
v/c Ratio (X)		0.05			0.07			0.70			0.65	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.2			7.8			14.0			12.9	
Lane LOS		A			A			B			B	
95% Queue		0.1			0.2			6.0			5.1	
Approach Delay, s/veh	7.2			7.8			14.0			12.9		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh / LOS	13.2						B					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	57	85	49	45	7	58	7	130	36	69	80	3
Future Volume (vph)	57	85	49	45	7	58	7	130	36	69	80	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	62	92	53	49	8	63	8	141	39	75	87	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	207	120	188	165								
Volume Left (vph)	62	49	8	75								
Volume Right (vph)	53	63	39	3								
Hadj (s)	-0.06	-0.20	-0.08	0.11								
Departure Headway (s)	4.9	4.9	4.9	5.1								
Degree Utilization, x	0.28	0.16	0.26	0.23								
Capacity (veh/h)	679	666	684	651								
Control Delay (s)	9.8	8.9	9.5	9.7								
Approach Delay (s)	9.8	8.9	9.5	9.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.5								
Level of Service				A								
Intersection Capacity Utilization				40.1%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	207	20	9	144	24	19	33	31	19	44	9
Future Volume (Veh/h)	8	207	20	9	144	24	19	33	31	19	44	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	225	22	10	157	26	21	36	34	21	48	10
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked												
vC, conflicting volume	197			254			486	478	243	510	476	185
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	197			254			486	478	243	510	476	185
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			95	92	96	95	90	99
cM capacity (veh/h)	1360			1303			435	471	791	412	472	847
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	256	193	91	79								
Volume Left	9	10	21	21								
Volume Right	22	26	34	10								
cSH	1360	1303	543	481								
Volume to Capacity	0.01	0.01	0.17	0.16								
Queue Length 95th (ft)	0	1	15	15								
Control Delay (s)	0.3	0.5	13.0	14.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.5	13.0	14.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.0									
Intersection Capacity Utilization			27.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	PM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Wisconsin Avenue
E/W Street Name	Wisconsin Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	69	61	123	0	57	49	10	0	108	582	62	0	11	582	34
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	76	68	136	0	63	54	11	0	120	645	69	0	12	645	38
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		280			128			834			695	
Entry Volume veh/h		275			125			818			681	
Circulating Flow (Vc), pc/h	720			841			156			237		
Exiting Flow (Vex), pc/h	149			212			732			844		
Capacity (cPCE), pc/h		550			487			967			892	
Capacity (c), veh/h		539			478			948			874	
v/c Ratio (X)		0.51			0.26			0.86			0.78	

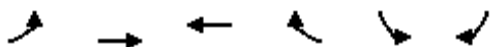
Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		15.9			11.5			26.5			20.9	
Lane LOS		C			B			D			C	
95% Queue		2.9			1.0			11.2			8.0	
Approach Delay, s/veh	15.9			11.5			26.5			20.9		
Approach LOS	C			B			D			C		
Intersection Delay, s/veh / LOS	22.0						C					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

9/1/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	125	93	14	21	22
Future Volume (Veh/h)	5	125	93	14	21	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	136	101	15	23	24
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	124				264	118
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	124				264	118
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	97
cM capacity (veh/h)	1453				718	927
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	141	116	47			
Volume Left	5	0	23			
Volume Right	0	15	24			
cSH	1453	1700	811			
Volume to Capacity	0.00	0.07	0.06			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.3	0.0	9.7			
Lane LOS	A		A			
Approach Delay (s)	0.3	0.0	9.7			
Approach LOS			A			
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			21.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	129	2	1	86	18	1	1	2	27	0	19
Future Volume (Veh/h)	14	129	2	1	86	18	1	1	2	27	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	140	2	1	93	20	1	1	2	29	0	21
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	115			142			299	288	141	280	279	107
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	115			142			299	288	141	280	279	107
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	96	100	98
cM capacity (veh/h)	1471			1441			632	614	907	662	621	944
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	157	114	4	50								
Volume Left	15	1	1	29								
Volume Right	2	20	2	21								
cSH	1471	1441	738	757								
Volume to Capacity	0.01	0.00	0.01	0.07								
Queue Length 95th (ft)	1	0	0	5								
Control Delay (s)	0.8	0.1	9.9	10.1								
Lane LOS	A	A	A	B								
Approach Delay (s)	0.8	0.1	9.9	10.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			27.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	79	79	23	57	1	47	1	32	0	1	0
Future Volume (vph)	1	79	79	23	57	1	47	1	32	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	86	86	25	62	1	51	1	35	0	1	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	173	88	87	1								
Volume Left (vph)	1	25	51	0								
Volume Right (vph)	86	1	35	0								
Hadj (s)	-0.26	0.08	-0.09	0.03								
Departure Headway (s)	3.9	4.4	4.4	4.6								
Degree Utilization, x	0.19	0.11	0.11	0.00								
Capacity (veh/h)	890	802	775	723								
Control Delay (s)	7.9	7.9	7.9	7.6								
Approach Delay (s)	7.9	7.9	7.9	7.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.9								
Level of Service				A								
Intersection Capacity Utilization				37.1%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	43	90	111	63	65	108
Future Volume (vph)	43	90	111	63	65	108
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	98	121	68	71	117
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	145	189	188			
Volume Left (vph)	47	0	71			
Volume Right (vph)	98	68	0			
Hadj (s)	-0.31	-0.18	0.11			
Departure Headway (s)	4.4	4.3	4.6			
Degree Utilization, x	0.18	0.22	0.24			
Capacity (veh/h)	747	805	753			
Control Delay (s)	8.4	8.5	9.0			
Approach Delay (s)	8.4	8.5	9.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.7			
Level of Service			A			
Intersection Capacity Utilization			36.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

9/1/2016

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (veh/h)	8	201	18	19	166	42	25	31	37	46	19	12		
Future Volume (Veh/h)	8	201	18	19	166	42	25	31	37	46	19	12		
Sign Control		Free			Free			Stop			Stop			
Grade		0%			0%			0%			0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	9	218	20	21	180	46	27	34	40	50	21	13		
Pedestrians		4			8			11			3			
Lane Width (ft)		12.0			12.0			12.0			12.0			
Walking Speed (ft/s)		4.0			4.0			4.0			4.0			
Percent Blockage		0			1			1			0			
Right turn flare (veh)														
Median type	None			None										
Median storage (veh)														
Upstream signal (ft)	253													
pX, platoon unblocked	0.92						0.92	0.92				0.92	0.92	0.92
vC, conflicting volume	229				249			530	528	247	559	515	210	
vC1, stage 1 conf vol														
vC2, stage 2 conf vol														
vCu, unblocked vol	117				249			444	442	247	476	428	96	
tC, single (s)	4.1				4.1			7.1	6.5	6.2	7.1	6.5	6.2	
tC, 2 stage (s)														
tF (s)	2.2				2.2			3.5	4.0	3.3	3.5	4.0	3.3	
p0 queue free %	99				98			94	92	95	87	95	99	
cM capacity (veh/h)	1349				1305			441	452	779	396	461	877	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1										
Volume Total	247	247	101	84										
Volume Left	9	21	27	50										
Volume Right	20	46	40	13										
cSH	1349	1305	538	450										
Volume to Capacity	0.01	0.02	0.19	0.19										
Queue Length 95th (ft)	1	1	17	17										
Control Delay (s)	0.3	0.8	13.2	14.8										
Lane LOS	A	A	B	B										
Approach Delay (s)	0.3	0.8	13.2	14.8										
Approach LOS				B	B									
Intersection Summary														
Average Delay				4.2										
Intersection Capacity Utilization	35.5%			ICU Level of Service					A					
Analysis Period (min)	15													

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Oceanside Blvd			
Agency or Co.	IBI Group				E/W Street Name	Oceanside Boulevard			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	1	1	0	0	0	1	1	0	0	1	0
Lane Assignment				LTR	L		TR		LT		R					LTR
Volume (V), veh/h	0	40	160	60	0	263	155	235	0	63	618	169	0	242	525	21
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	44	177	67	0	292	172	261	0	70	685	187	0	268	582	23
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	2				1				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		4.1129		5.1929	5.1929		4.2929	4.1129			4.1129	
Follow-Up Headway (sec)		3.1858		3.1858	3.1858		3.1858	3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		288		292	433		755	187			873	
Entry Volume veh/h		282		286	425		740	183			856	
Circulating Flow (Vc), pc/h	1142			799			489			534		
Exiting Flow (Vex), pc/h	632			265			990			941		
Capacity (cPCE), pc/h		508		508	508		783	802			778	
Capacity (c), veh/h		498		498	498		768	787			762	
v/c Ratio (X)		0.57		0.57	0.85		0.96	0.23			1.12	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		19.1		19.4	40.5		47.3	7.1			93.4	
Lane LOS		C		C	E		E	A			F	
95% Queue		3.5		3.6	8.8		15.0	0.9			24.7	
Approach Delay, s/veh	19.1			32.0			39.3			93.4		
Approach LOS	C			D			E			F		
Intersection Delay, s/veh / LOS	52.1						F					

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	513	6	22	570	63	9	10	57	118	8	30
Future Volume (vph)	15	513	6	22	570	63	9	10	57	118	8	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.96	1.00
Satd. Flow (prot)	1770	3531		1764	3482			3091			1779	1544
Flt Permitted	0.39	1.00		0.44	1.00			0.90			0.73	1.00
Satd. Flow (perm)	727	3531		817	3482			2802			1359	1544
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	558	7	24	620	68	10	11	62	128	9	33
RTOR Reduction (vph)	0	2	0	0	13	0	0	50	0	0	0	27
Lane Group Flow (vph)	16	563	0	24	675	0	0	33	0	0	137	6
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	13.1	13.1		13.1	13.1			5.3			5.3	5.3
Effective Green, g (s)	13.1	13.1		13.1	13.1			5.3			5.3	5.3
Actuated g/C Ratio	0.47	0.47		0.47	0.47			0.19			0.19	0.19
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	341	1657		383	1634			532			258	293
v/s Ratio Prot		0.16			c0.19							
v/s Ratio Perm	0.02			0.03				0.01			c0.10	0.00
v/c Ratio	0.05	0.34		0.06	0.41			0.06			0.53	0.02
Uniform Delay, d1	4.0	4.7		4.0	4.9			9.3			10.2	9.2
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.1	0.1		0.1	0.2			0.1			2.7	0.0
Delay (s)	4.1	4.8		4.1	5.0			9.3			12.8	9.2
Level of Service	A	A		A	A			A			B	A
Approach Delay (s)		4.8			5.0			9.3			12.1	
Approach LOS		A			A			A			B	
Intersection Summary												
HCM 2000 Control Delay		5.9			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.45										
Actuated Cycle Length (s)		27.9			Sum of lost time (s)			9.5				
Intersection Capacity Utilization		52.6%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	10	12	24	10	80	16	653	44	102	680	15
Future Volume (vph)	33	10	12	24	10	80	16	653	44	102	680	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.97			0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1743			1797	1555	1770	3500		1770	3526	
Flt Permitted		0.79			0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1427			1401	1555	1770	3500		1770	3526	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	11	13	26	11	87	17	710	48	111	739	16
RTOR Reduction (vph)	0	11	0	0	0	76	0	6	0	0	2	0
Lane Group Flow (vph)	0	49	0	0	37	11	17	752	0	111	753	0
Confl. Peds. (#/hr)	10		4	4		10			3			4
Confl. Bikes (#/hr)			1						2			3
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1		6
Permitted Phases	4			8		8						
Actuated Green, G (s)		5.5			5.5	5.5	0.6	18.6		6.4	24.4	
Effective Green, g (s)		5.5			5.5	5.5	0.6	18.6		6.4	24.4	
Actuated g/C Ratio		0.12			0.12	0.12	0.01	0.42		0.14	0.55	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		177			174	193	24	1472		256	1946	
v/s Ratio Prot							0.01	c0.21		c0.06	0.21	
v/s Ratio Perm		c0.03			0.03	0.01						
v/c Ratio		0.27			0.21	0.06	0.71	0.51		0.43	0.39	
Uniform Delay, d1		17.5			17.4	17.1	21.7	9.4		17.2	5.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.2	0.0	65.6	0.3		1.2	0.1	
Delay (s)		17.8			17.6	17.1	87.3	9.7		18.4	5.8	
Level of Service		B			B	B	F	A		B	A	
Approach Delay (s)		17.8			17.3			11.4			7.4	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay		10.1										
HCM 2000 Volume to Capacity ratio		0.45										
Actuated Cycle Length (s)		44.2										
Intersection Capacity Utilization		48.1%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	135	10	11	82	0	22	0	19	0	0	0
Future Volume (Veh/h)	2	135	10	11	82	0	22	0	19	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	147	11	12	89	0	24	0	21	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		252										
pX, platoon unblocked												
vC, conflicting volume	89			158			270	270	152	290	275	89
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			158			270	270	152	290	275	89
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			96	100	98	100	100	100
cM capacity (veh/h)	1506			1422			678	631	894	641	626	969
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	160	101	45	0								
Volume Left	2	12	24	0								
Volume Right	11	0	21	0								
cSH	1506	1422	764	1700								
Volume to Capacity	0.00	0.01	0.06	0.00								
Queue Length 95th (ft)	0	1	5	0								
Control Delay (s)	0.1	1.0	10.0	0.0								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.1	1.0	10.0	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			21.1%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Dittmar St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	75	16	0	29	0	16	1	5	0	0	0
Future Volume (Veh/h)	0	75	16	0	29	0	16	1	5	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	82	17	0	32	0	17	1	5	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	643											
pX, platoon unblocked												
vC, conflicting volume	32			99			122	122	90	128	131	32
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	32			99			122	122	90	128	131	32
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	99	100	100	100
cM capacity (veh/h)	1580			1494			852	768	967	840	760	1042
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	99	32	23	0								
Volume Left	0	0	17	0								
Volume Right	17	0	5	0								
cSH	1580	1494	871	1700								
Volume to Capacity	0.00	0.00	0.03	0.00								
Queue Length 95th (ft)	0	0	2	0								
Control Delay (s)	0.0	0.0	9.2	0.0								
Lane LOS			A	A								
Approach Delay (s)	0.0	0.0	9.2	0.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			14.9%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	37	154	11	21	184	11
Future Volume (vph)	37	154	11	21	184	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	167	12	23	200	12
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	207	35	212			
Volume Left (vph)	40	0	200			
Volume Right (vph)	167	23	0			
Hadj (s)	-0.41	-0.36	0.22			
Departure Headway (s)	4.1	4.2	4.6			
Degree Utilization, x	0.23	0.04	0.27			
Capacity (veh/h)	830	791	742			
Control Delay (s)	8.3	7.4	9.3			
Approach Delay (s)	8.3	7.4	9.3			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.7			
Level of Service			A			
Intersection Capacity Utilization			35.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	203	61	9	159	10	83	11	12	3	8	15
Future Volume (Veh/h)	6	203	61	9	159	10	83	11	12	3	8	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	221	66	10	173	11	90	12	13	3	9	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	576											
pX, platoon unblocked												
vC, conflicting volume	184			287			487	472	254	486	500	178
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	184			287			487	472	254	486	500	178
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			81	98	98	99	98	98
cM capacity (veh/h)	1391			1275			470	484	785	470	467	864
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	294	194	115	28								
Volume Left	7	10	90	3								
Volume Right	66	11	13	16								
cSH	1391	1275	494	634								
Volume to Capacity	0.01	0.01	0.23	0.04								
Queue Length 95th (ft)	0	1	22	3								
Control Delay (s)	0.2	0.5	14.5	10.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.5	14.5	10.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			35.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	208	5	15	173	26	3	7	14	12	3	3
Future Volume (Veh/h)	3	208	5	15	173	26	3	7	14	12	3	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	226	5	16	188	28	3	8	15	13	3	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	249											
pX, platoon unblocked												
vC, conflicting volume	216			231			473	482	228	488	471	202
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	216			231			473	482	228	488	471	202
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	98	98	97	99	100
cM capacity (veh/h)	1354			1337			492	477	811	470	484	839
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	234	232	26	19								
Volume Left	3	16	3	13								
Volume Right	5	28	15	3								
cSH	1354	1337	628	508								
Volume to Capacity	0.00	0.01	0.04	0.04								
Queue Length 95th (ft)	0	1	3	3								
Control Delay (s)	0.1	0.6	11.0	12.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.6	11.0	12.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			30.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	118	106	51	68	23	117	696	74	92	552	41
Future Volume (vph)	53	118	106	51	68	23	117	696	74	92	552	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.95			0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1750			1790		1770	3488		1770	3502	
Flt Permitted		0.91			0.78		0.95	1.00		0.34	1.00	
Satd. Flow (perm)		1605			1422		1770	3488		627	3502	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	128	115	55	74	25	127	757	80	100	600	45
RTOR Reduction (vph)	0	28	0	0	9	0	0	12	0	0	7	0
Lane Group Flow (vph)	0	273	0	0	145	0	127	825	0	100	638	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)		14.4			14.0		7.0	28.2		17.0	17.0	
Effective Green, g (s)		14.4			14.0		7.0	28.2		17.0	17.0	
Actuated g/C Ratio		0.28			0.27		0.13	0.54		0.33	0.33	
Clearance Time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.5		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		442			381		237	1884		204	1140	
v/s Ratio Prot							0.07	c0.24			c0.18	
v/s Ratio Perm		c0.17			0.10					0.16		
v/c Ratio		0.62			0.38		0.54	0.44		0.49	0.56	
Uniform Delay, d1		16.5			15.6		21.1	7.2		14.1	14.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.6			0.8		1.2	0.2		1.9	0.6	
Delay (s)		19.1			16.3		22.3	7.4		16.0	15.1	
Level of Service		B			B		C	A		B	B	
Approach Delay (s)		19.1			16.3			9.3			15.2	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			13.2				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			52.2				Sum of lost time (s)			14.2		
Intersection Capacity Utilization			59.5%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	260	13	13	117	5	15	18	6	8	7	9
Future Volume (Veh/h)	9	260	13	13	117	5	15	18	6	8	7	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	283	14	14	127	5	16	20	7	9	8	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		280										
pX, platoon unblocked				0.99			0.99	0.99	0.99	0.99	0.99	
vC, conflicting volume	132			297			482	470	290	484	474	130
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	132			289			475	463	282	478	468	130
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	96	99	98	98	99
cM capacity (veh/h)	1453			1264			479	484	752	468	481	920
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	307	146	43	27								
Volume Left	10	14	16	9								
Volume Right	14	5	7	10								
cSH	1453	1264	511	578								
Volume to Capacity	0.01	0.01	0.08	0.05								
Queue Length 95th (ft)	1	1	7	4								
Control Delay (s)	0.3	0.8	12.7	11.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.8	12.7	11.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			26.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	251	9	11	119	3	12	23	11	4	10	6
Future Volume (vph)	9	251	9	11	119	3	12	23	11	4	10	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	273	10	12	129	3	13	25	12	4	11	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	293	144	50	22								
Volume Left (vph)	10	12	13	4								
Volume Right (vph)	10	3	12	7								
Hadj (s)	0.02	0.04	-0.06	-0.12								
Departure Headway (s)	4.3	4.4	4.8	4.8								
Degree Utilization, x	0.35	0.18	0.07	0.03								
Capacity (veh/h)	828	781	677	670								
Control Delay (s)	9.5	8.4	8.2	8.0								
Approach Delay (s)	9.5	8.4	8.2	8.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.0								
Level of Service				A								
Intersection Capacity Utilization				26.4%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	267	16	68	115	33	16	80	154	63	17	4
Future Volume (vph)	17	267	16	68	115	33	16	80	154	63	17	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	290	17	74	125	36	17	87	167	68	18	4
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	325	235	271	90								
Volume Left (vph)	18	74	17	68								
Volume Right (vph)	17	36	167	4								
Hadj (s)	0.01	0.01	-0.32	0.16								
Departure Headway (s)	5.3	5.5	5.3	6.1								
Degree Utilization, x	0.48	0.36	0.40	0.15								
Capacity (veh/h)	634	610	622	509								
Control Delay (s)	13.2	11.5	11.7	10.2								
Approach Delay (s)	13.2	11.5	11.7	10.2								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay				12.0								
Level of Service				B								
Intersection Capacity Utilization				60.3%	ICU Level of Service		B					
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	5	57	58	4	41	22
Future Volume (vph)	5	57	58	4	41	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	62	63	4	45	24
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	67	67	69			
Volume Left (vph)	5	0	45			
Volume Right (vph)	62	4	0			
Hadj (s)	-0.51	0.00	0.16			
Departure Headway (s)	3.7	4.1	4.3			
Degree Utilization, x	0.07	0.08	0.08			
Capacity (veh/h)	938	851	826			
Control Delay (s)	7.0	7.4	7.6			
Approach Delay (s)	7.0	7.4	7.6			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.3			
Level of Service			A			
Intersection Capacity Utilization			20.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	103	33	203	82	350	37	569	269	293	478	18
Future Volume (vph)	15	103	33	203	82	350	37	569	269	293	478	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1553		1799	1583	1770	3331		1770	3514	
Flt Permitted	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1553		1799	1583	1770	3331		1770	3514	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	112	36	221	89	380	40	618	292	318	520	20
RTOR Reduction (vph)	0	0	33	0	0	313	0	57	0	0	2	0
Lane Group Flow (vph)	16	112	3	0	310	67	40	853	0	318	538	0
Confl. Peds. (#/hr)	7		2	2		7			5			8
Confl. Bikes (#/hr)						2			4			8
Turn Type	Split	NA	Perm	Split	NA	Over	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	6.6	6.6	6.6		17.3	14.0	3.2	22.4		14.0	33.2	
Effective Green, g (s)	6.6	6.6	6.6		17.3	14.0	3.2	22.4		14.0	33.2	
Actuated g/C Ratio	0.08	0.08	0.08		0.22	0.18	0.04	0.28		0.18	0.42	
Clearance Time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	147	154	129		391	279	71	939		312	1469	
v/s Ratio Prot	0.01	c0.06			c0.17	0.04	0.02	c0.26		c0.18	0.15	
v/s Ratio Perm			0.00									
v/c Ratio	0.11	0.73	0.02		0.79	0.24	0.56	0.91		1.02	0.37	
Uniform Delay, d1	33.7	35.5	33.4		29.4	28.1	37.4	27.5		32.7	15.9	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	13.5	0.0		10.5	0.2	6.0	12.3		55.9	0.2	
Delay (s)	33.8	49.0	33.5		39.9	28.3	43.4	39.8		88.6	16.0	
Level of Service	C	D	C		D	C	D	D		F	B	
Approach Delay (s)		44.1			33.5			39.9			42.9	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			39.5									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			79.4									Sum of lost time (s) 19.1
Intersection Capacity Utilization			74.7%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	618	6	8	594	28	4	0	8	13	3	30
Future Volume (Veh/h)	5	618	6	8	594	28	4	0	8	13	3	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	672	7	9	646	30	4	0	9	14	3	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh					2							
Upstream signal (ft)		279										
pX, platoon unblocked				0.95			0.95	0.95	0.95	0.95	0.95	
vC, conflicting volume	676			679			1399	1380	676	1374	1368	661
vC1, stage 1 conf vol							686	686		679	679	
vC2, stage 2 conf vol							714	694		694	689	
vCu, unblocked vol	676			637			1394	1373	634	1367	1361	661
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			99	100	98	96	99	93
cM capacity (veh/h)	915			901			297	330	456	314	331	462
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	684	685	13	50								
Volume Left	5	9	4	14								
Volume Right	7	30	9	33								
cSH	915	901	392	400								
Volume to Capacity	0.01	0.01	0.03	0.13								
Queue Length 95th (ft)	0	1	3	11								
Control Delay (s)	0.1	0.3	14.5	15.3								
Lane LOS	A	A	B	C								
Approach Delay (s)	0.1	0.3	14.5	15.3								
Approach LOS			B	C								
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			48.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	730	5	12	718	33	1	1	19	13	1	8
Future Volume (Veh/h)	5	730	5	12	718	33	1	1	19	13	1	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	793	5	13	780	36	1	1	21	14	1	9
Pedestrians		1						1				
Lane Width (ft)		12.0						12.0				
Walking Speed (ft/s)		4.0						4.0				
Percent Blockage		0						0				
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		687										
pX, platoon unblocked				0.99			0.99	0.99	0.99	0.99	0.99	
vC, conflicting volume	816			799			1641	1648	796	1651	1633	799
vC1, stage 1 conf vol							806	806		824	824	
vC2, stage 2 conf vol							834	842		827	809	
vCu, unblocked vol	816			793			1642	1650	790	1652	1634	799
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			100	100	95	94	100	98
cM capacity (veh/h)	812			820			256	278	386	247	278	385
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	803	829	23	24								
Volume Left	5	13	1	14								
Volume Right	5	36	21	9								
cSH	812	820	372	287								
Volume to Capacity	0.01	0.02	0.06	0.08								
Queue Length 95th (ft)	0	1	5	7								
Control Delay (s)	0.2	0.4	15.3	18.7								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.2	0.4	15.3	18.7								
Approach LOS			C	C								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			61.5%	ICU Level of Service					B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	722	0	9	743	205	0	0	5	3	0	11
Future Volume (Veh/h)	8	722	0	9	743	205	0	0	5	3	0	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	785	0	10	808	223	0	0	5	3	0	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLT			TWLT							
Median storage veh		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1031			785			1643	1854	785	1748	1742	920
vC1, stage 1 conf vol							803	803		940	940	
vC2, stage 2 conf vol							840	1051		808	803	
vCu, unblocked vol	1031			785			1643	1854	785	1748	1742	920
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			100	100	99	99	100	96
cM capacity (veh/h)	674			834			253	237	393	237	260	329
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total	794	10	1031	5	15							
Volume Left	9	10	0	0	3							
Volume Right	0	0	223	5	12							
cSH	674	834	1700	393	305							
Volume to Capacity	0.01	0.01	0.61	0.01	0.05							
Queue Length 95th (ft)	1	1	0	1	4							
Control Delay (s)	0.4	9.4	0.0	14.3	17.4							
Lane LOS	A	A		B	C							
Approach Delay (s)	0.4	0.1		14.3	17.4							
Approach LOS				B	C							
Intersection Summary												
Average Delay			0.4									
Intersection Capacity Utilization			Err%		ICU Level of Service				H			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	41	5	0	13	43	721	4	18	578	4
Future Volume (Veh/h)	0	0	41	5	0	13	43	721	4	18	578	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	45	5	0	14	47	784	4	20	628	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage veh								2			2	
Upstream signal (ft)											621	
pX, platoon unblocked												
vC, conflicting volume	1170	1552	630	1593	1552	394	632			788		
vC1, stage 1 conf vol	670	670		880	880							
vC2, stage 2 conf vol	500	882		713	672							
vCu, unblocked vol	1170	1552	630	1593	1552	394	632			788		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	89	98	100	98	95			98		
cM capacity (veh/h)	324	273	424	210	273	605	947			827		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	45	19	47	523	265	20	632					
Volume Left	0	5	47	0	0	20	0					
Volume Right	45	14	0	0	4	0	4					
cSH	424	405	947	1700	1700	827	1700					
Volume to Capacity	0.11	0.05	0.05	0.31	0.16	0.02	0.37					
Queue Length 95th (ft)	9	4	4	0	0	2	0					
Control Delay (s)	14.5	14.3	9.0	0.0	0.0	9.5	0.0					
Lane LOS	B	B	A			A						
Approach Delay (s)	14.5	14.3	0.5			0.3						
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			Err%		ICU Level of Service					H		
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection		Coast Hwy - Michigan Avenue		
Agency or Co.	IBI Group				E/W Street Name		Michigan Avenue		
Date Performed	05/23/2016				N/S Street Name		Coast Highway		
Analysis Year	2016				Analysis Time Period (hrs)		0.25		
Time Period	PM Peak Hour				Peak Hour Factor		0.92		
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			LTR				LTR				LTR				LTR	
Volume (V), veh/h	0	122	53	50	0	33	7	16	0	16	690	28	0	12	690	30
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	135	59	55	0	37	8	18	0	18	765	31	0	13	765	33
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		249			63			814			811	
Entry Volume veh/h		244			62			798			795	
Circulating Flow (Vc), pc/h	815			918			207			63		
Exiting Flow (Vex), pc/h	103			59			918			857		
Capacity (cPCE), pc/h		500			451			919			1061	
Capacity (c), veh/h		490			442			901			1040	
v/c Ratio (X)		0.50			0.14			0.89			0.76	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		16.9			10.2			30.2			17.5	
Lane LOS		C			B			D			C	
95% Queue		2.7			0.5			12.0			7.8	
Approach Delay, s/veh	16.9			10.2			30.2			17.5		
Approach LOS	C			B			D			C		
Intersection Delay, s/veh / LOS	22.5						C					

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/08/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↗	↖↖	↑↑					
Traffic Volume (veh/h)	582	209	627	667	0	0			
Future Volume (veh/h)	582	209	627	667	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863					
Adj Flow Rate, veh/h	633	227	682	725					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	1593	712	1205	3185					
Arrive On Green	0.45	0.45	0.35	0.90					
Sat Flow, veh/h	3632	1583	3442	3632					
Grp Volume(v), veh/h	633	227	682	725					
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1770					
Q Serve(g_s), s	4.8	3.7	6.4	1.0					
Cycle Q Clear(g_c), s	4.8	3.7	6.4	1.0					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	1593	712	1205	3185					
V/C Ratio(X)	0.40	0.32	0.57	0.23					
Avail Cap(c_a), veh/h	1593	712	1205	3185					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	7.4	7.1	10.5	0.3					
Incr Delay (d2), s/veh	0.7	1.2	1.9	0.2					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	2.5	1.8	3.4	0.5					
LnGrp Delay(d),s/veh	8.1	8.2	12.5	0.4					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	860			1407					
Approach Delay, s/veh	8.1			6.3					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			18.0	22.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			14.0	18.0				36.0	
Max Q Clear Time (g_c+l1), s			8.4	6.8				3.0	
Green Ext Time (p_c), s			1.4	3.9				5.8	
Intersection Summary									
HCM 2010 Ctrl Delay			7.0						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/08/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↰↱	↑↑	↰	↱		
Traffic Volume (veh/h)	1267	114	370	964	183	0		
Future Volume (veh/h)	1267	114	370	964	183	0		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	1377	124	402	1048	199	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1416	633	459	2124	473	422		
Arrive On Green	0.40	0.40	0.13	0.60	0.27	0.00		
Sat Flow, veh/h	3632	1583	3442	3632	1774	1583		
Grp Volume(v), veh/h	1377	124	402	1048	199	0		
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1770	1774	1583		
Q Serve(g_s), s	22.9	3.1	6.9	10.1	5.6	0.0		
Cycle Q Clear(g_c), s	22.9	3.1	6.9	10.1	5.6	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1416	633	459	2124	473	422		
V/C Ratio(X)	0.97	0.20	0.88	0.49	0.42	0.00		
Avail Cap(c_a), veh/h	1416	633	459	2124	473	422		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	17.7	11.7	25.5	6.8	18.2	0.0		
Incr Delay (d2), s/veh	18.2	0.7	20.3	0.8	2.7	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	14.7	1.4	4.5	5.0	3.1	0.0		
LnGrp Delay(d),s/veh	35.9	12.4	45.8	7.6	20.9	0.0		
LnGrp LOS	D	B	D	A	C			
Approach Vol, veh/h	1501			1450	199			
Approach Delay, s/veh	34.0			18.2	20.9			
Approach LOS	C			B	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	12.0	28.0				40.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	8.0	24.0				36.0
Max Q Clear Time (g_c+I1), s		7.6	8.9	24.9				12.1
Green Ext Time (p_c), s		0.3	0.0	0.0				8.4
Intersection Summary								
HCM 2010 Ctrl Delay			25.9					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary
51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/08/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1094	10	163	1017	450	8	0	62	323	18	125
Future Volume (veh/h)	0	1094	10	163	1017	450	8	0	62	323	18	125
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	1863	1863	0	1863	1863	1863	1863
Adj Flow Rate, veh/h	0	1189	11	177	1105	0	9	0	67	365	0	136
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1670	15	250	2343	1048	0	0	0	800	0	357
Arrive On Green	0.00	0.46	0.46	0.14	0.66	0.00	0.00	0.00	0.00	0.23	0.00	0.23
Sat Flow, veh/h	0	3686	33	1774	3539	1583		0		3548	0	1583
Grp Volume(v), veh/h	0	586	614	177	1105	0		0.0		365	0	136
Grp Sat Flow(s),veh/h/ln	0	1770	1857	1774	1770	1583				1774	0	1583
Q Serve(g_s), s	0.0	18.8	18.8	6.8	10.9	0.0				6.3	0.0	5.2
Cycle Q Clear(g_c), s	0.0	18.8	18.8	6.8	10.9	0.0				6.3	0.0	5.2
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	822	863	250	2343	1048				800	0	357
V/C Ratio(X)	0.00	0.71	0.71	0.71	0.47	0.00				0.46	0.00	0.38
Avail Cap(c_a), veh/h	0	822	863	250	2343	1048				800	0	357
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	15.2	15.2	29.1	5.9	0.0				23.7	0.0	23.3
Incr Delay (d2), s/veh	0.0	5.2	5.0	15.6	0.7	0.0				1.9	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.3	10.7	4.4	5.4	0.0				3.3	0.0	2.6
LnGrp Delay(d),s/veh	0.0	20.4	20.2	44.7	6.6	0.0				25.6	0.0	26.4
LnGrp LOS		C	C	D	A					C		C
Approach Vol, veh/h		1200			1282						501	
Approach Delay, s/veh		20.3			11.9						25.8	
Approach LOS		C			B						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			14.0	37.0		20.0		51.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			10.0	33.0		16.0		47.0				
Max Q Clear Time (g_c+I1), s			8.8	20.8		8.3		12.9				
Green Ext Time (p_c), s			0.1	6.3		1.2		10.1				
Intersection Summary												
HCM 2010 Ctrl Delay			17.6									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/25/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	252	584	23	69	857	426	21	7	37	417	19	103
Future Volume (veh/h)	252	584	23	69	857	426	21	7	37	417	19	103
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	274	635	25	75	932	463	23	8	40	293	245	112
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	296	1157	46	177	944	721	267	93	317	335	229	105
Arrive On Green	0.17	0.33	0.33	0.10	0.27	0.27	0.20	0.20	0.20	0.19	0.19	0.19
Sat Flow, veh/h	1774	3472	137	1774	3539	1583	1333	464	1583	1774	1211	554
Grp Volume(v), veh/h	274	323	337	75	932	463	31	0	40	293	0	357
Grp Sat Flow(s),veh/h/ln	1774	1770	1839	1774	1770	1583	1796	0	1583	1774	0	1765
Q Serve(g_s), s	13.7	13.4	13.4	3.6	23.6	20.3	1.3	0.0	1.9	14.4	0.0	17.0
Cycle Q Clear(g_c), s	13.7	13.4	13.4	3.6	23.6	20.3	1.3	0.0	1.9	14.4	0.0	17.0
Prop In Lane	1.00		0.07	1.00		1.00	0.74		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	296	590	613	177	944	721	359	0	317	335	0	333
V/C Ratio(X)	0.93	0.55	0.55	0.42	0.99	0.64	0.09	0.00	0.13	0.87	0.00	1.07
Avail Cap(c_a), veh/h	296	590	613	177	944	721	359	0	317	335	0	333
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.0	24.5	24.5	38.1	32.9	18.9	29.3	0.0	29.5	35.5	0.0	36.5
Incr Delay (d2), s/veh	36.5	3.6	3.5	7.2	26.4	4.4	0.5	0.0	0.8	25.7	0.0	69.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	7.2	7.4	2.1	15.0	12.3	0.7	0.0	0.9	9.5	0.0	14.7
LnGrp Delay(d),s/veh	73.5	28.1	28.0	45.3	59.3	23.2	29.8	0.0	30.4	61.2	0.0	105.9
LnGrp LOS	E	C	C	D	E	C	C		C	E		F
Approach Vol, veh/h		934			1470			71			650	
Approach Delay, s/veh		41.4			47.2			30.1			85.7	
Approach LOS		D			D			C			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		22.0	13.0	34.0		21.0	19.0	28.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		18.0	9.0	30.0		17.0	15.0	24.0				
Max Q Clear Time (g_c+I1), s		3.9	5.6	15.4		19.0	15.7	25.6				
Green Ext Time (p_c), s		0.2	0.0	3.5		0.0	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			53.1									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/08/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	834	139	45	735	259	177	56	72	612	136	449
Future Volume (veh/h)	70	834	139	45	735	259	177	56	72	612	136	449
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	76	907	151	49	799	282	126	153	78	771	0	488
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	118	945	157	79	1022	457	335	352	299	986	0	440
Arrive On Green	0.07	0.31	0.31	0.04	0.29	0.29	0.19	0.19	0.19	0.28	0.00	0.28
Sat Flow, veh/h	1774	3038	506	1774	3539	1583	1774	1863	1583	3548	0	1583
Grp Volume(v), veh/h	76	528	530	49	799	282	126	153	78	771	0	488
Grp Sat Flow(s),veh/h/ln	1774	1770	1774	1774	1770	1583	1774	1863	1583	1774	0	1583
Q Serve(g_s), s	3.8	26.4	26.4	2.4	18.7	13.9	5.6	6.5	3.8	18.0	0.0	25.0
Cycle Q Clear(g_c), s	3.8	26.4	26.4	2.4	18.7	13.9	5.6	6.5	3.8	18.0	0.0	25.0
Prop In Lane	1.00		0.29	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	118	551	552	79	1022	457	335	352	299	986	0	440
V/C Ratio(X)	0.64	0.96	0.96	0.62	0.78	0.62	0.38	0.43	0.26	0.78	0.00	1.11
Avail Cap(c_a), veh/h	118	551	552	79	1022	457	335	352	299	986	0	440
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	41.0	30.4	30.4	42.3	29.4	27.7	31.9	32.3	31.1	30.0	0.0	32.5
Incr Delay (d2), s/veh	23.8	29.6	29.6	31.6	5.9	6.1	3.2	3.9	2.1	6.2	0.0	76.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	17.3	17.3	1.9	9.9	6.8	3.0	3.7	1.8	9.6	0.0	20.2
LnGrp Delay(d),s/veh	64.8	60.0	60.0	73.9	35.3	33.8	35.1	36.1	33.2	36.2	0.0	108.6
LnGrp LOS	E	E	E	E	D	C	D	D	C	D		F
Approach Vol, veh/h	1134				1130				357		1259	
Approach Delay, s/veh	60.4				36.6				35.1		64.3	
Approach LOS	E				D				D		E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	21.0		8.0	32.0	29.0		10.0	30.0				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	17.0		4.0	28.0	25.0		6.0	26.0				
Max Q Clear Time (g_c+I1), s	8.5		4.4	28.4	27.0		5.8	20.7				
Green Ext Time (p_c), s	1.0		0.0	0.0	0.0		0.0	2.9				
Intersection Summary												
HCM 2010 Ctrl Delay	52.4											
HCM 2010 LOS	D											
Notes												

Intersection

Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	85	12	27	93	39	7	86	32	0	0	0
Future Vol, veh/h	40	85	12	27	93	39	7	86	32	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	43	92	13	29	101	42	8	93	35	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.5	8.4	8.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	6%	29%	17%
Vol Thru, %	69%	62%	58%
Vol Right, %	26%	9%	25%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	125	137	159
LT Vol	7	40	27
Through Vol	86	85	93
RT Vol	32	12	39
Lane Flow Rate	136	149	173
Geometry Grp	1	1	1
Degree of Util (X)	0.17	0.184	0.207
Departure Headway (Hd)	4.505	4.444	4.304
Convergence, Y/N	Yes	Yes	Yes
Cap	798	809	835
Service Time	2.529	2.463	2.322
HCM Lane V/C Ratio	0.17	0.184	0.207
HCM Control Delay	8.5	8.5	8.4
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	0.7	0.8

Appendix G – Analysis Output Sheets (Existing with Project Alternative 2)

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	78	51	71	290	486	142	14	107	71	18	66
Future Volume (vph)	85	78	51	71	290	486	142	14	107	71	18	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3158	1441		1782	1583		1792	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3158	1441		1782	1583		1792	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	85	55	77	315	528	154	15	116	77	20	72
RTOR Reduction (vph)	0	0	47	0	181	218	0	0	81	0	0	56
Lane Group Flow (vph)	92	85	8	77	398	46	0	169	35	0	97	16
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	7.2	11.0	11.0	6.6	14.0	14.0		24.6	24.6		17.6	17.6
Effective Green, g (s)	7.2	11.0	11.0	6.6	14.0	14.0		24.6	24.6		17.6	17.6
Actuated g/C Ratio	0.09	0.14	0.14	0.08	0.17	0.17		0.31	0.31		0.22	0.22
Clearance Time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	158	254	216	144	548	250		543	483		391	345
v/s Ratio Prot	c0.05	0.05		0.04	c0.13			c0.09			c0.05	
v/s Ratio Perm			0.00			0.03			0.02			0.01
v/c Ratio	0.58	0.33	0.03	0.53	0.73	0.18		0.31	0.07		0.25	0.05
Uniform Delay, d1	35.3	31.5	30.2	35.5	31.5	28.4		21.5	19.9		26.0	24.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	5.4	0.3	0.0	3.8	4.1	0.1		1.5	0.3		1.5	0.2
Delay (s)	40.6	31.8	30.2	39.3	35.5	28.6		23.0	20.2		27.5	25.1
Level of Service	D	C	C	D	D	C		C	C		C	C
Approach Delay (s)		34.9			33.8			21.9			26.5	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			31.1				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.43									
Actuated Cycle Length (s)			80.6				Sum of lost time (s)		20.8			
Intersection Capacity Utilization			44.7%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection		Coast Highway - SR-76 Ramps		
Agency or Co.	IBI Group				E/W Street Name		SR-76 Ramps		
Date Performed	07/22/2016				N/S Street Name		Coast Highway		
Analysis Year	2013				Analysis Time Period (hrs)		0.25		
Time Period	AM Peak Hour				Peak Hour Factor		0.92		
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment				LTR	LT		T					LT	L		TR	
Volume (V), veh/h	0	0	0	2	0	325	0	239	0	1	113	369	0	76	105	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	0	0	2	0	360	0	260	0	1	125	409	0	84	116	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (sec)		5.1929		4.2929	4.1129			4.1129		4.2929	4.1129		
Follow-Up Headway (sec)		3.1858		3.1858	3.1858			3.1858		3.1858	3.1858		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (Ve), pc/h		2		0	360	260		126	409	84	116		
Entry Volume veh/h		2		0	353	260		124	401	82	114		
Circulating Flow (Vc), pc/h	560			126			84			361			
Exiting Flow (Vex), pc/h	84			1			125			478			
Capacity (cPCE), pc/h		645		1028	1035			1065		862	878		
Capacity (c), veh/h		633		1008	1014			1045		845	860		
v/c Ratio (X)		0.00		0.00	0.35			0.12		0.10	0.13		

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.7		3.6	7.2	0.0		4.5	0.0	5.2	5.5	
Lane LOS		A		A	A	A		A	A	A	A	
95% Queue		0.0		0.0	1.6			0.4		0.3	0.5	
Approach Delay, s/veh	5.7			4.1			1.1			5.4		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	3.1						A					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	39	9	29	50	53	28	43	42	79	59	12
Future Volume (vph)	4	39	9	29	50	53	28	43	42	79	59	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	42	10	32	54	58	30	47	46	86	64	13
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	56	144	123	163								
Volume Left (vph)	4	32	30	86								
Volume Right (vph)	10	58	46	13								
Hadj (s)	-0.06	-0.16	-0.14	0.09								
Departure Headway (s)	4.7	4.5	4.4	4.6								
Degree Utilization, x	0.07	0.18	0.15	0.21								
Capacity (veh/h)	704	748	767	738								
Control Delay (s)	8.1	8.5	8.2	8.8								
Approach Delay (s)	8.1	8.5	8.2	8.8								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.5									
Level of Service			A									
Intersection Capacity Utilization			35.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

2/24/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↱		↰	↱	↰
Traffic Volume (vph)	112	11	31	6	21	43	29	218	13	17	299	64
Future Volume (vph)	112	11	31	6	21	43	29	218	13	17	299	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	2.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.92		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1782	1583		1702		1770	1847		1770	1863	1583
Flt Permitted		0.82	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1518	1583		1679		1770	1847		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	122	12	34	7	23	47	32	237	14	18	325	70
RTOR Reduction (vph)	0	0	26	0	36	0	0	3	0	0	0	30
Lane Group Flow (vph)	0	134	8	0	41	0	32	248	0	18	325	40
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Actuated Green, G (s)		11.0	11.0		11.0		3.2	12.9		11.7	26.2	26.2
Effective Green, g (s)		11.0	11.0		11.0		3.2	12.9		11.7	26.2	26.2
Actuated g/C Ratio		0.24	0.24		0.24		0.07	0.28		0.25	0.56	0.56
Clearance Time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	2.0
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		3.0	7.0	7.0
Lane Grp Cap (vph)		359	375		398		122	513		446	1051	893
v/s Ratio Prot							c0.02	c0.13		0.01	c0.17	
v/s Ratio Perm		c0.09	0.01		0.02							0.02
v/c Ratio		0.37	0.02		0.10		0.26	0.48		0.04	0.31	0.04
Uniform Delay, d1		14.8	13.6		13.8		20.5	14.0		13.1	5.3	4.5
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		2.3	0.1		0.4		1.2	0.7		0.0	0.6	0.1
Delay (s)		17.1	13.7		14.2		21.6	14.7		13.1	5.9	4.6
Level of Service		B	B		B		C	B		B	A	A
Approach Delay (s)		16.4			14.2			15.5			6.0	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay		11.4										
HCM 2000 Volume to Capacity ratio		0.38										
Actuated Cycle Length (s)		46.4										
Intersection Capacity Utilization		44.4%										
Analysis Period (min)		15										
c Critical Lane Group												

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Civic Center Drive			
Agency or Co.	IBI Group				E/W Street Name	Civic Center Drive			
Date Performed	07/22/2016				N/S Street Name	Coast Highway			
Analysis Year	2013				Analysis Time Period (hrs)	0.25			
Time Period	AM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	9	7	6	0	18	10	18	0	5	210	22	0	52	250	9
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	10	8	7	0	20	11	20	0	6	233	24	0	58	277	10
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		25			51			263			345	
Entry Volume veh/h		25			50			258			338	
Circulating Flow (Vc), pc/h	355			249			76			37		
Exiting Flow (Vex), pc/h	90			27			263			304		
Capacity (cPCE), pc/h		792			881			1047			1089	
Capacity (c), veh/h		777			864			1027			1068	
v/c Ratio (X)		0.03			0.06			0.25			0.32	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.9			4.7			5.9			6.5	
Lane LOS		A			A			A			A	
95% Queue		0.1			0.2			1.0			1.4	
Approach Delay, s/veh	4.9			4.7			5.9			6.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	6.1						A					

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	7/11/2016
Analysis Year	2013
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Pier View Way
E/W Street Name	Pier View Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	6	9	9	0	10	14	15	0	7	217	11	0	11	236	18
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	7	10	10	0	11	16	17	0	8	241	12	0	12	262	20
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		27			44			261			294	
Entry Volume veh/h		26			43			256			288	
Circulating Flow (Vc), pc/h	285			256			29			35		
Exiting Flow (Vex), pc/h	34			44			265			283		
Capacity (cPCE), pc/h		850			875			1098			1091	
Capacity (c), veh/h		833			858			1076			1070	
v/c Ratio (X)		0.03			0.05			0.24			0.27	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.6			4.7			5.6			5.9	
Lane LOS		A			A			A			A	
95% Queue		0.1			0.2			0.9			1.1	
Approach Delay, s/veh	4.6			4.7			5.6			5.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	5.6						A					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

11/17/2016

																	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR					
Lane Configurations																	
Sign Control	Stop			Stop				Stop			Stop						
Traffic Volume (vph)	2	5	19	17	9	5	88	137	6	7	94	6					
Future Volume (vph)	2	5	19	17	9	5	88	137	6	7	94	6					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92					
Hourly flow rate (vph)	2	5	21	18	10	5	96	149	7	8	102	7					
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2										
Volume Total (vph)	7	21	33	171	82	59	58										
Volume Left (vph)	2	0	18	96	0	8	0										
Volume Right (vph)	0	21	5	0	7	0	7										
Hadj (s)	0.18	-0.67	0.05	0.32	-0.03	0.10	-0.05										
Departure Headway (s)	5.6	4.7	5.4	5.1	4.7	5.0	4.8										
Degree Utilization, x	0.01	0.03	0.05	0.24	0.11	0.08	0.08										
Capacity (veh/h)	600	705	619	695	743	701	726										
Control Delay (s)	7.4	6.7	8.7	8.5	7.1	7.2	7.0										
Approach Delay (s)	6.9		8.7	8.0		7.1											
Approach LOS	A		A	A		A											
Intersection Summary																	
Delay			7.8														
Level of Service			A														
Intersection Capacity Utilization			26.6%	ICU Level of Service						A							
Analysis Period (min)			15														

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	80	46	74	56	27	65
Future Volume (vph)	80	46	74	56	27	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	50	80	61	29	71
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	87	50	141	100		
Volume Left (vph)	87	0	0	29		
Volume Right (vph)	0	50	61	0		
Hadj (s)	0.53	-0.67	-0.23	0.09		
Departure Headway (s)	5.6	4.4	4.1	4.5		
Degree Utilization, x	0.13	0.06	0.16	0.12		
Capacity (veh/h)	612	779	835	763		
Control Delay (s)	8.2	6.5	7.9	8.1		
Approach Delay (s)	7.6		7.9	8.1		
Approach LOS	A		A	A		
Intersection Summary						
Delay			7.9			
Level of Service			A			
Intersection Capacity Utilization			26.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Existing Year 2013 No Project

Level Of Service Computation Report
 2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #9 Cleveland Street and Mission Avenue

Cycle (sec): 100 Critical Vol./Cap.(X): 0.093
 Loss Time (sec): 0 Average Delay (sec/veh): 8.1
 Optimal Cycle: 0 Level Of Service: A

Street Name:	Cleveland Street						Mission Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1	0	0	1	0	1	0	1	1	0	1

Volume Module:	Cleveland Street			Cleveland Street			Mission Avenue			Mission Avenue		
Base Vol:	10	10	14	10	13	25	11	91	7	39	111	23
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	10	14	10	13	25	11	91	7	39	111	23
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	10	10	14	10	13	25	11	91	7	39	111	23
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	10	10	14	10	13	25	11	91	7	39	111	23
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	10	10	14	10	13	25	11	91	7	39	111	23

Saturation Flow Module:	Cleveland Street			Cleveland Street			Mission Avenue			Mission Avenue		
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.50	0.50	1.00	0.21	0.27	0.52	1.00	1.86	0.14	1.00	1.66	0.34
Final Sat.:	315	315	755	145	189	363	628	1290	100	646	1199	256

Capacity Analysis Module:	Cleveland Street			Cleveland Street			Mission Avenue			Mission Avenue		
Vol/Sat:	0.03	0.03	0.02	0.07	0.07	0.07	0.02	0.07	0.07	0.06	0.09	0.09
Crit Moves:	****			****			****			****		
Delay/Veh:	8.3	8.3	7.3	8.3	8.3	8.3	8.4	8.1	8.0	8.5	8.0	7.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	8.3	8.3	7.3	8.3	8.3	8.3	8.4	8.1	8.0	8.5	8.0	7.9
LOS by Move:	A	A	A	A	A	A	A	A	A	A	A	A
ApproachDel:	7.9			8.3			8.1			8.1		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	7.9			8.3			8.1			8.1		
LOS by Appr:	A			A			A			A		
AllWayAvgQ:	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1

Note: Queue reported is the number of cars per lane.

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	23	124	189	64	14	172	0	0	194	15
Future Volume (vph)	11	0	23	124	189	64	14	172	0	0	194	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00		1.00	1.00	0.95		1.00	1.00			0.95	0.95
Frpb, ped/bikes	1.00		0.96	1.00	0.99		1.00	1.00			1.00	0.97
Flpb, ped/bikes	0.99		1.00	0.98	1.00		1.00	1.00			1.00	1.00
Frt	1.00		0.85	1.00	0.96		1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1753		1527	1743	3375		1770	1863			1767	1464
Flt Permitted	0.58		1.00	0.95	1.00		0.60	1.00			1.00	1.00
Satd. Flow (perm)	1075		1527	1743	3375		1124	1863			1767	1464
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	0	25	135	205	70	15	187	0	0	211	16
RTOR Reduction (vph)	0	0	11	0	32	0	0	0	0	0	1	10
Lane Group Flow (vph)	12	0	14	135	243	0	15	187	0	0	212	4
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type	Perm		Perm	Perm	NA		Perm	NA			NA	Perm
Protected Phases					8			2			6	
Permitted Phases	4		4	8			2					6
Actuated Green, G (s)	27.3		27.3	27.3	27.3		12.7	12.7			12.7	12.7
Effective Green, g (s)	27.3		27.3	27.3	27.3		12.7	12.7			12.7	12.7
Actuated g/C Ratio	0.55		0.55	0.55	0.55		0.25	0.25			0.25	0.25
Clearance Time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)	586		833	951	1842		285	473			448	371
v/s Ratio Prot					0.07			0.10			c0.12	
v/s Ratio Perm	0.01		0.01	c0.08			0.01					0.00
v/c Ratio	0.02		0.02	0.14	0.13		0.05	0.40			0.47	0.01
Uniform Delay, d1	5.2		5.2	5.6	5.6		14.1	15.5			15.8	13.9
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00			0.26	0.62
Incremental Delay, d2	0.1		0.0	0.3	0.1		0.1	0.7			1.0	0.0
Delay (s)	5.3		5.2	5.9	5.7		14.2	16.2			5.1	8.6
Level of Service	A		A	A	A		B	B			A	A
Approach Delay (s)		5.2			5.8			16.1			5.4	
Approach LOS		A			A			B			A	
Intersection Summary												
HCM 2000 Control Delay			8.0									A
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			50.0									
Intersection Capacity Utilization			46.9%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	132	2	50	462	194	3	14	202	132	10	7
Future Volume (vph)	5	132	2	50	462	194	3	14	202	132	10	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0	4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.86		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (prot)	1770	3532		1770	3539	1583	1770	1601		1681	1679	
Flt Permitted	0.47	1.00		0.66	1.00	1.00	0.70	1.00		0.61	0.63	
Satd. Flow (perm)	871	3532		1229	3539	1583	1308	1601		1084	1103	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	143	2	54	502	211	3	15	220	143	11	8
RTOR Reduction (vph)	0	1	0	0	0	123	0	164	0	0	6	0
Lane Group Flow (vph)	5	144	0	54	502	88	3	71	0	82	74	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	12.6	12.6		12.2	12.2	12.2	7.5	7.5		7.5	7.5	
Effective Green, g (s)	12.6	12.6		12.2	12.2	12.2	7.5	7.5		7.5	7.5	
Actuated g/C Ratio	0.43	0.43		0.42	0.42	0.42	0.26	0.26		0.26	0.26	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0	4.6	4.6		4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	374	1518		511	1473	659	334	409		277	282	
v/s Ratio Prot		0.04			c0.14			0.04				
v/s Ratio Perm	0.01			0.04		0.06	0.00			c0.08	0.07	
v/c Ratio	0.01	0.09		0.11	0.34	0.13	0.01	0.17		0.30	0.26	
Uniform Delay, d1	4.8	5.0		5.2	5.8	5.3	8.1	8.5		8.8	8.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.0		0.1	0.2	0.1	0.0	0.3		0.8	0.7	
Delay (s)	4.8	5.0		5.3	6.0	5.4	8.1	8.8		9.6	9.4	
Level of Service	A	A		A	A	A	A	A		A	A	
Approach Delay (s)		5.0			5.8			8.8			9.5	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			6.7									
HCM 2000 Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			29.3									
Intersection Capacity Utilization			53.3%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

9/1/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↘	
Traffic Volume (veh/h)	35	12	44	60	11	17
Future Volume (Veh/h)	35	12	44	60	11	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	13	48	65	12	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh)						
Upstream signal (ft)			248			
pX, platoon unblocked						
vC, conflicting volume			51		206	44
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			51		206	44
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		98	98
cM capacity (veh/h)			1555		759	1025
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	51	113	30			
Volume Left	0	48	12			
Volume Right	13	0	18			
cSH	1700	1555	899			
Volume to Capacity	0.03	0.03	0.03			
Queue Length 95th (ft)	0	2	3			
Control Delay (s)	0.0	3.3	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.3	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization			22.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr/Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	115	21	0	0	0	23	230	99	37	261	39
Future Volume (vph)	16	115	21	0	0	0	23	230	99	37	261	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2					4.2	4.6	4.6	4.2	4.6	4.6
Lane Util. Factor	1.00	1.00					1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99					1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00					1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98					1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1805					1770	1863	1553	1770	1863	1521
Flt Permitted	0.95	1.00					0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1805					1770	1863	1553	1770	1863	1521
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	125	23	0	0	0	25	250	108	40	284	42
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	82	0	0	31
Lane Group Flow (vph)	17	137	0	0	0	0	25	250	26	40	284	11
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA					Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4					5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	18.0	18.0					4.0	11.1	11.1	4.8	11.9	11.9
Effective Green, g (s)	18.0	18.0					4.0	11.1	11.1	4.8	11.9	11.9
Actuated g/C Ratio	0.38	0.38					0.09	0.24	0.24	0.10	0.25	0.25
Clearance Time (s)	4.2	4.2					4.2	4.6	4.6	4.2	4.6	4.6
Vehicle Extension (s)	3.0	3.0					3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	679	692					150	440	367	181	472	385
v/s Ratio Prot	0.01	c0.08					0.01	0.13		c0.02	c0.15	
v/s Ratio Perm									0.02			0.01
v/c Ratio	0.03	0.20					0.17	0.57	0.07	0.22	0.60	0.03
Uniform Delay, d1	9.0	9.6					19.9	15.8	13.9	19.3	15.4	13.2
Progression Factor	1.00	1.00					1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.6					2.4	2.0	0.1	2.8	2.5	0.0
Delay (s)	9.1	10.3					22.3	17.8	14.0	22.1	17.9	13.2
Level of Service	A	B					C	B	B	C	B	B
Approach Delay (s)		10.2			0.0			17.0			17.8	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		16.1					HCM 2000 Level of Service		B			
HCM 2000 Volume to Capacity ratio		0.35										
Actuated Cycle Length (s)		46.9					Sum of lost time (s)		13.0			
Intersection Capacity Utilization		44.2%					ICU Level of Service		A			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	240	7	0	0	0	0	10	15	9	7	0
Future Volume (Veh/h)	5	240	7	0	0	0	0	10	15	9	7	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	261	8	0	0	0	0	11	16	10	8	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		255										
pX, platoon unblocked												
vC, conflicting volume	0			269			279	275	134	162	279	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			269			279	275	134	162	279	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	98	99	99	100
cM capacity (veh/h)	1622			1292			644	629	890	761	626	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	136	138	27	18								
Volume Left	5	0	0	10								
Volume Right	0	8	16	0								
cSH	1622	1700	761	695								
Volume to Capacity	0.00	0.08	0.04	0.03								
Queue Length 95th (ft)	0	0	3	2								
Control Delay (s)	0.3	0.0	9.9	10.3								
Lane LOS	A		A	B								
Approach Delay (s)	0.1		9.9	10.3								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			21.2%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	242	3	0	0	0	0	14	10	13	15	0
Future Volume (vph)	17	242	3	0	0	0	0	14	10	13	15	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	263	3	0	0	0	0	15	11	14	16	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	150	135	26	30								
Volume Left (vph)	18	0	0	14								
Volume Right (vph)	0	3	11	0								
Hadj (s)	0.09	0.02	-0.22	0.13								
Departure Headway (s)	4.7	4.7	4.4	4.7								
Degree Utilization, x	0.20	0.17	0.03	0.04								
Capacity (veh/h)	751	758	778	719								
Control Delay (s)	7.7	7.4	7.5	7.9								
Approach Delay (s)	7.6		7.5	7.9								
Approach LOS	A		A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			22.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St/Clementine & Seagaze St

9/1/2016

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	142	122	1	4	0	3	0	17	9	0	0	0								
Future Volume (vph)	142	122	1	4	0	3	0	17	9	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	154	133	1	4	0	3	0	18	10	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	154	134	7	28																
Volume Left (vph)	154	0	4	0																
Volume Right (vph)	0	1	3	10																
Hadj (s)	0.53	0.03	-0.11	-0.18																
Departure Headway (s)	5.1	4.6	4.2	4.4																
Degree Utilization, x	0.22	0.17	0.01	0.03																
Capacity (veh/h)	698	769	833	773																
Control Delay (s)	8.3	7.3	7.3	7.5																
Approach Delay (s)	7.9		7.3	7.5																
Approach LOS	A		A	A																
Intersection Summary																				
Delay			7.8																	
Level of Service			A																	
Intersection Capacity Utilization			22.3%	ICU Level of Service					A											
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	13	0	0	11	13	263	7	5	272	6
Future Volume (Veh/h)	0	0	13	0	0	11	13	263	7	5	272	6
Sign Control	Stop			Stop				Free			Free	
Grade	0%			0%				0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	14	0	0	12	14	286	8	5	296	7
Pedestrians	7			7							1	
Lane Width (ft)	12.0			12.0							12.0	
Walking Speed (ft/s)	4.0			4.0							4.0	
Percent Blockage	1			1							0	
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			440		
pX, platoon unblocked												
vC, conflicting volume	644	646	306	645	645	298	310				301	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	644	646	306	645	645	298	310				301	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	98	100	100	98	99				100	
cM capacity (veh/h)	370	380	729	368	380	737	1243				1253	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	14	12	14	294	5	303						
Volume Left	0	0	14	0	5	0						
Volume Right	14	12	0	8	0	7						
cSH	729	737	1243	1700	1253	1700						
Volume to Capacity	0.02	0.02	0.01	0.17	0.00	0.18						
Queue Length 95th (ft)	1	1	1	0	0	0						
Control Delay (s)	10.0	10.0	7.9	0.0	7.9	0.0						
Lane LOS	B	A	A		A							
Approach Delay (s)	10.0	10.0	0.4		0.1							
Approach LOS	B	A										
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			24.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Washington Avenue			
Agency or Co.	IBI Group				E/W Street Name	Washington Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2013				Analysis Time Period (hrs)	0.25			
Time Period	AM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	4	1	7	0	15	3	3	0	5	278	8	0	2	290	5
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	4	1	8	0	17	3	3	0	6	308	9	0	2	322	6
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929		
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (Ve), pc/h		13			23			323			330		
Entry Volume veh/h		13			23			317			324		
Circulating Flow (Vc), pc/h	341			318			7			26			
Exiting Flow (Vex), pc/h	12			15			315			347			
Capacity (cPCE), pc/h		804			822			1122			1101		
Capacity (c), veh/h		788			806			1100			1079		
v/c Ratio (X)		0.02			0.03			0.29			0.30		

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.7			4.7			6.0			6.3	
Lane LOS		A			A			A			A	
95% Queue		0.0			0.1			1.2			1.3	
Approach Delay, s/veh	4.7			4.7			6.0			6.3		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	6.1						A					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	25	33	29	13	4	34	5	69	20	40	47	1
Future Volume (vph)	25	33	29	13	4	34	5	69	20	40	47	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	36	32	14	4	37	5	75	22	43	51	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	95	55	102	95								
Volume Left (vph)	27	14	5	43								
Volume Right (vph)	32	37	22	1								
Hadj (s)	-0.11	-0.32	-0.09	0.12								
Departure Headway (s)	4.3	4.1	4.3	4.5								
Degree Utilization, x	0.11	0.06	0.12	0.12								
Capacity (veh/h)	797	813	807	765								
Control Delay (s)	7.8	7.4	7.8	8.1								
Approach Delay (s)	7.8	7.4	7.8	8.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay	7.8											
Level of Service	A											
Intersection Capacity Utilization	24.9%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	126	10	2	58	10	5	12	13	14	17	7
Future Volume (Veh/h)	5	126	10	2	58	10	5	12	13	14	17	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	137	11	2	63	11	5	13	14	15	18	8
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked												
vC, conflicting volume	88			155			250	252	150	260	252	84
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	88			155			250	252	150	260	252	84
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	98	98	98	97	99
cM capacity (veh/h)	1490			1417			667	637	892	653	637	964
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	153	76	32	41								
Volume Left	5	2	5	15								
Volume Right	11	11	14	8								
cSH	1490	1417	734	689								
Volume to Capacity	0.00	0.00	0.04	0.06								
Queue Length 95th (ft)	0	0	3	5								
Control Delay (s)	0.3	0.2	10.1	10.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.2	10.1	10.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.7									
Intersection Capacity Utilization			21.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Wisconsin Avenue			
Agency or Co.	IBI Group				E/W Street Name	Wisconsin Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2013				Analysis Time Period (hrs)	0.25			
Time Period	AM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	36	26	92	0	42	14	13	0	45	257	30	0	8	283	12
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	40	29	102	0	47	16	14	0	50	285	33	0	9	314	13
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		171			77			368			336	
Entry Volume veh/h		168			75			361			329	
Circulating Flow (Vc), pc/h	370			375			78			113		
Exiting Flow (Vex), pc/h	71			79			339			463		
Capacity (cPCE), pc/h		781			777			1045			1009	
Capacity (c), veh/h		765			761			1025			989	
v/c Ratio (X)		0.22			0.10			0.35			0.33	

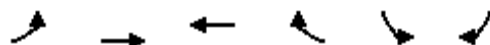
Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.1			5.7			7.2			7.1	
Lane LOS		A			A			A			A	
95% Queue		0.8			0.3			1.6			1.5	
Approach Delay, s/veh	7.1			5.7			7.2			7.1		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	7.0						A					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

9/1/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	60	58	3	10	9
Future Volume (Veh/h)	5	60	58	3	10	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	65	63	3	11	10
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	74				148	74
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	74				148	74
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1515				834	981
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	70	66	21			
Volume Left	5	0	11			
Volume Right	0	3	10			
cSH	1515	1700	898			
Volume to Capacity	0.00	0.04	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.6	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	0.6	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			17.6%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	56	5	12	53	7	3	4	8	22	1	3
Future Volume (Veh/h)	4	56	5	12	53	7	3	4	8	22	1	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	61	5	13	58	8	3	4	9	24	1	3
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	68			66			165	166	64	172	164	66
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	68			66			165	166	64	172	164	66
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	99	99	97	100	100
cM capacity (veh/h)	1531			1536			787	718	1001	771	719	994
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	70	79	16	28								
Volume Left	4	13	3	24								
Volume Right	5	8	9	3								
cSH	1531	1536	871	788								
Volume to Capacity	0.00	0.01	0.02	0.04								
Queue Length 95th (ft)	0	1	1	3								
Control Delay (s)	0.4	1.3	9.2	9.7								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.4	1.3	9.2	9.7								
Approach LOS			A	A								
Intersection Summary												
Average Delay			2.9									
Intersection Capacity Utilization			19.7%	ICU Level of Service					A			
Analysis Period (min)			15									

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	33	52	20	42	0	28	0	10	0	2	0
Future Volume (vph)	0	33	52	20	42	0	28	0	10	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	36	57	22	46	0	30	0	11	0	2	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	93	68	41	2								
Volume Left (vph)	0	22	30	0								
Volume Right (vph)	57	0	11	0								
Hadj (s)	-0.33	0.10	0.02	0.03								
Departure Headway (s)	3.7	4.2	4.3	4.3								
Degree Utilization, x	0.10	0.08	0.05	0.00								
Capacity (veh/h)	945	846	808	798								
Control Delay (s)	7.1	7.5	7.5	7.3								
Approach Delay (s)	7.1	7.5	7.5	7.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.3									
Level of Service			A									
Intersection Capacity Utilization			25.8%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	32	46	51	20	54	61
Future Volume (vph)	32	46	51	20	54	61
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	50	55	22	59	66
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	85	77	125			
Volume Left (vph)	35	0	59			
Volume Right (vph)	50	22	0			
Hadj (s)	-0.24	-0.14	0.13			
Departure Headway (s)	4.1	4.1	4.3			
Degree Utilization, x	0.10	0.09	0.15			
Capacity (veh/h)	834	851	818			
Control Delay (s)	7.5	7.5	8.0			
Approach Delay (s)	7.5	7.5	8.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			24.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	132	1	6	106	22	6	7	11	22	11	5
Future Volume (Veh/h)	4	132	1	6	106	22	6	7	11	22	11	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	143	1	7	115	24	7	8	12	24	12	5
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					253							
pX, platoon unblocked	0.96						0.96	0.96		0.96	0.96	0.96
vC, conflicting volume	142			155			318	318	162	320	307	134
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	93			155			276	276	162	277	264	84
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	99	99	96	98	99
cM capacity (veh/h)	1446			1412			623	598	868	621	607	935
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	148	146	27	41								
Volume Left	4	7	7	24								
Volume Right	1	24	12	5								
cSH	1446	1412	702	643								
Volume to Capacity	0.00	0.00	0.04	0.06								
Queue Length 95th (ft)	0	0	3	5								
Control Delay (s)	0.2	0.4	10.3	11.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.4	10.3	11.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			22.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

2/24/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱	↰	↱	↰	↰	↱		↰	↱	
Traffic Volume (vph)	15	97	52	113	98	109	27	216	60	119	274	11
Future Volume (vph)	15	97	52	113	98	109	27	216	60	119	274	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.96	1.00	1.00	0.93	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.99	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1851	1526	1681	1761	1465	1770	3411		1770	1847	
Flt Permitted		0.99	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1851	1526	1681	1761	1465	1770	3411		1770	1847	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	105	57	123	107	118	29	235	65	129	298	12
RTOR Reduction (vph)	0	0	51	0	0	103	0	19	0	0	1	0
Lane Group Flow (vph)	0	121	6	111	119	15	29	281	0	129	309	0
Confl. Peds. (#/hr)	14		10	10		14			3			15
Confl. Bikes (#/hr)			4			5			3			3
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		10.9	10.9	12.5	12.5	12.5	4.3	46.2		11.6	53.5	
Effective Green, g (s)		10.9	10.9	12.5	12.5	12.5	4.3	46.2		11.6	53.5	
Actuated g/C Ratio		0.11	0.11	0.12	0.12	0.12	0.04	0.46		0.12	0.54	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)		201	166	210	220	183	76	1575		205	988	
v/s Ratio Prot		c0.07		0.07	c0.07		0.02	0.08		c0.07	c0.17	
v/s Ratio Perm			0.00			0.01						
v/c Ratio		0.60	0.04	0.53	0.54	0.08	0.38	0.18		0.63	0.31	
Uniform Delay, d1		42.5	39.9	41.0	41.1	38.7	46.6	15.8		42.1	13.0	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.5	0.0	2.7	3.0	0.2	1.2	0.2		4.3	0.8	
Delay (s)		45.9	39.9	43.7	44.1	38.9	47.7	16.0		46.5	13.8	
Level of Service		D	D	D	D	D	D	B		D	B	
Approach Delay (s)		44.0			42.2			18.8			23.4	
Approach LOS		D			D			B			C	
Intersection Summary												
HCM 2000 Control Delay			30.1				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			100.0				Sum of lost time (s)			18.8		
Intersection Capacity Utilization			49.8%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	274	0	16	353	28	8	5	34	86	8	16
Future Volume (vph)	4	274	0	16	353	28	8	5	34	86	8	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.96	1.00
Satd. Flow (prot)	1770	3539		1765	3497			3095			1781	1551
Flt Permitted	0.82	1.00		0.82	1.00			0.94			1.00	1.00
Satd. Flow (perm)	1521	3539		1517	3497			2927			1862	1551
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	298	0	17	384	30	9	5	37	93	9	17
RTOR Reduction (vph)	0	0	0	0	13	0	0	31	0	0	0	14
Lane Group Flow (vph)	4	298	0	17	401	0	0	20	0	0	102	3
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	4.9	4.9		4.9	4.9			2.6			2.6	2.6
Effective Green, g (s)	4.9	4.9		4.9	4.9			2.6			2.6	2.6
Actuated g/C Ratio	0.29	0.29		0.29	0.29			0.15			0.15	0.15
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	438	1020		437	1007			447			284	237
v/s Ratio Prot		0.08			c0.11							
v/s Ratio Perm	0.00			0.01				0.01			c0.05	0.00
v/c Ratio	0.01	0.29		0.04	0.40			0.04			0.36	0.01
Uniform Delay, d1	4.3	4.7		4.4	4.9			6.1			6.5	6.1
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.0	0.2		0.0	0.3			0.1			1.1	0.0
Delay (s)	4.3	4.9		4.4	5.1			6.2			7.5	6.1
Level of Service	A	A		A	A			A			A	A
Approach Delay (s)		4.9			5.1			6.2			7.3	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay		5.4			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.38										
Actuated Cycle Length (s)		17.0			Sum of lost time (s)			9.5				
Intersection Capacity Utilization		45.5%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	8	13	13	5	48	2	292	26	40	394	13
Future Volume (vph)	19	8	13	13	5	48	2	292	26	40	394	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.96			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1728			1794	1557	1770	3489		1770	3519	
Flt Permitted		1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1769			1860	1557	1770	3489		1770	3519	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	9	14	14	5	52	2	317	28	43	428	14
RTOR Reduction (vph)	0	13	0	0	0	48	0	8	0	0	3	0
Lane Group Flow (vph)	0	31	0	0	19	4	2	337	0	43	439	0
Confl. Peds. (#/hr)	10		4	4		10			3			4
Confl. Bikes (#/hr)			1						2			3
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		2.6			2.6	2.6	0.6	17.4		0.6	17.4	
Effective Green, g (s)		2.6			2.6	2.6	0.6	17.4		0.6	17.4	
Actuated g/C Ratio		0.08			0.08	0.08	0.02	0.51		0.02	0.51	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		134			140	118	30	1769		30	1785	
v/s Ratio Prot							0.00	0.10		c0.02	c0.12	
v/s Ratio Perm		c0.02			0.01	0.00						
v/c Ratio		0.23			0.14	0.03	0.07	0.19		1.43	0.25	
Uniform Delay, d1		14.9			14.8	14.7	16.6	4.6		16.8	4.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.2	0.0	0.9	0.1		317.1	0.1	
Delay (s)		15.2			15.0	14.7	17.5	4.7		333.9	4.8	
Level of Service		B			B	B	B	A		F	A	
Approach Delay (s)		15.2			14.8			4.7			34.0	
Approach LOS		B			B			A			C	
Intersection Summary												
HCM 2000 Control Delay		21.0										
HCM 2000 Volume to Capacity ratio		0.28										
Actuated Cycle Length (s)		34.3										
Intersection Capacity Utilization		38.1%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	60	7	11	52	0	6	0	9	0	0	0
Future Volume (Veh/h)	0	60	7	11	52	0	6	0	9	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	65	8	12	57	0	7	0	10	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		252										
pX, platoon unblocked												
vC, conflicting volume	57			73			150	150	69	160	154	57
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	57			73			150	150	69	160	154	57
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	100	99	100	100	100
cM capacity (veh/h)	1547			1527			813	736	994	793	732	1009
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	73	69	17	0								
Volume Left	0	12	7	0								
Volume Right	8	0	10	0								
cSH	1547	1527	910	1700								
Volume to Capacity	0.00	0.01	0.02	0.00								
Queue Length 95th (ft)	0	1	1	0								
Control Delay (s)	0.0	1.3	9.0	0.0								
Lane LOS		A	A	A								
Approach Delay (s)	0.0	1.3	9.0	0.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			20.0%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	28	4	1	20	1	7	0	3	1	0	1
Future Volume (Veh/h)	1	28	4	1	20	1	7	0	3	1	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	30	4	1	22	1	8	0	3	1	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	23			34			60	59	32	62	60	22
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	23			34			60	59	32	62	60	22
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	100	100	100
cM capacity (veh/h)	1592			1578			935	831	1042	930	829	1054
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	35	24	11	2								
Volume Left	1	1	8	1								
Volume Right	4	1	3	1								
cSH	1592	1578	962	988								
Volume to Capacity	0.00	0.00	0.01	0.00								
Queue Length 95th (ft)	0	0	1	0								
Control Delay (s)	0.2	0.3	8.8	8.6								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.2	0.3	8.8	8.6								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			13.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	16	54	6	16	67	6
Future Volume (vph)	16	54	6	16	67	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	59	7	17	73	7
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	76	24	80			
Volume Left (vph)	17	0	73			
Volume Right (vph)	59	17	0			
Hadj (s)	-0.39	-0.39	0.22			
Departure Headway (s)	3.7	3.7	4.3			
Degree Utilization, x	0.08	0.02	0.10			
Capacity (veh/h)	933	927	820			
Control Delay (s)	7.1	6.8	7.7			
Approach Delay (s)	7.1	6.8	7.7			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.3			
Level of Service			A			
Intersection Capacity Utilization			21.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	101	45	8	67	2	34	5	8	9	6	3
Future Volume (Veh/h)	2	101	45	8	67	2	34	5	8	9	6	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	110	49	9	73	2	37	5	9	10	7	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					576							
pX, platoon unblocked												
vC, conflicting volume	75			159			237	232	134	242	255	74
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	75			159			237	232	134	242	255	74
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			95	99	99	99	99	100
cM capacity (veh/h)	1524			1420			705	663	914	697	644	988
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	161	84	51	20								
Volume Left	2	9	37	10								
Volume Right	49	2	9	3								
cSH	1524	1420	730	708								
Volume to Capacity	0.00	0.01	0.07	0.03								
Queue Length 95th (ft)	0	0	6	2								
Control Delay (s)	0.1	0.9	10.3	10.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.9	10.3	10.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.6									
Intersection Capacity Utilization			19.1%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	116	7	5	72	10	2	3	14	4	4	3
Future Volume (Veh/h)	0	116	7	5	72	10	2	3	14	4	4	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	126	8	5	78	11	2	3	15	4	4	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	249											
pX, platoon unblocked												
vC, conflicting volume	89			134			228	229	130	240	228	84
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			134			228	229	130	240	228	84
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	98	99	99	100
cM capacity (veh/h)	1506			1451			719	668	920	698	670	976
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	134	94	20	11								
Volume Left	0	5	2	4								
Volume Right	8	11	15	3								
cSH	1506	1451	848	744								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.0	0.4	9.3	9.9								
Lane LOS		A	A	A								
Approach Delay (s)	0.0	0.4	9.3	9.9								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			18.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	69	45	35	32	17	57	269	32	40	295	11
Future Volume (vph)	24	69	45	35	32	17	57	269	32	40	295	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.96			0.97		1.00	0.98		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1765			1776		1770	3482		1770	3520	
Flt Permitted		0.92			0.89		0.95	1.00		0.55	1.00	
Satd. Flow (perm)		1635			1621		1770	3482		1032	3520	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	75	49	38	35	18	62	292	35	43	321	12
RTOR Reduction (vph)	0	29	0	0	15	0	0	13	0	0	3	0
Lane Group Flow (vph)	0	121	0	0	76	0	62	314	0	43	330	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)		5.2			4.8		2.2	21.9		15.5	15.5	
Effective Green, g (s)		5.2			4.8		2.2	21.9		15.5	15.5	
Actuated g/C Ratio		0.14			0.13		0.06	0.60		0.42	0.42	
Clearance Time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.5		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		231			212		106	2077		435	1486	
v/s Ratio Prot							c0.04	0.09			c0.09	
v/s Ratio Perm		c0.07			0.05					0.04		
v/c Ratio		0.52			0.36		0.58	0.15		0.10	0.22	
Uniform Delay, d1		14.6			14.5		16.8	3.3		6.4	6.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.1			1.2		5.2	0.0		0.1	0.1	
Delay (s)		16.7			15.8		22.0	3.3		6.5	6.8	
Level of Service		B			B		C	A		A	A	
Approach Delay (s)		16.7			15.8			6.3			6.8	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		8.9										
HCM 2000 Volume to Capacity ratio		0.33										
Actuated Cycle Length (s)		36.7										
Intersection Capacity Utilization		38.9%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	136	5	6	77	5	2	6	5	4	5	7
Future Volume (Veh/h)	6	136	5	6	77	5	2	6	5	4	5	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	148	5	7	84	5	2	7	5	4	5	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		280										
pX, platoon unblocked												
vC, conflicting volume	89			153			276	268	150	274	268	86
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			153			276	268	150	274	268	86
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	99	99	99	99	99
cM capacity (veh/h)	1506			1428			662	632	896	665	632	972
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	160	96	14	17								
Volume Left	7	7	2	4								
Volume Right	5	5	5	8								
cSH	1506	1428	712	767								
Volume to Capacity	0.00	0.00	0.02	0.02								
Queue Length 95th (ft)	0	0	2	2								
Control Delay (s)	0.4	0.6	10.2	9.8								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.4	0.6	10.2	9.8								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			19.1%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	152	5	3	93	1	4	8	7	5	4	3
Future Volume (vph)	2	152	5	3	93	1	4	8	7	5	4	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	165	5	3	101	1	4	9	8	5	4	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	172	105	21	12								
Volume Left (vph)	2	3	4	5								
Volume Right (vph)	5	1	8	3								
Hadj (s)	0.02	0.03	-0.16	-0.03								
Departure Headway (s)	4.1	4.2	4.4	4.5								
Degree Utilization, x	0.20	0.12	0.03	0.01								
Capacity (veh/h)	864	846	770	741								
Control Delay (s)	8.1	7.8	7.5	7.6								
Approach Delay (s)	8.1	7.8	7.5	7.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.9								
Level of Service				A								
Intersection Capacity Utilization				19.1%	ICU Level of Service		A					
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	173	4	21	79	12	4	33	88	93	6	5
Future Volume (vph)	5	173	4	21	79	12	4	33	88	93	6	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	188	4	23	86	13	4	36	96	101	7	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	197	122	136	113								
Volume Left (vph)	5	23	4	101								
Volume Right (vph)	4	13	96	5								
Hadj (s)	0.03	0.01	-0.38	0.19								
Departure Headway (s)	4.7	4.8	4.5	5.0								
Degree Utilization, x	0.26	0.16	0.17	0.16								
Capacity (veh/h)	719	702	748	660								
Control Delay (s)	9.3	8.7	8.4	9.0								
Approach Delay (s)	9.3	8.7	8.4	9.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.9								
Level of Service				A								
Intersection Capacity Utilization				38.9%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	4	23	14	6	32	28
Future Volume (vph)	4	23	14	6	32	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	25	15	7	35	30
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	29	22	65			
Volume Left (vph)	4	0	35			
Volume Right (vph)	25	7	0			
Hadj (s)	-0.46	-0.16	0.14			
Departure Headway (s)	3.6	3.9	4.1			
Degree Utilization, x	0.03	0.02	0.07			
Capacity (veh/h)	963	909	863			
Control Delay (s)	6.7	7.0	7.4			
Approach Delay (s)	6.7	7.0	7.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.2			
Level of Service			A			
Intersection Capacity Utilization			19.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	81	26	218	33	185	19	163	104	157	230	4
Future Volume (vph)	10	81	26	218	33	185	19	163	104	157	230	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.94		1.00	1.00	
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1553		1785	1583	1770	3286		1770	3529	
Flt Permitted	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1553		1785	1583	1770	3286		1770	3529	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	88	28	237	36	201	21	177	113	171	250	4
RTOR Reduction (vph)	0	0	26	0	0	165	0	67	0	0	1	0
Lane Group Flow (vph)	11	88	2	0	273	36	21	223	0	171	253	0
Confl. Peds. (#/hr)	7		2	2		7			5			8
Confl. Bikes (#/hr)						2			4			8
Turn Type	Split	NA	Perm	Split	NA	Over	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	5.6	5.6	5.6		16.8	12.0	2.2	14.0		12.0	23.8	
Effective Green, g (s)	5.6	5.6	5.6		16.8	12.0	2.2	14.0		12.0	23.8	
Actuated g/C Ratio	0.08	0.08	0.08		0.25	0.18	0.03	0.21		0.18	0.35	
Clearance Time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	146	154	128		444	281	57	681		314	1244	
v/s Ratio Prot	0.01	c0.05			c0.15	0.02	0.01	c0.07		c0.10	0.07	
v/s Ratio Perm			0.00									
v/c Ratio	0.08	0.57	0.02		0.61	0.13	0.37	0.33		0.54	0.20	
Uniform Delay, d1	28.6	29.8	28.4		22.5	23.3	32.0	22.7		25.3	15.2	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	3.2	0.0		2.5	0.1	1.5	0.3		1.0	0.1	
Delay (s)	28.6	33.0	28.4		25.0	23.4	33.4	23.0		26.3	15.3	
Level of Service	C	C	C		C	C	C	C		C	B	
Approach Delay (s)		31.6			24.3			23.7			19.7	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			23.4									
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			67.5									
Intersection Capacity Utilization			50.5%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	300	1	3	447	18	0	0	5	10	0	11
Future Volume (Veh/h)	3	300	1	3	447	18	0	0	5	10	0	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	326	1	3	486	20	0	0	5	11	0	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage (veh)					2							
Upstream signal (ft)		279										
pX, platoon unblocked				0.98			0.98	0.98	0.98	0.98	0.98	
vC, conflicting volume	506			327			846	844	326	840	835	496
vC1, stage 1 conf vol							332	332		502	502	
vC2, stage 2 conf vol							514	512		338	333	
vCu, unblocked vol	506			301			832	830	300	825	820	496
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	98	100	98
cM capacity (veh/h)	1059			1233			468	470	723	480	475	574
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	330	509	5	23								
Volume Left	3	3	0	11								
Volume Right	1	20	5	12								
cSH	1059	1233	723	525								
Volume to Capacity	0.00	0.00	0.01	0.04								
Queue Length 95th (ft)	0	0	1	3								
Control Delay (s)	0.1	0.1	10.0	12.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	10.0	12.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.5									
Intersection Capacity Utilization			41.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	315	2	6	496	10	2	1	13	12	1	6
Future Volume (Veh/h)	4	315	2	6	496	10	2	1	13	12	1	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	342	2	7	539	11	2	1	14	13	1	7
Pedestrians		1						1				
Lane Width (ft)		12.0						12.0				
Walking Speed (ft/s)		4.0						4.0				
Percent Blockage		0						0				
Right turn flare (veh)												
Median type		TWLT			TWLT							
Median storage veh)		2			2							
Upstream signal (ft)		687										
pX, platoon unblocked												
vC, conflicting volume	550			345			919	916	344	924	912	546
vC1, stage 1 conf vol							352	352		558	558	
vC2, stage 2 conf vol							567	564		366	353	
vCu, unblocked vol	550			345			919	916	344	924	912	546
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	98	97	100	99
cM capacity (veh/h)	1020			1213			438	444	698	441	446	537
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	348	557	17	21								
Volume Left	4	7	2	13								
Volume Right	2	11	14	7								
cSH	1020	1213	633	469								
Volume to Capacity	0.00	0.01	0.03	0.04								
Queue Length 95th (ft)	0	0	2	4								
Control Delay (s)	0.1	0.2	10.8	13.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	10.8	13.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			40.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	386	1	6	498	66	0	0	5	1	0	10
Future Volume (Veh/h)	14	386	1	6	498	66	0	0	5	1	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	420	1	7	541	72	0	0	5	1	0	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLT			TWLT							
Median storage veh		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	613			421			1016	1078	420	1046	1042	577
vC1, stage 1 conf vol							450	450		591	591	
vC2, stage 2 conf vol							566	627		456	451	
vCu, unblocked vol	613			421			1016	1078	420	1046	1042	577
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			100	100	99	100	100	98
cM capacity (veh/h)	966			1138			406	394	633	405	411	516
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total	436	7	613	5	12							
Volume Left	15	7	0	0	1							
Volume Right	1	0	72	5	11							
cSH	966	1138	1700	633	505							
Volume to Capacity	0.02	0.01	0.36	0.01	0.02							
Queue Length 95th (ft)	1	0	0	1	2							
Control Delay (s)	0.5	8.2	0.0	10.7	12.3							
Lane LOS	A	A		B	B							
Approach Delay (s)	0.5	0.1		10.7	12.3							
Approach LOS				B	B							
Intersection Summary												
Average Delay			0.4									
Intersection Capacity Utilization			Err%		ICU Level of Service				H			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	33	5	0	5	14	222	4	7	502	5
Future Volume (Veh/h)	0	0	33	5	0	5	14	222	4	7	502	5
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	36	5	0	5	15	241	4	8	546	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL		TWLTL			
Median storage veh)							2		2			
Upstream signal (ft)									621			
pX, platoon unblocked												
vC, conflicting volume	720	840	548	871	840	122	551			245		
vC1, stage 1 conf vol	564	564		273	273							
vC2, stage 2 conf vol	156	275		598	567							
vCu, unblocked vol	720	840	548	871	840	122	551			245		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	92	99	100	99	99			99		
cM capacity (veh/h)	451	457	480	378	448	906	1015			1318		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	36	10	15	161	84	8	551					
Volume Left	0	5	15	0	0	8	0					
Volume Right	36	5	0	0	4	0	5					
cSH	480	533	1015	1700	1700	1318	1700					
Volume to Capacity	0.08	0.02	0.01	0.09	0.05	0.01	0.32					
Queue Length 95th (ft)	6	1	1	0	0	0	0					
Control Delay (s)	13.1	11.9	8.6	0.0	0.0	7.7	0.0					
Lane LOS	B	B	A				A					
Approach Delay (s)	13.1	11.9	0.5				0.1					
Approach LOS	B	B										
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			Err%	ICU Level of Service				H				
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Michigan Avenue			
Agency or Co.	IBI Group				E/W Street Name	Michigan Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2013				Analysis Time Period (hrs)	0.25			
Time Period	AM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	56	8	23	0	30	9	5	0	14	301	4	0	4	295	17
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	62	9	26	0	33	10	6	0	16	334	4	0	4	327	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		97			49			354			350	
Entry Volume veh/h		95			48			347			343	
Circulating Flow (Vc), pc/h	364			412			75			59		
Exiting Flow (Vex), pc/h	17			45			402			386		
Capacity (cPCE), pc/h		785			748			1048			1065	
Capacity (c), veh/h		770			734			1028			1044	
v/c Ratio (X)		0.12			0.07			0.34			0.33	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.0			5.6			7.0			6.8	
Lane LOS		A			A			A			A	
95% Queue		0.4			0.2			1.5			1.4	
Approach Delay, s/veh	6.0			5.6			7.0			6.8		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	6.7						A					

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/08/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↖	↑↑				
Traffic Volume (veh/h)	275	188	948	561	0	0		
Future Volume (veh/h)	275	188	948	561	0	0		
Number	4	14	3	8				
Initial Q (Qb), veh	0	0	0	0				
Ped-Bike Adj(A_pbT)		1.00	1.00					
Parking Bus, Adj	1.00	1.00	1.00	1.00				
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863				
Adj Flow Rate, veh/h	299	204	1030	610				
Adj No. of Lanes	2	1	2	2				
Peak Hour Factor	0.92	0.92	0.92	0.92				
Percent Heavy Veh, %	2	2	2	2				
Cap, veh/h	1416	633	1377	3185				
Arrive On Green	0.40	0.40	0.40	0.90				
Sat Flow, veh/h	3632	1583	3442	3632				
Grp Volume(v), veh/h	299	204	1030	610				
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1770				
Q Serve(g_s), s	2.2	3.5	10.3	0.8				
Cycle Q Clear(g_c), s	2.2	3.5	10.3	0.8				
Prop In Lane		1.00	1.00					
Lane Grp Cap(c), veh/h	1416	633	1377	3185				
V/C Ratio(X)	0.21	0.32	0.75	0.19				
Avail Cap(c_a), veh/h	1416	633	1377	3185				
HCM Platoon Ratio	1.00	1.00	1.00	1.00				
Upstream Filter(I)	1.00	1.00	1.00	1.00				
Uniform Delay (d), s/veh	7.9	8.3	10.3	0.2				
Incr Delay (d2), s/veh	0.3	1.3	3.8	0.1				
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0				
%ile BackOfQ(50%),veh/ln	1.1	1.8	5.4	0.4				
LnGrp Delay(d),s/veh	8.2	9.6	14.0	0.4				
LnGrp LOS	A	A	B	A				
Approach Vol, veh/h	503			1640				
Approach Delay, s/veh	8.8			9.0				
Approach LOS	A			A				
Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4				8
Phs Duration (G+Y+Rc), s			20.0	20.0				40.0
Change Period (Y+Rc), s			4.0	4.0				4.0
Max Green Setting (Gmax), s			16.0	16.0				36.0
Max Q Clear Time (g_c+I1), s			12.3	5.5				2.8
Green Ext Time (p_c), s			1.6	1.9				4.7
Intersection Summary								
HCM 2010 Ctrl Delay			8.9					
HCM 2010 LOS			A					

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/08/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↖	↑↑	↖	↗		
Traffic Volume (veh/h)	466	79	980	1434	79	1		
Future Volume (veh/h)	466	79	980	1434	79	1		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	507	86	1065	1559	86	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	871	390	1112	2232	437	390		
Arrive On Green	0.25	0.25	0.32	0.63	0.25	0.00		
Sat Flow, veh/h	3632	1583	3442	3632	1774	1583		
Grp Volume(v), veh/h	507	86	1065	1559	86	0		
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1770	1774	1583		
Q Serve(g_s), s	8.2	2.8	19.7	18.9	2.5	0.0		
Cycle Q Clear(g_c), s	8.2	2.8	19.7	18.9	2.5	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	871	390	1112	2232	437	390		
V/C Ratio(X)	0.58	0.22	0.96	0.70	0.20	0.00		
Avail Cap(c_a), veh/h	871	390	1112	2232	437	390		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	21.6	19.5	21.6	7.9	19.4	0.0		
Incr Delay (d2), s/veh	2.8	1.3	18.6	1.8	1.0	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	4.4	1.4	12.2	9.7	1.3	0.0		
LnGrp Delay(d),s/veh	24.4	20.8	40.1	9.8	20.4	0.0		
LnGrp LOS	C	C	D	A	C			
Approach Vol, veh/h	593			2624	86			
Approach Delay, s/veh	23.9			22.1	20.4			
Approach LOS	C			C	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	25.0	20.0				45.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	21.0	16.0				41.0
Max Q Clear Time (g_c+I1), s		4.5	21.7	10.2				20.9
Green Ext Time (p_c), s		0.1	0.0	1.8				12.2
Intersection Summary								
HCM 2010 Ctrl Delay			22.4					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary

51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/08/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	502	6	183	871	718	17	0	219	90	71	82
Future Volume (veh/h)	0	502	6	183	871	718	17	0	219	90	71	82
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	1863	1863	0	1863	1863	1863	1863
Adj Flow Rate, veh/h	0	546	7	199	947	0	18	0	238	88	92	89
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1101	14	273	1906	853	0	0	0	546	573	487
Arrive On Green	0.00	0.31	0.31	0.15	0.54	0.00	0.00	0.00	0.00	0.31	0.31	0.31
Sat Flow, veh/h	0	3672	46	1774	3539	1583		0		1774	1863	1583
Grp Volume(v), veh/h	0	270	283	199	947	0		0.0		88	92	89
Grp Sat Flow(s),veh/h/ln	0	1770	1855	1774	1770	1583				1774	1863	1583
Q Serve(g_s), s	0.0	6.5	6.5	5.6	8.8	0.0				1.9	1.9	2.1
Cycle Q Clear(g_c), s	0.0	6.5	6.5	5.6	8.8	0.0				1.9	1.9	2.1
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	544	571	273	1906	853				546	573	487
V/C Ratio(X)	0.00	0.50	0.50	0.73	0.50	0.00				0.16	0.16	0.18
Avail Cap(c_a), veh/h	0	544	571	273	1906	853				546	573	487
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	14.7	14.7	21.0	7.6	0.0				13.1	13.1	13.2
Incr Delay (d2), s/veh	0.0	3.2	3.1	15.7	0.9	0.0				0.6	0.6	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.6	3.8	3.9	4.5	0.0				1.0	1.0	1.1
LnGrp Delay(d),s/veh	0.0	17.9	17.8	36.7	8.5	0.0				13.7	13.7	14.0
LnGrp LOS		B	B	D	A					B	B	B
Approach Vol, veh/h		553			1146						269	
Approach Delay, s/veh		17.8			13.4						13.8	
Approach LOS		B			B						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			12.0	20.0		20.0		32.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			8.0	16.0		16.0		28.0				
Max Q Clear Time (g_c+I1), s			7.6	8.5		4.1		10.8				
Green Ext Time (p_c), s			0.0	2.0		0.8		6.4				
Intersection Summary												
HCM 2010 Ctrl Delay			14.7									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/25/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	325	393	13	22	517	506	24	29	48	197	5	80
Future Volume (veh/h)	325	393	13	22	517	506	24	29	48	197	5	80
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	353	427	14	24	562	550	26	32	52	153	90	87
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	355	1180	39	111	708	633	163	201	317	355	174	169
Arrive On Green	0.20	0.34	0.34	0.06	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1774	3498	114	1774	3539	1583	817	1005	1583	1774	872	843
Grp Volume(v), veh/h	353	216	225	24	562	550	58	0	52	153	0	177
Grp Sat Flow(s),veh/h/ln	1774	1770	1843	1774	1770	1583	1822	0	1583	1774	0	1714
Q Serve(g_s), s	15.9	7.4	7.4	1.0	12.1	16.0	2.1	0.0	2.2	6.0	0.0	7.4
Cycle Q Clear(g_c), s	15.9	7.4	7.4	1.0	12.1	16.0	2.1	0.0	2.2	6.0	0.0	7.4
Prop In Lane	1.00		0.06	1.00		1.00	0.45		1.00	1.00		0.49
Lane Grp Cap(c), veh/h	355	597	622	111	708	633	364	0	317	355	0	343
V/C Ratio(X)	0.99	0.36	0.36	0.22	0.79	0.87	0.16	0.00	0.16	0.43	0.00	0.52
Avail Cap(c_a), veh/h	355	597	622	111	708	633	364	0	317	355	0	343
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.0	20.0	20.0	35.6	30.4	19.2	26.4	0.0	26.5	28.0	0.0	28.5
Incr Delay (d2), s/veh	46.5	1.7	1.6	4.4	8.9	15.0	0.9	0.0	1.1	3.8	0.0	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.3	3.9	4.0	0.6	6.7	14.7	1.2	0.0	1.1	3.3	0.0	4.0
LnGrp Delay(d),s/veh	78.5	21.7	21.6	40.1	39.4	34.2	27.4	0.0	27.6	31.8	0.0	34.0
LnGrp LOS	E	C	C	D	D	C	C		C	C		C
Approach Vol, veh/h		794			1136			110			330	
Approach Delay, s/veh		46.9			36.9			27.5			33.0	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	9.0	31.0		20.0	20.0	20.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	5.0	27.0		16.0	16.0	16.0				
Max Q Clear Time (g_c+I1), s		4.2	3.0	9.4		9.4	17.9	18.0				
Green Ext Time (p_c), s		0.3	0.0	2.4		0.8	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				39.3								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/08/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	86	378	143	43	748	257	127	74	41	316	155	223
Future Volume (veh/h)	86	378	143	43	748	257	127	74	41	316	155	223
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	93	411	155	47	813	279	109	121	45	256	290	242
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	101	613	229	101	860	385	431	452	385	405	426	362
Arrive On Green	0.06	0.24	0.24	0.06	0.24	0.24	0.24	0.24	0.24	0.23	0.23	0.23
Sat Flow, veh/h	1774	2525	942	1774	3539	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	93	287	279	47	813	279	109	121	45	256	290	242
Grp Sat Flow(s),veh/h/ln	1774	1770	1697	1774	1770	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	3.7	10.2	10.4	1.8	15.8	11.3	3.5	3.7	1.6	9.1	10.0	9.7
Cycle Q Clear(g_c), s	3.7	10.2	10.4	1.8	15.8	11.3	3.5	3.7	1.6	9.1	10.0	9.7
Prop In Lane	1.00		0.56	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	101	430	412	101	860	385	431	452	385	405	426	362
V/C Ratio(X)	0.92	0.67	0.68	0.46	0.95	0.73	0.25	0.27	0.12	0.63	0.68	0.67
Avail Cap(c_a), veh/h	101	430	412	101	860	385	431	452	385	405	426	362
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.8	23.9	24.0	32.0	26.0	24.4	21.4	21.5	20.7	24.3	24.7	24.6
Incr Delay (d2), s/veh	69.0	8.0	8.7	14.5	20.1	11.3	1.4	1.4	0.6	7.3	8.5	9.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	6.0	5.9	1.3	10.1	6.2	1.9	2.1	0.7	5.2	6.1	5.2
LnGrp Delay(d),s/veh	101.9	31.9	32.7	46.4	46.1	35.7	22.8	22.9	21.3	31.6	33.2	34.0
LnGrp LOS	F	C	C	D	D	D	C	C	C	C	C	C
Approach Vol, veh/h		659			1139			275			788	
Approach Delay, s/veh		42.1			43.6			22.6			32.9	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.0	8.0	21.0		20.0	8.0	21.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	4.0	17.0		16.0	4.0	17.0				
Max Q Clear Time (g_c+I1), s		5.7	3.8	12.4		12.0	5.7	17.8				
Green Ext Time (p_c), s		0.8	0.0	1.4		1.4	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			38.3									
HCM 2010 LOS			D									
Notes												

Intersection

Intersection Delay, s/veh	9.2
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	43	93	13	62	70	165	3	84	22	0	0	0
Future Vol, veh/h	43	93	13	62	70	165	3	84	22	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	47	101	14	67	76	179	3	91	24	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.8	9.5	8.8
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	3%	29%	21%
Vol Thru, %	77%	62%	24%
Vol Right, %	20%	9%	56%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	109	149	297
LT Vol	3	43	62
Through Vol	84	93	70
RT Vol	22	13	165
Lane Flow Rate	118	162	323
Geometry Grp	1	1	1
Degree of Util (X)	0.16	0.205	0.369
Departure Headway (Hd)	4.852	4.559	4.119
Convergence, Y/N	Yes	Yes	Yes
Cap	738	787	875
Service Time	2.887	2.588	2.141
HCM Lane V/C Ratio	0.16	0.206	0.369
HCM Control Delay	8.8	8.8	9.5
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	0.8	1.7

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	258	103	163	362	295	1429	180	29	136	103	57	74
Future Volume (vph)	258	103	163	362	295	1429	180	29	136	103	57	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3030	1441		1786	1583		1805	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3030	1441		1786	1583		1805	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	280	112	177	393	321	1553	196	32	148	112	62	80
RTOR Reduction (vph)	0	0	150	0	500	573	0	0	114	0	0	65
Lane Group Flow (vph)	280	112	27	393	598	203	0	228	34	0	174	15
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.0	13.3	13.3	17.0	19.9	19.9		20.2	20.2		16.0	16.0
Effective Green, g (s)	14.0	13.3	13.3	17.0	19.9	19.9		20.2	20.2		16.0	16.0
Actuated g/C Ratio	0.16	0.15	0.15	0.19	0.23	0.23		0.23	0.23		0.18	0.18
Clearance Time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	283	283	241	344	690	328		413	366		330	290
v/s Ratio Prot	0.16	0.06		c0.22	c0.20			c0.13			c0.10	
v/s Ratio Perm			0.02			0.14			0.02			0.01
v/c Ratio	0.99	0.40	0.11	1.14	0.87	0.62		0.55	0.09		0.53	0.05
Uniform Delay, d1	36.6	33.4	31.9	35.1	32.4	30.3		29.6	26.4		32.2	29.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	50.0	0.3	0.1	93.0	10.7	2.4		5.2	0.5		5.9	0.3
Delay (s)	86.6	33.7	32.0	128.2	43.1	32.7		34.8	26.9		38.2	29.7
Level of Service	F	C	C	F	D	C		C	C		D	C
Approach Delay (s)		59.2			54.3			31.7			35.5	
Approach LOS		E			D			C			D	
Intersection Summary												
HCM 2000 Control Delay			51.3				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			87.3				Sum of lost time (s)		20.8			
Intersection Capacity Utilization			96.1%				ICU Level of Service		F			
Analysis Period (min)			15									
c Critical Lane Group												

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection		Coast Highway - SR-76 Ramps		
Agency or Co.	IBI Group				E/W Street Name		SR-76 Ramps		
Date Performed	05/23/2016				N/S Street Name		Coast Highway		
Analysis Year	2013				Analysis Time Period (hrs)		0.25		
Time Period	PM Peak Hour				Peak Hour Factor		0.92		
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment				LTR	LT		T					LT	L		TR	
Volume (V), veh/h	0	0	0	5	0	526	0	205	0	5	280	536	0	353	359	2
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	0	0	6	0	583	0	223	0	6	310	594	0	391	398	2
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (sec)		5.1929		4.2929	4.1129			4.1129		4.2929	4.1129		
Follow-Up Headway (sec)		3.1858		3.1858	3.1858			3.1858		3.1858	3.1858		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (Ve), pc/h		6		0	583	223		316	594	391	400		
Entry Volume veh/h		6		0	572	223		310	582	383	392		
Circulating Flow (Vc), pc/h	1372			316			391			589			
Exiting Flow (Vex), pc/h	391			8			310			987			
Capacity (cPCE), pc/h		287		892	906			859		726	748		
Capacity (c), veh/h		281		874	888			843		712	734		
v/c Ratio (X)		0.02		0.00	0.64			0.37		0.54	0.53		

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		13.2		4.1	14.3	0.0		8.6	0.0	13.5	13.1	
Lane LOS		B		A	B	A		A	A	B	B	
95% Queue		0.1		0.0	4.8			1.7		3.2	3.2	
Approach Delay, s/veh	13.2			10.3			3.0			13.3		
Approach LOS	B			B			A			B		
Intersection Delay, s/veh / LOS	8.6						A					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	38	26	62	65	100	41	78	65	115	106	25
Future Volume (vph)	1	38	26	62	65	100	41	78	65	115	106	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	41	28	67	71	109	45	85	71	125	115	27
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	70	247	201	267								
Volume Left (vph)	1	67	45	125								
Volume Right (vph)	28	109	71	27								
Hadj (s)	-0.20	-0.18	-0.13	0.07								
Departure Headway (s)	5.3	5.0	5.0	5.1								
Degree Utilization, x	0.10	0.35	0.28	0.38								
Capacity (veh/h)	592	658	668	662								
Control Delay (s)	8.9	10.7	9.9	11.2								
Approach Delay (s)	8.9	10.7	9.9	11.2								
Approach LOS	A	B	A	B								
Intersection Summary												
Delay				10.5								
Level of Service				B								
Intersection Capacity Utilization				52.2%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

2/24/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↪		↩↪		↩	↪		↩	↪	↩↪
Traffic Volume (vph)	162	50	68	11	44	27	48	554	17	43	560	117
Future Volume (vph)	162	50	68	11	44	27	48	554	17	43	560	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	2.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1794	1583		1769		1770	1855		1770	1863	1583
Flt Permitted		0.76	1.00		0.96		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1419	1583		1717		1770	1855		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	176	54	74	12	48	29	52	602	18	47	609	127
RTOR Reduction (vph)	0	0	53	0	21	0	0	1	0	0	0	58
Lane Group Flow (vph)	0	230	21	0	68	0	52	619	0	47	609	69
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Actuated Green, G (s)		19.0	19.0		19.0		5.7	27.7		10.1	36.9	36.9
Effective Green, g (s)		19.0	19.0		19.0		5.7	27.7		10.1	36.9	36.9
Actuated g/C Ratio		0.28	0.28		0.28		0.08	0.41		0.15	0.55	0.55
Clearance Time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	2.0
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		3.0	7.0	7.0
Lane Grp Cap (vph)		398	444		482		149	760		264	1016	864
v/s Ratio Prot							c0.03	c0.33		0.03	c0.33	
v/s Ratio Perm		c0.16	0.01		0.04							0.04
v/c Ratio		0.58	0.05		0.14		0.35	0.81		0.18	0.60	0.08
Uniform Delay, d1		20.9	17.7		18.2		29.2	17.7		25.1	10.4	7.3
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		4.8	0.2		0.5		1.4	6.7		0.3	2.1	0.1
Delay (s)		25.7	17.9		18.7		30.6	24.4		25.4	12.5	7.4
Level of Service		C	B		B		C	C		C	B	A
Approach Delay (s)		23.8			18.7			24.8			12.4	
Approach LOS		C			B			C			B	
Intersection Summary												
HCM 2000 Control Delay			19.1									
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			67.6									
Intersection Capacity Utilization			65.0%									
Analysis Period (min)			15									
c Critical Lane Group												

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Civic Center Drive			
Agency or Co.	IBI Group				E/W Street Name	Civic Center Drive			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	26	29	23	0	29	34	65	0	19	548	53	0	36	572	22
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	29	32	26	0	32	38	72	0	21	608	59	0	40	634	24
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		87			142			688			698	
Entry Volume veh/h		85			139			675			684	
Circulating Flow (Vc), pc/h	706			658			101			91		
Exiting Flow (Vex), pc/h	131			83			709			692		
Capacity (cPCE), pc/h		558			585			1021			1032	
Capacity (c), veh/h		547			574			1001			1011	
v/c Ratio (X)		0.16			0.24			0.67			0.68	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		8.6			9.5			14.0			14.0	
Lane LOS		A			A			B			B	
95% Queue		0.5			0.9			5.5			5.5	
Approach Delay, s/veh	8.6			9.5			14.0			14.0		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh / LOS	13.3						B					

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	7/12/2016
Analysis Year	2016
Time Period	PM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Pier View Way
E/W Street Name	Pier View Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	38	30	42	0	18	30	51	0	32	531	42	0	23	531	72
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	42	33	47	0	20	33	57	0	35	589	47	0	26	589	80
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		122			110			671			695	
Entry Volume veh/h		120			108			658			681	
Circulating Flow (Vc), pc/h	635			666			101			88		
Exiting Flow (Vex), pc/h	106			148			688			656		
Capacity (cPCE), pc/h		599			581			1021			1035	
Capacity (c), veh/h		587			569			1001			1015	
v/c Ratio (X)		0.20			0.19			0.66			0.67	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		8.7			8.7			13.5			13.8	
Lane LOS		A			A			B			B	
95% Queue		0.8			0.7			5.1			5.4	
Approach Delay, s/veh	8.7			8.7			13.5			13.8		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh / LOS	12.9						B					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

11/17/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	32	13	116	107	13	18	40	250	50	18	225	10
Future Volume (vph)	32	13	116	107	13	18	40	250	50	18	225	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	14	126	116	14	20	43	272	54	20	245	11
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	49	126	150	179	190	143	134					
Volume Left (vph)	35	0	116	43	0	20	0					
Volume Right (vph)	0	126	20	0	54	0	11					
Hadj (s)	0.39	-0.67	0.11	0.15	-0.16	0.10	-0.02					
Departure Headway (s)	6.8	5.8	6.5	6.1	5.7	6.1	6.0					
Degree Utilization, x	0.09	0.20	0.27	0.30	0.30	0.24	0.22					
Capacity (veh/h)	485	571	515	570	600	555	568					
Control Delay (s)	9.3	9.0	11.9	10.5	10.0	9.9	9.5					
Approach Delay (s)	9.1		11.9	10.2		9.7						
Approach LOS	A		B	B		A						
Intersection Summary												
Delay			10.1									
Level of Service			B									
Intersection Capacity Utilization			41.1%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	181	81	106	126	59	124
Future Volume (vph)	181	81	106	126	59	124
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	197	88	115	137	64	135
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	197	88	252	199		
Volume Left (vph)	197	0	0	64		
Volume Right (vph)	0	88	137	0		
Hadj (s)	0.53	-0.67	-0.29	0.10		
Departure Headway (s)	6.1	4.9	4.7	5.1		
Degree Utilization, x	0.34	0.12	0.33	0.28		
Capacity (veh/h)	555	684	732	665		
Control Delay (s)	11.0	7.4	9.9	10.1		
Approach Delay (s)	9.9		9.9	10.1		
Approach LOS	A		A	B		
Intersection Summary						
Delay			10.0			
Level of Service			A			
Intersection Capacity Utilization			43.1%	ICU Level of Service	A	
Analysis Period (min)			15			

Existing Year 2013 No Project

Level Of Service Computation Report
2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #9 Cleveland Street and Mission Avenue

Cycle (sec): 100 Critical Vol./Cap.(X): 0.292
Loss Time (sec): 0 Average Delay (sec/veh): 10.6
Optimal Cycle: 0 Level Of Service: B

Street Name:	Cleveland Street						Mission Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1	0	0	1	0	1	0	1	1	0	1

Volume Module:	Cleveland Street NB			Cleveland Street SB			Mission Avenue EB			Mission Avenue WB		
Base Vol:	43	38	58	72	29	59	28	224	33	93	204	63
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	43	38	58	72	29	59	28	224	33	93	204	63
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	43	38	58	72	29	59	28	224	33	93	204	63
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	43	38	58	72	29	59	28	224	33	93	204	63
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	43	38	58	72	29	59	28	224	33	93	204	63

Saturation Flow Module:	Cleveland Street NB			Cleveland Street SB			Mission Avenue EB			Mission Avenue WB		
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.53	0.47	1.00	0.45	0.18	0.37	1.00	1.74	0.26	1.00	1.53	0.47
Final Sat.:	268	237	584	247	99	202	504	961	144	519	872	279

Capacity Analysis Module:	Cleveland Street NB			Cleveland Street SB			Mission Avenue EB			Mission Avenue WB		
Vol/Sat:	0.16	0.16	0.10	0.29	0.29	0.29	0.06	0.23	0.23	0.18	0.23	0.23
Crit Moves:	****			****			****			****		
Delay/Veh:	10.6	10.6	9.0	11.6	11.6	11.6	9.9	10.7	10.5	10.7	10.5	10.1
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	10.6	10.6	9.0	11.6	11.6	11.6	9.9	10.7	10.5	10.7	10.5	10.1
LOS by Move:	B	B	A	B	B	B	A	B	B	B	B	B
ApproachDel:	9.9			11.6			10.6			10.5		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	9.9			11.6			10.6			10.5		
LOS by Appr:	A			B			B			B		
AllWayAvgQ:	0.2	0.2	0.1	0.4	0.4	0.4	0.1	0.3	0.3	0.2	0.3	0.3

Note: Queue reported is the number of cars per lane.

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	0	65	137	380	121	53	507	0	0	426	61
Future Volume (vph)	43	0	65	137	380	121	53	507	0	0	426	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00		1.00	1.00	0.95		1.00	1.00			0.95	0.95
Frpb, ped/bikes	1.00		0.96	1.00	0.99		1.00	1.00			1.00	0.97
Flpb, ped/bikes	0.99		1.00	0.98	1.00		1.00	1.00			1.00	1.00
Frt	1.00		0.85	1.00	0.96		1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1756		1522	1737	3381		1770	1863			1765	1461
Flt Permitted	0.42		1.00	0.95	1.00		0.32	1.00			1.00	1.00
Satd. Flow (perm)	779		1522	1737	3381		589	1863			1765	1461
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	0	71	149	413	132	58	551	0	0	463	66
RTOR Reduction (vph)	0	0	41	0	44	0	0	0	0	0	1	31
Lane Group Flow (vph)	47	0	30	149	501	0	58	551	0	0	469	28
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type	Perm		Perm	Perm	NA		Perm	NA			NA	Perm
Protected Phases					8			2			6	
Permitted Phases	4		4	8			2					6
Actuated Green, G (s)	25.5		25.5	25.5	25.5		24.5	24.5			24.5	24.5
Effective Green, g (s)	25.5		25.5	25.5	25.5		24.5	24.5			24.5	24.5
Actuated g/C Ratio	0.42		0.42	0.42	0.42		0.41	0.41			0.41	0.41
Clearance Time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)	331		646	738	1436		240	760			720	596
v/s Ratio Prot					c0.15			c0.30			0.27	
v/s Ratio Perm	0.06		0.02	0.09			0.10					0.02
v/c Ratio	0.14		0.05	0.20	0.35		0.24	0.72			0.65	0.05
Uniform Delay, d1	10.6		10.1	10.8	11.6		11.7	14.9			14.3	10.7
Progression Factor	1.00		1.00	1.00	1.00		0.20	0.21			1.36	2.11
Incremental Delay, d2	0.9		0.1	0.6	0.7		0.3	1.8			1.8	0.0
Delay (s)	11.5		10.3	11.5	12.3		2.7	4.8			21.4	22.7
Level of Service	B		B	B	B		A	A			C	C
Approach Delay (s)		10.7			12.1			4.6			21.5	
Approach LOS		B			B			A			C	
Intersection Summary												
HCM 2000 Control Delay			12.2				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			67.1%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	351	3	142	638	268	5	44	477	365	51	25
Future Volume (vph)	15	351	3	142	638	268	5	44	477	365	51	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0	4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.86		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.97	
Satd. Flow (prot)	1770	3535		1770	3539	1583	1770	1607		1681	1684	
Flt Permitted	0.28	1.00		0.51	1.00	1.00	0.60	1.00		0.32	0.42	
Satd. Flow (perm)	529	3535		951	3539	1583	1116	1607		575	736	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	382	3	154	693	291	5	48	518	397	55	27
RTOR Reduction (vph)	0	1	0	0	0	197	0	145	0	0	7	0
Lane Group Flow (vph)	16	384	0	154	693	94	5	421	0	238	234	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	19.8	19.8		19.4	19.4	19.4	31.0	31.0		31.0	31.0	
Effective Green, g (s)	19.8	19.8		19.4	19.4	19.4	31.0	31.0		31.0	31.0	
Actuated g/C Ratio	0.33	0.33		0.32	0.32	0.32	0.52	0.52		0.52	0.52	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0	4.6	4.6		4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	174	1166		307	1144	511	576	830		297	380	
v/s Ratio Prot		0.11			c0.20			0.26				
v/s Ratio Perm	0.03			0.16		0.06	0.00			c0.41	0.32	
v/c Ratio	0.09	0.33		0.50	0.61	0.18	0.01	0.51		0.80	0.62	
Uniform Delay, d1	13.9	15.1		16.4	17.1	14.6	7.0	9.5		12.0	10.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.2		1.5	1.0	0.2	0.0	2.2		20.0	7.3	
Delay (s)	14.2	15.3		17.9	18.0	14.8	7.1	11.7		31.9	17.6	
Level of Service	B	B		B	B	B	A	B		C	B	
Approach Delay (s)		15.3			17.2			11.7			24.7	
Approach LOS		B			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			17.1									
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			60.0									
Intersection Capacity Utilization			80.6%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

9/1/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↙	
Traffic Volume (veh/h)	177	32	50	126	50	63
Future Volume (Veh/h)	177	32	50	126	50	63
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	192	35	54	137	54	68
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				248		
pX, platoon unblocked						
vC, conflicting volume			227		454	210
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			227		454	210
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		90	92
cM capacity (veh/h)			1341		541	831
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	227	191	122			
Volume Left	0	54	54			
Volume Right	35	0	68			
cSH	1700	1341	671			
Volume to Capacity	0.13	0.04	0.18			
Queue Length 95th (ft)	0	3	16			
Control Delay (s)	0.0	2.4	11.5			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.4	11.5			
Approach LOS			B			
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			37.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr/Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	365	67	0	0	0	58	651	245	113	479	62
Future Volume (vph)	70	365	67	0	0	0	58	651	245	113	479	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2					4.2	4.6	4.6	4.2	4.6	4.6
Lane Util. Factor	1.00	1.00					1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99					1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00					1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98					1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1803					1770	1863	1552	1770	1863	1515
Flt Permitted	0.95	1.00					0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1803					1770	1863	1552	1770	1863	1515
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	397	73	0	0	0	63	708	266	123	521	67
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	94	0	0	40
Lane Group Flow (vph)	76	459	0	0	0	0	63	708	172	123	521	27
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA					Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4					5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	18.0	18.0					4.4	23.7	23.7	5.3	24.6	24.6
Effective Green, g (s)	18.0	18.0					4.4	23.7	23.7	5.3	24.6	24.6
Actuated g/C Ratio	0.30	0.30					0.07	0.39	0.39	0.09	0.41	0.41
Clearance Time (s)	4.2	4.2					4.2	4.6	4.6	4.2	4.6	4.6
Vehicle Extension (s)	3.0	3.0					3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	531	540					129	735	613	156	763	621
v/s Ratio Prot	0.04	c0.25					0.04	c0.38		0.07	c0.28	
v/s Ratio Perm									0.11			0.02
v/c Ratio	0.14	0.85					0.49	0.96	0.28	0.79	0.68	0.04
Uniform Delay, d1	15.4	19.7					26.7	17.7	12.4	26.8	14.5	10.6
Progression Factor	1.00	1.00					0.95	0.85	0.58	0.74	0.53	0.72
Incremental Delay, d2	0.6	15.4					10.9	23.1	1.0	30.4	4.6	0.1
Delay (s)	15.9	35.1					36.3	38.2	8.1	50.4	12.2	7.8
Level of Service	B	D					D	D	A	D	B	A
Approach Delay (s)		32.4			0.0			30.3			18.4	
Approach LOS		C			A			C			B	
Intersection Summary												
HCM 2000 Control Delay		27.1			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.92										
Actuated Cycle Length (s)		60.0			Sum of lost time (s)			13.0				
Intersection Capacity Utilization		75.0%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	677	14	0	0	0	0	8	33	24	18	0
Future Volume (Veh/h)	15	677	14	0	0	0	0	8	33	24	18	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	736	15	0	0	0	0	9	36	26	20	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		255										
pX, platoon unblocked												
vC, conflicting volume	0			751			786	776	376	440	783	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			751			786	776	376	440	783	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	97	94	94	94	100
cM capacity (veh/h)	1622			854			267	324	622	458	321	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	384	383	45	46								
Volume Left	16	0	0	26								
Volume Right	0	15	36	0								
cSH	1622	1700	525	386								
Volume to Capacity	0.01	0.23	0.09	0.12								
Queue Length 95th (ft)	1	0	7	10								
Control Delay (s)	0.4	0.0	12.5	15.6								
Lane LOS	A		B	C								
Approach Delay (s)	0.2		12.5	15.6								
Approach LOS			B	C								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			35.2%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	26	692	16	0	0	0	0	20	34	33	42	0
Future Volume (vph)	26	692	16	0	0	0	0	20	34	33	42	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	752	17	0	0	0	0	22	37	36	46	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	404	393	59	82								
Volume Left (vph)	28	0	0	36								
Volume Right (vph)	0	17	37	0								
Hadj (s)	0.07	0.00	-0.34	0.12								
Departure Headway (s)	5.0	4.9	5.2	5.6								
Degree Utilization, x	0.56	0.54	0.09	0.13								
Capacity (veh/h)	708	724	646	598								
Control Delay (s)	12.9	12.2	8.7	9.5								
Approach Delay (s)	12.5		8.7	9.5								
Approach LOS	B		A	A								
Intersection Summary												
Delay			12.0									
Level of Service			B									
Intersection Capacity Utilization			37.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

9/1/2016

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Sign Control	Yield				Stop			Stop			Stop		
Traffic Volume (vph)	377	405	19	6	0	4	0	7	7	0	0	0	
Future Volume (vph)	377	405	19	6	0	4	0	7	7	0	0	0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	410	440	21	7	0	4	0	8	8	0	0	0	
Direction, Lane #	EB 1	EB 2	WB 1	NB 1									
Volume Total (vph)	410	461	11	16									
Volume Left (vph)	410	0	7	0									
Volume Right (vph)	0	21	4	8									
Hadj (s)	0.53	0.00	-0.06	-0.27									
Departure Headway (s)	5.1	4.6	4.7	5.2									
Degree Utilization, x	0.58	0.58	0.01	0.02									
Capacity (veh/h)	704	785	753	652									
Control Delay (s)	13.7	12.5	7.7	8.3									
Approach Delay (s)	13.1		7.7	8.3									
Approach LOS	B		A	A									
Intersection Summary													
Delay			12.9										
Level of Service			B										
Intersection Capacity Utilization			37.6%	ICU Level of Service			A						
Analysis Period (min)			15										

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	37	0	0	11	16	644	16	8	589	17
Future Volume (Veh/h)	0	0	37	0	0	11	16	644	16	8	589	17
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	40	0	0	12	17	700	17	9	640	18
Pedestrians	7				7						1	
Lane Width (ft)	12.0				12.0						12.0	
Walking Speed (ft/s)	4.0				4.0						4.0	
Percent Blockage	1				1						0	
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			440		
pX, platoon unblocked	0.87	0.87	0.78	0.87	0.87	0.83	0.78				0.83	
vC, conflicting volume	1421	1432	656	1448	1432	716	665				724	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	967	980	422	998	981	556	434				565	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	92	100	100	97	98				99	
cM capacity (veh/h)	190	208	492	171	208	437	877				831	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	40	12	17	717	9	658						
Volume Left	0	0	17	0	9	0						
Volume Right	40	12	0	17	0	18						
cSH	492	437	877	1700	831	1700						
Volume to Capacity	0.08	0.03	0.02	0.42	0.01	0.39						
Queue Length 95th (ft)	7	2	1	0	1	0						
Control Delay (s)	13.0	13.5	9.2	0.0	9.4	0.0						
Lane LOS	B	B	A			A						
Approach Delay (s)	13.0	13.5	0.2			0.1						
Approach LOS	B	B										
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			45.2%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Washington Avenue			
Agency or Co.	IBI Group				E/W Street Name	Washington Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	4	0	20	0	21	5	9	0	13	665	14	0	18	604	17
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	4	0	22	0	23	6	10	0	14	737	16	0	20	670	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		26			39			767			709	
Entry Volume veh/h		25			38			752			695	
Circulating Flow (Vc), pc/h	713			755			24			43		
Exiting Flow (Vex), pc/h	36			39			751			715		
Capacity (cPCE), pc/h		554			531			1103			1082	
Capacity (c), veh/h		543			521			1082			1061	
v/c Ratio (X)		0.05			0.07			0.70			0.65	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.2			7.8			14.0			12.9	
Lane LOS		A			A			B			B	
95% Queue		0.1			0.2			6.0			5.1	
Approach Delay, s/veh	7.2			7.8			14.0			12.9		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh / LOS	13.2						B					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	57	85	49	45	7	58	7	130	36	69	80	3
Future Volume (vph)	57	85	49	45	7	58	7	130	36	69	80	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	62	92	53	49	8	63	8	141	39	75	87	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	207	120	188	165								
Volume Left (vph)	62	49	8	75								
Volume Right (vph)	53	63	39	3								
Hadj (s)	-0.06	-0.20	-0.08	0.11								
Departure Headway (s)	4.9	4.9	4.9	5.1								
Degree Utilization, x	0.28	0.16	0.26	0.23								
Capacity (veh/h)	679	666	684	651								
Control Delay (s)	9.8	8.9	9.5	9.7								
Approach Delay (s)	9.8	8.9	9.5	9.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.5								
Level of Service				A								
Intersection Capacity Utilization				40.1%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	207	20	9	144	24	19	33	31	19	44	9
Future Volume (Veh/h)	8	207	20	9	144	24	19	33	31	19	44	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	225	22	10	157	26	21	36	34	21	48	10
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)	265											
pX, platoon unblocked												
vC, conflicting volume	197			254			486	478	243	510	476	185
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	197			254			486	478	243	510	476	185
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			95	92	96	95	90	99
cM capacity (veh/h)	1360			1303			435	471	791	412	472	847
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	256	193	91	79								
Volume Left	9	10	21	21								
Volume Right	22	26	34	10								
cSH	1360	1303	543	481								
Volume to Capacity	0.01	0.01	0.17	0.16								
Queue Length 95th (ft)	0	1	15	15								
Control Delay (s)	0.3	0.5	13.0	14.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.5	13.0	14.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.0									
Intersection Capacity Utilization			27.4%	ICU Level of Service				A				
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Wisconsin Avenue			
Agency or Co.	IBI Group				E/W Street Name	Wisconsin Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	69	61	123	0	57	49	10	0	108	582	62	0	11	582	34
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	76	68	136	0	63	54	11	0	120	645	69	0	12	645	38
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929		
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858		

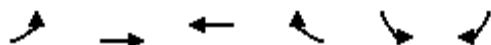
Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (Ve), pc/h		280			128			834			695		
Entry Volume veh/h		275			125			818			681		
Circulating Flow (Vc), pc/h	720			841			156			237			
Exiting Flow (Vex), pc/h	149			212			732			844			
Capacity (cPCE), pc/h		550			487			967			892		
Capacity (c), veh/h		539			478			948			874		
v/c Ratio (X)		0.51			0.26			0.86			0.78		

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		15.9			11.5			26.5			20.9	
Lane LOS		C			B			D			C	
95% Queue		2.9			1.0			11.2			8.0	
Approach Delay, s/veh	15.9			11.5			26.5			20.9		
Approach LOS	C			B			D			C		
Intersection Delay, s/veh / LOS	22.0						C					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

9/1/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	125	93	14	21	22
Future Volume (Veh/h)	5	125	93	14	21	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	136	101	15	23	24
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	124				264	118
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	124				264	118
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	97
cM capacity (veh/h)	1453				718	927
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	141	116	47			
Volume Left	5	0	23			
Volume Right	0	15	24			
cSH	1453	1700	811			
Volume to Capacity	0.00	0.07	0.06			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.3	0.0	9.7			
Lane LOS	A		A			
Approach Delay (s)	0.3	0.0	9.7			
Approach LOS			A			
Intersection Summary						
Average Delay		1.6				
Intersection Capacity Utilization		21.0%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	129	2	1	86	18	1	1	2	27	0	19
Future Volume (Veh/h)	14	129	2	1	86	18	1	1	2	27	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	140	2	1	93	20	1	1	2	29	0	21
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	115			142			299	288	141	280	279	107
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	115			142			299	288	141	280	279	107
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	96	100	98
cM capacity (veh/h)	1471			1441			632	614	907	662	621	944
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	157	114	4	50								
Volume Left	15	1	1	29								
Volume Right	2	20	2	21								
cSH	1471	1441	738	757								
Volume to Capacity	0.01	0.00	0.01	0.07								
Queue Length 95th (ft)	1	0	0	5								
Control Delay (s)	0.8	0.1	9.9	10.1								
Lane LOS	A	A	A	B								
Approach Delay (s)	0.8	0.1	9.9	10.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			27.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	79	79	23	57	1	47	1	32	0	1	0
Future Volume (vph)	1	79	79	23	57	1	47	1	32	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	86	86	25	62	1	51	1	35	0	1	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	173	88	87	1								
Volume Left (vph)	1	25	51	0								
Volume Right (vph)	86	1	35	0								
Hadj (s)	-0.26	0.08	-0.09	0.03								
Departure Headway (s)	3.9	4.4	4.4	4.6								
Degree Utilization, x	0.19	0.11	0.11	0.00								
Capacity (veh/h)	890	802	775	723								
Control Delay (s)	7.9	7.9	7.9	7.6								
Approach Delay (s)	7.9	7.9	7.9	7.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.9								
Level of Service				A								
Intersection Capacity Utilization				37.1%	ICU Level of Service		A					
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	43	90	111	63	65	108
Future Volume (vph)	43	90	111	63	65	108
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	98	121	68	71	117
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	145	189	188			
Volume Left (vph)	47	0	71			
Volume Right (vph)	98	68	0			
Hadj (s)	-0.31	-0.18	0.11			
Departure Headway (s)	4.4	4.3	4.6			
Degree Utilization, x	0.18	0.22	0.24			
Capacity (veh/h)	747	805	753			
Control Delay (s)	8.4	8.5	9.0			
Approach Delay (s)	8.4	8.5	9.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.7			
Level of Service			A			
Intersection Capacity Utilization			36.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	201	18	19	166	42	25	31	37	46	19	12
Future Volume (Veh/h)	8	201	18	19	166	42	25	31	37	46	19	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	218	20	21	180	46	27	34	40	50	21	13
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)	253											
pX, platoon unblocked	0.92						0.92	0.92		0.92	0.92	0.92
vC, conflicting volume	229			249			530	528	247	559	515	210
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	117			249			444	442	247	476	428	96
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			94	92	95	87	95	99
cM capacity (veh/h)	1349			1305			441	452	779	396	461	877
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	247	247	101	84								
Volume Left	9	21	27	50								
Volume Right	20	46	40	13								
cSH	1349	1305	538	450								
Volume to Capacity	0.01	0.02	0.19	0.19								
Queue Length 95th (ft)	1	1	17	17								
Control Delay (s)	0.3	0.8	13.2	14.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.8	13.2	14.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.2									
Intersection Capacity Utilization			35.5%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

2/24/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩	↩	↩	↩	↩	↩	↩	↩	↩	↩
Traffic Volume (vph)	40	160	60	263	155	235	63	618	169	242	525	21
Future Volume (vph)	40	160	60	263	155	235	63	618	169	242	525	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.97	1.00	1.00	0.93	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.99	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1844	1532	1681	1746	1478	1770	3412		1770	1847	
Flt Permitted		0.99	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1844	1532	1681	1746	1478	1770	3412		1770	1847	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	174	65	286	168	255	68	672	184	263	571	23
RTOR Reduction (vph)	0	0	55	0	0	210	0	27	0	0	2	0
Lane Group Flow (vph)	0	217	10	223	231	45	68	829	0	263	592	0
Confl. Peds. (#/hr)	14		10	10		14			3			15
Confl. Bikes (#/hr)			4			5			3			3
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		14.4	14.4	15.9	15.9	15.9	5.8	25.2		15.7	35.1	
Effective Green, g (s)		14.4	14.4	15.9	15.9	15.9	5.8	25.2		15.7	35.1	
Actuated g/C Ratio		0.16	0.16	0.18	0.18	0.18	0.06	0.28		0.17	0.39	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)		295	245	296	308	261	114	955		308	720	
v/s Ratio Prot		c0.12		c0.13	0.13		0.04	0.24		c0.15	c0.32	
v/s Ratio Perm			0.01			0.03						
v/c Ratio		0.74	0.04	0.75	0.75	0.17	0.60	0.87		0.85	0.82	
Uniform Delay, d1		36.0	32.0	35.2	35.2	31.5	41.0	30.8		36.0	24.7	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		8.0	0.0	10.7	10.1	0.4	5.5	10.6		19.3	10.3	
Delay (s)		43.9	32.0	45.9	45.3	31.8	46.4	41.4		55.3	34.9	
Level of Service		D	C	D	D	C	D	D		E	C	
Approach Delay (s)		41.2			40.6			41.8			41.2	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			41.2									
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			90.0									
Intersection Capacity Utilization			75.9%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	513	6	22	570	63	9	10	57	118	8	30
Future Volume (vph)	15	513	6	22	570	63	9	10	57	118	8	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.96	1.00
Satd. Flow (prot)	1770	3531		1764	3482			3091			1779	1544
Flt Permitted	0.39	1.00		0.44	1.00			0.90			0.73	1.00
Satd. Flow (perm)	727	3531		817	3482			2802			1359	1544
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	558	7	24	620	68	10	11	62	128	9	33
RTOR Reduction (vph)	0	2	0	0	13	0	0	50	0	0	0	27
Lane Group Flow (vph)	16	563	0	24	675	0	0	33	0	0	137	6
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	13.1	13.1		13.1	13.1			5.3			5.3	5.3
Effective Green, g (s)	13.1	13.1		13.1	13.1			5.3			5.3	5.3
Actuated g/C Ratio	0.47	0.47		0.47	0.47			0.19			0.19	0.19
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	341	1657		383	1634			532			258	293
v/s Ratio Prot		0.16			c0.19							
v/s Ratio Perm	0.02			0.03				0.01			c0.10	0.00
v/c Ratio	0.05	0.34		0.06	0.41			0.06			0.53	0.02
Uniform Delay, d1	4.0	4.7		4.0	4.9			9.3			10.2	9.2
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.1	0.1		0.1	0.2			0.1			2.7	0.0
Delay (s)	4.1	4.8		4.1	5.0			9.3			12.8	9.2
Level of Service	A	A		A	A			A			B	A
Approach Delay (s)		4.8			5.0			9.3			12.1	
Approach LOS		A			A			A			B	
Intersection Summary												
HCM 2000 Control Delay		5.9			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.45										
Actuated Cycle Length (s)		27.9			Sum of lost time (s)			9.5				
Intersection Capacity Utilization		52.6%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	33	10	12	24	10	80	16	653	44	102	680	15
Future Volume (vph)	33	10	12	24	10	80	16	653	44	102	680	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.97			0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1743			1797	1555	1770	3500		1770	3526	
Flt Permitted		0.79			0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1427			1401	1555	1770	3500		1770	3526	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	11	13	26	11	87	17	710	48	111	739	16
RTOR Reduction (vph)	0	11	0	0	0	76	0	6	0	0	2	0
Lane Group Flow (vph)	0	49	0	0	37	11	17	752	0	111	753	0
Confl. Peds. (#/hr)	10		4	4		10			3			4
Confl. Bikes (#/hr)			1						2			3
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1		6
Permitted Phases	4			8		8						
Actuated Green, G (s)		5.5			5.5	5.5	0.6	18.6		6.4	24.4	
Effective Green, g (s)		5.5			5.5	5.5	0.6	18.6		6.4	24.4	
Actuated g/C Ratio		0.12			0.12	0.12	0.01	0.42		0.14	0.55	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		177			174	193	24	1472		256	1946	
v/s Ratio Prot							0.01	c0.21		c0.06	0.21	
v/s Ratio Perm		c0.03			0.03	0.01						
v/c Ratio		0.27			0.21	0.06	0.71	0.51		0.43	0.39	
Uniform Delay, d1		17.5			17.4	17.1	21.7	9.4		17.2	5.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.2	0.0	65.6	0.3		1.2	0.1	
Delay (s)		17.8			17.6	17.1	87.3	9.7		18.4	5.8	
Level of Service		B			B	B	F	A		B	A	
Approach Delay (s)		17.8			17.3			11.4			7.4	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay		10.1										
HCM 2000 Volume to Capacity ratio		0.45										
Actuated Cycle Length (s)		44.2										
Intersection Capacity Utilization		48.1%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	135	10	11	82	0	22	0	19	0	0	0
Future Volume (Veh/h)	2	135	10	11	82	0	22	0	19	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	147	11	12	89	0	24	0	21	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		252										
pX, platoon unblocked												
vC, conflicting volume	89			158			270	270	152	290	275	89
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			158			270	270	152	290	275	89
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			96	100	98	100	100	100
cM capacity (veh/h)	1506			1422			678	631	894	641	626	969
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	160	101	45	0								
Volume Left	2	12	24	0								
Volume Right	11	0	21	0								
cSH	1506	1422	764	1700								
Volume to Capacity	0.00	0.01	0.06	0.00								
Queue Length 95th (ft)	0	1	5	0								
Control Delay (s)	0.1	1.0	10.0	0.0								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.1	1.0	10.0	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			21.1%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	75	16	0	29	0	16	1	5	0	0	0
Future Volume (Veh/h)	0	75	16	0	29	0	16	1	5	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	82	17	0	32	0	17	1	5	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	643											
pX, platoon unblocked												
vC, conflicting volume	32			99			122	122	90	128	131	32
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	32			99			122	122	90	128	131	32
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	99	100	100	100
cM capacity (veh/h)	1580			1494			852	768	967	840	760	1042
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	99	32	23	0								
Volume Left	0	0	17	0								
Volume Right	17	0	5	0								
cSH	1580	1494	871	1700								
Volume to Capacity	0.00	0.00	0.03	0.00								
Queue Length 95th (ft)	0	0	2	0								
Control Delay (s)	0.0	0.0	9.2	0.0								
Lane LOS			A	A								
Approach Delay (s)	0.0	0.0	9.2	0.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			14.9%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	37	154	11	21	184	11
Future Volume (vph)	37	154	11	21	184	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	167	12	23	200	12
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	207	35	212			
Volume Left (vph)	40	0	200			
Volume Right (vph)	167	23	0			
Hadj (s)	-0.41	-0.36	0.22			
Departure Headway (s)	4.1	4.2	4.6			
Degree Utilization, x	0.23	0.04	0.27			
Capacity (veh/h)	830	791	742			
Control Delay (s)	8.3	7.4	9.3			
Approach Delay (s)	8.3	7.4	9.3			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.7			
Level of Service			A			
Intersection Capacity Utilization			35.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	203	61	9	159	10	83	11	12	3	8	15
Future Volume (Veh/h)	6	203	61	9	159	10	83	11	12	3	8	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	221	66	10	173	11	90	12	13	3	9	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	576											
pX, platoon unblocked												
vC, conflicting volume	184			287			487	472	254	486	500	178
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	184			287			487	472	254	486	500	178
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			81	98	98	99	98	98
cM capacity (veh/h)	1391			1275			470	484	785	470	467	864
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	294	194	115	28								
Volume Left	7	10	90	3								
Volume Right	66	11	13	16								
cSH	1391	1275	494	634								
Volume to Capacity	0.01	0.01	0.23	0.04								
Queue Length 95th (ft)	0	1	22	3								
Control Delay (s)	0.2	0.5	14.5	10.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.5	14.5	10.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			35.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	208	5	15	173	26	3	7	14	12	3	3
Future Volume (Veh/h)	3	208	5	15	173	26	3	7	14	12	3	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	226	5	16	188	28	3	8	15	13	3	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	249											
pX, platoon unblocked												
vC, conflicting volume	216			231			473	482	228	488	471	202
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	216			231			473	482	228	488	471	202
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	98	98	97	99	100
cM capacity (veh/h)	1354			1337			492	477	811	470	484	839
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	234	232	26	19								
Volume Left	3	16	3	13								
Volume Right	5	28	15	3								
cSH	1354	1337	628	508								
Volume to Capacity	0.00	0.01	0.04	0.04								
Queue Length 95th (ft)	0	1	3	3								
Control Delay (s)	0.1	0.6	11.0	12.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.6	11.0	12.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			30.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	118	106	51	68	23	117	696	74	92	552	41
Future Volume (vph)	53	118	106	51	68	23	117	696	74	92	552	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			5.0			4.2		5.0		
Lane Util. Factor		1.00			1.00			1.00		0.95		
Frt		0.95			0.98			1.00		0.99		
Flt Protected		0.99			0.98			0.95		1.00		
Satd. Flow (prot)		1750			1790			1770		3488		
Flt Permitted		0.91			0.78			0.95		1.00		
Satd. Flow (perm)		1605			1422			1770		3488		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	128	115	55	74	25	127	757	80	100	600	45
RTOR Reduction (vph)	0	28	0	0	9	0	0	12	0	0	7	0
Lane Group Flow (vph)	0	273	0	0	145	0	127	825	0	100	638	0
Turn Type	Perm	NA		Perm		NA		Prot		NA		
Protected Phases		4			8			5		2		
Permitted Phases	4				8						6	
Actuated Green, G (s)		14.4			14.0			7.0		28.2		
Effective Green, g (s)		14.4			14.0			7.0		28.2		
Actuated g/C Ratio		0.28			0.27			0.13		0.54		
Clearance Time (s)		4.6			5.0			4.2		5.0		
Vehicle Extension (s)		3.0			3.5			2.0		3.0		
Lane Grp Cap (vph)		442			381			237		1884		
v/s Ratio Prot								0.07		c0.24		
v/s Ratio Perm		c0.17			0.10						0.16	
v/c Ratio		0.62			0.38			0.54		0.44		
Uniform Delay, d1		16.5			15.6			21.1		7.2		
Progression Factor		1.00			1.00			1.00		1.00		
Incremental Delay, d2		2.6			0.8			1.2		0.2		
Delay (s)		19.1			16.3			22.3		7.4		
Level of Service		B			B			C		A		
Approach Delay (s)		19.1			16.3			9.3			15.2	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			13.2		HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			52.2		Sum of lost time (s)				14.2			
Intersection Capacity Utilization			59.5%		ICU Level of Service				B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	260	13	13	117	5	15	18	6	8	7	9
Future Volume (Veh/h)	9	260	13	13	117	5	15	18	6	8	7	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	283	14	14	127	5	16	20	7	9	8	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		280										
pX, platoon unblocked				0.99			0.99	0.99	0.99	0.99	0.99	
vC, conflicting volume	132			297			482	470	290	484	474	130
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	132			289			475	463	282	478	468	130
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	96	99	98	98	99
cM capacity (veh/h)	1453			1264			479	484	752	468	481	920
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	307	146	43	27								
Volume Left	10	14	16	9								
Volume Right	14	5	7	10								
cSH	1453	1264	511	578								
Volume to Capacity	0.01	0.01	0.08	0.05								
Queue Length 95th (ft)	1	1	7	4								
Control Delay (s)	0.3	0.8	12.7	11.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.8	12.7	11.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			26.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	251	9	11	119	3	12	23	11	4	10	6
Future Volume (vph)	9	251	9	11	119	3	12	23	11	4	10	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	273	10	12	129	3	13	25	12	4	11	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	293	144	50	22								
Volume Left (vph)	10	12	13	4								
Volume Right (vph)	10	3	12	7								
Hadj (s)	0.02	0.04	-0.06	-0.12								
Departure Headway (s)	4.3	4.4	4.8	4.8								
Degree Utilization, x	0.35	0.18	0.07	0.03								
Capacity (veh/h)	828	781	677	670								
Control Delay (s)	9.5	8.4	8.2	8.0								
Approach Delay (s)	9.5	8.4	8.2	8.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.0								
Level of Service				A								
Intersection Capacity Utilization				26.4%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	267	16	68	115	33	16	80	154	63	17	4
Future Volume (vph)	17	267	16	68	115	33	16	80	154	63	17	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	290	17	74	125	36	17	87	167	68	18	4
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	325	235	271	90								
Volume Left (vph)	18	74	17	68								
Volume Right (vph)	17	36	167	4								
Hadj (s)	0.01	0.01	-0.32	0.16								
Departure Headway (s)	5.3	5.5	5.3	6.1								
Degree Utilization, x	0.48	0.36	0.40	0.15								
Capacity (veh/h)	634	610	622	509								
Control Delay (s)	13.2	11.5	11.7	10.2								
Approach Delay (s)	13.2	11.5	11.7	10.2								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay				12.0								
Level of Service				B								
Intersection Capacity Utilization				60.3%	ICU Level of Service		B					
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	5	57	58	4	41	22
Future Volume (vph)	5	57	58	4	41	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	62	63	4	45	24
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	67	67	69			
Volume Left (vph)	5	0	45			
Volume Right (vph)	62	4	0			
Hadj (s)	-0.51	0.00	0.16			
Departure Headway (s)	3.7	4.1	4.3			
Degree Utilization, x	0.07	0.08	0.08			
Capacity (veh/h)	938	851	826			
Control Delay (s)	7.0	7.4	7.6			
Approach Delay (s)	7.0	7.4	7.6			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.3			
Level of Service			A			
Intersection Capacity Utilization			20.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	103	33	203	82	350	37	569	269	293	478	18
Future Volume (vph)	15	103	33	203	82	350	37	569	269	293	478	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1553		1799	1583	1770	3331		1770	3514	
Flt Permitted	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1553		1799	1583	1770	3331		1770	3514	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	112	36	221	89	380	40	618	292	318	520	20
RTOR Reduction (vph)	0	0	33	0	0	313	0	57	0	0	2	0
Lane Group Flow (vph)	16	112	3	0	310	67	40	853	0	318	538	0
Confl. Peds. (#/hr)	7		2	2		7			5			8
Confl. Bikes (#/hr)						2			4			8
Turn Type	Split	NA	Perm	Split	NA	Over	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	6.6	6.6	6.6		17.3	14.0	3.2	22.4		14.0	33.2	
Effective Green, g (s)	6.6	6.6	6.6		17.3	14.0	3.2	22.4		14.0	33.2	
Actuated g/C Ratio	0.08	0.08	0.08		0.22	0.18	0.04	0.28		0.18	0.42	
Clearance Time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	147	154	129		391	279	71	939		312	1469	
v/s Ratio Prot	0.01	c0.06			c0.17	0.04	0.02	c0.26		c0.18	0.15	
v/s Ratio Perm			0.00									
v/c Ratio	0.11	0.73	0.02		0.79	0.24	0.56	0.91		1.02	0.37	
Uniform Delay, d1	33.7	35.5	33.4		29.4	28.1	37.4	27.5		32.7	15.9	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	13.5	0.0		10.5	0.2	6.0	12.3		55.9	0.2	
Delay (s)	33.8	49.0	33.5		39.9	28.3	43.4	39.8		88.6	16.0	
Level of Service	C	D	C		D	C	D	D		F	B	
Approach Delay (s)		44.1			33.5			39.9			42.9	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			39.5									
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			79.4									
Intersection Capacity Utilization			74.7%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	618	6	8	594	28	4	0	8	13	3	30
Future Volume (Veh/h)	5	618	6	8	594	28	4	0	8	13	3	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	672	7	9	646	30	4	0	9	14	3	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh					2							
Upstream signal (ft)		279										
pX, platoon unblocked				0.95			0.95	0.95	0.95	0.95	0.95	
vC, conflicting volume	676			679			1399	1380	676	1374	1368	661
vC1, stage 1 conf vol							686	686		679	679	
vC2, stage 2 conf vol							714	694		694	689	
vCu, unblocked vol	676			637			1394	1373	634	1367	1361	661
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			99	100	98	96	99	93
cM capacity (veh/h)	915			901			297	330	456	314	331	462
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	684	685	13	50								
Volume Left	5	9	4	14								
Volume Right	7	30	9	33								
cSH	915	901	392	400								
Volume to Capacity	0.01	0.01	0.03	0.13								
Queue Length 95th (ft)	0	1	3	11								
Control Delay (s)	0.1	0.3	14.5	15.3								
Lane LOS	A	A	B	C								
Approach Delay (s)	0.1	0.3	14.5	15.3								
Approach LOS			B	C								
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			48.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	730	5	12	718	33	1	1	19	13	1	8
Future Volume (Veh/h)	5	730	5	12	718	33	1	1	19	13	1	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	793	5	13	780	36	1	1	21	14	1	9
Pedestrians		1						1				
Lane Width (ft)		12.0						12.0				
Walking Speed (ft/s)		4.0						4.0				
Percent Blockage		0						0				
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh)		2			2							
Upstream signal (ft)		687										
pX, platoon unblocked				0.99			0.99	0.99	0.99	0.99	0.99	
vC, conflicting volume	816			799			1641	1648	796	1651	1633	799
vC1, stage 1 conf vol							806	806		824	824	
vC2, stage 2 conf vol							834	842		827	809	
vCu, unblocked vol	816			793			1642	1650	790	1652	1634	799
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			100	100	95	94	100	98
cM capacity (veh/h)	812			820			256	278	386	247	278	385
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	803	829	23	24								
Volume Left	5	13	1	14								
Volume Right	5	36	21	9								
cSH	812	820	372	287								
Volume to Capacity	0.01	0.02	0.06	0.08								
Queue Length 95th (ft)	0	1	5	7								
Control Delay (s)	0.2	0.4	15.3	18.7								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.2	0.4	15.3	18.7								
Approach LOS			C	C								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			61.5%	ICU Level of Service					B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	722	0	9	743	205	0	0	5	3	0	11
Future Volume (Veh/h)	8	722	0	9	743	205	0	0	5	3	0	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	785	0	10	808	223	0	0	5	3	0	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLT			TWLT							
Median storage veh		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1031			785			1643	1854	785	1748	1742	920
vC1, stage 1 conf vol							803	803		940	940	
vC2, stage 2 conf vol							840	1051		808	803	
vCu, unblocked vol	1031			785			1643	1854	785	1748	1742	920
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			100	100	99	99	100	96
cM capacity (veh/h)	674			834			253	237	393	237	260	329
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total	794	10	1031	5	15							
Volume Left	9	10	0	0	3							
Volume Right	0	0	223	5	12							
cSH	674	834	1700	393	305							
Volume to Capacity	0.01	0.01	0.61	0.01	0.05							
Queue Length 95th (ft)	1	1	0	1	4							
Control Delay (s)	0.4	9.4	0.0	14.3	17.4							
Lane LOS	A	A		B	C							
Approach Delay (s)	0.4	0.1		14.3	17.4							
Approach LOS				B	C							
Intersection Summary												
Average Delay			0.4									
Intersection Capacity Utilization			Err%		ICU Level of Service				H			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	41	5	0	13	43	721	4	18	578	4
Future Volume (Veh/h)	0	0	41	5	0	13	43	721	4	18	578	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	45	5	0	14	47	784	4	20	628	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage (veh)								2			2	
Upstream signal (ft)											621	
pX, platoon unblocked												
vC, conflicting volume	1170	1552	630	1593	1552	394	632			788		
vC1, stage 1 conf vol	670	670		880	880							
vC2, stage 2 conf vol	500	882		713	672							
vCu, unblocked vol	1170	1552	630	1593	1552	394	632			788		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	89	98	100	98	95			98		
cM capacity (veh/h)	324	273	424	210	273	605	947			827		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	45	19	47	523	265	20	632					
Volume Left	0	5	47	0	0	20	0					
Volume Right	45	14	0	0	4	0	4					
cSH	424	405	947	1700	1700	827	1700					
Volume to Capacity	0.11	0.05	0.05	0.31	0.16	0.02	0.37					
Queue Length 95th (ft)	9	4	4	0	0	2	0					
Control Delay (s)	14.5	14.3	9.0	0.0	0.0	9.5	0.0					
Lane LOS	B	B	A			A						
Approach Delay (s)	14.5	14.3	0.5			0.3						
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			Err%		ICU Level of Service					H		
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection		Coast Hwy - Michigan Avenue		
Agency or Co.	IBI Group				E/W Street Name		Michigan Avenue		
Date Performed	05/23/2016				N/S Street Name		Coast Highway		
Analysis Year	2016				Analysis Time Period (hrs)		0.25		
Time Period	PM Peak Hour				Peak Hour Factor		0.92		
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	122	53	50	0	33	7	16	0	16	690	28	0	12	690	30
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	135	59	55	0	37	8	18	0	18	765	31	0	13	765	33
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929		
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (Ve), pc/h		249			63			814			811		
Entry Volume veh/h		244			62			798			795		
Circulating Flow (Vc), pc/h	815			918			207			63			
Exiting Flow (Vex), pc/h	103			59			918			857			
Capacity (cPCE), pc/h		500			451			919			1061		
Capacity (c), veh/h		490			442			901			1040		
v/c Ratio (X)		0.50			0.14			0.89			0.76		

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		16.9			10.2			30.2			17.5	
Lane LOS		C			B			D			C	
95% Queue		2.7			0.5			12.0			7.8	
Approach Delay, s/veh	16.9			10.2			30.2			17.5		
Approach LOS	C			B			D			C		
Intersection Delay, s/veh / LOS	22.5						C					

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/08/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↖	↑↑				
Traffic Volume (veh/h)	582	209	627	667	0	0		
Future Volume (veh/h)	582	209	627	667	0	0		
Number	4	14	3	8				
Initial Q (Qb), veh	0	0	0	0				
Ped-Bike Adj(A_pbT)		1.00	1.00					
Parking Bus, Adj	1.00	1.00	1.00	1.00				
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863				
Adj Flow Rate, veh/h	633	227	682	725				
Adj No. of Lanes	2	1	2	2				
Peak Hour Factor	0.92	0.92	0.92	0.92				
Percent Heavy Veh, %	2	2	2	2				
Cap, veh/h	1593	712	1205	3185				
Arrive On Green	0.45	0.45	0.35	0.90				
Sat Flow, veh/h	3632	1583	3442	3632				
Grp Volume(v), veh/h	633	227	682	725				
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1770				
Q Serve(g_s), s	4.8	3.7	6.4	1.0				
Cycle Q Clear(g_c), s	4.8	3.7	6.4	1.0				
Prop In Lane		1.00	1.00					
Lane Grp Cap(c), veh/h	1593	712	1205	3185				
V/C Ratio(X)	0.40	0.32	0.57	0.23				
Avail Cap(c_a), veh/h	1593	712	1205	3185				
HCM Platoon Ratio	1.00	1.00	1.00	1.00				
Upstream Filter(I)	1.00	1.00	1.00	1.00				
Uniform Delay (d), s/veh	7.4	7.1	10.5	0.3				
Incr Delay (d2), s/veh	0.7	1.2	1.9	0.2				
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0				
%ile BackOfQ(50%),veh/ln	2.5	1.8	3.4	0.5				
LnGrp Delay(d),s/veh	8.1	8.2	12.5	0.4				
LnGrp LOS	A	A	B	A				
Approach Vol, veh/h	860			1407				
Approach Delay, s/veh	8.1			6.3				
Approach LOS	A			A				
Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4				8
Phs Duration (G+Y+Rc), s			18.0	22.0				40.0
Change Period (Y+Rc), s			4.0	4.0				4.0
Max Green Setting (Gmax), s			14.0	18.0				36.0
Max Q Clear Time (g_c+l1), s			8.4	6.8				3.0
Green Ext Time (p_c), s			1.4	3.9				5.8
Intersection Summary								
HCM 2010 Ctrl Delay			7.0					
HCM 2010 LOS			A					

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/08/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑↑	↑	↑		
Traffic Volume (veh/h)	1267	114	370	964	183	0		
Future Volume (veh/h)	1267	114	370	964	183	0		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	1377	124	402	1048	199	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1416	633	459	2124	473	422		
Arrive On Green	0.40	0.40	0.13	0.60	0.27	0.00		
Sat Flow, veh/h	3632	1583	3442	3632	1774	1583		
Grp Volume(v), veh/h	1377	124	402	1048	199	0		
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1770	1774	1583		
Q Serve(g_s), s	22.9	3.1	6.9	10.1	5.6	0.0		
Cycle Q Clear(g_c), s	22.9	3.1	6.9	10.1	5.6	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1416	633	459	2124	473	422		
V/C Ratio(X)	0.97	0.20	0.88	0.49	0.42	0.00		
Avail Cap(c_a), veh/h	1416	633	459	2124	473	422		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	17.7	11.7	25.5	6.8	18.2	0.0		
Incr Delay (d2), s/veh	18.2	0.7	20.3	0.8	2.7	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	14.7	1.4	4.5	5.0	3.1	0.0		
LnGrp Delay(d),s/veh	35.9	12.4	45.8	7.6	20.9	0.0		
LnGrp LOS	D	B	D	A	C			
Approach Vol, veh/h	1501			1450	199			
Approach Delay, s/veh	34.0			18.2	20.9			
Approach LOS	C			B	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	12.0	28.0				40.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	8.0	24.0				36.0
Max Q Clear Time (g_c+I1), s		7.6	8.9	24.9				12.1
Green Ext Time (p_c), s		0.3	0.0	0.0				8.4
Intersection Summary								
HCM 2010 Ctrl Delay			25.9					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary

51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/08/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1094	10	163	1017	450	8	0	62	323	18	125
Future Volume (veh/h)	0	1094	10	163	1017	450	8	0	62	323	18	125
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	1863	1863	0	1863	1863	1863	1863
Adj Flow Rate, veh/h	0	1189	11	177	1105	0	9	0	67	365	0	136
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1670	15	250	2343	1048	0	0	0	800	0	357
Arrive On Green	0.00	0.46	0.46	0.14	0.66	0.00	0.00	0.00	0.00	0.23	0.00	0.23
Sat Flow, veh/h	0	3686	33	1774	3539	1583		0		3548	0	1583
Grp Volume(v), veh/h	0	586	614	177	1105	0		0.0		365	0	136
Grp Sat Flow(s),veh/h/ln	0	1770	1857	1774	1770	1583				1774	0	1583
Q Serve(g_s), s	0.0	18.8	18.8	6.8	10.9	0.0				6.3	0.0	5.2
Cycle Q Clear(g_c), s	0.0	18.8	18.8	6.8	10.9	0.0				6.3	0.0	5.2
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	822	863	250	2343	1048				800	0	357
V/C Ratio(X)	0.00	0.71	0.71	0.71	0.47	0.00				0.46	0.00	0.38
Avail Cap(c_a), veh/h	0	822	863	250	2343	1048				800	0	357
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	15.2	15.2	29.1	5.9	0.0				23.7	0.0	23.3
Incr Delay (d2), s/veh	0.0	5.2	5.0	15.6	0.7	0.0				1.9	0.0	3.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.3	10.7	4.4	5.4	0.0				3.3	0.0	2.6
LnGrp Delay(d),s/veh	0.0	20.4	20.2	44.7	6.6	0.0				25.6	0.0	26.4
LnGrp LOS		C	C	D	A					C		C
Approach Vol, veh/h		1200			1282						501	
Approach Delay, s/veh		20.3			11.9						25.8	
Approach LOS		C			B						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			14.0	37.0		20.0		51.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			10.0	33.0		16.0		47.0				
Max Q Clear Time (g_c+I1), s			8.8	20.8		8.3		12.9				
Green Ext Time (p_c), s			0.1	6.3		1.2		10.1				
Intersection Summary												
HCM 2010 Ctrl Delay			17.6									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/25/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	252	584	23	69	857	426	21	7	37	417	19	103
Future Volume (veh/h)	252	584	23	69	857	426	21	7	37	417	19	103
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	274	635	25	75	932	463	23	8	40	293	245	112
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	296	1157	46	177	944	721	267	93	317	335	229	105
Arrive On Green	0.17	0.33	0.33	0.13	0.35	0.35	0.20	0.20	0.20	0.19	0.19	0.19
Sat Flow, veh/h	1774	3472	137	1774	3539	1583	1333	464	1583	1774	1211	554
Grp Volume(v), veh/h	274	323	337	75	932	463	31	0	40	293	0	357
Grp Sat Flow(s),veh/h/ln	1774	1770	1839	1774	1770	1583	1796	0	1583	1774	0	1765
Q Serve(g_s), s	13.7	13.4	13.4	3.5	23.5	20.6	1.3	0.0	1.9	14.4	0.0	17.0
Cycle Q Clear(g_c), s	13.7	13.4	13.4	3.5	23.5	20.6	1.3	0.0	1.9	14.4	0.0	17.0
Prop In Lane	1.00		0.07	1.00		1.00	0.74		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	296	590	613	177	944	721	359	0	317	335	0	333
V/C Ratio(X)	0.93	0.55	0.55	0.42	0.99	0.64	0.09	0.00	0.13	0.87	0.00	1.07
Avail Cap(c_a), veh/h	296	590	613	177	944	721	359	0	317	335	0	333
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	37.0	24.5	24.5	36.6	28.9	16.7	29.3	0.0	29.5	35.5	0.0	36.5
Incr Delay (d2), s/veh	36.5	3.6	3.5	7.2	26.4	4.4	0.5	0.0	0.8	25.7	0.0	69.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.7	7.2	7.4	2.1	14.8	12.3	0.7	0.0	0.9	9.5	0.0	14.7
LnGrp Delay(d),s/veh	73.5	28.1	28.0	43.9	55.3	21.0	29.8	0.0	30.4	61.2	0.0	105.9
LnGrp LOS	E	C	C	D	E	C	C		C	E		F
Approach Vol, veh/h		934			1470			71			650	
Approach Delay, s/veh		41.4			43.9			30.1			85.7	
Approach LOS		D			D			C			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		22.0	13.0	34.0		21.0	19.0	28.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		18.0	9.0	30.0		17.0	15.0	24.0				
Max Q Clear Time (g_c+I1), s		3.9	5.5	15.4		19.0	15.7	25.5				
Green Ext Time (p_c), s		0.2	0.0	3.5		0.0	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			51.6									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/08/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	834	139	45	735	259	177	56	72	612	136	449
Future Volume (veh/h)	70	834	139	45	735	259	177	56	72	612	136	449
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	76	907	151	49	799	282	126	153	78	771	0	488
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	118	945	157	79	1022	457	335	352	299	986	0	440
Arrive On Green	0.09	0.41	0.41	0.04	0.29	0.29	0.19	0.19	0.19	0.28	0.00	0.28
Sat Flow, veh/h	1774	3038	506	1774	3539	1583	1774	1863	1583	3548	0	1583
Grp Volume(v), veh/h	76	528	530	49	799	282	126	153	78	771	0	488
Grp Sat Flow(s),veh/h/ln	1774	1770	1774	1774	1770	1583	1774	1863	1583	1774	0	1583
Q Serve(g_s), s	3.7	26.1	26.1	2.4	18.7	13.9	5.6	6.5	3.8	18.0	0.0	25.0
Cycle Q Clear(g_c), s	3.7	26.1	26.1	2.4	18.7	13.9	5.6	6.5	3.8	18.0	0.0	25.0
Prop In Lane	1.00		0.29	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	118	551	552	79	1022	457	335	352	299	986	0	440
V/C Ratio(X)	0.64	0.96	0.96	0.62	0.78	0.62	0.38	0.43	0.26	0.78	0.00	1.11
Avail Cap(c_a), veh/h	118	551	552	79	1022	457	335	352	299	986	0	440
HCM Platoon Ratio	1.33	1.33	1.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.0	25.8	25.8	42.3	29.4	27.7	31.9	32.3	31.1	30.0	0.0	32.5
Incr Delay (d2), s/veh	23.8	29.6	29.6	31.6	5.9	6.1	3.2	3.9	2.1	6.2	0.0	76.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	17.1	17.2	1.9	9.9	6.8	3.0	3.7	1.8	9.6	0.0	20.2
LnGrp Delay(d),s/veh	63.8	55.4	55.4	73.9	35.3	33.8	35.1	36.1	33.2	36.2	0.0	108.6
LnGrp LOS	E	E	E	E	D	C	D	D	C	D		F
Approach Vol, veh/h	1134				1130				357		1259	
Approach Delay, s/veh	56.0				36.6				35.1		64.3	
Approach LOS	E				D				D		E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	21.0		8.0	32.0	29.0		10.0	30.0				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	17.0		4.0	28.0	25.0		6.0	26.0				
Max Q Clear Time (g_c+I1), s	8.5		4.4	28.1	27.0		5.7	20.7				
Green Ext Time (p_c), s	1.0		0.0	0.0	0.0		0.0	2.9				
Intersection Summary												
HCM 2010 Ctrl Delay	51.1											
HCM 2010 LOS	D											
Notes												

Intersection

Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	85	12	27	93	39	7	86	32	0	0	0
Future Vol, veh/h	40	85	12	27	93	39	7	86	32	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	43	92	13	29	101	42	8	93	35	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.5	8.4	8.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	6%	29%	17%
Vol Thru, %	69%	62%	58%
Vol Right, %	26%	9%	25%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	125	137	159
LT Vol	7	40	27
Through Vol	86	85	93
RT Vol	32	12	39
Lane Flow Rate	136	149	173
Geometry Grp	1	1	1
Degree of Util (X)	0.17	0.184	0.207
Departure Headway (Hd)	4.505	4.444	4.304
Convergence, Y/N	Yes	Yes	Yes
Cap	798	809	835
Service Time	2.529	2.463	2.322
HCM Lane V/C Ratio	0.17	0.184	0.207
HCM Control Delay	8.5	8.5	8.4
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	0.7	0.8

Appendix H – Analysis Output Sheets (Existing with Project Alternative 3)

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	85	78	51	71	290	486	142	14	107	71	18	66
Future Volume (vph)	85	78	51	71	290	486	142	14	107	71	18	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3158	1441		1782	1583		1792	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3158	1441		1782	1583		1792	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	92	85	55	77	315	528	154	15	116	77	20	72
RTOR Reduction (vph)	0	0	47	0	181	218	0	0	81	0	0	56
Lane Group Flow (vph)	92	85	8	77	398	46	0	169	35	0	97	16
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	7.2	11.0	11.0	6.6	14.0	14.0		24.6	24.6		17.6	17.6
Effective Green, g (s)	7.2	11.0	11.0	6.6	14.0	14.0		24.6	24.6		17.6	17.6
Actuated g/C Ratio	0.09	0.14	0.14	0.08	0.17	0.17		0.31	0.31		0.22	0.22
Clearance Time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	158	254	216	144	548	250		543	483		391	345
v/s Ratio Prot	c0.05	0.05		0.04	c0.13			c0.09			c0.05	
v/s Ratio Perm			0.00			0.03			0.02			0.01
v/c Ratio	0.58	0.33	0.03	0.53	0.73	0.18		0.31	0.07		0.25	0.05
Uniform Delay, d1	35.3	31.5	30.2	35.5	31.5	28.4		21.5	19.9		26.0	24.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	5.4	0.3	0.0	3.8	4.1	0.1		1.5	0.3		1.5	0.2
Delay (s)	40.6	31.8	30.2	39.3	35.5	28.6		23.0	20.2		27.5	25.1
Level of Service	D	C	C	D	D	C		C	C		C	C
Approach Delay (s)		34.9			33.8			21.9			26.5	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			31.1				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.43									
Actuated Cycle Length (s)			80.6				Sum of lost time (s)			20.8		
Intersection Capacity Utilization			44.7%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	07/22/2016
Analysis Year	2013
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				T				L			
Volume (V), veh/h	0	0	0	2	0	325	0	239	0	1	113	369	0	76	105	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	0	0	2	0	360	0	260	0	1	125	409	0	84	116	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929		4.2929	4.1129			4.1129		4.2929	4.1129	
Follow-Up Headway (sec)		3.1858		3.1858	3.1858			3.1858		3.1858	3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		2		0	360	260		126	409	84	116	
Entry Volume veh/h		2		0	353	260		124	401	82	114	
Circulating Flow (Vc), pc/h	560			126			84			361		
Exiting Flow (Vex), pc/h	84			1			125			478		
Capacity (cPCE), pc/h		645		1028	1035			1065		862	878	
Capacity (c), veh/h		633		1008	1014			1045		845	860	
v/c Ratio (X)		0.00		0.00	0.35			0.12		0.10	0.13	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.7		3.6	7.2	0.0		4.5	0.0	5.2	5.5	
Lane LOS		A		A	A	A		A	A	A	A	
95% Queue		0.0		0.0	1.6			0.4		0.3	0.5	
Approach Delay, s/veh	5.7			4.1			1.1			5.4		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	3.1						A					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	4	39	9	29	50	53	28	43	42	79	59	12
Future Volume (vph)	4	39	9	29	50	53	28	43	42	79	59	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	42	10	32	54	58	30	47	46	86	64	13
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	56	144	123	163								
Volume Left (vph)	4	32	30	86								
Volume Right (vph)	10	58	46	13								
Hadj (s)	-0.06	-0.16	-0.14	0.09								
Departure Headway (s)	4.7	4.5	4.4	4.6								
Degree Utilization, x	0.07	0.18	0.15	0.21								
Capacity (veh/h)	704	748	767	738								
Control Delay (s)	8.1	8.5	8.2	8.8								
Approach Delay (s)	8.1	8.5	8.2	8.8								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.5									
Level of Service			A									
Intersection Capacity Utilization			35.7%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

2/24/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↔		↖	↗		↖	↗	↗
Traffic Volume (vph)	112	11	31	6	21	43	29	218	13	17	299	64
Future Volume (vph)	112	11	31	6	21	43	29	218	13	17	299	64
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	2.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.92		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1782	1583		1702		1770	1847		1770	1863	1583
Flt Permitted		0.82	1.00		0.98		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1518	1583		1679		1770	1847		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	122	12	34	7	23	47	32	237	14	18	325	70
RTOR Reduction (vph)	0	0	26	0	36	0	0	3	0	0	0	30
Lane Group Flow (vph)	0	134	8	0	41	0	32	248	0	18	325	40
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Actuated Green, G (s)		11.0	11.0		11.0		3.2	12.9		11.7	26.2	26.2
Effective Green, g (s)		11.0	11.0		11.0		3.2	12.9		11.7	26.2	26.2
Actuated g/C Ratio		0.24	0.24		0.24		0.07	0.28		0.25	0.56	0.56
Clearance Time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	2.0
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		3.0	7.0	7.0
Lane Grp Cap (vph)		359	375		398		122	513		446	1051	893
v/s Ratio Prot							c0.02	c0.13		0.01	c0.17	
v/s Ratio Perm		c0.09	0.01		0.02							0.02
v/c Ratio		0.37	0.02		0.10		0.26	0.48		0.04	0.31	0.04
Uniform Delay, d1		14.8	13.6		13.8		20.5	14.0		13.1	5.3	4.5
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		2.3	0.1		0.4		1.2	0.7		0.0	0.6	0.1
Delay (s)		17.1	13.7		14.2		21.6	14.7		13.1	5.9	4.6
Level of Service		B	B		B		C	B		B	A	A
Approach Delay (s)		16.4			14.2			15.5			6.0	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay		11.4										
HCM 2000 Volume to Capacity ratio		0.38										
Actuated Cycle Length (s)		46.4										
Intersection Capacity Utilization		44.4%										
Analysis Period (min)		15										
c Critical Lane Group												

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Civic Center Drive			
Agency or Co.	IBI Group				E/W Street Name	Civic Center Drive			
Date Performed	07/22/2016				N/S Street Name	Coast Highway			
Analysis Year	2013				Analysis Time Period (hrs)	0.25			
Time Period	AM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	9	7	6	0	18	10	18	0	5	210	22	0	52	250	9
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	10	8	7	0	20	11	20	0	6	233	24	0	58	277	10
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		25			51			263			345	
Entry Volume veh/h		25			50			258			338	
Circulating Flow (Vc), pc/h	355			249			76			37		
Exiting Flow (Vex), pc/h	90			27			263			304		
Capacity (cPCE), pc/h		792			881			1047			1089	
Capacity (c), veh/h		777			864			1027			1068	
v/c Ratio (X)		0.03			0.06			0.25			0.32	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.9			4.7			5.9			6.5	
Lane LOS		A			A			A			A	
95% Queue		0.1			0.2			1.0			1.4	
Approach Delay, s/veh	4.9			4.7			5.9			6.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	6.1						A					

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	7/11/2016
Analysis Year	2013
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Pier View Way
E/W Street Name	Pier View Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	6	9	9	0	10	14	15	0	7	217	11	0	11	236	18
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	7	10	10	0	11	16	17	0	8	241	12	0	12	262	20
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		27			44			261			294	
Entry Volume veh/h		26			43			256			288	
Circulating Flow (Vc), pc/h	285			256			29			35		
Exiting Flow (Vex), pc/h	34			44			265			283		
Capacity (cPCE), pc/h		850			875			1098			1091	
Capacity (c), veh/h		833			858			1076			1070	
v/c Ratio (X)		0.03			0.05			0.24			0.27	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.6			4.7			5.6			5.9	
Lane LOS		A			A			A			A	
95% Queue		0.1			0.2			0.9			1.1	
Approach Delay, s/veh	4.6			4.7			5.6			5.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	5.6						A					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

11/17/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	5	19	17	9	5	88	137	6	7	94	6
Future Volume (vph)	2	5	19	17	9	5	88	137	6	7	94	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	5	21	18	10	5	96	149	7	8	102	7
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	7	21	33	171	82	59	58					
Volume Left (vph)	2	0	18	96	0	8	0					
Volume Right (vph)	0	21	5	0	7	0	7					
Hadj (s)	0.18	-0.67	0.05	0.32	-0.03	0.10	-0.05					
Departure Headway (s)	5.6	4.7	5.4	5.1	4.7	5.0	4.8					
Degree Utilization, x	0.01	0.03	0.05	0.24	0.11	0.08	0.08					
Capacity (veh/h)	600	705	619	695	743	701	726					
Control Delay (s)	7.4	6.7	8.7	8.5	7.1	7.2	7.0					
Approach Delay (s)	6.9		8.7	8.0		7.1						
Approach LOS	A		A	A		A						
Intersection Summary												
Delay			7.8									
Level of Service			A									
Intersection Capacity Utilization			26.6%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	80	46	74	56	27	65
Future Volume (vph)	80	46	74	56	27	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	87	50	80	61	29	71
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	87	50	141	100		
Volume Left (vph)	87	0	0	29		
Volume Right (vph)	0	50	61	0		
Hadj (s)	0.53	-0.67	-0.23	0.09		
Departure Headway (s)	5.6	4.4	4.1	4.5		
Degree Utilization, x	0.13	0.06	0.16	0.12		
Capacity (veh/h)	612	779	835	763		
Control Delay (s)	8.2	6.5	7.9	8.1		
Approach Delay (s)	7.6		7.9	8.1		
Approach LOS	A		A	A		
Intersection Summary						
Delay			7.9			
Level of Service			A			
Intersection Capacity Utilization			26.7%	ICU Level of Service	A	
Analysis Period (min)			15			

Existing Year 2013 No Project

Level Of Service Computation Report
 2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #9 Cleveland Street and Mission Avenue

Cycle (sec): 100 Critical Vol./Cap.(X): 0.093
 Loss Time (sec): 0 Average Delay (sec/veh): 8.1
 Optimal Cycle: 0 Level Of Service: A

Street Name:	Cleveland Street						Mission Avenue					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Control:	Stop Sign			Stop Sign			Stop Sign			Stop Sign		
Rights:	Include			Include			Include			Include		
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Lanes:	0	1	0	0	1	0	1	0	1	1	0	1

Volume Module:	Cleveland Street			Cleveland Street			Mission Avenue			Mission Avenue		
Base Vol:	10	10	14	10	13	25	11	91	7	39	111	23
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	10	14	10	13	25	11	91	7	39	111	23
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	10	10	14	10	13	25	11	91	7	39	111	23
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	10	10	14	10	13	25	11	91	7	39	111	23
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Final Volume:	10	10	14	10	13	25	11	91	7	39	111	23

Saturation Flow Module:	Cleveland Street			Cleveland Street			Mission Avenue			Mission Avenue		
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.50	0.50	1.00	0.21	0.27	0.52	1.00	1.86	0.14	1.00	1.66	0.34
Final Sat.:	315	315	755	145	189	363	628	1290	100	646	1199	256

Capacity Analysis Module:	Cleveland Street			Cleveland Street			Mission Avenue			Mission Avenue		
Vol/Sat:	0.03	0.03	0.02	0.07	0.07	0.07	0.02	0.07	0.07	0.06	0.09	0.09
Crit Moves:	****			****			****			****		
Delay/Veh:	8.3	8.3	7.3	8.3	8.3	8.3	8.4	8.1	8.0	8.5	8.0	7.9
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	8.3	8.3	7.3	8.3	8.3	8.3	8.4	8.1	8.0	8.5	8.0	7.9
LOS by Move:	A	A	A	A	A	A	A	A	A	A	A	A
ApproachDel:	7.9			8.3			8.1			8.1		
Delay Adj:	1.00			1.00			1.00			1.00		
ApprAdjDel:	7.9			8.3			8.1			8.1		
LOS by Appr:	A			A			A			A		
AllWayAvgQ:	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1

Note: Queue reported is the number of cars per lane.

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	0	23	124	189	64	14	172	0	0	194	15
Future Volume (vph)	11	0	23	124	189	64	14	172	0	0	194	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00		1.00	1.00	0.95		1.00	1.00			0.95	0.95
Frpb, ped/bikes	1.00		0.96	1.00	0.99		1.00	1.00			1.00	0.97
Flpb, ped/bikes	0.99		1.00	0.98	1.00		1.00	1.00			1.00	1.00
Frt	1.00		0.85	1.00	0.96		1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1753		1527	1743	3375		1770	1863			1767	1464
Flt Permitted	0.58		1.00	0.95	1.00		0.60	1.00			1.00	1.00
Satd. Flow (perm)	1075		1527	1743	3375		1124	1863			1767	1464
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	0	25	135	205	70	15	187	0	0	211	16
RTOR Reduction (vph)	0	0	11	0	32	0	0	0	0	0	1	10
Lane Group Flow (vph)	12	0	14	135	243	0	15	187	0	0	212	4
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type	Perm		Perm	Perm	NA		Perm	NA			NA	Perm
Protected Phases					8			2			6	
Permitted Phases	4		4	8			2					6
Actuated Green, G (s)	27.3		27.3	27.3	27.3		12.7	12.7			12.7	12.7
Effective Green, g (s)	27.3		27.3	27.3	27.3		12.7	12.7			12.7	12.7
Actuated g/C Ratio	0.55		0.55	0.55	0.55		0.25	0.25			0.25	0.25
Clearance Time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)	586		833	951	1842		285	473			448	371
v/s Ratio Prot					0.07			0.10			c0.12	
v/s Ratio Perm	0.01		0.01	c0.08			0.01					0.00
v/c Ratio	0.02		0.02	0.14	0.13		0.05	0.40			0.47	0.01
Uniform Delay, d1	5.2		5.2	5.6	5.6		14.1	15.5			15.8	13.9
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00			0.26	0.62
Incremental Delay, d2	0.1		0.0	0.3	0.1		0.1	0.7			1.0	0.0
Delay (s)	5.3		5.2	5.9	5.7		14.2	16.2			5.1	8.6
Level of Service	A		A	A	A		B	B			A	A
Approach Delay (s)		5.2			5.8			16.1			5.4	
Approach LOS		A			A			B			A	
Intersection Summary												
HCM 2000 Control Delay			8.0									A
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			50.0									
Intersection Capacity Utilization			46.9%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	132	2	50	462	194	3	14	202	132	10	7
Future Volume (vph)	5	132	2	50	462	194	3	14	202	132	10	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0	4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.86		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.96	
Satd. Flow (prot)	1770	3532		1770	3539	1583	1770	1601		1681	1679	
Flt Permitted	0.47	1.00		0.66	1.00	1.00	0.70	1.00		0.61	0.63	
Satd. Flow (perm)	871	3532		1229	3539	1583	1308	1601		1084	1103	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	5	143	2	54	502	211	3	15	220	143	11	8
RTOR Reduction (vph)	0	1	0	0	0	123	0	164	0	0	6	0
Lane Group Flow (vph)	5	144	0	54	502	88	3	71	0	82	74	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	12.6	12.6		12.2	12.2	12.2	7.5	7.5		7.5	7.5	
Effective Green, g (s)	12.6	12.6		12.2	12.2	12.2	7.5	7.5		7.5	7.5	
Actuated g/C Ratio	0.43	0.43		0.42	0.42	0.42	0.26	0.26		0.26	0.26	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0	4.6	4.6		4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	374	1518		511	1473	659	334	409		277	282	
v/s Ratio Prot		0.04			c0.14			0.04				
v/s Ratio Perm	0.01			0.04		0.06	0.00			c0.08	0.07	
v/c Ratio	0.01	0.09		0.11	0.34	0.13	0.01	0.17		0.30	0.26	
Uniform Delay, d1	4.8	5.0		5.2	5.8	5.3	8.1	8.5		8.8	8.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.0	0.0		0.1	0.2	0.1	0.0	0.3		0.8	0.7	
Delay (s)	4.8	5.0		5.3	6.0	5.4	8.1	8.8		9.6	9.4	
Level of Service	A	A		A	A	A	A	A		A	A	
Approach Delay (s)		5.0			5.8			8.8			9.5	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay			6.7									
HCM 2000 Level of Service										A		
HCM 2000 Volume to Capacity ratio			0.32									
Actuated Cycle Length (s)			29.3							9.6		
Intersection Capacity Utilization			53.3%							A		
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

9/1/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↰	↰	
Traffic Volume (veh/h)	35	12	44	60	11	17
Future Volume (Veh/h)	35	12	44	60	11	17
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	13	48	65	12	18
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				248		
pX, platoon unblocked						
vC, conflicting volume			51		206	44
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			51		206	44
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			97		98	98
cM capacity (veh/h)			1555		759	1025
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	51	113	30			
Volume Left	0	48	12			
Volume Right	13	0	18			
cSH	1700	1555	899			
Volume to Capacity	0.03	0.03	0.03			
Queue Length 95th (ft)	0	2	3			
Control Delay (s)	0.0	3.3	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.3	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			3.3			
Intersection Capacity Utilization			22.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr/Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	16	115	21	0	0	0	23	230	99	37	261	39
Future Volume (vph)	16	115	21	0	0	0	23	230	99	37	261	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2					4.2	4.6	4.6	4.2	4.6	4.6
Lane Util. Factor	1.00	1.00					1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99					1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00					1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98					1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1805					1770	1863	1553	1770	1863	1521
Flt Permitted	0.95	1.00					0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1805					1770	1863	1553	1770	1863	1521
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	17	125	23	0	0	0	25	250	108	40	284	42
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	82	0	0	31
Lane Group Flow (vph)	17	137	0	0	0	0	25	250	26	40	284	11
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA					Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4					5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	18.0	18.0					4.0	11.1	11.1	4.8	11.9	11.9
Effective Green, g (s)	18.0	18.0					4.0	11.1	11.1	4.8	11.9	11.9
Actuated g/C Ratio	0.38	0.38					0.09	0.24	0.24	0.10	0.25	0.25
Clearance Time (s)	4.2	4.2					4.2	4.6	4.6	4.2	4.6	4.6
Vehicle Extension (s)	3.0	3.0					3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	679	692					150	440	367	181	472	385
v/s Ratio Prot	0.01	c0.08					0.01	0.13		c0.02	c0.15	
v/s Ratio Perm									0.02			0.01
v/c Ratio	0.03	0.20					0.17	0.57	0.07	0.22	0.60	0.03
Uniform Delay, d1	9.0	9.6					19.9	15.8	13.9	19.3	15.4	13.2
Progression Factor	1.00	1.00					1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.6					2.4	2.0	0.1	2.8	2.5	0.0
Delay (s)	9.1	10.3					22.3	17.8	14.0	22.1	17.9	13.2
Level of Service	A	B					C	B	B	C	B	B
Approach Delay (s)		10.2			0.0			17.0			17.8	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		16.1			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.35										
Actuated Cycle Length (s)		46.9			Sum of lost time (s)			13.0				
Intersection Capacity Utilization		44.2%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	240	7	0	0	0	0	10	15	9	7	0
Future Volume (Veh/h)	5	240	7	0	0	0	0	10	15	9	7	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	261	8	0	0	0	0	11	16	10	8	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		255										
pX, platoon unblocked												
vC, conflicting volume	0			269			279	275	134	162	279	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			269			279	275	134	162	279	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	98	98	99	99	100
cM capacity (veh/h)	1622			1292			644	629	890	761	626	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	136	138	27	18								
Volume Left	5	0	0	10								
Volume Right	0	8	16	0								
cSH	1622	1700	761	695								
Volume to Capacity	0.00	0.08	0.04	0.03								
Queue Length 95th (ft)	0	0	3	2								
Control Delay (s)	0.3	0.0	9.9	10.3								
Lane LOS	A		A	B								
Approach Delay (s)	0.1		9.9	10.3								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			21.2%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	242	3	0	0	0	0	14	10	13	15	0
Future Volume (vph)	17	242	3	0	0	0	0	14	10	13	15	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	263	3	0	0	0	0	15	11	14	16	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	150	135	26	30								
Volume Left (vph)	18	0	0	14								
Volume Right (vph)	0	3	11	0								
Hadj (s)	0.09	0.02	-0.22	0.13								
Departure Headway (s)	4.7	4.7	4.4	4.7								
Degree Utilization, x	0.20	0.17	0.03	0.04								
Capacity (veh/h)	751	758	778	719								
Control Delay (s)	7.7	7.4	7.5	7.9								
Approach Delay (s)	7.6		7.5	7.9								
Approach LOS	A		A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			22.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St/Clementine & Seagaze St

9/1/2016

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	142	122	1	4	0	3	0	17	9	0	0	0								
Future Volume (vph)	142	122	1	4	0	3	0	17	9	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	154	133	1	4	0	3	0	18	10	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	154	134	7	28																
Volume Left (vph)	154	0	4	0																
Volume Right (vph)	0	1	3	10																
Hadj (s)	0.53	0.03	-0.11	-0.18																
Departure Headway (s)	5.1	4.6	4.2	4.4																
Degree Utilization, x	0.22	0.17	0.01	0.03																
Capacity (veh/h)	698	769	833	773																
Control Delay (s)	8.3	7.3	7.3	7.5																
Approach Delay (s)	7.9		7.3	7.5																
Approach LOS	A		A	A																
Intersection Summary																				
Delay			7.8																	
Level of Service			A																	
Intersection Capacity Utilization			22.3%	ICU Level of Service					A											
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	13	0	0	11	13	263	7	5	272	6
Future Volume (Veh/h)	0	0	13	0	0	11	13	263	7	5	272	6
Sign Control	Stop			Stop				Free			Free	
Grade	0%			0%				0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	14	0	0	12	14	286	8	5	296	7
Pedestrians	7			7							1	
Lane Width (ft)	12.0			12.0							12.0	
Walking Speed (ft/s)	4.0			4.0							4.0	
Percent Blockage	1			1							0	
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			440		
pX, platoon unblocked												
vC, conflicting volume	644	646	306	645	645	298	310				301	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	644	646	306	645	645	298	310				301	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	98	100	100	98	99				100	
cM capacity (veh/h)	370	380	729	368	380	737	1243				1253	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	14	12	14	294	5	303						
Volume Left	0	0	14	0	5	0						
Volume Right	14	12	0	8	0	7						
cSH	729	737	1243	1700	1253	1700						
Volume to Capacity	0.02	0.02	0.01	0.17	0.00	0.18						
Queue Length 95th (ft)	1	1	1	0	0	0						
Control Delay (s)	10.0	10.0	7.9	0.0	7.9	0.0						
Lane LOS	B	A	A		A							
Approach Delay (s)	10.0	10.0	0.4		0.1							
Approach LOS	B	A										
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			24.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Washington Avenue			
Agency or Co.	IBI Group				E/W Street Name	Washington Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2013				Analysis Time Period (hrs)	0.25			
Time Period	AM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	4	1	7	0	15	3	3	0	5	278	8	0	2	290	5
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	4	1	8	0	17	3	3	0	6	308	9	0	2	322	6
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929		
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (Ve), pc/h		13			23			323			330		
Entry Volume veh/h		13			23			317			324		
Circulating Flow (Vc), pc/h	341			318			7			26			
Exiting Flow (Vex), pc/h	12			15			315			347			
Capacity (cPCE), pc/h		804			822			1122			1101		
Capacity (c), veh/h		788			806			1100			1079		
v/c Ratio (X)		0.02			0.03			0.29			0.30		

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.7			4.7			6.0			6.3	
Lane LOS		A			A			A			A	
95% Queue		0.0			0.1			1.2			1.3	
Approach Delay, s/veh	4.7			4.7			6.0			6.3		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	6.1						A					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	25	33	29	13	4	34	5	69	20	40	47	1
Future Volume (vph)	25	33	29	13	4	34	5	69	20	40	47	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	36	32	14	4	37	5	75	22	43	51	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	95	55	102	95								
Volume Left (vph)	27	14	5	43								
Volume Right (vph)	32	37	22	1								
Hadj (s)	-0.11	-0.32	-0.09	0.12								
Departure Headway (s)	4.3	4.1	4.3	4.5								
Degree Utilization, x	0.11	0.06	0.12	0.12								
Capacity (veh/h)	797	813	807	765								
Control Delay (s)	7.8	7.4	7.8	8.1								
Approach Delay (s)	7.8	7.4	7.8	8.1								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.8								
Level of Service				A								
Intersection Capacity Utilization				24.9%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	126	10	2	58	10	5	12	13	14	17	7
Future Volume (Veh/h)	5	126	10	2	58	10	5	12	13	14	17	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	137	11	2	63	11	5	13	14	15	18	8
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	265											
pX, platoon unblocked												
vC, conflicting volume	88			155			250	252	150	260	252	84
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	88			155			250	252	150	260	252	84
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	98	98	98	97	99
cM capacity (veh/h)	1490			1417			667	637	892	653	637	964
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	153	76	32	41								
Volume Left	5	2	5	15								
Volume Right	11	11	14	8								
cSH	1490	1417	734	689								
Volume to Capacity	0.00	0.00	0.04	0.06								
Queue Length 95th (ft)	0	0	3	5								
Control Delay (s)	0.3	0.2	10.1	10.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.2	10.1	10.6								
Approach LOS				B	B							
Intersection Summary												
Average Delay				2.7								
Intersection Capacity Utilization				21.4%	ICU Level of Service				A			
Analysis Period (min)				15								

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Wisconsin Avenue			
Agency or Co.	IBI Group				E/W Street Name	Wisconsin Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2013				Analysis Time Period (hrs)	0.25			
Time Period	AM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	36	26	92	0	42	14	13	0	45	257	30	0	8	283	12
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	40	29	102	0	47	16	14	0	50	285	33	0	9	314	13
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		171			77			368			336	
Entry Volume veh/h		168			75			361			329	
Circulating Flow (Vc), pc/h	370			375			78			113		
Exiting Flow (Vex), pc/h	71			79			339			463		
Capacity (cPCE), pc/h		781			777			1045			1009	
Capacity (c), veh/h		765			761			1025			989	
v/c Ratio (X)		0.22			0.10			0.35			0.33	

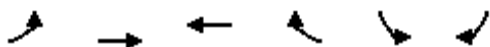
Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.1			5.7			7.2			7.1	
Lane LOS		A			A			A			A	
95% Queue		0.8			0.3			1.6			1.5	
Approach Delay, s/veh	7.1			5.7			7.2			7.1		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	7.0						A					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

9/1/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	60	58	3	10	9
Future Volume (Veh/h)	5	60	58	3	10	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	65	63	3	11	10
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	74				148	74
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	74				148	74
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1515				834	981
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	70	66	21			
Volume Left	5	0	11			
Volume Right	0	3	10			
cSH	1515	1700	898			
Volume to Capacity	0.00	0.04	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.6	0.0	9.1			
Lane LOS	A		A			
Approach Delay (s)	0.6	0.0	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			1.5			
Intersection Capacity Utilization			17.6%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	56	5	12	53	7	3	4	8	22	1	3
Future Volume (Veh/h)	4	56	5	12	53	7	3	4	8	22	1	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	61	5	13	58	8	3	4	9	24	1	3
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	68			66			165	166	64	172	164	66
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	68			66			165	166	64	172	164	66
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	99	99	97	100	100
cM capacity (veh/h)	1531			1536			787	718	1001	771	719	994
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	70	79	16	28								
Volume Left	4	13	3	24								
Volume Right	5	8	9	3								
cSH	1531	1536	871	788								
Volume to Capacity	0.00	0.01	0.02	0.04								
Queue Length 95th (ft)	0	1	1	3								
Control Delay (s)	0.4	1.3	9.2	9.7								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.4	1.3	9.2	9.7								
Approach LOS			A	A								
Intersection Summary												
Average Delay			2.9									
Intersection Capacity Utilization			19.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	33	52	20	42	0	28	0	10	0	2	0
Future Volume (vph)	0	33	52	20	42	0	28	0	10	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	36	57	22	46	0	30	0	11	0	2	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	93	68	41	2								
Volume Left (vph)	0	22	30	0								
Volume Right (vph)	57	0	11	0								
Hadj (s)	-0.33	0.10	0.02	0.03								
Departure Headway (s)	3.7	4.2	4.3	4.3								
Degree Utilization, x	0.10	0.08	0.05	0.00								
Capacity (veh/h)	945	846	808	798								
Control Delay (s)	7.1	7.5	7.5	7.3								
Approach Delay (s)	7.1	7.5	7.5	7.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.3								
Level of Service				A								
Intersection Capacity Utilization				25.8%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	32	46	51	20	54	61
Future Volume (vph)	32	46	51	20	54	61
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	50	55	22	59	66
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	85	77	125			
Volume Left (vph)	35	0	59			
Volume Right (vph)	50	22	0			
Hadj (s)	-0.24	-0.14	0.13			
Departure Headway (s)	4.1	4.1	4.3			
Degree Utilization, x	0.10	0.09	0.15			
Capacity (veh/h)	834	851	818			
Control Delay (s)	7.5	7.5	8.0			
Approach Delay (s)	7.5	7.5	8.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.7			
Level of Service			A			
Intersection Capacity Utilization			24.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	132	1	6	106	22	6	7	11	22	11	5
Future Volume (Veh/h)	4	132	1	6	106	22	6	7	11	22	11	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	143	1	7	115	24	7	8	12	24	12	5
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					253							
pX, platoon unblocked	0.96						0.96	0.96		0.96	0.96	0.96
vC, conflicting volume	142			155			318	318	162	320	307	134
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	93			155			276	276	162	277	264	84
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	99	99	96	98	99
cM capacity (veh/h)	1446			1412			623	598	868	621	607	935
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	148	146	27	41								
Volume Left	4	7	7	24								
Volume Right	1	24	12	5								
cSH	1446	1412	702	643								
Volume to Capacity	0.00	0.00	0.04	0.06								
Queue Length 95th (ft)	0	0	3	5								
Control Delay (s)	0.2	0.4	10.3	11.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.4	10.3	11.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			22.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

2/24/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↖	↗	↖	↖↗		↖	↗	
Traffic Volume (vph)	15	97	52	113	98	109	27	216	60	119	274	11
Future Volume (vph)	15	97	52	113	98	109	27	216	60	119	274	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.96	1.00	1.00	0.93	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.99	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1851	1526	1681	1761	1465	1770	3411		1770	1847	
Flt Permitted		0.99	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1851	1526	1681	1761	1465	1770	3411		1770	1847	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	105	57	123	107	118	29	235	65	129	298	12
RTOR Reduction (vph)	0	0	51	0	0	103	0	19	0	0	1	0
Lane Group Flow (vph)	0	121	6	111	119	15	29	281	0	129	309	0
Confl. Peds. (#/hr)	14		10	10		14			3			15
Confl. Bikes (#/hr)			4			5			3			3
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		10.9	10.9	12.5	12.5	12.5	4.3	46.2		11.6	53.5	
Effective Green, g (s)		10.9	10.9	12.5	12.5	12.5	4.3	46.2		11.6	53.5	
Actuated g/C Ratio		0.11	0.11	0.12	0.12	0.12	0.04	0.46		0.12	0.54	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)		201	166	210	220	183	76	1575		205	988	
v/s Ratio Prot		c0.07		0.07	c0.07		0.02	0.08		c0.07	c0.17	
v/s Ratio Perm			0.00			0.01						
v/c Ratio		0.60	0.04	0.53	0.54	0.08	0.38	0.18		0.63	0.31	
Uniform Delay, d1		42.5	39.9	41.0	41.1	38.7	46.6	15.8		42.1	13.0	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.5	0.0	2.7	3.0	0.2	1.2	0.2		4.3	0.8	
Delay (s)		45.9	39.9	43.7	44.1	38.9	47.7	16.0		46.5	13.8	
Level of Service		D	D	D	D	D	D	B		D	B	
Approach Delay (s)		44.0			42.2			18.8			23.4	
Approach LOS		D			D			B			C	
Intersection Summary												
HCM 2000 Control Delay			30.1									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			100.0									Sum of lost time (s) 18.8
Intersection Capacity Utilization			49.8%									ICU Level of Service A
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	4	274	0	16	353	28	8	5	34	86	8	16
Future Volume (vph)	4	274	0	16	353	28	8	5	34	86	8	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.96	1.00
Satd. Flow (prot)	1770	3539		1765	3497			3095			1781	1551
Flt Permitted	0.82	1.00		0.82	1.00			0.94			1.00	1.00
Satd. Flow (perm)	1521	3539		1517	3497			2927			1862	1551
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	4	298	0	17	384	30	9	5	37	93	9	17
RTOR Reduction (vph)	0	0	0	0	13	0	0	31	0	0	0	14
Lane Group Flow (vph)	4	298	0	17	401	0	0	20	0	0	102	3
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	4.9	4.9		4.9	4.9			2.6			2.6	2.6
Effective Green, g (s)	4.9	4.9		4.9	4.9			2.6			2.6	2.6
Actuated g/C Ratio	0.29	0.29		0.29	0.29			0.15			0.15	0.15
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	438	1020		437	1007			447			284	237
v/s Ratio Prot		0.08			c0.11							
v/s Ratio Perm	0.00			0.01				0.01			c0.05	0.00
v/c Ratio	0.01	0.29		0.04	0.40			0.04			0.36	0.01
Uniform Delay, d1	4.3	4.7		4.4	4.9			6.1			6.5	6.1
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.0	0.2		0.0	0.3			0.1			1.1	0.0
Delay (s)	4.3	4.9		4.4	5.1			6.2			7.5	6.1
Level of Service	A	A		A	A			A			A	A
Approach Delay (s)		4.9			5.1			6.2			7.3	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay		5.4			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.38										
Actuated Cycle Length (s)		17.0			Sum of lost time (s)			9.5				
Intersection Capacity Utilization		45.5%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	8	13	13	5	48	2	292	26	40	394	13
Future Volume (vph)	19	8	13	13	5	48	2	292	26	40	394	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.96			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.98			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1728			1794	1557	1770	3489		1770	3519	
Flt Permitted		1.00			1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1769			1860	1557	1770	3489		1770	3519	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	9	14	14	5	52	2	317	28	43	428	14
RTOR Reduction (vph)	0	13	0	0	0	48	0	8	0	0	3	0
Lane Group Flow (vph)	0	31	0	0	19	4	2	337	0	43	439	0
Confl. Peds. (#/hr)	10		4	4		10			3			4
Confl. Bikes (#/hr)			1						2			3
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		2.6			2.6	2.6	0.6	17.4		0.6	17.4	
Effective Green, g (s)		2.6			2.6	2.6	0.6	17.4		0.6	17.4	
Actuated g/C Ratio		0.08			0.08	0.08	0.02	0.51		0.02	0.51	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		134			140	118	30	1769		30	1785	
v/s Ratio Prot							0.00	0.10		c0.02	c0.12	
v/s Ratio Perm		c0.02			0.01	0.00						
v/c Ratio		0.23			0.14	0.03	0.07	0.19		1.43	0.25	
Uniform Delay, d1		14.9			14.8	14.7	16.6	4.6		16.8	4.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.2	0.0	0.9	0.1		317.1	0.1	
Delay (s)		15.2			15.0	14.7	17.5	4.7		333.9	4.8	
Level of Service		B			B	B	B	A		F	A	
Approach Delay (s)		15.2			14.8			4.7			34.0	
Approach LOS		B			B			A			C	
Intersection Summary												
HCM 2000 Control Delay			21.0				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.28									
Actuated Cycle Length (s)			34.3				Sum of lost time (s)			13.7		
Intersection Capacity Utilization			38.1%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	60	7	11	52	0	6	0	9	0	0	0
Future Volume (Veh/h)	0	60	7	11	52	0	6	0	9	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	65	8	12	57	0	7	0	10	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)	252											
pX, platoon unblocked												
vC, conflicting volume	57			73			150	150	69	160	154	57
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	57			73			150	150	69	160	154	57
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	100	99	100	100	100
cM capacity (veh/h)	1547			1527			813	736	994	793	732	1009
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	73	69	17	0								
Volume Left	0	12	7	0								
Volume Right	8	0	10	0								
cSH	1547	1527	910	1700								
Volume to Capacity	0.00	0.01	0.02	0.00								
Queue Length 95th (ft)	0	1	1	0								
Control Delay (s)	0.0	1.3	9.0	0.0								
Lane LOS		A	A	A								
Approach Delay (s)	0.0	1.3	9.0	0.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			20.0%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	28	4	1	20	1	7	0	3	1	0	1
Future Volume (Veh/h)	1	28	4	1	20	1	7	0	3	1	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	30	4	1	22	1	8	0	3	1	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)	643											
pX, platoon unblocked												
vC, conflicting volume	23			34			60	59	32	62	60	22
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	23			34			60	59	32	62	60	22
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	100	100	100	100	100
cM capacity (veh/h)	1592			1578			935	831	1042	930	829	1054
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	35	24	11	2								
Volume Left	1	1	8	1								
Volume Right	4	1	3	1								
cSH	1592	1578	962	988								
Volume to Capacity	0.00	0.00	0.01	0.00								
Queue Length 95th (ft)	0	0	1	0								
Control Delay (s)	0.2	0.3	8.8	8.6								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.2	0.3	8.8	8.6								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			13.3%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	16	54	6	16	67	6
Future Volume (vph)	16	54	6	16	67	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	59	7	17	73	7
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	76	24	80			
Volume Left (vph)	17	0	73			
Volume Right (vph)	59	17	0			
Hadj (s)	-0.39	-0.39	0.22			
Departure Headway (s)	3.7	3.7	4.3			
Degree Utilization, x	0.08	0.02	0.10			
Capacity (veh/h)	933	927	820			
Control Delay (s)	7.1	6.8	7.7			
Approach Delay (s)	7.1	6.8	7.7			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.3			
Level of Service			A			
Intersection Capacity Utilization			21.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	101	45	8	67	2	34	5	8	9	6	3
Future Volume (Veh/h)	2	101	45	8	67	2	34	5	8	9	6	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	110	49	9	73	2	37	5	9	10	7	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					576							
pX, platoon unblocked												
vC, conflicting volume	75			159			237	232	134	242	255	74
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	75			159			237	232	134	242	255	74
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			95	99	99	99	99	100
cM capacity (veh/h)	1524			1420			705	663	914	697	644	988
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	161	84	51	20								
Volume Left	2	9	37	10								
Volume Right	49	2	9	3								
cSH	1524	1420	730	708								
Volume to Capacity	0.00	0.01	0.07	0.03								
Queue Length 95th (ft)	0	0	6	2								
Control Delay (s)	0.1	0.9	10.3	10.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.9	10.3	10.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.6									
Intersection Capacity Utilization			19.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	116	7	5	72	10	2	3	14	4	4	3
Future Volume (Veh/h)	0	116	7	5	72	10	2	3	14	4	4	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	126	8	5	78	11	2	3	15	4	4	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					249							
pX, platoon unblocked												
vC, conflicting volume	89			134			228	229	130	240	228	84
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			134			228	229	130	240	228	84
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	98	99	99	100
cM capacity (veh/h)	1506			1451			719	668	920	698	670	976
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	134	94	20	11								
Volume Left	0	5	2	4								
Volume Right	8	11	15	3								
cSH	1506	1451	848	744								
Volume to Capacity	0.00	0.00	0.02	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.0	0.4	9.3	9.9								
Lane LOS		A	A	A								
Approach Delay (s)	0.0	0.4	9.3	9.9								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			18.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	69	45	35	32	17	57	269	32	40	295	11
Future Volume (vph)	24	69	45	35	32	17	57	269	32	40	295	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.96			0.97		1.00	0.98		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1765			1776		1770	3482		1770	3520	
Flt Permitted		0.92			0.89		0.95	1.00		0.55	1.00	
Satd. Flow (perm)		1635			1621		1770	3482		1032	3520	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	75	49	38	35	18	62	292	35	43	321	12
RTOR Reduction (vph)	0	29	0	0	15	0	0	13	0	0	3	0
Lane Group Flow (vph)	0	121	0	0	76	0	62	314	0	43	330	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)		5.2			4.8		2.2	21.9		15.5	15.5	
Effective Green, g (s)		5.2			4.8		2.2	21.9		15.5	15.5	
Actuated g/C Ratio		0.14			0.13		0.06	0.60		0.42	0.42	
Clearance Time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.5		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		231			212		106	2077		435	1486	
v/s Ratio Prot							c0.04	0.09			c0.09	
v/s Ratio Perm		c0.07			0.05					0.04		
v/c Ratio		0.52			0.36		0.58	0.15		0.10	0.22	
Uniform Delay, d1		14.6			14.5		16.8	3.3		6.4	6.8	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.1			1.2		5.2	0.0		0.1	0.1	
Delay (s)		16.7			15.8		22.0	3.3		6.5	6.8	
Level of Service		B			B		C	A		A	A	
Approach Delay (s)		16.7			15.8			6.3			6.8	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		8.9			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.33										
Actuated Cycle Length (s)		36.7			Sum of lost time (s)			14.2				
Intersection Capacity Utilization		38.9%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	136	5	6	77	5	2	6	5	4	5	7
Future Volume (Veh/h)	6	136	5	6	77	5	2	6	5	4	5	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	148	5	7	84	5	2	7	5	4	5	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)		280										
pX, platoon unblocked												
vC, conflicting volume	89			153			276	268	150	274	268	86
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			153			276	268	150	274	268	86
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	99	99	99	99	99
cM capacity (veh/h)	1506			1428			662	632	896	665	632	972
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	160	96	14	17								
Volume Left	7	7	2	4								
Volume Right	5	5	5	8								
cSH	1506	1428	712	767								
Volume to Capacity	0.00	0.00	0.02	0.02								
Queue Length 95th (ft)	0	0	2	2								
Control Delay (s)	0.4	0.6	10.2	9.8								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.4	0.6	10.2	9.8								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			19.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	152	5	3	93	1	4	8	7	5	4	3
Future Volume (vph)	2	152	5	3	93	1	4	8	7	5	4	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	165	5	3	101	1	4	9	8	5	4	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	172	105	21	12								
Volume Left (vph)	2	3	4	5								
Volume Right (vph)	5	1	8	3								
Hadj (s)	0.02	0.03	-0.16	-0.03								
Departure Headway (s)	4.1	4.2	4.4	4.5								
Degree Utilization, x	0.20	0.12	0.03	0.01								
Capacity (veh/h)	864	846	770	741								
Control Delay (s)	8.1	7.8	7.5	7.6								
Approach Delay (s)	8.1	7.8	7.5	7.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.9								
Level of Service				A								
Intersection Capacity Utilization				19.1%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	173	4	21	79	12	4	33	88	93	6	5
Future Volume (vph)	5	173	4	21	79	12	4	33	88	93	6	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	188	4	23	86	13	4	36	96	101	7	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	197	122	136	113								
Volume Left (vph)	5	23	4	101								
Volume Right (vph)	4	13	96	5								
Hadj (s)	0.03	0.01	-0.38	0.19								
Departure Headway (s)	4.7	4.8	4.5	5.0								
Degree Utilization, x	0.26	0.16	0.17	0.16								
Capacity (veh/h)	719	702	748	660								
Control Delay (s)	9.3	8.7	8.4	9.0								
Approach Delay (s)	9.3	8.7	8.4	9.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.9								
Level of Service				A								
Intersection Capacity Utilization				38.9%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	4	23	14	6	32	28
Future Volume (vph)	4	23	14	6	32	28
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	25	15	7	35	30
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	29	22	65			
Volume Left (vph)	4	0	35			
Volume Right (vph)	25	7	0			
Hadj (s)	-0.46	-0.16	0.14			
Departure Headway (s)	3.6	3.9	4.1			
Degree Utilization, x	0.03	0.02	0.07			
Capacity (veh/h)	963	909	863			
Control Delay (s)	6.7	7.0	7.4			
Approach Delay (s)	6.7	7.0	7.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.2			
Level of Service			A			
Intersection Capacity Utilization			19.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	10	81	26	218	33	185	19	163	104	157	230	4
Future Volume (vph)	10	81	26	218	33	185	19	163	104	157	230	4
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.94		1.00	1.00	
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1553		1785	1583	1770	3286		1770	3529	
Flt Permitted	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1553		1785	1583	1770	3286		1770	3529	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	11	88	28	237	36	201	21	177	113	171	250	4
RTOR Reduction (vph)	0	0	26	0	0	165	0	67	0	0	1	0
Lane Group Flow (vph)	11	88	2	0	273	36	21	223	0	171	253	0
Confl. Peds. (#/hr)	7		2	2		7			5			8
Confl. Bikes (#/hr)						2			4			8
Turn Type	Split	NA	Perm	Split	NA	Over	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	5.6	5.6	5.6		16.8	12.0	2.2	14.0		12.0	23.8	
Effective Green, g (s)	5.6	5.6	5.6		16.8	12.0	2.2	14.0		12.0	23.8	
Actuated g/C Ratio	0.08	0.08	0.08		0.25	0.18	0.03	0.21		0.18	0.35	
Clearance Time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	146	154	128		444	281	57	681		314	1244	
v/s Ratio Prot	0.01	c0.05			c0.15	0.02	0.01	c0.07		c0.10	0.07	
v/s Ratio Perm			0.00									
v/c Ratio	0.08	0.57	0.02		0.61	0.13	0.37	0.33		0.54	0.20	
Uniform Delay, d1	28.6	29.8	28.4		22.5	23.3	32.0	22.7		25.3	15.2	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	3.2	0.0		2.5	0.1	1.5	0.3		1.0	0.1	
Delay (s)	28.6	33.0	28.4		25.0	23.4	33.4	23.0		26.3	15.3	
Level of Service	C	C	C		C	C	C	C		C	B	
Approach Delay (s)		31.6			24.3			23.7			19.7	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			23.4									
HCM 2000 Volume to Capacity ratio			0.51									
Actuated Cycle Length (s)			67.5									
Intersection Capacity Utilization			50.5%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	300	1	3	447	18	0	0	5	10	0	11
Future Volume (Veh/h)	3	300	1	3	447	18	0	0	5	10	0	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	326	1	3	486	20	0	0	5	11	0	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			TWLTL								
Median storage veh	2											
Upstream signal (ft)	279											
pX, platoon unblocked				0.98				0.98	0.98	0.98	0.98	0.98
vC, conflicting volume	506			327			846	844	326	840	835	496
vC1, stage 1 conf vol							332	332			502	502
vC2, stage 2 conf vol							514	512			338	333
vCu, unblocked vol	506			301			832	830	300	825	820	496
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5			6.1	5.5
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	98	100	98
cM capacity (veh/h)	1059			1233			468	470	723	480	475	574
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	330	509	5	23								
Volume Left	3	3	0	11								
Volume Right	1	20	5	12								
cSH	1059	1233	723	525								
Volume to Capacity	0.00	0.00	0.01	0.04								
Queue Length 95th (ft)	0	0	1	3								
Control Delay (s)	0.1	0.1	10.0	12.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.1	10.0	12.2								
Approach LOS				B	B							
Intersection Summary												
Average Delay				0.5								
Intersection Capacity Utilization				41.0%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	315	2	6	496	10	2	1	13	12	1	6
Future Volume (Veh/h)	4	315	2	6	496	10	2	1	13	12	1	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	342	2	7	539	11	2	1	14	13	1	7
Pedestrians		1						1				
Lane Width (ft)		12.0						12.0				
Walking Speed (ft/s)		4.0						4.0				
Percent Blockage		0						0				
Right turn flare (veh)												
Median type		TWLT			TWLT							
Median storage veh		2			2							
Upstream signal (ft)		687										
pX, platoon unblocked												
vC, conflicting volume	550			345			919	916	344	924	912	546
vC1, stage 1 conf vol							352	352		558	558	
vC2, stage 2 conf vol							567	564		366	353	
vCu, unblocked vol	550			345			919	916	344	924	912	546
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	98	97	100	99
cM capacity (veh/h)	1020			1213			438	444	698	441	446	537
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	348	557	17	21								
Volume Left	4	7	2	13								
Volume Right	2	11	14	7								
cSH	1020	1213	633	469								
Volume to Capacity	0.00	0.01	0.03	0.04								
Queue Length 95th (ft)	0	0	2	4								
Control Delay (s)	0.1	0.2	10.8	13.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.2	10.8	13.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			40.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	386	1	6	498	66	0	0	5	1	0	10
Future Volume (Veh/h)	14	386	1	6	498	66	0	0	5	1	0	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	420	1	7	541	72	0	0	5	1	0	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage veh	2			2								
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	613			421			1016	1078	420	1046	1042	577
vC1, stage 1 conf vol							450	450		591	591	
vC2, stage 2 conf vol							566	627		456	451	
vCu, unblocked vol	613			421			1016	1078	420	1046	1042	577
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			100	100	99	100	100	98
cM capacity (veh/h)	966			1138			406	394	633	405	411	516
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total	436	7	613	5	12							
Volume Left	15	7	0	0	1							
Volume Right	1	0	72	5	11							
cSH	966	1138	1700	633	505							
Volume to Capacity	0.02	0.01	0.36	0.01	0.02							
Queue Length 95th (ft)	1	0	0	1	2							
Control Delay (s)	0.5	8.2	0.0	10.7	12.3							
Lane LOS	A	A		B	B							
Approach Delay (s)	0.5	0.1		10.7	12.3							
Approach LOS				B	B							
Intersection Summary												
Average Delay			0.4									
Intersection Capacity Utilization			Err%		ICU Level of Service				H			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	33	5	0	5	14	222	4	7	502	5
Future Volume (Veh/h)	0	0	33	5	0	5	14	222	4	7	502	5
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	36	5	0	5	15	241	4	8	546	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLT			TWLT	
Median storage veh								2			2	
Upstream signal (ft)											621	
pX, platoon unblocked												
vC, conflicting volume	720	840	548	871	840	122	551			245		
vC1, stage 1 conf vol	564	564		273	273							
vC2, stage 2 conf vol	156	275		598	567							
vCu, unblocked vol	720	840	548	871	840	122	551			245		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	92	99	100	99	99			99		
cM capacity (veh/h)	451	457	480	378	448	906	1015			1318		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	36	10	15	161	84	8	551					
Volume Left	0	5	15	0	0	8	0					
Volume Right	36	5	0	0	4	0	5					
cSH	480	533	1015	1700	1700	1318	1700					
Volume to Capacity	0.08	0.02	0.01	0.09	0.05	0.01	0.32					
Queue Length 95th (ft)	6	1	1	0	0	0	0					
Control Delay (s)	13.1	11.9	8.6	0.0	0.0	7.7	0.0					
Lane LOS	B	B	A			A						
Approach Delay (s)	13.1	11.9	0.5			0.1						
Approach LOS	B	B										
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			Err%	ICU Level of Service						H		
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2013
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Michigan Avenue
E/W Street Name	Michigan Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	56	8	23	0	30	9	5	0	14	301	4	0	4	295	17
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	62	9	26	0	33	10	6	0	16	334	4	0	4	327	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		97			49			354			350	
Entry Volume veh/h		95			48			347			343	
Circulating Flow (Vc), pc/h	364			412			75			59		
Exiting Flow (Vex), pc/h	17			45			402			386		
Capacity (cPCE), pc/h		785			748			1048			1065	
Capacity (c), veh/h		770			734			1028			1044	
v/c Ratio (X)		0.12			0.07			0.34			0.33	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.0			5.6			7.0			6.8	
Lane LOS		A			A			A			A	
95% Queue		0.4			0.2			1.5			1.4	
Approach Delay, s/veh	6.0			5.6			7.0			6.8		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	6.7						A					

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

06/25/2018

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↗	↘↘	↑↑↑					
Traffic Volume (veh/h)	275	188	948	561	0	0			
Future Volume (veh/h)	275	188	948	561	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863					
Adj Flow Rate, veh/h	299	204	1030	610					
Adj No. of Lanes	2	1	2	3					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	1416	633	1377	4577					
Arrive On Green	0.40	0.40	0.40	0.90					
Sat Flow, veh/h	3632	1583	3442	5253					
Grp Volume(v), veh/h	299	204	1030	610					
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1695					
Q Serve(g_s), s	2.2	3.5	10.3	0.5					
Cycle Q Clear(g_c), s	2.2	3.5	10.3	0.5					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	1416	633	1377	4577					
V/C Ratio(X)	0.21	0.32	0.75	0.13					
Avail Cap(c_a), veh/h	1416	633	1377	4577					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	7.9	8.3	10.3	0.2					
Incr Delay (d2), s/veh	0.3	1.3	3.8	0.1					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	1.1	1.8	5.4	0.3					
LnGrp Delay(d),s/veh	8.2	9.6	14.0	0.3					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	503			1640					
Approach Delay, s/veh	8.8			8.9					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			20.0	20.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			16.0	16.0				36.0	
Max Q Clear Time (g_c+I1), s			12.3	5.5				2.5	
Green Ext Time (p_c), s			1.6	1.9				4.7	
Intersection Summary									
HCM 2010 Ctrl Delay			8.9						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↑	↑↑	↑↑					
Traffic Volume (veh/h)	275	188	948	561	0	0			
Future Volume (veh/h)	275	188	948	561	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937					
Adj Flow Rate, veh/h	299	204	1030	610					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	1472	659	1432	3313					
Arrive On Green	0.40	0.40	0.40	0.90					
Sat Flow, veh/h	3778	1647	3579	3778					
Grp Volume(v), veh/h	299	204	1030	610					
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840					
Q Serve(g_s), s	2.1	3.4	9.7	0.8					
Cycle Q Clear(g_c), s	2.1	3.4	9.7	0.8					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	1472	659	1432	3313					
V/C Ratio(X)	0.20	0.31	0.72	0.18					
Avail Cap(c_a), veh/h	1472	659	1432	3313					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	7.8	8.2	10.1	0.2					
Incr Delay (d2), s/veh	0.3	1.2	3.1	0.1					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	1.1	1.8	5.3	0.4					
LnGrp Delay(d),s/veh	8.1	9.4	13.3	0.4					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	503			1640					
Approach Delay, s/veh	8.7			8.5					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			20.0	20.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			16.0	16.0				36.0	
Max Q Clear Time (g_c+I1), s			11.7	5.4				2.8	
Green Ext Time (p_c), s			1.8	2.0				4.7	
Intersection Summary									
HCM 2010 Ctrl Delay			8.5						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/11/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑↑	↑	↑		
Traffic Volume (veh/h)	466	79	980	1434	79	1		
Future Volume (veh/h)	466	79	980	1434	79	1		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	507	86	1065	1559	86	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	982	439	954	2208	492	439		
Arrive On Green	0.27	0.27	0.27	0.60	0.27	0.00		
Sat Flow, veh/h	3778	1647	3579	3778	1845	1647		
Grp Volume(v), veh/h	507	86	1065	1559	86	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840	1845	1647		
Q Serve(g_s), s	7.0	2.4	16.0	17.6	2.2	0.0		
Cycle Q Clear(g_c), s	7.0	2.4	16.0	17.6	2.2	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	982	439	954	2208	492	439		
V/C Ratio(X)	0.52	0.20	1.12	0.71	0.17	0.00		
Avail Cap(c_a), veh/h	982	439	954	2208	492	439		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	18.7	17.0	22.0	8.3	16.9	0.0		
Incr Delay (d2), s/veh	1.9	1.0	66.4	1.9	0.8	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	3.8	1.2	16.6	9.3	1.2	0.0		
LnGrp Delay(d),s/veh	20.7	18.0	88.4	10.3	17.7	0.0		
LnGrp LOS	C	B	F	B	B			
Approach Vol, veh/h	593			2624	86			
Approach Delay, s/veh	20.3			42.0	17.7			
Approach LOS	C			D	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	20.0	20.0				40.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	16.0	16.0				36.0
Max Q Clear Time (g_c+I1), s		4.2	18.0	9.0				19.6
Green Ext Time (p_c), s		0.1	0.0	2.1				10.6
Intersection Summary								
HCM 2010 Ctrl Delay			37.4					
HCM 2010 LOS			D					

HCM 2010 Signalized Intersection Summary
51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	502	6	183	871	718	17	0	219	90	71	82
Future Volume (veh/h)	0	502	6	183	871	718	17	0	219	90	71	82
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1937	1976	1937	1937	1937	1937	0	1937	1937	1937	1937
Adj Flow Rate, veh/h	0	546	7	199	947	0	18	0	238	88	92	89
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1145	15	284	1982	887	0	0	0	568	596	507
Arrive On Green	0.00	0.31	0.31	0.15	0.54	0.00	0.00	0.00	0.00	0.31	0.31	0.31
Sat Flow, veh/h	0	3818	48	1845	3681	1647		0		1845	1937	1647
Grp Volume(v), veh/h	0	270	283	199	947	0		0.0		88	92	89
Grp Sat Flow(s),veh/h/ln	0	1840	1929	1845	1840	1647				1845	1937	1647
Q Serve(g_s), s	0.0	6.2	6.2	5.3	8.3	0.0				1.8	1.8	2.1
Cycle Q Clear(g_c), s	0.0	6.2	6.2	5.3	8.3	0.0				1.8	1.8	2.1
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	566	593	284	1982	887				568	596	507
V/C Ratio(X)	0.00	0.48	0.48	0.70	0.48	0.00				0.16	0.15	0.18
Avail Cap(c_a), veh/h	0	566	593	284	1982	887				568	596	507
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	14.6	14.6	20.9	7.5	0.0				13.1	13.1	13.2
Incr Delay (d2), s/veh	0.0	2.9	2.7	13.5	0.8	0.0				0.6	0.6	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.6	3.8	3.8	4.3	0.0				1.0	1.0	1.0
LnGrp Delay(d),s/veh	0.0	17.5	17.3	34.4	8.3	0.0				13.7	13.6	13.9
LnGrp LOS		B	B	C	A					B	B	B
Approach Vol, veh/h		553			1146						269	
Approach Delay, s/veh		17.4			12.8						13.7	
Approach LOS		B			B						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			12.0	20.0		20.0		32.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			8.0	16.0		16.0		28.0				
Max Q Clear Time (g_c+I1), s			7.3	8.2		4.1		10.3				
Green Ext Time (p_c), s			0.0	2.0		0.8		6.5				
Intersection Summary												
HCM 2010 Ctrl Delay			14.2									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/25/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	325	393	13	22	517	506	24	29	48	197	5	80
Future Volume (veh/h)	325	393	13	22	517	506	24	29	48	197	5	80
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1976	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	353	427	14	24	562	550	26	32	52	153	90	87
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	369	1273	42	92	736	659	170	209	329	369	181	175
Arrive On Green	0.20	0.35	0.35	0.05	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1845	3638	119	1845	3681	1647	849	1045	1647	1845	906	876
Grp Volume(v), veh/h	353	216	225	24	562	550	58	0	52	153	0	177
Grp Sat Flow(s),veh/h/ln	1845	1840	1916	1845	1840	1647	1895	0	1647	1845	0	1783
Q Serve(g_s), s	15.1	6.9	6.9	1.0	11.5	16.0	2.0	0.0	2.1	5.8	0.0	7.1
Cycle Q Clear(g_c), s	15.1	6.9	6.9	1.0	11.5	16.0	2.0	0.0	2.1	5.8	0.0	7.1
Prop In Lane	1.00		0.06	1.00		1.00	0.45		1.00	1.00		0.49
Lane Grp Cap(c), veh/h	369	644	671	92	736	659	379	0	329	369	0	357
V/C Ratio(X)	0.96	0.33	0.34	0.26	0.76	0.84	0.15	0.00	0.16	0.41	0.00	0.50
Avail Cap(c_a), veh/h	369	644	671	92	736	659	379	0	329	369	0	357
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.7	19.1	19.2	36.6	30.2	19.2	26.4	0.0	26.4	27.9	0.0	28.4
Incr Delay (d2), s/veh	37.1	1.4	1.4	6.7	7.4	11.9	0.9	0.0	1.0	3.4	0.0	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.5	3.7	3.9	0.7	6.6	14.3	1.1	0.0	1.0	3.3	0.0	3.9
LnGrp Delay(d),s/veh	68.8	20.5	20.5	43.3	37.6	31.1	27.3	0.0	27.5	31.3	0.0	33.3
LnGrp LOS	E	C	C	D	D	C	C		C	C		C
Approach Vol, veh/h		794			1136			110			330	
Approach Delay, s/veh		42.0			34.6			27.4			32.4	
Approach LOS		D			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	8.0	32.0		20.0	20.0	20.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	4.0	28.0		16.0	16.0	16.0				
Max Q Clear Time (g_c+I1), s		4.1	3.0	8.9		9.1	17.1	18.0				
Green Ext Time (p_c), s		0.3	0.0	2.5		0.8	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			36.4									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	86	378	143	43	748	257	127	74	41	316	155	223	
Future Volume (veh/h)	86	378	143	43	748	257	127	74	41	316	155	223	
Number	7	4	14	3	8	18	5	2	12	1	6	16	
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0	
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1937	1937	1937	1937	1937	1937	
Adj Flow Rate, veh/h	93	411	155	47	813	279	109	121	45	256	290	242	
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2	
Cap, veh/h	132	638	238	132	894	400	422	443	376	422	443	376	
Arrive On Green	0.07	0.24	0.24	0.07	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23	
Sat Flow, veh/h	1845	2626	979	1845	3681	1647	1845	1937	1647	1845	1937	1647	
Grp Volume(v), veh/h	93	287	279	47	813	279	109	121	45	256	290	242	
Grp Sat Flow(s),veh/h/ln	1845	1840	1764	1845	1840	1647	1845	1937	1647	1845	1937	1647	
Q Serve(g_s), s	3.5	9.8	10.0	1.7	15.0	10.8	3.4	3.6	1.5	8.7	9.5	9.3	
Cycle Q Clear(g_c), s	3.5	9.8	10.0	1.7	15.0	10.8	3.4	3.6	1.5	8.7	9.5	9.3	
Prop In Lane	1.00		0.56	1.00		1.00	1.00		1.00	1.00		1.00	
Lane Grp Cap(c), veh/h	132	447	429	132	894	400	422	443	376	422	443	376	
V/C Ratio(X)	0.71	0.64	0.65	0.36	0.91	0.70	0.26	0.27	0.12	0.61	0.65	0.64	
Avail Cap(c_a), veh/h	132	447	429	132	894	400	422	443	376	422	443	376	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Uniform Delay (d), s/veh	31.8	23.8	23.8	31.0	25.8	24.2	22.1	22.2	21.4	24.2	24.5	24.4	
Incr Delay (d2), s/veh	27.2	6.9	7.5	7.4	14.8	9.7	1.5	1.5	0.6	6.4	7.4	8.2	
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
%ile BackOfQ(50%),veh/ln	2.8	5.8	5.7	1.1	9.4	6.0	1.9	2.1	0.8	5.2	6.0	5.1	
LnGrp Delay(d),s/veh	59.0	30.7	31.3	38.4	40.6	33.9	23.6	23.7	22.1	30.5	31.9	32.6	
LnGrp LOS	E	C	C	D	D	C	C	C	C	C	C	C	
Approach Vol, veh/h	659				1139				275				788
Approach Delay, s/veh	34.9				38.8				23.4				31.7
Approach LOS	C				D				C				C
Timer	1	2	3	4	5	6	7	8					
Assigned Phs	2		3	4	6		7	8					
Phs Duration (G+Y+Rc), s	20.0		9.0	21.0	20.0		9.0	21.0					
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0					
Max Green Setting (Gmax), s	16.0		5.0	17.0	16.0		5.0	17.0					
Max Q Clear Time (g_c+I1), s	5.6		3.7	12.0	11.5		5.5	17.0					
Green Ext Time (p_c), s	0.8		0.0	1.6	1.5		0.0	0.0					
Intersection Summary													
HCM 2010 Ctrl Delay			34.5										
HCM 2010 LOS			C										
Notes													

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	43	93	13	62	70	165	3	84	22	0	0	0
Future Vol, veh/h	43	93	13	62	70	165	3	84	22	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	47	101	14	67	76	179	3	91	24	0	0	0
Number of Lanes	0	1	1	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	9.2	9.9	8.9
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1
Vol Left, %	3%	32%	0%	21%
Vol Thru, %	77%	68%	0%	24%
Vol Right, %	20%	0%	100%	56%
Sign Control	Stop	Stop	Stop	Stop
Traffic Vol by Lane	109	136	13	297
LT Vol	3	43	0	62
Through Vol	84	93	0	70
RT Vol	22	0	13	165
Lane Flow Rate	118	148	14	323
Geometry Grp	2	7	7	5
Degree of Util (X)	0.161	0.215	0.017	0.38
Departure Headway (Hd)	4.899	5.232	4.368	4.241
Convergence, Y/N	Yes	Yes	Yes	Yes
Cap	731	686	819	849
Service Time	2.936	2.962	2.098	2.265
HCM Lane V/C Ratio	0.161	0.216	0.017	0.38
HCM Control Delay	8.9	9.4	7.2	9.9
HCM Lane LOS	A	A	A	A
HCM 95th-tile Q	0.6	0.8	0.1	1.8

Intersection												
Int Delay, s/veh	3.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖						↖	↗
Traffic Vol, veh/h	0	207	267	163	83	0	0	0	0	40	0	133
Future Vol, veh/h	0	207	267	163	83	0	0	0	0	40	0	133
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	225	290	177	90	0	0	0	0	43	0	145
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	225	0	0				669	669	90
Stage 1	-	-	-	-	-	-				444	444	-
Stage 2	-	-	-	-	-	-				225	225	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1344	-	0				423	379	968
Stage 1	0	-	-	-	-	0				646	575	-
Stage 2	0	-	-	-	-	0				812	718	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1344	-	-				364	0	968
Mov Cap-2 Maneuver	-	-	-	-	-	-				364	0	-
Stage 1	-	-	-	-	-	-				556	0	-
Stage 2	-	-	-	-	-	-				812	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			5.4			11					
HCM LOS							B					
Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2						
Capacity (veh/h)	-	-	1344	-	364	968						
HCM Lane V/C Ratio	-	-	0.132	-	0.119	0.149						
HCM Control Delay (s)	-	-	8.1	0	16.2	9.4						
HCM Lane LOS	-	-	A	A	C	A						
HCM 95th %tile Q(veh)	-	-	0.5	-	0.4	0.5						

HCM 2010 Signalized Intersection Summary

56: I-5 SB On/Off-Ramp & Vista Way

06/25/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↗	↑	↖	↗↘		
Traffic Volume (veh/h)	294	119	1739	698	10	1652		
Future Volume (veh/h)	294	119	1739	698	10	1652		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	320	0	1890	759	11	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	404	181	1844	1264	469	736		
Arrive On Green	0.11	0.00	0.54	0.68	0.26	0.00		
Sat Flow, veh/h	3632	1583	3442	1863	1774	2787		
Grp Volume(v), veh/h	320	0	1890	759	11	0		
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1863	1774	1393		
Q Serve(g_s), s	12.3	0.0	75.0	30.9	0.6	0.0		
Cycle Q Clear(g_c), s	12.3	0.0	75.0	30.9	0.6	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	404	181	1844	1264	469	736		
V/C Ratio(X)	0.79	0.00	1.03	0.60	0.02	0.00		
Avail Cap(c_a), veh/h	404	181	1844	1264	469	736		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	60.4	0.0	32.5	12.2	38.1	0.0		
Incr Delay (d2), s/veh	14.6	0.0	27.6	2.1	0.1	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	6.9	0.0	42.4	16.6	0.3	0.0		
LnGrp Delay(d),s/veh	75.0	0.0	60.1	14.3	38.2	0.0		
LnGrp LOS	E		F	B	D			
Approach Vol, veh/h	320			2649	11			
Approach Delay, s/veh	75.0			47.0	38.2			
Approach LOS	E			D	D			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		41.0	79.0	20.0				99.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		37.0	75.0	16.0				95.0
Max Q Clear Time (g_c+I1), s		2.6	77.0	14.3				32.9
Green Ext Time (p_c), s		0.0	0.0	0.3				6.9
Intersection Summary								
HCM 2010 Ctrl Delay			50.0					
HCM 2010 LOS			D					

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	258	103	163	362	295	1429	180	29	136	103	57	74
Future Volume (vph)	258	103	163	362	295	1429	180	29	136	103	57	74
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3030	1441		1786	1583		1805	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3030	1441		1786	1583		1805	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	280	112	177	393	321	1553	196	32	148	112	62	80
RTOR Reduction (vph)	0	0	150	0	500	573	0	0	114	0	0	65
Lane Group Flow (vph)	280	112	27	393	598	203	0	228	34	0	174	15
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	14.0	13.3	13.3	17.0	19.9	19.9		20.2	20.2		16.0	16.0
Effective Green, g (s)	14.0	13.3	13.3	17.0	19.9	19.9		20.2	20.2		16.0	16.0
Actuated g/C Ratio	0.16	0.15	0.15	0.19	0.23	0.23		0.23	0.23		0.18	0.18
Clearance Time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	283	283	241	344	690	328		413	366		330	290
v/s Ratio Prot	0.16	0.06		c0.22	c0.20			c0.13			c0.10	
v/s Ratio Perm			0.02			0.14			0.02			0.01
v/c Ratio	0.99	0.40	0.11	1.14	0.87	0.62		0.55	0.09		0.53	0.05
Uniform Delay, d1	36.6	33.4	31.9	35.1	32.4	30.3		29.6	26.4		32.2	29.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	50.0	0.3	0.1	93.0	10.7	2.4		5.2	0.5		5.9	0.3
Delay (s)	86.6	33.7	32.0	128.2	43.1	32.7		34.8	26.9		38.2	29.7
Level of Service	F	C	C	F	D	C		C	C		D	C
Approach Delay (s)		59.2			54.3			31.7			35.5	
Approach LOS		E			D			C			D	
Intersection Summary												
HCM 2000 Control Delay			51.3				HCM 2000 Level of Service			D		
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			87.3				Sum of lost time (s)		20.8			
Intersection Capacity Utilization			96.1%				ICU Level of Service		F			
Analysis Period (min)			15									
c Critical Lane Group												

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2013
Time Period	PM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				T				L			
Volume (V), veh/h	0	0	0	5	0	526	0	205	0	5	280	536	0	353	359	2
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	0	0	6	0	583	0	223	0	6	310	594	0	391	398	2
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929		4.2929	4.1129			4.1129		4.2929	4.1129	
Follow-Up Headway (sec)		3.1858		3.1858	3.1858			3.1858		3.1858	3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		6		0	583	223		316	594	391	400	
Entry Volume veh/h		6		0	572	223		310	582	383	392	
Circulating Flow (Vc), pc/h	1372			316			391			589		
Exiting Flow (Vex), pc/h	391			8			310			987		
Capacity (cPCE), pc/h		287		892	906			859		726	748	
Capacity (c), veh/h		281		874	888			843		712	734	
v/c Ratio (X)		0.02		0.00	0.64			0.37		0.54	0.53	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		13.2		4.1	14.3	0.0		8.6	0.0	13.5	13.1	
Lane LOS		B		A	B	A		A	A	B	B	
95% Queue		0.1		0.0	4.8			1.7		3.2	3.2	
Approach Delay, s/veh	13.2			10.3			3.0			13.3		
Approach LOS	B			B			A			B		
Intersection Delay, s/veh / LOS	8.6						A					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	38	26	62	65	100	41	78	65	115	106	25
Future Volume (vph)	1	38	26	62	65	100	41	78	65	115	106	25
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	41	28	67	71	109	45	85	71	125	115	27
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	70	247	201	267								
Volume Left (vph)	1	67	45	125								
Volume Right (vph)	28	109	71	27								
Hadj (s)	-0.20	-0.18	-0.13	0.07								
Departure Headway (s)	5.3	5.0	5.0	5.1								
Degree Utilization, x	0.10	0.35	0.28	0.38								
Capacity (veh/h)	592	658	668	662								
Control Delay (s)	8.9	10.7	9.9	11.2								
Approach Delay (s)	8.9	10.7	9.9	11.2								
Approach LOS	A	B	A	B								
Intersection Summary												
Delay	10.5											
Level of Service	B											
Intersection Capacity Utilization	52.2%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

2/24/2017

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↩	↩		↩		↩	↩		↩	↩	↩
Traffic Volume (vph)	162	50	68	11	44	27	48	554	17	43	560	117
Future Volume (vph)	162	50	68	11	44	27	48	554	17	43	560	117
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	2.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1794	1583		1769		1770	1855		1770	1863	1583
Flt Permitted		0.76	1.00		0.96		0.95	1.00		0.95	1.00	1.00
Satd. Flow (perm)		1419	1583		1717		1770	1855		1770	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	176	54	74	12	48	29	52	602	18	47	609	127
RTOR Reduction (vph)	0	0	53	0	21	0	0	1	0	0	0	58
Lane Group Flow (vph)	0	230	21	0	68	0	52	619	0	47	609	69
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	Perm
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								6
Actuated Green, G (s)		19.0	19.0		19.0		5.7	27.7		10.1	36.9	36.9
Effective Green, g (s)		19.0	19.0		19.0		5.7	27.7		10.1	36.9	36.9
Actuated g/C Ratio		0.28	0.28		0.28		0.08	0.41		0.15	0.55	0.55
Clearance Time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	2.0
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		3.0	7.0	7.0
Lane Grp Cap (vph)		398	444		482		149	760		264	1016	864
v/s Ratio Prot							c0.03	c0.33		0.03	c0.33	
v/s Ratio Perm		c0.16	0.01		0.04							0.04
v/c Ratio		0.58	0.05		0.14		0.35	0.81		0.18	0.60	0.08
Uniform Delay, d1		20.9	17.7		18.2		29.2	17.7		25.1	10.4	7.3
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		4.8	0.2		0.5		1.4	6.7		0.3	2.1	0.1
Delay (s)		25.7	17.9		18.7		30.6	24.4		25.4	12.5	7.4
Level of Service		C	B		B		C	C		C	B	A
Approach Delay (s)		23.8			18.7			24.8			12.4	
Approach LOS		C			B			C			B	
Intersection Summary												
HCM 2000 Control Delay			19.1									
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			67.6									
Intersection Capacity Utilization			65.0%									
Analysis Period (min)			15									
c Critical Lane Group												

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	PM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Civic Center Drive
E/W Street Name	Civic Center Drive
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	26	29	23	0	29	34	65	0	19	548	53	0	36	572	22
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	29	32	26	0	32	38	72	0	21	608	59	0	40	634	24
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		87			142			688			698	
Entry Volume veh/h		85			139			675			684	
Circulating Flow (Vc), pc/h	706			658			101			91		
Exiting Flow (Vex), pc/h	131			83			709			692		
Capacity (cPCE), pc/h		558			585			1021			1032	
Capacity (c), veh/h		547			574			1001			1011	
v/c Ratio (X)		0.16			0.24			0.67			0.68	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		8.6			9.5			14.0			14.0	
Lane LOS		A			A			B			B	
95% Queue		0.5			0.9			5.5			5.5	
Approach Delay, s/veh	8.6			9.5			14.0			14.0		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh / LOS	13.3						B					

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	7/12/2016
Analysis Year	2016
Time Period	PM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Pier View Way
E/W Street Name	Pier View Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	38	30	42	0	18	30	51	0	32	531	42	0	23	531	72
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	42	33	47	0	20	33	57	0	35	589	47	0	26	589	80
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		122			110			671			695	
Entry Volume veh/h		120			108			658			681	
Circulating Flow (Vc), pc/h	635			666			101			88		
Exiting Flow (Vex), pc/h	106			148			688			656		
Capacity (cPCE), pc/h		599			581			1021			1035	
Capacity (c), veh/h		587			569			1001			1015	
v/c Ratio (X)		0.20			0.19			0.66			0.67	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		8.7			8.7			13.5			13.8	
Lane LOS		A			A			B			B	
95% Queue		0.8			0.7			5.1			5.4	
Approach Delay, s/veh	8.7			8.7			13.5			13.8		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh / LOS	12.9						B					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

11/17/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	32	13	116	107	13	18	40	250	50	18	225	10
Future Volume (vph)	32	13	116	107	13	18	40	250	50	18	225	10
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	14	126	116	14	20	43	272	54	20	245	11
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	49	126	150	179	190	143	134					
Volume Left (vph)	35	0	116	43	0	20	0					
Volume Right (vph)	0	126	20	0	54	0	11					
Hadj (s)	0.39	-0.67	0.11	0.15	-0.16	0.10	-0.02					
Departure Headway (s)	6.8	5.8	6.5	6.1	5.7	6.1	6.0					
Degree Utilization, x	0.09	0.20	0.27	0.30	0.30	0.24	0.22					
Capacity (veh/h)	485	571	515	570	600	555	568					
Control Delay (s)	9.3	9.0	11.9	10.5	10.0	9.9	9.5					
Approach Delay (s)	9.1		11.9	10.2		9.7						
Approach LOS	A		B	B		A						
Intersection Summary												
Delay			10.1									
Level of Service			B									
Intersection Capacity Utilization			41.1%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	181	81	106	126	59	124
Future Volume (vph)	181	81	106	126	59	124
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	197	88	115	137	64	135
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	197	88	252	199		
Volume Left (vph)	197	0	0	64		
Volume Right (vph)	0	88	137	0		
Hadj (s)	0.53	-0.67	-0.29	0.10		
Departure Headway (s)	6.1	4.9	4.7	5.1		
Degree Utilization, x	0.34	0.12	0.33	0.28		
Capacity (veh/h)	555	684	732	665		
Control Delay (s)	11.0	7.4	9.9	10.1		
Approach Delay (s)	9.9		9.9	10.1		
Approach LOS	A		A	B		
Intersection Summary						
Delay			10.0			
Level of Service			A			
Intersection Capacity Utilization			43.1%	ICU Level of Service	A	
Analysis Period (min)			15			

Existing Year 2013 No Project

Level Of Service Computation Report
 2000 HCM 4-Way Stop Method (Base Volume Alternative)

Intersection #9 Cleveland Street and Mission Avenue

Cycle (sec): 100 Critical Vol./Cap.(X): 0.292
 Loss Time (sec): 0 Average Delay (sec/veh): 10.6
 Optimal Cycle: 0 Level Of Service: B

Street Name: Cleveland Street Mission Avenue
 Approach: North Bound South Bound East Bound West Bound
 Movement: L - T - R L - T - R L - T - R L - T - R
 Control: Stop Sign Stop Sign Stop Sign Stop Sign
 Rights: Include Include Include Include
 Min. Green: 0 0 0 0 0 0 0 0 0 0 0 0
 Lanes: 0 1 0 0 1 0 0 1 0 0 1 0 1 0 1 1 0

Volume Module:
 Base Vol: 43 38 58 72 29 59 28 224 33 93 204 63
 Growth Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Initial Bse: 43 38 58 72 29 59 28 224 33 93 204 63
 User Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 PHF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 PHF Volume: 43 38 58 72 29 59 28 224 33 93 204 63
 Reduct Vol: 0 0 0 0 0 0 0 0 0 0 0 0
 Reduced Vol: 43 38 58 72 29 59 28 224 33 93 204 63
 PCE Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 MLF Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 FinalVolume: 43 38 58 72 29 59 28 224 33 93 204 63

Saturation Flow Module:
 Adjustment: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 Lanes: 0.53 0.47 1.00 0.45 0.18 0.37 1.00 1.74 0.26 1.00 1.53 0.47
 Final Sat.: 268 237 584 247 99 202 504 961 144 519 872 279

Capacity Analysis Module:
 Vol/Sat: 0.16 0.16 0.10 0.29 0.29 0.29 0.06 0.23 0.23 0.18 0.23 0.23
 Crit Moves: ****
 Delay/Veh: 10.6 10.6 9.0 11.6 11.6 11.6 9.9 10.7 10.5 10.7 10.5 10.1
 Delay Adj: 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00 1.00
 AdjDel/Veh: 10.6 10.6 9.0 11.6 11.6 11.6 9.9 10.7 10.5 10.7 10.5 10.1
 LOS by Move: B B A B B B A B B B B B
 ApproachDel: 9.9 11.6 10.6 10.5
 Delay Adj: 1.00 1.00 1.00
 ApprAdjDel: 9.9 11.6 10.6 10.5
 LOS by Appr: A B B B
 AllWayAvgQ: 0.2 0.2 0.1 0.4 0.4 0.4 0.1 0.3 0.3 0.2 0.3 0.3

Note: Queue reported is the number of cars per lane.

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	0	65	137	380	121	53	507	0	0	426	61
Future Volume (vph)	43	0	65	137	380	121	53	507	0	0	426	61
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	5.0
Lane Util. Factor	1.00		1.00	1.00	0.95		1.00	1.00			0.95	0.95
Frpb, ped/bikes	1.00		0.96	1.00	0.99		1.00	1.00			1.00	0.97
Flpb, ped/bikes	0.99		1.00	0.98	1.00		1.00	1.00			1.00	1.00
Frt	1.00		0.85	1.00	0.96		1.00	1.00			1.00	0.85
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00			1.00	1.00
Satd. Flow (prot)	1756		1522	1737	3381		1770	1863			1765	1461
Flt Permitted	0.42		1.00	0.95	1.00		0.32	1.00			1.00	1.00
Satd. Flow (perm)	779		1522	1737	3381		589	1863			1765	1461
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	0	71	149	413	132	58	551	0	0	463	66
RTOR Reduction (vph)	0	0	41	0	44	0	0	0	0	0	1	31
Lane Group Flow (vph)	47	0	30	149	501	0	58	551	0	0	469	28
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type	Perm		Perm	Perm	NA		Perm	NA			NA	Perm
Protected Phases					8			2			6	
Permitted Phases	4		4	8			2					6
Actuated Green, G (s)	25.5		25.5	25.5	25.5		24.5	24.5			24.5	24.5
Effective Green, g (s)	25.5		25.5	25.5	25.5		24.5	24.5			24.5	24.5
Actuated g/C Ratio	0.42		0.42	0.42	0.42		0.41	0.41			0.41	0.41
Clearance Time (s)	5.0		5.0	5.0	5.0		5.0	5.0			5.0	5.0
Vehicle Extension (s)	3.0		3.0	3.0	3.0		4.0	4.0			4.0	4.0
Lane Grp Cap (vph)	331		646	738	1436		240	760			720	596
v/s Ratio Prot					c0.15			c0.30			0.27	
v/s Ratio Perm	0.06		0.02	0.09			0.10					0.02
v/c Ratio	0.14		0.05	0.20	0.35		0.24	0.72			0.65	0.05
Uniform Delay, d1	10.6		10.1	10.8	11.6		11.7	14.9			14.3	10.7
Progression Factor	1.00		1.00	1.00	1.00		0.20	0.21			1.36	2.11
Incremental Delay, d2	0.9		0.1	0.6	0.7		0.3	1.8			1.8	0.0
Delay (s)	11.5		10.3	11.5	12.3		2.7	4.8			21.4	22.7
Level of Service	B		B	B	B		A	A			C	C
Approach Delay (s)		10.7			12.1			4.6			21.5	
Approach LOS		B			B			A			C	
Intersection Summary												
HCM 2000 Control Delay			12.2				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.53									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			10.0		
Intersection Capacity Utilization			67.1%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	351	3	142	638	268	5	44	477	365	51	25
Future Volume (vph)	15	351	3	142	638	268	5	44	477	365	51	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0	4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00	1.00	1.00		0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85	1.00	0.86		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00		0.95	0.97	
Satd. Flow (prot)	1770	3535		1770	3539	1583	1770	1607		1681	1684	
Flt Permitted	0.28	1.00		0.51	1.00	1.00	0.60	1.00		0.32	0.42	
Satd. Flow (perm)	529	3535		951	3539	1583	1116	1607		575	736	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	382	3	154	693	291	5	48	518	397	55	27
RTOR Reduction (vph)	0	1	0	0	0	197	0	145	0	0	7	0
Lane Group Flow (vph)	16	384	0	154	693	94	5	421	0	238	234	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2			6		
Actuated Green, G (s)	19.8	19.8		19.4	19.4	19.4	31.0	31.0		31.0	31.0	
Effective Green, g (s)	19.8	19.8		19.4	19.4	19.4	31.0	31.0		31.0	31.0	
Actuated g/C Ratio	0.33	0.33		0.32	0.32	0.32	0.52	0.52		0.52	0.52	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0	4.6	4.6		4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5	4.0	4.0		4.0	4.0	
Lane Grp Cap (vph)	174	1166		307	1144	511	576	830		297	380	
v/s Ratio Prot		0.11			c0.20			0.26				
v/s Ratio Perm	0.03			0.16		0.06	0.00			c0.41	0.32	
v/c Ratio	0.09	0.33		0.50	0.61	0.18	0.01	0.51		0.80	0.62	
Uniform Delay, d1	13.9	15.1		16.4	17.1	14.6	7.0	9.5		12.0	10.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.2		1.5	1.0	0.2	0.0	2.2		20.0	7.3	
Delay (s)	14.2	15.3		17.9	18.0	14.8	7.1	11.7		31.9	17.6	
Level of Service	B	B		B	B	B	A	B		C	B	
Approach Delay (s)		15.3			17.2			11.7			24.7	
Approach LOS		B			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			17.1									B
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			60.0									9.6
Intersection Capacity Utilization			80.6%									D
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

9/1/2016

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	177	32	50	126	50	63
Future Volume (Veh/h)	177	32	50	126	50	63
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	192	35	54	137	54	68
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				248		
pX, platoon unblocked						
vC, conflicting volume			227		454	210
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			227		454	210
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		90	92
cM capacity (veh/h)			1341		541	831
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	227	191	122			
Volume Left	0	54	54			
Volume Right	35	0	68			
cSH	1700	1341	671			
Volume to Capacity	0.13	0.04	0.18			
Queue Length 95th (ft)	0	3	16			
Control Delay (s)	0.0	2.4	11.5			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.4	11.5			
Approach LOS			B			
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			37.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr/Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	70	365	67	0	0	0	58	651	245	113	479	62
Future Volume (vph)	70	365	67	0	0	0	58	651	245	113	479	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2					4.2	4.6	4.6	4.2	4.6	4.6
Lane Util. Factor	1.00	1.00					1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	0.99					1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00					1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.98					1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00					0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1803					1770	1863	1552	1770	1863	1515
Flt Permitted	0.95	1.00					0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	1770	1803					1770	1863	1552	1770	1863	1515
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	76	397	73	0	0	0	63	708	266	123	521	67
RTOR Reduction (vph)	0	11	0	0	0	0	0	0	94	0	0	40
Lane Group Flow (vph)	76	459	0	0	0	0	63	708	172	123	521	27
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA					Prot	NA	Perm	Prot	NA	Perm
Protected Phases	4	4					5	2		1	6	
Permitted Phases									2			6
Actuated Green, G (s)	18.0	18.0					4.4	23.7	23.7	5.3	24.6	24.6
Effective Green, g (s)	18.0	18.0					4.4	23.7	23.7	5.3	24.6	24.6
Actuated g/C Ratio	0.30	0.30					0.07	0.39	0.39	0.09	0.41	0.41
Clearance Time (s)	4.2	4.2					4.2	4.6	4.6	4.2	4.6	4.6
Vehicle Extension (s)	3.0	3.0					3.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	531	540					129	735	613	156	763	621
v/s Ratio Prot	0.04	c0.25					0.04	c0.38		0.07	c0.28	
v/s Ratio Perm									0.11			0.02
v/c Ratio	0.14	0.85					0.49	0.96	0.28	0.79	0.68	0.04
Uniform Delay, d1	15.4	19.7					26.7	17.7	12.4	26.8	14.5	10.6
Progression Factor	1.00	1.00					0.95	0.85	0.58	0.74	0.53	0.72
Incremental Delay, d2	0.6	15.4					10.9	23.1	1.0	30.4	4.6	0.1
Delay (s)	15.9	35.1					36.3	38.2	8.1	50.4	12.2	7.8
Level of Service	B	D					D	D	A	D	B	A
Approach Delay (s)		32.4			0.0			30.3			18.4	
Approach LOS		C			A			C			B	
Intersection Summary												
HCM 2000 Control Delay		27.1			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.92										
Actuated Cycle Length (s)		60.0			Sum of lost time (s)			13.0				
Intersection Capacity Utilization		75.0%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	677	14	0	0	0	0	8	33	24	18	0
Future Volume (Veh/h)	15	677	14	0	0	0	0	8	33	24	18	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	736	15	0	0	0	0	9	36	26	20	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		255										
pX, platoon unblocked												
vC, conflicting volume	0			751			786	776	376	440	783	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			751			786	776	376	440	783	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	97	94	94	94	100
cM capacity (veh/h)	1622			854			267	324	622	458	321	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	384	383	45	46								
Volume Left	16	0	0	26								
Volume Right	0	15	36	0								
cSH	1622	1700	525	386								
Volume to Capacity	0.01	0.23	0.09	0.12								
Queue Length 95th (ft)	1	0	7	10								
Control Delay (s)	0.4	0.0	12.5	15.6								
Lane LOS	A		B	C								
Approach Delay (s)	0.2		12.5	15.6								
Approach LOS			B	C								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			35.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze St

9/1/2016

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Sign Control		Stop			Stop			Stop			Stop		
Traffic Volume (vph)	26	692	16	0	0	0	0	20	34	33	42	0	
Future Volume (vph)	26	692	16	0	0	0	0	20	34	33	42	0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	28	752	17	0	0	0	0	22	37	36	46	0	
Direction, Lane #	EB 1	EB 2	NB 1	SB 1									
Volume Total (vph)	404	393	59	82									
Volume Left (vph)	28	0	0	36									
Volume Right (vph)	0	17	37	0									
Hadj (s)	0.07	0.00	-0.34	0.12									
Departure Headway (s)	5.0	4.9	5.2	5.6									
Degree Utilization, x	0.56	0.54	0.09	0.13									
Capacity (veh/h)	708	724	646	598									
Control Delay (s)	12.9	12.2	8.7	9.5									
Approach Delay (s)	12.5		8.7	9.5									
Approach LOS	B		A	A									
Intersection Summary													
Delay			12.0										
Level of Service			B										
Intersection Capacity Utilization			37.8%	ICU Level of Service			A						
Analysis Period (min)			15										

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

9/1/2016

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	377	405	19	6	0	4	0	7	7	0	0	0								
Future Volume (vph)	377	405	19	6	0	4	0	7	7	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	410	440	21	7	0	4	0	8	8	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	410	461	11	16																
Volume Left (vph)	410	0	7	0																
Volume Right (vph)	0	21	4	8																
Hadj (s)	0.53	0.00	-0.06	-0.27																
Departure Headway (s)	5.1	4.6	4.7	5.2																
Degree Utilization, x	0.58	0.58	0.01	0.02																
Capacity (veh/h)	704	785	753	652																
Control Delay (s)	13.7	12.5	7.7	8.3																
Approach Delay (s)	13.1		7.7	8.3																
Approach LOS	B		A	A																
Intersection Summary																				
Delay			12.9																	
Level of Service			B																	
Intersection Capacity Utilization			37.6%	ICU Level of Service						A										
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	37	0	0	11	16	644	16	8	589	17
Future Volume (Veh/h)	0	0	37	0	0	11	16	644	16	8	589	17
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	40	0	0	12	17	700	17	9	640	18
Pedestrians	7				7						1	
Lane Width (ft)	12.0				12.0						12.0	
Walking Speed (ft/s)	4.0				4.0						4.0	
Percent Blockage	1				1						0	
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			440		
pX, platoon unblocked	0.87	0.87	0.78	0.87	0.87	0.83	0.78				0.83	
vC, conflicting volume	1421	1432	656	1448	1432	716	665				724	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	967	980	422	998	981	556	434				565	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	92	100	100	97	98				99	
cM capacity (veh/h)	190	208	492	171	208	437	877				831	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	40	12	17	717	9	658						
Volume Left	0	0	17	0	9	0						
Volume Right	40	12	0	17	0	18						
cSH	492	437	877	1700	831	1700						
Volume to Capacity	0.08	0.03	0.02	0.42	0.01	0.39						
Queue Length 95th (ft)	7	2	1	0	1	0						
Control Delay (s)	13.0	13.5	9.2	0.0	9.4	0.0						
Lane LOS	B	B	A			A						
Approach Delay (s)	13.0	13.5	0.2			0.1						
Approach LOS	B	B										
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			45.2%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Washington Avenue			
Agency or Co.	IBI Group				E/W Street Name	Washington Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	4	0	20	0	21	5	9	0	13	665	14	0	18	604	17
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	4	0	22	0	23	6	10	0	14	737	16	0	20	670	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		26			39			767			709	
Entry Volume veh/h		25			38			752			695	
Circulating Flow (Vc), pc/h	713			755			24			43		
Exiting Flow (Vex), pc/h	36			39			751			715		
Capacity (cPCE), pc/h		554			531			1103			1082	
Capacity (c), veh/h		543			521			1082			1061	
v/c Ratio (X)		0.05			0.07			0.70			0.65	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.2			7.8			14.0			12.9	
Lane LOS		A			A			B			B	
95% Queue		0.1			0.2			6.0			5.1	
Approach Delay, s/veh	7.2			7.8			14.0			12.9		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh / LOS	13.2						B					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	57	85	49	45	7	58	7	130	36	69	80	3
Future Volume (vph)	57	85	49	45	7	58	7	130	36	69	80	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	62	92	53	49	8	63	8	141	39	75	87	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	207	120	188	165								
Volume Left (vph)	62	49	8	75								
Volume Right (vph)	53	63	39	3								
Hadj (s)	-0.06	-0.20	-0.08	0.11								
Departure Headway (s)	4.9	4.9	4.9	5.1								
Degree Utilization, x	0.28	0.16	0.26	0.23								
Capacity (veh/h)	679	666	684	651								
Control Delay (s)	9.8	8.9	9.5	9.7								
Approach Delay (s)	9.8	8.9	9.5	9.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.5									
Level of Service			A									
Intersection Capacity Utilization			40.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	207	20	9	144	24	19	33	31	19	44	9
Future Volume (Veh/h)	8	207	20	9	144	24	19	33	31	19	44	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	225	22	10	157	26	21	36	34	21	48	10
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked												
vC, conflicting volume	197			254			486	478	243	510	476	185
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	197			254			486	478	243	510	476	185
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			95	92	96	95	90	99
cM capacity (veh/h)	1360			1303			435	471	791	412	472	847
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	256	193	91	79								
Volume Left	9	10	21	21								
Volume Right	22	26	34	10								
cSH	1360	1303	543	481								
Volume to Capacity	0.01	0.01	0.17	0.16								
Queue Length 95th (ft)	0	1	15	15								
Control Delay (s)	0.3	0.5	13.0	14.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.5	13.0	14.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.0									
Intersection Capacity Utilization			27.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	PM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Wisconsin Avenue
E/W Street Name	Wisconsin Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	69	61	123	0	57	49	10	0	108	582	62	0	11	582	34
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	76	68	136	0	63	54	11	0	120	645	69	0	12	645	38
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		280			128			834			695	
Entry Volume veh/h		275			125			818			681	
Circulating Flow (Vc), pc/h	720			841			156			237		
Exiting Flow (Vex), pc/h	149			212			732			844		
Capacity (cPCE), pc/h		550			487			967			892	
Capacity (c), veh/h		539			478			948			874	
v/c Ratio (X)		0.51			0.26			0.86			0.78	

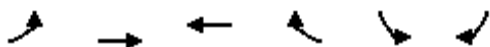
Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		15.9			11.5			26.5			20.9	
Lane LOS		C			B			D			C	
95% Queue		2.9			1.0			11.2			8.0	
Approach Delay, s/veh	15.9			11.5			26.5			20.9		
Approach LOS	C			B			D			C		
Intersection Delay, s/veh / LOS	22.0						C					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

9/1/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	125	93	14	21	22
Future Volume (Veh/h)	5	125	93	14	21	22
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	136	101	15	23	24
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	124				264	118
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	124				264	118
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	97
cM capacity (veh/h)	1453				718	927
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	141	116	47			
Volume Left	5	0	23			
Volume Right	0	15	24			
cSH	1453	1700	811			
Volume to Capacity	0.00	0.07	0.06			
Queue Length 95th (ft)	0	0	5			
Control Delay (s)	0.3	0.0	9.7			
Lane LOS	A		A			
Approach Delay (s)	0.3	0.0	9.7			
Approach LOS			A			
Intersection Summary						
Average Delay			1.6			
Intersection Capacity Utilization			21.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	129	2	1	86	18	1	1	2	27	0	19
Future Volume (Veh/h)	14	129	2	1	86	18	1	1	2	27	0	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	140	2	1	93	20	1	1	2	29	0	21
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	115			142			299	288	141	280	279	107
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	115			142			299	288	141	280	279	107
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	96	100	98
cM capacity (veh/h)	1471			1441			632	614	907	662	621	944
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	157	114	4	50								
Volume Left	15	1	1	29								
Volume Right	2	20	2	21								
cSH	1471	1441	738	757								
Volume to Capacity	0.01	0.00	0.01	0.07								
Queue Length 95th (ft)	1	0	0	5								
Control Delay (s)	0.8	0.1	9.9	10.1								
Lane LOS	A	A	A	B								
Approach Delay (s)	0.8	0.1	9.9	10.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			27.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	79	79	23	57	1	47	1	32	0	1	0
Future Volume (vph)	1	79	79	23	57	1	47	1	32	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	86	86	25	62	1	51	1	35	0	1	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	173	88	87	1								
Volume Left (vph)	1	25	51	0								
Volume Right (vph)	86	1	35	0								
Hadj (s)	-0.26	0.08	-0.09	0.03								
Departure Headway (s)	3.9	4.4	4.4	4.6								
Degree Utilization, x	0.19	0.11	0.11	0.00								
Capacity (veh/h)	890	802	775	723								
Control Delay (s)	7.9	7.9	7.9	7.6								
Approach Delay (s)	7.9	7.9	7.9	7.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.9								
Level of Service				A								
Intersection Capacity Utilization				37.1%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	43	90	111	63	65	108
Future Volume (vph)	43	90	111	63	65	108
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	98	121	68	71	117
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	145	189	188			
Volume Left (vph)	47	0	71			
Volume Right (vph)	98	68	0			
Hadj (s)	-0.31	-0.18	0.11			
Departure Headway (s)	4.4	4.3	4.6			
Degree Utilization, x	0.18	0.22	0.24			
Capacity (veh/h)	747	805	753			
Control Delay (s)	8.4	8.5	9.0			
Approach Delay (s)	8.4	8.5	9.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.7			
Level of Service			A			
Intersection Capacity Utilization			36.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

9/1/2016

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (veh/h)	8	201	18	19	166	42	25	31	37	46	19	12		
Future Volume (Veh/h)	8	201	18	19	166	42	25	31	37	46	19	12		
Sign Control		Free			Free			Stop			Stop			
Grade		0%			0%			0%			0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	9	218	20	21	180	46	27	34	40	50	21	13		
Pedestrians		4			8			11			3			
Lane Width (ft)		12.0			12.0			12.0			12.0			
Walking Speed (ft/s)		4.0			4.0			4.0			4.0			
Percent Blockage		0			1			1			0			
Right turn flare (veh)														
Median type		None			None									
Median storage (veh)														
Upstream signal (ft)	253													
pX, platoon unblocked	0.92							0.92	0.92			0.92	0.92	0.92
vC, conflicting volume	229				249				530	528	247	559	515	210
vC1, stage 1 conf vol														
vC2, stage 2 conf vol														
vCu, unblocked vol	117				249				444	442	247	476	428	96
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)														
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99				98				94	92	95	87	95	99
cM capacity (veh/h)	1349				1305				441	452	779	396	461	877
Direction, Lane #	EB 1	WB 1	NB 1	SB 1										
Volume Total	247	247	101	84										
Volume Left	9	21	27	50										
Volume Right	20	46	40	13										
cSH	1349	1305	538	450										
Volume to Capacity	0.01	0.02	0.19	0.19										
Queue Length 95th (ft)	1	1	17	17										
Control Delay (s)	0.3	0.8	13.2	14.8										
Lane LOS	A	A	B	B										
Approach Delay (s)	0.3	0.8	13.2	14.8										
Approach LOS			B	B										
Intersection Summary														
Average Delay	4.2													
Intersection Capacity Utilization	35.5%			ICU Level of Service					A					
Analysis Period (min)	15													

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

2/24/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔	↔	↔	↕		↔	↔	
Traffic Volume (vph)	40	160	60	263	155	235	63	618	169	242	525	21
Future Volume (vph)	40	160	60	263	155	235	63	618	169	242	525	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.97	1.00	1.00	0.93	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.99	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1844	1532	1681	1746	1478	1770	3412		1770	1847	
Flt Permitted		0.99	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1844	1532	1681	1746	1478	1770	3412		1770	1847	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	174	65	286	168	255	68	672	184	263	571	23
RTOR Reduction (vph)	0	0	55	0	0	210	0	27	0	0	2	0
Lane Group Flow (vph)	0	217	10	223	231	45	68	829	0	263	592	0
Confl. Peds. (#/hr)	14		10	10		14			3			15
Confl. Bikes (#/hr)			4			5			3			3
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		14.4	14.4	15.9	15.9	15.9	5.8	25.2		15.7	35.1	
Effective Green, g (s)		14.4	14.4	15.9	15.9	15.9	5.8	25.2		15.7	35.1	
Actuated g/C Ratio		0.16	0.16	0.18	0.18	0.18	0.06	0.28		0.17	0.39	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)		295	245	296	308	261	114	955		308	720	
v/s Ratio Prot		c0.12		c0.13	0.13		0.04	0.24		c0.15	c0.32	
v/s Ratio Perm			0.01			0.03						
v/c Ratio		0.74	0.04	0.75	0.75	0.17	0.60	0.87		0.85	0.82	
Uniform Delay, d1		36.0	32.0	35.2	35.2	31.5	41.0	30.8		36.0	24.7	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		8.0	0.0	10.7	10.1	0.4	5.5	10.6		19.3	10.3	
Delay (s)		43.9	32.0	45.9	45.3	31.8	46.4	41.4		55.3	34.9	
Level of Service		D	C	D	D	C	D	D		E	C	
Approach Delay (s)		41.2			40.6			41.8			41.2	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			41.2									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			90.0									Sum of lost time (s) 18.8
Intersection Capacity Utilization			75.9%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	513	6	22	570	63	9	10	57	118	8	30
Future Volume (vph)	15	513	6	22	570	63	9	10	57	118	8	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.96	1.00
Satd. Flow (prot)	1770	3531		1764	3482			3091			1779	1544
Flt Permitted	0.39	1.00		0.44	1.00			0.90			0.73	1.00
Satd. Flow (perm)	727	3531		817	3482			2802			1359	1544
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	558	7	24	620	68	10	11	62	128	9	33
RTOR Reduction (vph)	0	2	0	0	13	0	0	50	0	0	0	27
Lane Group Flow (vph)	16	563	0	24	675	0	0	33	0	0	137	6
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	13.1	13.1		13.1	13.1			5.3			5.3	5.3
Effective Green, g (s)	13.1	13.1		13.1	13.1			5.3			5.3	5.3
Actuated g/C Ratio	0.47	0.47		0.47	0.47			0.19			0.19	0.19
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	341	1657		383	1634			532			258	293
v/s Ratio Prot		0.16			c0.19							
v/s Ratio Perm	0.02			0.03				0.01			c0.10	0.00
v/c Ratio	0.05	0.34		0.06	0.41			0.06			0.53	0.02
Uniform Delay, d1	4.0	4.7		4.0	4.9			9.3			10.2	9.2
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.1	0.1		0.1	0.2			0.1			2.7	0.0
Delay (s)	4.1	4.8		4.1	5.0			9.3			12.8	9.2
Level of Service	A	A		A	A			A			B	A
Approach Delay (s)		4.8			5.0			9.3			12.1	
Approach LOS		A			A			A			B	
Intersection Summary												
HCM 2000 Control Delay		5.9			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.45										
Actuated Cycle Length (s)		27.9			Sum of lost time (s)			9.5				
Intersection Capacity Utilization		52.6%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕↕		↕	↕↕	
Traffic Volume (vph)	33	10	12	24	10	80	16	653	44	102	680	15
Future Volume (vph)	33	10	12	24	10	80	16	653	44	102	680	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.97			0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1743			1797	1555	1770	3500		1770	3526	
Flt Permitted		0.79			0.75	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1427			1401	1555	1770	3500		1770	3526	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	36	11	13	26	11	87	17	710	48	111	739	16
RTOR Reduction (vph)	0	11	0	0	0	76	0	6	0	0	2	0
Lane Group Flow (vph)	0	49	0	0	37	11	17	752	0	111	753	0
Confl. Peds. (#/hr)	10		4	4		10			3			4
Confl. Bikes (#/hr)			1						2			3
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		5.5			5.5	5.5	0.6	18.6		6.4	24.4	
Effective Green, g (s)		5.5			5.5	5.5	0.6	18.6		6.4	24.4	
Actuated g/C Ratio		0.12			0.12	0.12	0.01	0.42		0.14	0.55	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		177			174	193	24	1472		256	1946	
v/s Ratio Prot							0.01	c0.21		c0.06	0.21	
v/s Ratio Perm		c0.03			0.03	0.01						
v/c Ratio		0.27			0.21	0.06	0.71	0.51		0.43	0.39	
Uniform Delay, d1		17.5			17.4	17.1	21.7	9.4		17.2	5.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.2	0.0	65.6	0.3		1.2	0.1	
Delay (s)		17.8			17.6	17.1	87.3	9.7		18.4	5.8	
Level of Service		B			B	B	F	A		B	A	
Approach Delay (s)		17.8			17.3			11.4			7.4	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay		10.1										
HCM 2000 Volume to Capacity ratio		0.45										
Actuated Cycle Length (s)		44.2										
Intersection Capacity Utilization		48.1%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	135	10	11	82	0	22	0	19	0	0	0
Future Volume (Veh/h)	2	135	10	11	82	0	22	0	19	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	147	11	12	89	0	24	0	21	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	252											
pX, platoon unblocked												
vC, conflicting volume	89			158			270	270	152	290	275	89
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			158			270	270	152	290	275	89
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			96	100	98	100	100	100
cM capacity (veh/h)	1506			1422			678	631	894	641	626	969
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	160	101	45	0								
Volume Left	2	12	24	0								
Volume Right	11	0	21	0								
cSH	1506	1422	764	1700								
Volume to Capacity	0.00	0.01	0.06	0.00								
Queue Length 95th (ft)	0	1	5	0								
Control Delay (s)	0.1	1.0	10.0	0.0								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.1	1.0	10.0	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			21.1%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	75	16	0	29	0	16	1	5	0	0	0
Future Volume (Veh/h)	0	75	16	0	29	0	16	1	5	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	82	17	0	32	0	17	1	5	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	32			99			122	122	90	128	131	32
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	32			99			122	122	90	128	131	32
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	99	100	100	100
cM capacity (veh/h)	1580			1494			852	768	967	840	760	1042
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	99	32	23	0								
Volume Left	0	0	17	0								
Volume Right	17	0	5	0								
cSH	1580	1494	871	1700								
Volume to Capacity	0.00	0.00	0.03	0.00								
Queue Length 95th (ft)	0	0	2	0								
Control Delay (s)	0.0	0.0	9.2	0.0								
Lane LOS			A	A								
Approach Delay (s)	0.0	0.0	9.2	0.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			14.9%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	37	154	11	21	184	11
Future Volume (vph)	37	154	11	21	184	11
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	167	12	23	200	12
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	207	35	212			
Volume Left (vph)	40	0	200			
Volume Right (vph)	167	23	0			
Hadj (s)	-0.41	-0.36	0.22			
Departure Headway (s)	4.1	4.2	4.6			
Degree Utilization, x	0.23	0.04	0.27			
Capacity (veh/h)	830	791	742			
Control Delay (s)	8.3	7.4	9.3			
Approach Delay (s)	8.3	7.4	9.3			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.7			
Level of Service			A			
Intersection Capacity Utilization			35.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	203	61	9	159	10	83	11	12	3	8	15
Future Volume (Veh/h)	6	203	61	9	159	10	83	11	12	3	8	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	221	66	10	173	11	90	12	13	3	9	16
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	576											
pX, platoon unblocked												
vC, conflicting volume	184			287			487	472	254	486	500	178
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	184			287			487	472	254	486	500	178
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			81	98	98	99	98	98
cM capacity (veh/h)	1391			1275			470	484	785	470	467	864
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	294	194	115	28								
Volume Left	7	10	90	3								
Volume Right	66	11	13	16								
cSH	1391	1275	494	634								
Volume to Capacity	0.01	0.01	0.23	0.04								
Queue Length 95th (ft)	0	1	22	3								
Control Delay (s)	0.2	0.5	14.5	10.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.5	14.5	10.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			35.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	208	5	15	173	26	3	7	14	12	3	3
Future Volume (Veh/h)	3	208	5	15	173	26	3	7	14	12	3	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	226	5	16	188	28	3	8	15	13	3	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					249							
pX, platoon unblocked												
vC, conflicting volume	216			231			473	482	228	488	471	202
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	216			231			473	482	228	488	471	202
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	98	98	97	99	100
cM capacity (veh/h)	1354			1337			492	477	811	470	484	839
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	234	232	26	19								
Volume Left	3	16	3	13								
Volume Right	5	28	15	3								
cSH	1354	1337	628	508								
Volume to Capacity	0.00	0.01	0.04	0.04								
Queue Length 95th (ft)	0	1	3	3								
Control Delay (s)	0.1	0.6	11.0	12.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.6	11.0	12.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			30.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	118	106	51	68	23	117	696	74	92	552	41
Future Volume (vph)	53	118	106	51	68	23	117	696	74	92	552	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.95			0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1750			1790		1770	3488		1770	3502	
Flt Permitted		0.91			0.78		0.95	1.00		0.34	1.00	
Satd. Flow (perm)		1605			1422		1770	3488		627	3502	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	128	115	55	74	25	127	757	80	100	600	45
RTOR Reduction (vph)	0	28	0	0	9	0	0	12	0	0	7	0
Lane Group Flow (vph)	0	273	0	0	145	0	127	825	0	100	638	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)		14.4			14.0		7.0	28.2		17.0	17.0	
Effective Green, g (s)		14.4			14.0		7.0	28.2		17.0	17.0	
Actuated g/C Ratio		0.28			0.27		0.13	0.54		0.33	0.33	
Clearance Time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.5		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		442			381		237	1884		204	1140	
v/s Ratio Prot							0.07	c0.24			c0.18	
v/s Ratio Perm		c0.17			0.10					0.16		
v/c Ratio		0.62			0.38		0.54	0.44		0.49	0.56	
Uniform Delay, d1		16.5			15.6		21.1	7.2		14.1	14.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.6			0.8		1.2	0.2		1.9	0.6	
Delay (s)		19.1			16.3		22.3	7.4		16.0	15.1	
Level of Service		B			B		C	A		B	B	
Approach Delay (s)		19.1			16.3			9.3			15.2	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			13.2				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.58									
Actuated Cycle Length (s)			52.2				Sum of lost time (s)			14.2		
Intersection Capacity Utilization			59.5%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

9/1/2016

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (veh/h)	9	260	13	13	117	5	15	18	6	8	7	9		
Future Volume (Veh/h)	9	260	13	13	117	5	15	18	6	8	7	9		
Sign Control		Free			Free			Stop			Stop			
Grade		0%			0%			0%			0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	10	283	14	14	127	5	16	20	7	9	8	10		
Pedestrians														
Lane Width (ft)														
Walking Speed (ft/s)														
Percent Blockage														
Right turn flare (veh)														
Median type	None			None										
Median storage veh														
Upstream signal (ft)	280													
pX, platoon unblocked				0.99				0.99	0.99	0.99	0.99	0.99		
vC, conflicting volume	132				297				482	470	290	484	474	130
vC1, stage 1 conf vol														
vC2, stage 2 conf vol														
vCu, unblocked vol	132				289				475	463	282	478	468	130
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)														
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99				99				97	96	99	98	98	99
cM capacity (veh/h)	1453				1264				479	484	752	468	481	920
Direction, Lane #	EB 1	WB 1	NB 1	SB 1										
Volume Total	307	146	43	27										
Volume Left	10	14	16	9										
Volume Right	14	5	7	10										
cSH	1453	1264	511	578										
Volume to Capacity	0.01	0.01	0.08	0.05										
Queue Length 95th (ft)	1	1	7	4										
Control Delay (s)	0.3	0.8	12.7	11.5										
Lane LOS	A	A	B	B										
Approach Delay (s)	0.3	0.8	12.7	11.5										
Approach LOS				B	B									
Intersection Summary														
Average Delay				2.1										
Intersection Capacity Utilization				26.4%	ICU Level of Service				A					
Analysis Period (min)				15										

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	251	9	11	119	3	12	23	11	4	10	6
Future Volume (vph)	9	251	9	11	119	3	12	23	11	4	10	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	273	10	12	129	3	13	25	12	4	11	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	293	144	50	22								
Volume Left (vph)	10	12	13	4								
Volume Right (vph)	10	3	12	7								
Hadj (s)	0.02	0.04	-0.06	-0.12								
Departure Headway (s)	4.3	4.4	4.8	4.8								
Degree Utilization, x	0.35	0.18	0.07	0.03								
Capacity (veh/h)	828	781	677	670								
Control Delay (s)	9.5	8.4	8.2	8.0								
Approach Delay (s)	9.5	8.4	8.2	8.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.0								
Level of Service				A								
Intersection Capacity Utilization				26.4%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	267	16	68	115	33	16	80	154	63	17	4
Future Volume (vph)	17	267	16	68	115	33	16	80	154	63	17	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	290	17	74	125	36	17	87	167	68	18	4
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	325	235	271	90								
Volume Left (vph)	18	74	17	68								
Volume Right (vph)	17	36	167	4								
Hadj (s)	0.01	0.01	-0.32	0.16								
Departure Headway (s)	5.3	5.5	5.3	6.1								
Degree Utilization, x	0.48	0.36	0.40	0.15								
Capacity (veh/h)	634	610	622	509								
Control Delay (s)	13.2	11.5	11.7	10.2								
Approach Delay (s)	13.2	11.5	11.7	10.2								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay				12.0								
Level of Service				B								
Intersection Capacity Utilization				60.3%	ICU Level of Service		B					
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	5	57	58	4	41	22
Future Volume (vph)	5	57	58	4	41	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	62	63	4	45	24
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	67	67	69			
Volume Left (vph)	5	0	45			
Volume Right (vph)	62	4	0			
Hadj (s)	-0.51	0.00	0.16			
Departure Headway (s)	3.7	4.1	4.3			
Degree Utilization, x	0.07	0.08	0.08			
Capacity (veh/h)	938	851	826			
Control Delay (s)	7.0	7.4	7.6			
Approach Delay (s)	7.0	7.4	7.6			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.3			
Level of Service			A			
Intersection Capacity Utilization			20.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	103	33	203	82	350	37	569	269	293	478	18
Future Volume (vph)	15	103	33	203	82	350	37	569	269	293	478	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1553		1799	1583	1770	3331		1770	3514	
Flt Permitted	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1553		1799	1583	1770	3331		1770	3514	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	112	36	221	89	380	40	618	292	318	520	20
RTOR Reduction (vph)	0	0	33	0	0	313	0	57	0	0	2	0
Lane Group Flow (vph)	16	112	3	0	310	67	40	853	0	318	538	0
Confl. Peds. (#/hr)	7		2	2		7			5			8
Confl. Bikes (#/hr)						2			4			8
Turn Type	Split	NA	Perm	Split	NA	Over	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	6.6	6.6	6.6		17.3	14.0	3.2	22.4		14.0	33.2	
Effective Green, g (s)	6.6	6.6	6.6		17.3	14.0	3.2	22.4		14.0	33.2	
Actuated g/C Ratio	0.08	0.08	0.08		0.22	0.18	0.04	0.28		0.18	0.42	
Clearance Time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	147	154	129		391	279	71	939		312	1469	
v/s Ratio Prot	0.01	c0.06			c0.17	0.04	0.02	c0.26		c0.18	0.15	
v/s Ratio Perm			0.00									
v/c Ratio	0.11	0.73	0.02		0.79	0.24	0.56	0.91		1.02	0.37	
Uniform Delay, d1	33.7	35.5	33.4		29.4	28.1	37.4	27.5		32.7	15.9	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	13.5	0.0		10.5	0.2	6.0	12.3		55.9	0.2	
Delay (s)	33.8	49.0	33.5		39.9	28.3	43.4	39.8		88.6	16.0	
Level of Service	C	D	C		D	C	D	D		F	B	
Approach Delay (s)		44.1			33.5			39.9			42.9	
Approach LOS		D			C			D			D	
Intersection Summary												
HCM 2000 Control Delay			39.5									
HCM 2000 Volume to Capacity ratio			0.88									
Actuated Cycle Length (s)			79.4									
Intersection Capacity Utilization			74.7%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	618	6	8	594	28	4	0	8	13	3	30
Future Volume (Veh/h)	5	618	6	8	594	28	4	0	8	13	3	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	672	7	9	646	30	4	0	9	14	3	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh					2							
Upstream signal (ft)		279										
pX, platoon unblocked				0.95			0.95	0.95	0.95	0.95	0.95	
vC, conflicting volume	676			679			1399	1380	676	1374	1368	661
vC1, stage 1 conf vol							686	686		679	679	
vC2, stage 2 conf vol							714	694		694	689	
vCu, unblocked vol	676			637			1394	1373	634	1367	1361	661
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			99	100	98	96	99	93
cM capacity (veh/h)	915			901			297	330	456	314	331	462
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	684	685	13	50								
Volume Left	5	9	4	14								
Volume Right	7	30	9	33								
cSH	915	901	392	400								
Volume to Capacity	0.01	0.01	0.03	0.13								
Queue Length 95th (ft)	0	1	3	11								
Control Delay (s)	0.1	0.3	14.5	15.3								
Lane LOS	A	A	B	C								
Approach Delay (s)	0.1	0.3	14.5	15.3								
Approach LOS			B	C								
Intersection Summary												
Average Delay			0.9									
Intersection Capacity Utilization			48.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	730	5	12	718	33	1	1	19	13	1	8
Future Volume (Veh/h)	5	730	5	12	718	33	1	1	19	13	1	8
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	793	5	13	780	36	1	1	21	14	1	9
Pedestrians		1						1				
Lane Width (ft)		12.0						12.0				
Walking Speed (ft/s)		4.0						4.0				
Percent Blockage		0						0				
Right turn flare (veh)												
Median type		TWLT			TWLT							
Median storage veh		2			2							
Upstream signal (ft)		687										
pX, platoon unblocked				0.99			0.99	0.99	0.99	0.99	0.99	
vC, conflicting volume	816			799			1641	1648	796	1651	1633	799
vC1, stage 1 conf vol							806	806		824	824	
vC2, stage 2 conf vol							834	842		827	809	
vCu, unblocked vol	816			793			1642	1650	790	1652	1634	799
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			100	100	95	94	100	98
cM capacity (veh/h)	812			820			256	278	386	247	278	385
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	803	829	23	24								
Volume Left	5	13	1	14								
Volume Right	5	36	21	9								
cSH	812	820	372	287								
Volume to Capacity	0.01	0.02	0.06	0.08								
Queue Length 95th (ft)	0	1	5	7								
Control Delay (s)	0.2	0.4	15.3	18.7								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.2	0.4	15.3	18.7								
Approach LOS			C	C								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			61.5%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	722	0	9	743	205	0	0	5	3	0	11
Future Volume (Veh/h)	8	722	0	9	743	205	0	0	5	3	0	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	785	0	10	808	223	0	0	5	3	0	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1031			785			1643	1854	785	1748	1742	920
vC1, stage 1 conf vol							803	803		940	940	
vC2, stage 2 conf vol							840	1051		808	803	
vCu, unblocked vol	1031			785			1643	1854	785	1748	1742	920
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			100	100	99	99	100	96
cM capacity (veh/h)	674			834			253	237	393	237	260	329
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	SB 1							
Volume Total	794	10	1031	5	15							
Volume Left	9	10	0	0	3							
Volume Right	0	0	223	5	12							
cSH	674	834	1700	393	305							
Volume to Capacity	0.01	0.01	0.61	0.01	0.05							
Queue Length 95th (ft)	1	1	0	1	4							
Control Delay (s)	0.4	9.4	0.0	14.3	17.4							
Lane LOS	A	A		B	C							
Approach Delay (s)	0.4	0.1		14.3	17.4							
Approach LOS				B	C							
Intersection Summary												
Average Delay			0.4									
Intersection Capacity Utilization			Err%		ICU Level of Service				H			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	41	5	0	13	43	721	4	18	578	4
Future Volume (Veh/h)	0	0	41	5	0	13	43	721	4	18	578	4
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	45	5	0	14	47	784	4	20	628	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL		TWLTL			
Median storage veh							2		2			
Upstream signal (ft)									621			
pX, platoon unblocked												
vC, conflicting volume	1170	1552	630	1593	1552	394	632			788		
vC1, stage 1 conf vol	670	670	880		880							
vC2, stage 2 conf vol	500	882	713		672							
vCu, unblocked vol	1170	1552	630	1593	1552	394	632			788		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5	6.5		5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	89	98	100	98	95			98		
cM capacity (veh/h)	324	273	424	210	273	605	947			827		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	45	19	47	523	265	20	632					
Volume Left	0	5	47	0	0	20	0					
Volume Right	45	14	0	0	4	0	4					
cSH	424	405	947	1700	1700	827	1700					
Volume to Capacity	0.11	0.05	0.05	0.31	0.16	0.02	0.37					
Queue Length 95th (ft)	9	4	4	0	0	2	0					
Control Delay (s)	14.5	14.3	9.0	0.0	0.0	9.5	0.0					
Lane LOS	B	B	A				A					
Approach Delay (s)	14.5	14.3	0.5				0.3					
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			Err%	ICU Level of Service				H				
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	PM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Michigan Avenue
E/W Street Name	Michigan Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	122	53	50	0	33	7	16	0	16	690	28	0	12	690	30
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	135	59	55	0	37	8	18	0	18	765	31	0	13	765	33
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		249			63			814			811	
Entry Volume veh/h		244			62			798			795	
Circulating Flow (Vc), pc/h	815			918			207			63		
Exiting Flow (Vex), pc/h	103			59			918			857		
Capacity (cPCE), pc/h		500			451			919			1061	
Capacity (c), veh/h		490			442			901			1040	
v/c Ratio (X)		0.50			0.14			0.89			0.76	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		16.9			10.2			30.2			17.5	
Lane LOS		C			B			D			C	
95% Queue		2.7			0.5			12.0			7.8	
Approach Delay, s/veh	16.9			10.2			30.2			17.5		
Approach LOS	C			B			D			C		
Intersection Delay, s/veh / LOS	22.5						C					

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NV On-Ramp/San Rafael Dr

06/25/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	109	1	15	98	851	14	26	1778	129
Future Volume (veh/h)	0	0	0	109	1	15	98	851	14	26	1778	129
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h				119	0	0	107	925	0	28	1933	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				710	0	317	111	2988	930	111	2079	930
Arrive On Green				0.20	0.00	0.00	0.06	0.59	0.00	0.06	0.59	0.00
Sat Flow, veh/h				3548	0	1583	1774	5085	1583	1774	3539	1583
Grp Volume(v), veh/h				119	0	0	107	925	0	28	1933	0
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1695	1583	1774	1770	1583
Q Serve(g_s), s				2.2	0.0	0.0	4.8	7.3	0.0	1.2	39.7	0.0
Cycle Q Clear(g_c), s				2.2	0.0	0.0	4.8	7.3	0.0	1.2	39.7	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				710	0	317	111	2988	930	111	2079	930
V/C Ratio(X)				0.17	0.00	0.00	0.97	0.31	0.00	0.25	0.93	0.00
Avail Cap(c_a), veh/h				710	0	317	111	2988	930	111	2079	930
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				26.5	0.0	0.0	37.4	8.3	0.0	35.7	15.0	0.0
Incr Delay (d2), s/veh				0.5	0.0	0.0	76.5	0.3	0.0	5.4	8.9	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.1	0.0	0.0	4.7	3.5	0.0	0.8	21.6	0.0
LnGrp Delay(d),s/veh				27.0	0.0	0.0	113.9	8.6	0.0	41.1	23.9	0.0
LnGrp LOS				C			F	A		D	C	
Approach Vol, veh/h					119			1032			1961	
Approach Delay, s/veh					27.0			19.5			24.2	
Approach LOS					C			B			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	9.0	51.0			9.0	51.0		20.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	5.0	47.0			5.0	47.0		16.0				
Max Q Clear Time (g_c+I1), s	9.3	9.3			6.8	41.7		4.2				
Green Ext Time (p_c), s	0.0	7.9			0.0	4.7		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				22.7								
HCM 2010 LOS				C								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↗	↖↖	↑↑					
Traffic Volume (veh/h)	582	209	627	667	0	0			
Future Volume (veh/h)	582	209	627	667	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937					
Adj Flow Rate, veh/h	633	227	682	725					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	1656	741	1253	3313					
Arrive On Green	0.45	0.45	0.35	0.90					
Sat Flow, veh/h	3778	1647	3579	3778					
Grp Volume(v), veh/h	633	227	682	725					
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840					
Q Serve(g_s), s	4.6	3.5	6.1	1.0					
Cycle Q Clear(g_c), s	4.6	3.5	6.1	1.0					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	1656	741	1253	3313					
V/C Ratio(X)	0.38	0.31	0.54	0.22					
Avail Cap(c_a), veh/h	1656	741	1253	3313					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	7.3	7.0	10.4	0.2					
Incr Delay (d2), s/veh	0.7	1.1	1.7	0.2					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	2.4	1.8	3.2	0.5					
LnGrp Delay(d),s/veh	8.0	8.1	12.1	0.4					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	860			1407					
Approach Delay, s/veh	8.0			6.1					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			18.0	22.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			14.0	18.0				36.0	
Max Q Clear Time (g_c+l1), s			8.1	6.6				3.0	
Green Ext Time (p_c), s			1.5	4.0				5.8	
Intersection Summary									
HCM 2010 Ctrl Delay			6.8						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/11/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↙↙	↑↑	↙	↗		
Traffic Volume (veh/h)	1267	114	370	964	183	0		
Future Volume (veh/h)	1267	114	370	964	183	0		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	1377	124	402	1048	199	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1472	659	477	2208	492	439		
Arrive On Green	0.40	0.40	0.13	0.60	0.27	0.00		
Sat Flow, veh/h	3778	1647	3579	3778	1845	1647		
Grp Volume(v), veh/h	1377	124	402	1048	199	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840	1845	1647		
Q Serve(g_s), s	21.5	2.9	6.6	9.6	5.3	0.0		
Cycle Q Clear(g_c), s	21.5	2.9	6.6	9.6	5.3	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1472	659	477	2208	492	439		
V/C Ratio(X)	0.94	0.19	0.84	0.47	0.40	0.00		
Avail Cap(c_a), veh/h	1472	659	477	2208	492	439		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	17.3	11.7	25.4	6.7	18.1	0.0		
Incr Delay (d2), s/veh	12.4	0.6	16.4	0.7	2.5	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	13.2	1.4	4.3	5.0	3.0	0.0		
LnGrp Delay(d),s/veh	29.6	12.3	41.8	7.4	20.5	0.0		
LnGrp LOS	C	B	D	A	C			
Approach Vol, veh/h	1501			1450	199			
Approach Delay, s/veh	28.2			17.0	20.5			
Approach LOS	C			B	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	12.0	28.0				40.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	8.0	24.0				36.0
Max Q Clear Time (g_c+I1), s		7.3	8.6	23.5				11.6
Green Ext Time (p_c), s		0.3	0.0	0.4				8.4
Intersection Summary								
HCM 2010 Ctrl Delay			22.5					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary

51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	1094	10	163	1017	450	8	0	62	323	18	125
Future Volume (veh/h)	0	1094	10	163	1017	450	8	0	62	323	18	125
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1937	1976	1937	1937	1937	1937	0	1937	1937	1937	1937
Adj Flow Rate, veh/h	0	1189	11	177	1105	0	9	0	67	365	0	136
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1567	14	238	2256	1009	0	0	0	952	0	425
Arrive On Green	0.00	0.42	0.42	0.13	0.61	0.00	0.00	0.00	0.00	0.26	0.00	0.26
Sat Flow, veh/h	0	3834	35	1845	3681	1647		0		3690	0	1647
Grp Volume(v), veh/h	0	586	614	177	1105	0		0.0		365	0	136
Grp Sat Flow(s),veh/h/ln	0	1840	1931	1845	1840	1647				1845	0	1647
Q Serve(g_s), s	0.0	16.8	16.8	5.7	10.3	0.0				5.0	0.0	4.1
Cycle Q Clear(g_c), s	0.0	16.8	16.8	5.7	10.3	0.0				5.0	0.0	4.1
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	772	810	238	2256	1009				952	0	425
V/C Ratio(X)	0.00	0.76	0.76	0.74	0.49	0.00				0.38	0.00	0.32
Avail Cap(c_a), veh/h	0	772	810	238	2256	1009				952	0	425
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	15.3	15.3	26.0	6.6	0.0				18.9	0.0	18.6
Incr Delay (d2), s/veh	0.0	6.9	6.6	18.8	0.8	0.0				1.2	0.0	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	9.9	10.4	4.1	5.3	0.0				2.7	0.0	2.1
LnGrp Delay(d),s/veh	0.0	22.2	21.9	44.9	7.4	0.0				20.1	0.0	20.6
LnGrp LOS		C	C	D	A					C		C
Approach Vol, veh/h		1200			1282						501	
Approach Delay, s/veh		22.1			12.6						20.2	
Approach LOS		C			B						C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			12.0	30.0		20.0		42.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			8.0	26.0		16.0		38.0				
Max Q Clear Time (g_c+I1), s			7.7	18.8		7.0		12.3				
Green Ext Time (p_c), s			0.0	4.3		1.3		9.2				
Intersection Summary												
HCM 2010 Ctrl Delay			17.7									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	252	584	23	69	857	426	21	7	37	417	19	103
Future Volume (veh/h)	252	584	23	69	857	426	21	7	37	417	19	103
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1976	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	274	635	25	75	932	463	23	8	40	293	245	112
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	277	1038	41	185	874	391	295	102	350	369	252	115
Arrive On Green	0.15	0.29	0.29	0.10	0.24	0.24	0.21	0.21	0.21	0.20	0.20	0.20
Sat Flow, veh/h	1845	3611	142	1845	3681	1647	1386	482	1647	1845	1260	576
Grp Volume(v), veh/h	274	323	337	75	932	463	31	0	40	293	0	357
Grp Sat Flow(s),veh/h/ln	1845	1840	1912	1845	1840	1647	1868	0	1647	1845	0	1836
Q Serve(g_s), s	11.9	12.2	12.2	3.1	19.0	19.0	1.1	0.0	1.6	12.1	0.0	15.5
Cycle Q Clear(g_c), s	11.9	12.2	12.2	3.1	19.0	19.0	1.1	0.0	1.6	12.1	0.0	15.5
Prop In Lane	1.00		0.07	1.00		1.00	0.74		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	277	529	550	185	874	391	397	0	350	369	0	367
V/C Ratio(X)	0.99	0.61	0.61	0.41	1.07	1.18	0.08	0.00	0.11	0.79	0.00	0.97
Avail Cap(c_a), veh/h	277	529	550	185	874	391	397	0	350	369	0	367
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.9	24.6	24.6	33.8	30.5	30.5	25.2	0.0	25.4	30.4	0.0	31.8
Incr Delay (d2), s/veh	51.6	5.2	5.0	6.5	49.7	105.9	0.4	0.0	0.7	16.0	0.0	40.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.0	6.9	7.1	1.9	15.6	20.1	0.6	0.0	0.8	7.7	0.0	12.0
LnGrp Delay(d),s/veh	85.6	29.8	29.7	40.3	80.2	136.4	25.6	0.0	26.1	46.5	0.0	72.3
LnGrp LOS	F	C	C	D	F	F	C		C	D		E
Approach Vol, veh/h		934			1470			71			650	
Approach Delay, s/veh		46.1			95.8			25.9			60.7	
Approach LOS		D			F			C			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.0	12.0	27.0		20.0	16.0	23.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	8.0	23.0		16.0	12.0	19.0				
Max Q Clear Time (g_c+I1), s		3.6	5.1	14.2		17.5	13.9	21.0				
Green Ext Time (p_c), s		0.2	0.0	2.7		0.0	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				72.1								
HCM 2010 LOS				E								
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/25/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	252	584	23	69	857	426	21	7	37	417	19	103
Future Volume (veh/h)	252	584	23	69	857	426	21	7	37	417	19	103
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1976	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	274	635	25	75	932	463	23	8	40	293	245	112
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	277	1038	41	185	874	720	295	102	350	369	252	115
Arrive On Green	0.15	0.29	0.29	0.07	0.16	0.16	0.21	0.21	0.21	0.20	0.20	0.20
Sat Flow, veh/h	1845	3611	142	1845	3681	1647	1386	482	1647	1845	1260	576
Grp Volume(v), veh/h	274	323	337	75	932	463	31	0	40	293	0	357
Grp Sat Flow(s),veh/h/ln	1845	1840	1912	1845	1840	1647	1868	0	1647	1845	0	1836
Q Serve(g_s), s	11.9	12.2	12.2	3.1	19.0	17.2	1.1	0.0	1.6	12.1	0.0	15.5
Cycle Q Clear(g_c), s	11.9	12.2	12.2	3.1	19.0	17.2	1.1	0.0	1.6	12.1	0.0	15.5
Prop In Lane	1.00		0.07	1.00		1.00	0.74		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	277	529	550	185	874	720	397	0	350	369	0	367
V/C Ratio(X)	0.99	0.61	0.61	0.41	1.07	0.64	0.08	0.00	0.11	0.79	0.00	0.97
Avail Cap(c_a), veh/h	277	529	550	185	874	720	397	0	350	369	0	367
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.9	24.6	24.6	35.0	33.6	19.3	25.2	0.0	25.4	30.4	0.0	31.8
Incr Delay (d2), s/veh	51.6	5.2	5.0	6.5	49.7	4.4	0.4	0.0	0.7	16.0	0.0	40.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.0	6.9	7.1	1.9	15.7	11.1	0.6	0.0	0.8	7.7	0.0	12.0
LnGrp Delay(d),s/veh	85.6	29.8	29.7	41.6	83.3	23.7	25.6	0.0	26.1	46.5	0.0	72.3
LnGrp LOS	F	C	C	D	F	C	C		C	D		E
Approach Vol, veh/h		934			1470			71			650	
Approach Delay, s/veh		46.1			62.4			25.9			60.7	
Approach LOS		D			E			C			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.0	12.0	27.0		20.0	16.0	23.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	8.0	23.0		16.0	12.0	19.0				
Max Q Clear Time (g_c+I1), s		3.6	5.1	14.2		17.5	13.9	21.0				
Green Ext Time (p_c), s		0.2	0.0	2.7		0.0	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				56.3								
HCM 2010 LOS				E								
Notes												

Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	85	12	27	93	39	7	86	32	0	0	0
Future Vol, veh/h	40	85	12	27	93	39	7	86	32	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	43	92	13	29	101	42	8	93	35	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	8.5	8.4	8.5
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	6%	29%	17%
Vol Thru, %	69%	62%	58%
Vol Right, %	26%	9%	25%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	125	137	159
LT Vol	7	40	27
Through Vol	86	85	93
RT Vol	32	12	39
Lane Flow Rate	136	149	173
Geometry Grp	1	1	1
Degree of Util (X)	0.17	0.184	0.207
Departure Headway (Hd)	4.505	4.444	4.304
Convergence, Y/N	Yes	Yes	Yes
Cap	798	809	835
Service Time	2.529	2.463	2.322
HCM Lane V/C Ratio	0.17	0.184	0.207
HCM Control Delay	8.5	8.5	8.4
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.6	0.7	0.8

Intersection												
Int Delay, s/veh	3.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑		↑						↑	↑
Traffic Vol, veh/h	0	273	214	102	49	0	0	0	0	65	0	110
Future Vol, veh/h	0	273	214	102	49	0	0	0	0	65	0	110
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	297	233	111	53	0	0	0	0	71	0	120
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	297	0	0				572	572	53
Stage 1	-	-	-	-	-	-				275	275	-
Stage 2	-	-	-	-	-	-				297	297	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1264	-	0				482	430	1014
Stage 1	0	-	-	-	-	0				771	683	-
Stage 2	0	-	-	-	-	0				754	668	-
Platoon blocked, %	-	-	-	-	-	-				-	-	-
Mov Cap-1 Maneuver	-	-	-	1264	-	-				439	0	1014
Mov Cap-2 Maneuver	-	-	-	-	-	-				439	0	-
Stage 1	-	-	-	-	-	-				702	0	-
Stage 2	-	-	-	-	-	-				754	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			5.5			11.2					
HCM LOS							B					
Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2						
Capacity (veh/h)	-	-	1264	-	439	1014						
HCM Lane V/C Ratio	-	-	0.088	-	0.161	0.118						
HCM Control Delay (s)	-	-	8.1	0	14.8	9						
HCM Lane LOS	-	-	A	A	B	A						
HCM 95th %tile Q(veh)	-	-	0.3	-	0.6	0.4						

HCM 2010 Signalized Intersection Summary

56: I-5 SB On/Off-Ramp & Vista Way

06/25/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↖	↑	↖	↗↗		
Traffic Volume (veh/h)	537	81	1598	927	33	2440		
Future Volume (veh/h)	537	81	1598	927	33	2440		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	584	0	1737	1008	36	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	480	215	1229	971	748	1174		
Arrive On Green	0.14	0.00	0.36	0.52	0.42	0.00		
Sat Flow, veh/h	3632	1583	3442	1863	1774	2787		
Grp Volume(v), veh/h	584	0	1737	1008	36	0		
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1863	1774	1393		
Q Serve(g_s), s	19.0	0.0	50.0	73.0	1.7	0.0		
Cycle Q Clear(g_c), s	19.0	0.0	50.0	73.0	1.7	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	480	215	1229	971	748	1174		
V/C Ratio(X)	1.22	0.00	1.41	1.04	0.05	0.00		
Avail Cap(c_a), veh/h	480	215	1229	971	748	1174		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	60.5	0.0	45.0	33.5	23.9	0.0		
Incr Delay (d2), s/veh	115.0	0.0	190.8	39.1	0.1	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	16.9	0.0	56.3	47.8	0.8	0.0		
LnGrp Delay(d),s/veh	175.5	0.0	235.8	72.6	24.0	0.0		
LnGrp LOS	F		F	F	C			
Approach Vol, veh/h	584			2745	36			
Approach Delay, s/veh	175.5			175.9	24.0			
Approach LOS	F			F	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		63.0	54.0	23.0				77.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		59.0	50.0	19.0				73.0
Max Q Clear Time (g_c+I1), s		3.7	52.0	21.0				75.0
Green Ext Time (p_c), s		0.1	0.0	0.0				0.0
Intersection Summary								
HCM 2010 Ctrl Delay			174.2					
HCM 2010 LOS			F					

Appendix I.1 – Analysis Output Sheets (Future No Project)

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	89	68	110	332	597	190	20	166	87	26	70
Future Volume (vph)	90	89	68	110	332	597	190	20	166	87	26	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3149	1441		1782	1583		1793	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3149	1441		1782	1583		1793	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	97	74	120	361	649	207	22	180	95	28	76
RTOR Reduction (vph)	0	0	65	0	216	260	0	0	120	0	0	59
Lane Group Flow (vph)	98	97	9	120	470	64	0	229	60	0	123	17
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	5.3	9.1	9.1	7.1	14.5	14.5		20.5	20.5		16.2	16.2
Effective Green, g (s)	5.3	9.1	9.1	7.1	14.5	14.5		20.5	20.5		16.2	16.2
Actuated g/C Ratio	0.07	0.12	0.12	0.10	0.20	0.20		0.28	0.28		0.22	0.22
Clearance Time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	127	230	195	170	619	283		495	440		394	347
v/s Ratio Prot	0.06	0.05		c0.07	c0.15			c0.13			c0.07	
v/s Ratio Perm			0.01			0.04			0.04			0.01
v/c Ratio	0.77	0.42	0.05	0.71	0.76	0.23		0.46	0.14		0.31	0.05
Uniform Delay, d1	33.6	29.9	28.5	32.3	28.0	24.9		22.0	20.0		24.1	22.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	24.6	0.5	0.0	12.5	4.7	0.1		3.1	0.6		2.1	0.3
Delay (s)	58.3	30.3	28.5	44.8	32.7	25.0		25.1	20.6		26.1	22.9
Level of Service	E	C	C	D	C	C		C	C		C	C
Approach Delay (s)		40.0			31.8			23.1			24.9	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			30.4				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			73.7				Sum of lost time (s)		20.8			
Intersection Capacity Utilization			52.5%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Coast Hwy & Driveway/SR-76 ramps

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕		↖	↗	↗		↕	↖		↕	
Traffic Volume (vph)	0	0	3	412	0	319	1	139	468	101	129	0
Future Volume (vph)	0	0	3	412	0	319	1	139	468	101	129	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6		4.6	4.6	4.0		4.6	4.0		4.6	
Lane Util. Factor		1.00		0.95	0.95	1.00		0.95	1.00		0.95	
Frt		0.86		1.00	1.00	0.85		1.00	0.85		1.00	
Flt Protected		1.00		0.95	0.95	1.00		1.00	1.00		0.98	
Satd. Flow (prot)		1611		1681	1681	1583		3538	1583		3463	
Flt Permitted		1.00		0.95	0.95	1.00		1.00	1.00		0.98	
Satd. Flow (perm)		1611		1681	1681	1583		3538	1583		3463	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	3	448	0	347	1	151	509	110	140	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	224	224	347	0	152	509	0	250	0
Turn Type		NA		Split	NA	Free	Split	NA	Free	Split	NA	
Protected Phases		4		8	8		2	2		6	6	
Permitted Phases	4					Free			Free			
Actuated Green, G (s)		0.9		14.0	14.0	69.9		18.4	69.9		18.2	
Effective Green, g (s)		0.9		14.0	14.0	69.9		18.4	69.9		18.2	
Actuated g/C Ratio		0.01		0.20	0.20	1.00		0.26	1.00		0.26	
Clearance Time (s)		4.6		4.6	4.6			4.6			4.6	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		20		336	336	1583		931	1583		901	
v/s Ratio Prot		0.00		c0.13	0.13			0.04			0.07	
v/s Ratio Perm						0.22			c0.32			
v/c Ratio		0.00		0.67	0.67	0.22		0.16	0.32		0.28	
Uniform Delay, d1		34.1		25.8	25.8	0.0		19.8	0.0		20.6	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		0.0		4.9	4.9	0.3		0.4	0.5		0.8	
Delay (s)		34.1		30.7	30.7	0.3		20.2	0.5		21.4	
Level of Service		C		C	C	A		C	A		C	
Approach Delay (s)		34.1			17.5			5.1			21.4	
Approach LOS		C			B			A			C	
Intersection Summary												
HCM 2000 Control Delay			13.3			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			69.9			Sum of lost time (s)			18.4			
Intersection Capacity Utilization			40.0%			ICU Level of Service			A			
Analysis Period (min)			15									
Description: SR-76 & Coast Hwy												
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	51	12	39	66	67	36	52	56	100	72	15
Future Volume (vph)	5	51	12	39	66	67	36	52	56	100	72	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	55	13	42	72	73	39	57	61	109	78	16
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	73	187	157	203								
Volume Left (vph)	5	42	39	109								
Volume Right (vph)	13	73	61	16								
Hadj (s)	-0.06	-0.16	-0.15	0.09								
Departure Headway (s)	5.0	4.7	4.7	4.8								
Degree Utilization, x	0.10	0.25	0.20	0.27								
Capacity (veh/h)	652	705	721	698								
Control Delay (s)	8.5	9.3	8.9	9.7								
Approach Delay (s)	8.5	9.3	8.9	9.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.2									
Level of Service			A									
Intersection Capacity Utilization			40.0%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	14	32	8	27	60	30	250	18	24	343	67
Future Volume (vph)	116	14	32	8	27	60	30	250	18	24	343	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.91		1.00	0.99		1.00	0.98	
Flt Protected		0.96	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1783	1583		1697		1770	3503		1770	3452	
Flt Permitted		0.68	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1259	1583		1671		1770	3503		1770	3452	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	126	15	35	9	29	65	33	272	20	26	373	73
RTOR Reduction (vph)	0	0	28	0	51	0	0	5	0	0	12	0
Lane Group Flow (vph)	0	141	7	0	52	0	33	287	0	26	434	0
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		17.1	17.1		17.1		9.0	42.1		10.0	47.9	
Effective Green, g (s)		17.1	17.1		17.1		9.0	42.1		10.0	47.9	
Actuated g/C Ratio		0.21	0.21		0.21		0.11	0.53		0.12	0.60	
Clearance Time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		3.0	7.0	
Lane Grp Cap (vph)		269	338		357		199	1843		221	2066	
v/s Ratio Prot							0.02	c0.08		0.01	c0.13	
v/s Ratio Perm		c0.11	0.00		0.03							
v/c Ratio		0.52	0.02		0.15		0.17	0.16		0.12	0.21	
Uniform Delay, d1		27.8	24.8		25.5		32.1	9.8		31.1	7.4	
Progression Factor		1.00	1.00		1.00		0.52	0.23		1.00	1.00	
Incremental Delay, d2		5.6	0.1		0.7		0.4	0.2		0.2	0.2	
Delay (s)		33.5	24.9		26.2		17.2	2.4		31.3	7.5	
Level of Service		C	C		C		B	A		C	A	
Approach Delay (s)		31.8			26.2			3.9			8.9	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		12.8										
HCM 2000 Volume to Capacity ratio		0.29										
Actuated Cycle Length (s)		80.0										
Intersection Capacity Utilization		43.1%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Coast Hwy & Civic Center Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	10	9	24	15	23	8	256	29	66	304	13
Future Volume (vph)	13	10	9	24	15	23	8	256	29	66	304	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2			4.6			4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.93		1.00	0.91			0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	1730		1770	1692			3481			3491	
Flt Permitted	0.73	1.00		0.74	1.00			0.94			0.80	
Satd. Flow (perm)	1360	1730		1385	1692			3275			2802	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	11	10	26	16	25	9	278	32	72	330	14
RTOR Reduction (vph)	0	3	0	0	8	0	0	18	0	0	5	0
Lane Group Flow (vph)	14	18	0	26	33	0	0	301	0	0	411	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	53.3	53.3		53.3	53.3			17.9			17.9	
Effective Green, g (s)	53.3	53.3		53.3	53.3			17.9			17.9	
Actuated g/C Ratio	0.67	0.67		0.67	0.67			0.22			0.22	
Clearance Time (s)	4.2	4.2		4.2	4.2			4.6			4.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	
Lane Grp Cap (vph)	906	1152		922	1127			732			626	
v/s Ratio Prot		0.01			c0.02							
v/s Ratio Perm	0.01			0.02				0.09			c0.15	
v/c Ratio	0.02	0.02		0.03	0.03			0.41			0.66	
Uniform Delay, d1	4.5	4.5		4.5	4.5			26.5			28.2	
Progression Factor	1.00	1.00		1.00	1.00			1.52			0.67	
Incremental Delay, d2	0.0	0.0		0.1	0.0			0.5			2.7	
Delay (s)	4.5	4.5		4.6	4.6			40.8			21.6	
Level of Service	A	A		A	A			D			C	
Approach Delay (s)		4.5			4.6			40.8			21.6	
Approach LOS		A			A			D			C	
Intersection Summary												
HCM 2000 Control Delay			26.8			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.19									
Actuated Cycle Length (s)			80.0			Sum of lost time (s)			8.8			
Intersection Capacity Utilization			38.2%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

6: Coast Hwy & Pier View Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								 			 	
Traffic Volume (vph)	9	15	14	16	23	24	11	312	18	18	339	28
Future Volume (vph)	9	15	14	16	23	24	11	312	18	18	339	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		5.0	5.0			5.0			4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98			1.00			1.00	
Flpb, ped/bikes	0.98	1.00		0.99	1.00			1.00			1.00	
Frt	1.00	0.93		1.00	0.92			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1732	1705		1745	1690			3497			3479	
Flt Permitted	0.72	1.00		0.74	1.00			0.93			0.92	
Satd. Flow (perm)	1320	1705		1353	1690			3268			3219	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	16	15	17	25	26	12	339	20	20	368	30
RTOR Reduction (vph)	0	5	0	0	8	0	0	9	0	0	12	0
Lane Group Flow (vph)	10	26	0	17	43	0	0	362	0	0	406	0
Confl. Peds. (#/hr)	16		11	11		16	10		17	17		10
Confl. Bikes (#/hr)			2			2						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	55.2	55.2		54.4	54.4			15.6			16.1	
Effective Green, g (s)	55.2	55.2		54.4	54.4			15.6			16.1	
Actuated g/C Ratio	0.69	0.69		0.68	0.68			0.19			0.20	
Clearance Time (s)	4.2	4.2		5.0	5.0			5.0			4.5	
Vehicle Extension (s)	3.0	3.0		3.5	3.5			3.0			3.5	
Lane Grp Cap (vph)	910	1176		920	1149			637			647	
v/s Ratio Prot		0.02			c0.03							
v/s Ratio Perm	0.01			0.01				0.11			c0.13	
v/c Ratio	0.01	0.02		0.02	0.04			0.57			0.63	
Uniform Delay, d1	3.9	3.9		4.1	4.2			29.2			29.2	
Progression Factor	1.00	1.00		1.00	1.00			0.66			0.27	
Incremental Delay, d2	0.0	0.0		0.0	0.1			1.1			2.0	
Delay (s)	3.9	3.9		4.2	4.3			20.4			10.0	
Level of Service	A	A		A	A			C			A	
Approach Delay (s)		3.9			4.2			20.4			10.0	
Approach LOS		A			A			C			A	
Intersection Summary												
HCM 2000 Control Delay	13.6			HCM 2000 Level of Service			B					
HCM 2000 Volume to Capacity ratio	0.17											
Actuated Cycle Length (s)	80.0			Sum of lost time (s)			10.0					
Intersection Capacity Utilization	46.0%			ICU Level of Service			A					
Analysis Period (min)	15											
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

11/17/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	3	6	22	23	11	7	101	216	8	10	148	8
Future Volume (vph)	3	6	22	23	11	7	101	216	8	10	148	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	7	24	25	12	8	110	235	9	11	161	9
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	10	24	45	228	127	92	90					
Volume Left (vph)	3	0	25	110	0	11	0					
Volume Right (vph)	0	24	8	0	9	0	9					
Hadj (s)	0.18	-0.67	0.04	0.28	-0.02	0.09	-0.04					
Departure Headway (s)	6.0	5.1	5.8	5.2	4.9	5.1	5.0					
Degree Utilization, x	0.02	0.03	0.07	0.33	0.17	0.13	0.12					
Capacity (veh/h)	553	639	577	684	721	676	696					
Control Delay (s)	7.9	7.1	9.2	9.4	7.7	7.7	7.5					
Approach Delay (s)	7.3		9.2	8.8		7.6						
Approach LOS	A		A	A		A						
Intersection Summary												
Delay			8.4									
Level of Service			A									
Intersection Capacity Utilization			32.7%		ICU Level of Service			A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	128	60	123	90	35	108
Future Volume (vph)	128	60	123	90	35	108
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	139	65	134	98	38	117
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	139	65	232	155		
Volume Left (vph)	139	0	0	38		
Volume Right (vph)	0	65	98	0		
Hadj (s)	0.53	-0.67	-0.22	0.08		
Departure Headway (s)	5.9	4.7	4.4	4.8		
Degree Utilization, x	0.23	0.09	0.29	0.21		
Capacity (veh/h)	571	710	777	708		
Control Delay (s)	9.5	7.0	9.2	9.1		
Approach Delay (s)	8.7		9.2	9.1		
Approach LOS	A		A	A		
Intersection Summary						
Delay			9.0			
Level of Service			A			
Intersection Capacity Utilization			36.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	0	133	39	175	32	0	0	0	0	30	40
Future Volume (vph)	18	0	133	39	175	32	0	0	0	0	30	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0						4.0	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.98						0.92	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3457						3239	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3457						3239	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	0	145	42	190	35	0	0	0	0	33	43
RTOR Reduction (vph)	0	0	133	37	25	0	0	0	0	0	15	0
Lane Group Flow (vph)	20	0	12	5	200	0	0	0	0	0	61	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	6.6		6.6	9.9	9.9						51.5	
Effective Green, g (s)	6.6		6.6	9.9	9.9						51.5	
Actuated g/C Ratio	0.08		0.08	0.12	0.12						0.64	
Clearance Time (s)	4.0		4.0	4.0	4.0						4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	146		229	219	427						2085	
v/s Ratio Prot	c0.01		0.00	0.00	c0.06						c0.02	
v/s Ratio Perm												
v/c Ratio	0.14		0.05	0.02	0.47						0.03	
Uniform Delay, d1	34.1		33.8	30.8	32.6						5.2	
Progression Factor	1.00		1.00	1.83	0.94						1.00	
Incremental Delay, d2	0.4		0.1	0.0	0.8						0.0	
Delay (s)	34.5		33.9	56.3	31.5						5.2	
Level of Service	C		C	E	C						A	
Approach Delay (s)		34.0			35.4			0.0			5.2	
Approach LOS		C			D			A			A	
Intersection Summary												
HCM 2000 Control Delay			30.4			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.10									
Actuated Cycle Length (s)			80.0			Sum of lost time (s)			12.0			
Intersection Capacity Utilization			22.5%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

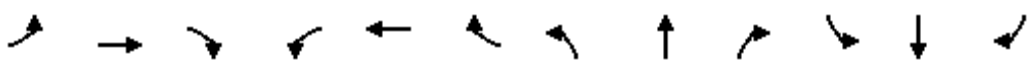
9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	173	260	88	69	510	0	0	291	31
Future Volume (vph)	0	0	0	173	260	88	69	510	0	0	291	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.0	5.0		5.0	5.0			5.0	
Lane Util. Factor				1.00	0.95		1.00	0.95			0.95	
Frpb, ped/bikes				1.00	0.99		1.00	1.00			1.00	
Flpb, ped/bikes				0.99	1.00		1.00	1.00			1.00	
Frt				1.00	0.96		1.00	1.00			0.99	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1744	3383		1770	3539			3476	
Flt Permitted				0.95	1.00		0.50	1.00			1.00	
Satd. Flow (perm)				1744	3383		924	3539			3476	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	188	283	96	75	554	0	0	316	34
RTOR Reduction (vph)	0	0	0	0	28	0	0	0	0	0	14	0
Lane Group Flow (vph)	0	0	0	188	351	0	75	554	0	0	336	0
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					
Actuated Green, G (s)				49.3	49.3		20.7	20.7			20.7	
Effective Green, g (s)				49.3	49.3		20.7	20.7			20.7	
Actuated g/C Ratio				0.62	0.62		0.26	0.26			0.26	
Clearance Time (s)				5.0	5.0		5.0	5.0			5.0	
Vehicle Extension (s)				3.0	3.0		4.0	4.0			4.0	
Lane Grp Cap (vph)				1074	2084		239	915			899	
v/s Ratio Prot					0.10			c0.16			0.10	
v/s Ratio Perm				c0.11			0.08					
v/c Ratio				0.18	0.17		0.31	0.61			0.37	
Uniform Delay, d1				6.6	6.6		23.9	26.1			24.3	
Progression Factor				1.00	1.00		0.55	0.54			0.32	
Incremental Delay, d2				0.4	0.2		1.0	1.3			0.4	
Delay (s)				7.0	6.7		14.1	15.5			8.2	
Level of Service				A	A		B	B			A	
Approach Delay (s)		0.0			6.8			15.3			8.2	
Approach LOS		A			A			B			A	
Intersection Summary												
HCM 2000 Control Delay			10.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.30									
Actuated Cycle Length (s)			80.0			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			47.4%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	155	1	172	581	223	15	30	260	150	58	8
Future Volume (vph)	28	155	1	172	581	223	15	30	260	150	58	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.98	
Satd. Flow (prot)	1770	3536		1770	3539	1583		1833	1583	1681	1716	
Flt Permitted	0.41	1.00		0.65	1.00	1.00		0.87	1.00	0.73	0.85	
Satd. Flow (perm)	767	3536		1202	3539	1583		1626	1583	1283	1491	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	168	1	187	632	242	16	33	283	163	63	9
RTOR Reduction (vph)	0	1	0	0	0	128	0	0	215	0	7	0
Lane Group Flow (vph)	30	168	0	187	632	114	0	49	68	116	112	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	15.9	15.9		15.5	15.5	15.5		7.9	7.9	7.9	7.9	
Effective Green, g (s)	15.9	15.9		15.5	15.5	15.5		7.9	7.9	7.9	7.9	
Actuated g/C Ratio	0.48	0.48		0.47	0.47	0.47		0.24	0.24	0.24	0.24	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	369	1703		564	1662	743		389	378	307	356	
v/s Ratio Prot		0.05			c0.18							
v/s Ratio Perm	0.04			0.16		0.07		0.03	0.04	c0.09	0.08	
v/c Ratio	0.08	0.10		0.33	0.38	0.15		0.13	0.18	0.38	0.32	
Uniform Delay, d1	4.6	4.7		5.5	5.6	5.0		9.8	10.0	10.5	10.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.0		0.4	0.2	0.1		0.2	0.3	1.1	0.7	
Delay (s)	4.7	4.7		5.9	5.8	5.1		10.0	10.3	11.6	11.0	
Level of Service	A	A		A	A	A		B	B	B	B	
Approach Delay (s)		4.7			5.7			10.2			11.3	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			7.1				HCM 2000 Level of Service			A		
HCM 2000 Volume to Capacity ratio			0.38									
Actuated Cycle Length (s)			33.0				Sum of lost time (s)			9.6		
Intersection Capacity Utilization			43.8%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

9/1/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (veh/h)	142	18	63	50	17	24
Future Volume (Veh/h)	142	18	63	50	17	24
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	154	20	68	54	18	26
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				248		
pX, platoon unblocked						
vC, conflicting volume			174		354	164
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			174		354	164
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			95		97	97
cM capacity (veh/h)			1403		613	881
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	174	122	44			
Volume Left	0	68	18			
Volume Right	20	0	26			
cSH	1700	1403	747			
Volume to Capacity	0.10	0.05	0.06			
Queue Length 95th (ft)	0	4	5			
Control Delay (s)	0.0	4.5	10.1			
Lane LOS		A	B			
Approach Delay (s)	0.0	4.5	10.1			
Approach LOS			B			
Intersection Summary						
Average Delay		2.9				
Intersection Capacity Utilization		28.0%	ICU Level of Service	A		
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr/Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	56	112	0	0	0	31	267	65	74	258	59
Future Volume (vph)	100	56	112	0	0	0	31	267	65	74	258	59
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2					4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	1.00					1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.97					1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00					1.00	1.00		1.00	1.00	
Frt	1.00	0.90					1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1630					1770	3419		1770	3408	
Flt Permitted	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1630					1770	3419		1770	3408	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	61	122	0	0	0	34	290	71	80	280	64
RTOR Reduction (vph)	0	84	0	0	0	0	0	34	0	0	24	0
Lane Group Flow (vph)	109	99	0	0	0	0	34	327	0	80	320	0
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA					Prot	NA		Prot	NA	
Protected Phases	4	4					5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	24.8	24.8					9.8	14.5		27.7	32.4	
Effective Green, g (s)	24.8	24.8					9.8	14.5		27.7	32.4	
Actuated g/C Ratio	0.31	0.31					0.12	0.18		0.35	0.40	
Clearance Time (s)	4.2	4.2					4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0					3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	548	505					216	619		612	1380	
v/s Ratio Prot	c0.06	0.06					0.02	c0.10		0.05	c0.09	
v/s Ratio Perm												
v/c Ratio	0.20	0.20					0.16	0.53		0.13	0.23	
Uniform Delay, d1	20.3	20.3					31.4	29.7		17.9	15.6	
Progression Factor	1.00	1.00					1.23	0.86		0.48	0.38	
Incremental Delay, d2	0.8	0.9					1.5	3.2		0.4	0.4	
Delay (s)	21.1	21.1					40.1	28.6		9.1	6.3	
Level of Service	C	C					D	C		A	A	
Approach Delay (s)		21.1			0.0			29.6			6.8	
Approach LOS		C			A			C			A	
Intersection Summary												
HCM 2000 Control Delay		18.7			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.29										
Actuated Cycle Length (s)		80.0			Sum of lost time (s)			13.0				
Intersection Capacity Utilization		44.9%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	189	9	0	0	0	0	4	15	22	7	0
Future Volume (Veh/h)	11	189	9	0	0	0	0	4	15	22	7	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	205	10	0	0	0	0	4	16	24	8	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		255										
pX, platoon unblocked												
vC, conflicting volume	0			215			238	234	108	144	239	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			215			238	234	108	144	239	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	99	98	97	99	100
cM capacity (veh/h)	1622			1352			686	660	926	788	656	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	114	112	20	32								
Volume Left	12	0	0	24								
Volume Right	0	10	16	0								
cSH	1622	1700	857	750								
Volume to Capacity	0.01	0.07	0.02	0.04								
Queue Length 95th (ft)	1	0	2	3								
Control Delay (s)	0.8	0.0	9.3	10.0								
Lane LOS	A		A	B								
Approach Delay (s)	0.4		9.3	10.0								
Approach LOS			A	B								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			20.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	43	356	5	0	0	0	0	9	20	20	30	0
Future Volume (vph)	43	356	5	0	0	0	0	9	20	20	30	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	387	5	0	0	0	0	10	22	22	33	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	241	199	32	55								
Volume Left (vph)	47	0	0	22								
Volume Right (vph)	0	5	22	0								
Hadj (s)	0.13	0.02	-0.38	0.11								
Departure Headway (s)	4.9	4.7	4.6	5.0								
Degree Utilization, x	0.32	0.26	0.04	0.08								
Capacity (veh/h)	731	745	735	670								
Control Delay (s)	9.0	8.2	7.7	8.4								
Approach Delay (s)	8.6		7.7	8.4								
Approach LOS	A		A	A								
Intersection Summary												
Delay			8.5									
Level of Service			A									
Intersection Capacity Utilization			27.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

9/1/2016

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	53	167	11	48	0	50	0	41	36	0	0	0								
Future Volume (vph)	53	167	11	48	0	50	0	41	36	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	58	182	12	52	0	54	0	45	39	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	58	194	106	84																
Volume Left (vph)	58	0	52	0																
Volume Right (vph)	0	12	54	39																
Hadj (s)	0.53	-0.01	-0.17	-0.24																
Departure Headway (s)	5.3	4.8	4.3	4.5																
Degree Utilization, x	0.09	0.26	0.13	0.10																
Capacity (veh/h)	664	736	805	751																
Control Delay (s)	7.6	8.2	7.9	8.0																
Approach Delay (s)	8.1		7.9	8.0																
Approach LOS	A		A	A																
Intersection Summary																				
Delay			8.0																	
Level of Service			A																	
Intersection Capacity Utilization			29.5%	ICU Level of Service					A											
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	1	15	21	4	19	15	297	12	9	307	7
Future Volume (Veh/h)	9	1	15	21	4	19	15	297	12	9	307	7
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	1	16	23	4	21	16	323	13	10	334	8
Pedestrians		7			7						1	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		1			1						0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								1261			414	
pX, platoon unblocked												
vC, conflicting volume	582	740	178	572	738	176	349			343		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	582	740	178	572	738	176	349			343		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	98	94	99	97	99			99		
cM capacity (veh/h)	370	332	829	382	333	831	1200			1206		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	27	48	178	174	177	175						
Volume Left	10	23	16	0	10	0						
Volume Right	16	21	0	13	0	8						
cSH	548	492	1200	1700	1206	1700						
Volume to Capacity	0.05	0.10	0.01	0.10	0.01	0.10						
Queue Length 95th (ft)	4	8	1	0	1	0						
Control Delay (s)	11.9	13.1	0.8	0.0	0.5	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s)	11.9	13.1	0.4		0.3							
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			30.5%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

18: Coast Hwy & Washington Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	1	11	4	0	4	8	341	11	3	356	8
Future Volume (Veh/h)	6	1	11	4	0	4	8	341	11	3	356	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	1	12	4	0	4	9	371	12	3	387	9
Pedestrians		11			7						12	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		1			1						1	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								831			844	
pX, platoon unblocked												
vC, conflicting volume	628	816	209	614	815	210	407			390		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	628	816	209	614	815	210	407			390		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	100	98	99	100	99	99			100		
cM capacity (veh/h)	352	302	790	360	302	783	1138			1158		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	20	8	194	198	196	202						
Volume Left	7	4	9	0	3	0						
Volume Right	12	4	0	12	0	9						
cSH	521	493	1138	1700	1158	1700						
Volume to Capacity	0.04	0.02	0.01	0.12	0.00	0.12						
Queue Length 95th (ft)	3	1	1	0	0	0						
Control Delay (s)	12.2	12.4	0.4	0.0	0.1	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s)	12.2	12.4	0.2		0.1							
Approach LOS	B	B										
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			28.8%		ICU Level of Service		A					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	50	65	48	23	8	74	8	119	35	87	81	2
Future Volume (vph)	50	65	48	23	8	74	8	119	35	87	81	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	71	52	25	9	80	9	129	38	95	88	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	177	114	176	185								
Volume Left (vph)	54	25	9	95								
Volume Right (vph)	52	80	38	2								
Hadj (s)	-0.08	-0.34	-0.09	0.13								
Departure Headway (s)	4.9	4.7	4.8	5.0								
Degree Utilization, x	0.24	0.15	0.23	0.26								
Capacity (veh/h)	681	690	701	673								
Control Delay (s)	9.4	8.5	9.3	9.7								
Approach Delay (s)	9.4	8.5	9.3	9.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.3									
Level of Service			A									
Intersection Capacity Utilization			42.0%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	177	14	3	82	12	7	15	17	17	22	9
Future Volume (Veh/h)	6	177	14	3	82	12	7	15	17	17	22	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	192	15	3	89	13	8	16	18	18	24	10
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	265											
pX, platoon unblocked												
vC, conflicting volume	116			214			345	342	206	355	344	110
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	116			214			345	342	206	355	344	110
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			99	97	98	97	96	99
cM capacity (veh/h)	1456			1348			569	566	829	557	565	931
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	214	105	42	52								
Volume Left	7	3	8	18								
Volume Right	15	13	18	10								
cSH	1456	1348	656	608								
Volume to Capacity	0.00	0.00	0.06	0.09								
Queue Length 95th (ft)	0	0	5	7								
Control Delay (s)	0.3	0.2	10.9	11.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.2	10.9	11.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay				2.8								
Intersection Capacity Utilization				24.7%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

21: Coast Hwy & Wisconsin Ave

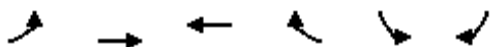
9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	36	127	56	19	17	62	319	40	11	351	17
Future Volume (vph)	50	36	127	56	19	17	62	319	40	11	351	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2			4.2		4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.88			0.98		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1645			1764		1770	3481		1770	3515	
Flt Permitted	0.89	1.00			0.71		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1649	1645			1297		1770	3481		1770	3515	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	39	138	61	21	18	67	347	43	12	382	18
RTOR Reduction (vph)	0	114	0	0	15	0	0	13	0	0	5	0
Lane Group Flow (vph)	54	63	0	0	85	0	67	377	0	12	395	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	6.7	6.7			6.7		2.1	17.8		0.6	16.3	
Effective Green, g (s)	6.7	6.7			6.7		2.1	17.8		0.6	16.3	
Actuated g/C Ratio	0.18	0.18			0.18		0.06	0.47		0.02	0.43	
Clearance Time (s)	4.2	4.2			4.2		4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	289	289			228		97	1626		27	1503	
v/s Ratio Prot		0.04					c0.04	0.11		0.01	c0.11	
v/s Ratio Perm	0.03				c0.07							
v/c Ratio	0.19	0.22			0.37		0.69	0.23		0.44	0.26	
Uniform Delay, d1	13.4	13.5			13.8		17.7	6.1		18.6	7.0	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.4			1.0		19.1	0.1		11.2	0.1	
Delay (s)	13.7	13.8			14.9		36.8	6.2		29.8	7.2	
Level of Service	B	B			B		D	A		C	A	
Approach Delay (s)		13.8			14.9			10.7			7.8	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			10.6				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.33									
Actuated Cycle Length (s)			38.1				Sum of lost time (s)			13.0		
Intersection Capacity Utilization			42.9%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

9/1/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	48	47	3	10	9
Future Volume (Veh/h)	5	48	47	3	10	9
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	52	51	3	11	10
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	62				124	62
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	62				124	62
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				99	99
cM capacity (veh/h)	1531				862	996
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	57	54	21			
Volume Left	5	0	11			
Volume Right	0	3	10			
cSH	1531	1700	921			
Volume to Capacity	0.00	0.03	0.02			
Queue Length 95th (ft)	0	0	2			
Control Delay (s)	0.7	0.0	9.0			
Lane LOS	A		A			
Approach Delay (s)	0.7	0.0	9.0			
Approach LOS			A			
Intersection Summary						
Average Delay		1.7				
Intersection Capacity Utilization		17.0%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	51	6	14	49	5	4	4	10	15	1	2
Future Volume (Veh/h)	3	51	6	14	49	5	4	4	10	15	1	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	55	7	15	53	5	4	4	11	16	1	2
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	60			62			154	154	58	165	156	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	60			62			154	154	58	165	156	60
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	99	99	98	100	100
cM capacity (veh/h)	1541			1541			800	728	1007	778	727	1003
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	65	73	19	19								
Volume Left	3	15	4	16								
Volume Right	7	5	11	2								
cSH	1541	1541	887	794								
Volume to Capacity	0.00	0.01	0.02	0.02								
Queue Length 95th (ft)	0	1	2	2								
Control Delay (s)	0.4	1.6	9.1	9.6								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.4	1.6	9.1	9.6								
Approach LOS			A	A								
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization			19.3%		ICU Level of Service				A			
Analysis Period (min)			15									

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	33	42	18	42	0	22	0	9	0	2	0
Future Volume (vph)	0	33	42	18	42	0	22	0	9	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	36	46	20	46	0	24	0	10	0	2	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	82	66	34	2								
Volume Left (vph)	0	20	24	0								
Volume Right (vph)	46	0	10	0								
Hadj (s)	-0.30	0.09	0.00	0.03								
Departure Headway (s)	3.7	4.1	4.2	4.3								
Degree Utilization, x	0.09	0.08	0.04	0.00								
Capacity (veh/h)	944	854	819	809								
Control Delay (s)	7.1	7.5	7.4	7.3								
Approach Delay (s)	7.1	7.5	7.4	7.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.3								
Level of Service				A								
Intersection Capacity Utilization				25.3%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	38	54	68	24	64	81
Future Volume (vph)	38	54	68	24	64	81
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	41	59	74	26	70	88
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	100	100	158			
Volume Left (vph)	41	0	70			
Volume Right (vph)	59	26	0			
Hadj (s)	-0.24	-0.12	0.12			
Departure Headway (s)	4.2	4.2	4.4			
Degree Utilization, x	0.12	0.12	0.19			
Capacity (veh/h)	792	830	805			
Control Delay (s)	7.8	7.7	8.4			
Approach Delay (s)	7.8	7.7	8.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.0			
Level of Service			A			
Intersection Capacity Utilization			26.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	188	1	8	151	31	9	10	15	31	16	7
Future Volume (Veh/h)	6	188	1	8	151	31	9	10	15	31	16	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	204	1	9	164	34	10	11	16	34	17	8
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					253							
pX, platoon unblocked	0.94						0.94	0.94		0.94	0.94	0.94
vC, conflicting volume	201			216			449	448	224	450	432	188
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	116			216			381	380	224	382	362	103
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			98	98	98	93	97	99
cM capacity (veh/h)	1379			1341			508	507	803	508	518	889
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	212	207	37	59								
Volume Left	7	9	10	34								
Volume Right	1	34	16	8								
cSH	1379	1341	603	542								
Volume to Capacity	0.01	0.01	0.06	0.11								
Queue Length 95th (ft)	0	1	5	9								
Control Delay (s)	0.3	0.4	11.4	12.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.4	11.4	12.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization			27.0%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	119	64	123	120	128	33	259	65	140	328	14
Future Volume (vph)	19	119	64	123	120	128	33	259	65	140	328	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.97	1.00	1.00	0.96	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1850	1533	1681	1762	1523	1770	3420		1770	3509	
Flt Permitted		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1850	1533	1681	1762	1523	1770	3420		1770	3509	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	129	70	134	130	139	36	282	71	152	357	15
RTOR Reduction (vph)	0	0	61	0	0	118	0	28	0	0	3	0
Lane Group Flow (vph)	0	150	9	121	143	21	36	325	0	152	369	0
Confl. Peds. (#/hr)	14		10	10		14			3			15
Confl. Bikes (#/hr)			4			5			3			3
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		10.8	10.8	12.2	12.2	12.2	6.1	23.4		14.8	32.1	
Effective Green, g (s)		10.8	10.8	12.2	12.2	12.2	6.1	23.4		14.8	32.1	
Actuated g/C Ratio		0.14	0.14	0.15	0.15	0.15	0.08	0.29		0.19	0.40	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)		249	206	256	268	232	134	1000		327	1407	
v/s Ratio Prot		c0.08		0.07	c0.08		0.02	c0.10		c0.09	0.11	
v/s Ratio Perm			0.01			0.01						
v/c Ratio		0.60	0.05	0.47	0.53	0.09	0.27	0.33		0.46	0.26	
Uniform Delay, d1		32.6	30.1	31.0	31.3	29.1	34.8	22.1		29.1	16.0	
Progression Factor		1.00	1.00	0.38	0.40	0.13	0.68	0.23		1.00	1.00	
Incremental Delay, d2		2.8	0.0	1.6	2.2	0.2	0.4	0.9		0.4	0.5	
Delay (s)		35.4	30.1	13.3	14.6	4.0	23.9	5.9		29.5	16.5	
Level of Service		D	C	B	B	A	C	A		C	B	
Approach Delay (s)		33.7			10.6			7.5			20.2	
Approach LOS		C			B			A			C	
Intersection Summary												
HCM 2000 Control Delay			16.4				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			80.0				Sum of lost time (s)			18.8		
Intersection Capacity Utilization			51.9%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	6	359	0	22	462	42	11	7	47	128	11	24
Future Volume (vph)	6	359	0	22	462	42	11	7	47	128	11	24
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.95
Flpb, ped/bikes	1.00	1.00		0.99	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.99			0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.96	1.00
Satd. Flow (prot)	1770	3539		1751	3490			3087			1779	1511
Flt Permitted	0.27	1.00		0.42	1.00			0.92			0.71	1.00
Satd. Flow (perm)	494	3539		775	3490			2867			1328	1511
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	7	390	0	24	502	46	12	8	51	139	12	26
RTOR Reduction (vph)	0	0	0	0	12	0	0	18	0	0	0	9
Lane Group Flow (vph)	7	390	0	24	536	0	0	53	0	0	151	17
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	18.0	18.0		18.0	18.0			52.5			52.5	52.5
Effective Green, g (s)	18.0	18.0		18.0	18.0			52.5			52.5	52.5
Actuated g/C Ratio	0.22	0.22		0.22	0.22			0.66			0.66	0.66
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	111	796		174	785			1881			871	991
v/s Ratio Prot		0.11			c0.15							
v/s Ratio Perm	0.01			0.03				0.02			c0.11	0.01
v/c Ratio	0.06	0.49		0.14	0.68			0.03			0.17	0.02
Uniform Delay, d1	24.4	27.0		24.8	28.4			4.8			5.3	4.8
Progression Factor	0.32	0.39		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.2	0.5		0.4	2.5			0.0			0.4	0.0
Delay (s)	8.1	11.0		25.2	30.9			4.8			5.8	4.8
Level of Service	A	B		C	C			A			A	A
Approach Delay (s)		11.0			30.6			4.8			5.6	
Approach LOS		B			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			19.1				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.30									
Actuated Cycle Length (s)			80.0				Sum of lost time (s)			9.5		
Intersection Capacity Utilization			61.2%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (vph)	25	12	17	22	7	80	3	302	43	67	407	17
Future Volume (vph)	25	12	17	22	7	80	3	302	43	67	407	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.96			1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected		0.98			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1727			1790	1547	1770	3459		1770	3514	
Flt Permitted		0.91			0.86	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1602			1597	1547	1770	3459		1770	3514	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	13	18	24	8	87	3	328	47	73	442	18
RTOR Reduction (vph)	0	8	0	0	0	39	0	20	0	0	5	0
Lane Group Flow (vph)	0	50	0	0	32	48	3	355	0	73	455	0
Confl. Peds. (#/hr)	10		4	4		10			3			4
Confl. Bikes (#/hr)			1						2			3
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		44.3			44.3	44.3	0.8	11.9		10.1	21.2	
Effective Green, g (s)		44.3			44.3	44.3	0.8	11.9		10.1	21.2	
Actuated g/C Ratio		0.55			0.55	0.55	0.01	0.15		0.13	0.26	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		887			884	856	17	514		223	931	
v/s Ratio Prot							0.00	c0.10		0.04	c0.13	
v/s Ratio Perm		c0.03			0.02	0.03						
v/c Ratio		0.06			0.04	0.06	0.18	0.69		0.33	0.49	
Uniform Delay, d1		8.2			8.1	8.2	39.3	32.3		31.9	24.8	
Progression Factor		1.00			1.00	1.00	1.20	0.75		0.54	0.45	
Incremental Delay, d2		0.1			0.1	0.1	4.9	4.0		0.8	0.4	
Delay (s)		8.3			8.2	8.3	52.0	28.2		18.1	11.7	
Level of Service		A			A	A	D	C		B	B	
Approach Delay (s)		8.3			8.3			28.3			12.6	
Approach LOS		A			A			C			B	
Intersection Summary												
HCM 2000 Control Delay			17.4				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			80.0				Sum of lost time (s)			13.7		
Intersection Capacity Utilization			58.8%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	109	18	29	95	0	16	0	24	0	0	0
Future Volume (Veh/h)	0	109	18	29	95	0	16	0	24	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	118	20	32	103	0	17	0	26	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		252										
pX, platoon unblocked												
vC, conflicting volume	103			138			295	295	128	321	305	103
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	103			138			295	295	128	321	305	103
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			97	100	97	100	100	100
cM capacity (veh/h)	1489			1446			646	603	922	604	595	952
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	138	135	43	0								
Volume Left	0	32	17	0								
Volume Right	20	0	26	0								
cSH	1489	1446	789	1700								
Volume to Capacity	0.00	0.02	0.05	0.00								
Queue Length 95th (ft)	0	2	4	0								
Control Delay (s)	0.0	1.9	9.8	0.0								
Lane LOS		A	A	A								
Approach Delay (s)	0.0	1.9	9.8	0.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			26.8%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	48	9	2	34	2	16	0	7	2	0	2
Future Volume (Veh/h)	2	48	9	2	34	2	16	0	7	2	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	52	10	2	37	2	17	0	8	2	0	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	39			62			105	104	57	111	108	38
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	39			62			105	104	57	111	108	38
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	99	100	100	100
cM capacity (veh/h)	1571			1541			871	784	1009	858	780	1034
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	64	41	25	4								
Volume Left	2	2	17	2								
Volume Right	10	2	8	2								
cSH	1571	1541	911	938								
Volume to Capacity	0.00	0.00	0.03	0.00								
Queue Length 95th (ft)	0	0	2	0								
Control Delay (s)	0.2	0.4	9.1	8.9								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.2	0.4	9.1	8.9								
Approach LOS			A	A								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			13.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	31	72	12	31	89	12
Future Volume (vph)	31	72	12	31	89	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	78	13	34	97	13
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	112	47	110			
Volume Left (vph)	34	0	97			
Volume Right (vph)	78	34	0			
Hadj (s)	-0.32	-0.40	0.21			
Departure Headway (s)	3.9	3.8	4.4			
Degree Utilization, x	0.12	0.05	0.13			
Capacity (veh/h)	881	894	796			
Control Delay (s)	7.5	7.1	8.1			
Approach Delay (s)	7.5	7.1	8.1			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.6			
Level of Service			A			
Intersection Capacity Utilization			25.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	133	74	14	88	3	56	8	14	13	9	4
Future Volume (Veh/h)	3	133	74	14	88	3	56	8	14	13	9	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	145	80	15	96	3	61	9	15	14	10	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					576							
pX, platoon unblocked												
vC, conflicting volume	99			225			328	320	185	338	358	98
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	99			225			328	320	185	338	358	98
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			90	98	98	98	98	100
cM capacity (veh/h)	1494			1344			608	589	857	592	560	959
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	228	114	85	28								
Volume Left	3	15	61	14								
Volume Right	80	3	15	4								
cSH	1494	1344	639	613								
Volume to Capacity	0.00	0.01	0.13	0.05								
Queue Length 95th (ft)	0	1	11	4								
Control Delay (s)	0.1	1.1	11.5	11.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	1.1	11.5	11.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization			26.5%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	130	8	6	81	11	2	3	16	4	4	3
Future Volume (Veh/h)	0	130	8	6	81	11	2	3	16	4	4	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	141	9	7	88	12	2	3	17	4	4	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)					249							
pX, platoon unblocked												
vC, conflicting volume	100			150			258	260	146	272	258	94
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	100			150			258	260	146	272	258	94
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	98	99	99	100
cM capacity (veh/h)	1493			1431			686	642	902	663	643	963
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	150	107	22	11								
Volume Left	0	7	2	4								
Volume Right	9	12	17	3								
cSH	1493	1431	832	716								
Volume to Capacity	0.00	0.00	0.03	0.02								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.0	0.5	9.4	10.1								
Lane LOS		A	A	B								
Approach Delay (s)	0.0	0.5	9.4	10.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			19.9%	ICU Level of Service	A							
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	80	52	39	37	19	66	271	35	44	298	13
Future Volume (vph)	28	80	52	39	37	19	66	271	35	44	298	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.96			0.97		1.00	0.98		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1765			1775		1770	3479		1770	3517	
Flt Permitted		0.94			0.68		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1676			1225		1770	3479		1770	3517	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	87	57	42	40	21	72	295	38	48	324	14
RTOR Reduction (vph)	0	25	0	0	14	0	0	8	0	0	2	0
Lane Group Flow (vph)	0	149	0	0	89	0	72	325	0	48	336	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		12.3			11.9		11.4	47.1		6.0	42.5	
Effective Green, g (s)		12.3			11.9		11.4	47.1		6.0	42.5	
Actuated g/C Ratio		0.15			0.15		0.14	0.59		0.08	0.53	
Clearance Time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.5		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		257			182		252	2048		132	1868	
v/s Ratio Prot							c0.04	0.09		c0.03	c0.10	
v/s Ratio Perm		c0.09			0.07							
v/c Ratio		0.58			0.49		0.29	0.16		0.36	0.18	
Uniform Delay, d1		31.4			31.3		30.7	7.5		35.2	9.7	
Progression Factor		1.00			1.00		1.06	1.06		0.47	0.19	
Incremental Delay, d2		3.1			2.5		0.2	0.2		1.7	0.2	
Delay (s)		34.6			33.7		32.7	8.1		18.1	2.1	
Level of Service		C			C		C	A		B	A	
Approach Delay (s)		34.6			33.7			12.4			4.1	
Approach LOS		C			C			B			A	
Intersection Summary												
HCM 2000 Control Delay			15.1									
HCM 2000 Volume to Capacity ratio			0.29									
Actuated Cycle Length (s)			80.0									
Intersection Capacity Utilization			40.1%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	236	9	12	133	10	4	12	10	8	10	13
Future Volume (Veh/h)	11	236	9	12	133	10	4	12	10	8	10	13
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	257	10	13	145	11	4	13	11	9	11	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		280										
pX, platoon unblocked												
vC, conflicting volume	156			267			482	468	262	480	468	150
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	156			267			482	468	262	480	468	150
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			99	97	99	98	98	98
cM capacity (veh/h)	1424			1297			472	484	777	472	484	896
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	279	169	28	34								
Volume Left	12	13	4	9								
Volume Right	10	11	11	14								
cSH	1424	1297	565	592								
Volume to Capacity	0.01	0.01	0.05	0.06								
Queue Length 95th (ft)	1	1	4	5								
Control Delay (s)	0.4	0.7	11.7	11.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.4	0.7	11.7	11.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			25.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	202	10	6	124	1	8	12	14	6	6	3
Future Volume (vph)	2	202	10	6	124	1	8	12	14	6	6	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	220	11	7	135	1	9	13	15	7	7	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	233	143	37	17								
Volume Left (vph)	2	7	9	7								
Volume Right (vph)	11	1	15	3								
Hadj (s)	0.01	0.04	-0.16	0.01								
Departure Headway (s)	4.2	4.3	4.6	4.8								
Degree Utilization, x	0.27	0.17	0.05	0.02								
Capacity (veh/h)	843	807	721	685								
Control Delay (s)	8.7	8.2	7.8	7.9								
Approach Delay (s)	8.7	8.2	7.8	7.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.4									
Level of Service			A									
Intersection Capacity Utilization			21.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	8	222	5	23	102	20	5	49	95	156	9	8
Future Volume (vph)	8	222	5	23	102	20	5	49	95	156	9	8
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	241	5	25	111	22	5	53	103	170	10	9
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	255	158	161	189								
Volume Left (vph)	9	25	5	170								
Volume Right (vph)	5	22	103	9								
Hadj (s)	0.03	-0.02	-0.34	0.19								
Departure Headway (s)	5.1	5.2	5.0	5.4								
Degree Utilization, x	0.36	0.23	0.22	0.29								
Capacity (veh/h)	656	631	648	610								
Control Delay (s)	11.0	9.8	9.4	10.6								
Approach Delay (s)	11.0	9.8	9.4	10.6								
Approach LOS	B	A	A	B								
Intersection Summary												
Delay				10.3								
Level of Service				B								
Intersection Capacity Utilization				45.5%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	48	22	10	57	45
Future Volume (vph)	0	48	22	10	57	45
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	52	24	11	62	49
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	52	35	111			
Volume Left (vph)	0	0	62			
Volume Right (vph)	52	11	0			
Hadj (s)	-0.57	-0.15	0.15			
Departure Headway (s)	3.6	4.0	4.2			
Degree Utilization, x	0.05	0.04	0.13			
Capacity (veh/h)	944	882	846			
Control Delay (s)	6.9	7.1	7.8			
Approach Delay (s)	6.9	7.1	7.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.4			
Level of Service			A			
Intersection Capacity Utilization			15.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	110	36	223	45	190	26	166	170	161	235	5
Future Volume (vph)	14	110	36	223	45	190	26	166	170	161	235	5
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97		1.00	1.00	1.00	0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.92		1.00	1.00	
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1535		1788	1583	1770	3210		1770	3526	
Flt Permitted	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1535		1788	1583	1770	3210		1770	3526	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	120	39	242	49	207	28	180	185	175	255	5
RTOR Reduction (vph)	0	0	35	0	0	162	0	143	0	0	1	0
Lane Group Flow (vph)	15	120	4	0	291	45	28	222	0	175	259	0
Confl. Peds. (#/hr)	7		2	2		7			5			8
Confl. Bikes (#/hr)						2			4			8
Turn Type	Split	NA	Perm	Split	NA	Over	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	7.3	7.3	7.3		17.9	17.5	2.8	18.2		17.5	32.9	
Effective Green, g (s)	7.3	7.3	7.3		17.9	17.5	2.8	18.2		17.5	32.9	
Actuated g/C Ratio	0.09	0.09	0.09		0.22	0.22	0.03	0.23		0.22	0.41	
Clearance Time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	161	169	140		400	346	61	730		387	1450	
v/s Ratio Prot	0.01	c0.06			c0.16	0.03	0.02	c0.07		c0.10	0.07	
v/s Ratio Perm			0.00									
v/c Ratio	0.09	0.71	0.03		0.73	0.13	0.46	0.30		0.45	0.18	
Uniform Delay, d1	33.3	35.3	33.1		28.8	25.1	37.9	25.6		27.1	15.0	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		0.79	0.81	
Incremental Delay, d2	0.1	11.1	0.0		6.5	0.1	2.0	1.1		0.3	0.3	
Delay (s)	33.4	46.4	33.1		35.3	25.2	39.8	26.7		21.6	12.4	
Level of Service	C	D	C		D	C	D	C		C	B	
Approach Delay (s)		42.3			31.1			27.7			16.1	
Approach LOS		D			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			27.1									
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			80.0									
Intersection Capacity Utilization			58.7%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	346	2	6	515	33	0	0	10	18	0	20
Future Volume (Veh/h)	5	346	2	6	515	33	0	0	10	18	0	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	376	2	7	560	36	0	0	11	20	0	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh					2							
Upstream signal (ft)		279										
pX, platoon unblocked				0.96			0.96	0.96	0.96	0.96	0.96	
vC, conflicting volume	596			378			1001	997	377	990	980	578
vC1, stage 1 conf vol							387	387		592	592	
vC2, stage 2 conf vol							614	610		398	388	
vCu, unblocked vol	596			332			980	976	331	969	959	578
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			100	100	98	95	100	96
cM capacity (veh/h)	980			1179			401	419	683	421	426	516
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	383	603	11	42								
Volume Left	5	7	0	20								
Volume Right	2	36	11	22								
cSH	980	1179	683	466								
Volume to Capacity	0.01	0.01	0.02	0.09								
Queue Length 95th (ft)	0	0	1	7								
Control Delay (s)	0.2	0.2	10.4	13.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.2	10.4	13.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.8									
Intersection Capacity Utilization			48.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Dittmar St & Vista Way

9/1/2016

																		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Lane Configurations																		
Traffic Volume (veh/h)	4	394	2	7	620	11	2	1	16	14	1	7						
Future Volume (Veh/h)	4	394	2	7	620	11	2	1	16	14	1	7						
Sign Control	Free			Free			Stop			Stop								
Grade	0%			0%			0%			0%								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92						
Hourly flow rate (vph)	4	428	2	8	674	12	2	1	17	15	1	8						
Pedestrians	1						1											
Lane Width (ft)	12.0						12.0											
Walking Speed (ft/s)	4.0						4.0											
Percent Blockage	0						0											
Right turn flare (veh)																		
Median type	TWLTL			TWLTL														
Median storage veh)	2			2														
Upstream signal (ft)	687																	
pX, platoon unblocked																		
vC, conflicting volume	686				431				1138	1140	430	1150	1135	681				
vC1, stage 1 conf vol							438	438				696	696					
vC2, stage 2 conf vol							700	702				454	439					
vCu, unblocked vol	686				431				1138	1140	430	1150	1135	681				
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1	6.5	6.2				
tC, 2 stage (s)							6.1	5.5				6.1	5.5					
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5	4.0	3.3				
p0 queue free %	100				99				99	100	97	96	100	98				
cM capacity (veh/h)	908				1128				364	379	625	365	381	450				
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1												
Volume Total	4	430	8	686	20	24												
Volume Left	4	0	8	0	2	15												
Volume Right	0	2	0	12	17	8												
cSH	908	1700	1128	1700	566	390												
Volume to Capacity	0.00	0.25	0.01	0.40	0.04	0.06												
Queue Length 95th (ft)	0	0	1	0	3	5												
Control Delay (s)	9.0	0.0	8.2	0.0	11.6	14.8												
Lane LOS	A		A		B	B												
Approach Delay (s)	0.1		0.1		11.6	14.8												
Approach LOS					B	B												
Intersection Summary																		
Average Delay				0.6														
Intersection Capacity Utilization				44.9%	ICU Level of Service			A										
Analysis Period (min)				15														

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	434	1	8	560	107	0	0	7	0	0	18
Future Volume (Veh/h)	22	434	1	8	560	107	0	0	7	0	0	18
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	472	1	9	609	116	0	0	8	0	0	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage veh	2			2								
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	725			473			1168	1264	472	1213	1206	667
vC1, stage 1 conf vol							520	520		685	685	
vC2, stage 2 conf vol							647	743		528	521	
vCu, unblocked vol	725			473			1168	1264	472	1213	1206	667
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			100	100	99	100	100	96
cM capacity (veh/h)	878			1089			348	339	592	351	365	459
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	24	473	9	725	8	20						
Volume Left	24	0	9	0	0	0						
Volume Right	0	1	0	116	8	20						
cSH	878	1700	1089	1700	592	459						
Volume to Capacity	0.03	0.28	0.01	0.43	0.01	0.04						
Queue Length 95th (ft)	2	0	1	0	1	3						
Control Delay (s)	9.2	0.0	8.3	0.0	11.2	13.2						
Lane LOS	A		A		B	B						
Approach Delay (s)	0.4		0.1		11.2	13.2						
Approach LOS					B	B						
Intersection Summary												
Average Delay				0.5								
Intersection Capacity Utilization				52.6%	ICU Level of Service			A				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

9/1/2016

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Traffic Volume (veh/h)	0	0	51	0	0	12	22	254	5	8	573	8								
Future Volume (Veh/h)	0	0	51	0	0	12	22	254	5	8	573	8								
Sign Control	Stop				Stop				Free											
Grade	0%				0%				0%											
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	0	0	55	0	0	13	24	276	5	9	623	9								
Pedestrians																				
Lane Width (ft)																				
Walking Speed (ft/s)																				
Percent Blockage																				
Right turn flare (veh)																				
Median type							TWLTL		TWLTL											
Median storage veh)							2		2											
Upstream signal (ft)									621											
pX, platoon unblocked	0.93	0.93	0.93	0.93	0.93	0.93														
vC, conflicting volume	844	974	628	1022	976	140	632	281												
vC1, stage 1 conf vol	646	646	326		326															
vC2, stage 2 conf vol	199	329	696		650															
vCu, unblocked vol	792	933	558	984	935	140	563	281												
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1	4.1												
tC, 2 stage (s)	6.5	5.5	6.5		5.5															
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2												
p0 queue free %	100	100	87	100	100	99	97	99												
cM capacity (veh/h)	405	410	438	305	396	882	931	1278												
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2													
Volume Total	55	13	24	184	97	9	632													
Volume Left	0	0	24	0	0	9	0													
Volume Right	55	13	0	0	5	0	9													
cSH	438	882	931	1700	1700	1278	1700													
Volume to Capacity	0.13	0.01	0.03	0.11	0.06	0.01	0.37													
Queue Length 95th (ft)	11	1	2	0	0	1	0													
Control Delay (s)	14.4	9.1	9.0	0.0	0.0	7.8	0.0													
Lane LOS	B	A	A					A												
Approach Delay (s)	14.4	9.1	0.7					0.1												
Approach LOS	B	A																		
Intersection Summary																				
Average Delay			1.2																	
Intersection Capacity Utilization			40.6%	ICU Level of Service				A												
Analysis Period (min)			15																	

HCM Signalized Intersection Capacity Analysis

45: Coast Hwy & Michigan Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	52	8	25	33	10	5	15	329	4	4	322	18
Future Volume (vph)	52	8	25	33	10	5	15	329	4	4	322	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5		4.5			4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00		0.95			0.95	
Frt		1.00	0.85		1.00	0.85		1.00			0.99	
Flt Protected		0.96	1.00		0.96	1.00		1.00			1.00	
Satd. Flow (prot)		1786	1583		1794	1583		3526			3509	
Flt Permitted		0.72	1.00		0.73	1.00		0.94			0.95	
Satd. Flow (perm)		1345	1583		1365	1583		3309			3344	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	57	9	27	36	11	5	16	358	4	4	350	20
RTOR Reduction (vph)	0	0	24	0	0	5	0	0	0	0	2	0
Lane Group Flow (vph)	0	66	3	0	47	1	0	378	0	0	372	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		8.0	8.0		8.0	8.0		63.0			63.0	
Effective Green, g (s)		8.0	8.0		8.0	8.0		63.0			63.0	
Actuated g/C Ratio		0.10	0.10		0.10	0.10		0.79			0.79	
Clearance Time (s)		4.5	4.5		4.5	4.5		4.5			4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		134	158		136	158		2605			2633	
v/s Ratio Prot												
v/s Ratio Perm		c0.05	0.00		0.03	0.00		c0.11			0.11	
v/c Ratio		0.49	0.02		0.35	0.00		0.14			0.14	
Uniform Delay, d1		34.1	32.5		33.6	32.4		2.0			2.0	
Progression Factor		1.00	1.00		1.00	1.00		1.00			0.94	
Incremental Delay, d2		2.8	0.0		1.5	0.0		0.1			0.1	
Delay (s)		36.9	32.5		35.1	32.4		2.2			2.0	
Level of Service		D	C		D	C		A			A	
Approach Delay (s)		35.6			34.8			2.2			2.0	
Approach LOS		D			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		7.5										
HCM 2000 Volume to Capacity ratio		0.18										
Actuated Cycle Length (s)		80.0										
Intersection Capacity Utilization		37.7%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

46: Coast Hwy

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	8	3	0	1	7	241	3	1	241	3
Future Volume (Veh/h)	3	0	8	3	0	1	7	241	3	1	241	3
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	0	9	3	0	1	8	262	3	1	262	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage (veh)												
Upstream signal (ft)	836								1100			
pX, platoon unblocked												
vC, conflicting volume	414	546	132	422	546	132	265	265				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	414	546	132	422	546	132	265	265				
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	99	100	99	99	100	100	99	100				
cM capacity (veh/h)	520	440	892	508	440	892	1296	1296				
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	12	4	139	134	132	134						
Volume Left	3	3	8	0	1	0						
Volume Right	9	1	0	3	0	3						
cSH	757	570	1296	1700	1296	1700						
Volume to Capacity	0.02	0.01	0.01	0.08	0.00	0.08						
Queue Length 95th (ft)	1	1	0	0	0	0						
Control Delay (s)	9.8	11.4	0.5	0.0	0.1	0.0						
Lane LOS	A	B	A		A							
Approach Delay (s)	9.8	11.4	0.3		0.0							
Approach LOS	A	B										
Intersection Summary												
Average Delay			0.4									
Intersection Capacity Utilization			21.8%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

47: Coast Hwy

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	4	7	11	3	30	3	141	11	28	137	9
Future Volume (Veh/h)	3	4	7	11	3	30	3	141	11	28	137	9
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	4	8	12	3	33	3	153	12	30	149	10
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)								538			726	
pX, platoon unblocked												
vC, conflicting volume	331	385	80	310	384	82	159			165		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	331	385	80	310	384	82	159			165		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	99	99	99	98	99	97	100			98		
cM capacity (veh/h)	565	535	965	600	535	961	1418			1411		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	15	48	80	88	104	84						
Volume Left	3	12	3	0	30	0						
Volume Right	8	33	0	12	0	10						
cSH	712	801	1418	1700	1411	1700						
Volume to Capacity	0.02	0.06	0.00	0.05	0.02	0.05						
Queue Length 95th (ft)	2	5	0	0	2	0						
Control Delay (s)	10.2	9.8	0.3	0.0	2.3	0.0						
Lane LOS	B	A	A		A							
Approach Delay (s)	10.2	9.8	0.1		1.3							
Approach LOS	B	A										
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			22.9%		ICU Level of Service		A					
Analysis Period (min)			15									

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

06/29/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	154	7	34	7	66	8	23	735	17
Future Volume (veh/h)	0	0	0	154	7	34	7	66	8	23	735	17
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h				173	0	0	8	72	0	25	799	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				1135	0	507	142	1831	570	142	1274	570
Arrive On Green				0.32	0.00	0.00	0.08	0.36	0.00	0.08	0.36	0.00
Sat Flow, veh/h				3548	0	1583	1774	5085	1583	1774	3539	1583
Grp Volume(v), veh/h				173	0	0	8	72	0	25	799	0
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1695	1583	1774	1770	1583
Q Serve(g_s), s				1.7	0.0	0.0	0.2	0.5	0.0	0.7	9.3	0.0
Cycle Q Clear(g_c), s				1.7	0.0	0.0	0.2	0.5	0.0	0.7	9.3	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				1135	0	507	142	1831	570	142	1274	570
V/C Ratio(X)				0.15	0.00	0.00	0.06	0.04	0.00	0.18	0.63	0.00
Avail Cap(c_a), veh/h				1135	0	507	142	1831	570	142	1274	570
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				12.2	0.0	0.0	21.3	10.4	0.0	21.5	13.2	0.0
Incr Delay (d2), s/veh				0.3	0.0	0.0	0.8	0.0	0.0	2.7	2.3	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.9	0.0	0.0	0.1	0.2	0.0	0.4	5.0	0.0
LnGrp Delay(d),s/veh				12.4	0.0	0.0	22.0	10.4	0.0	24.2	15.6	0.0
LnGrp LOS				B			C	B		C	B	
Approach Vol, veh/h					173			80			824	
Approach Delay, s/veh					12.4			11.6			15.8	
Approach LOS					B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	8.0	22.0			8.0	22.0		20.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	18.0			4.0	18.0		16.0				
Max Q Clear Time (g_c+I1), s	2.7	2.5			2.2	11.3		3.7				
Green Ext Time (p_c), s	0.0	0.3			0.0	2.9		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				15.0								
HCM 2010 LOS				B								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↑	↑↑	↑↑					
Traffic Volume (veh/h)	450	160	402	919	0	0			
Future Volume (veh/h)	450	160	402	919	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863					
Adj Flow Rate, veh/h	489	174	437	999					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	1770	792	1032	3185					
Arrive On Green	0.50	0.50	0.30	0.90					
Sat Flow, veh/h	3632	1583	3442	3632					
Grp Volume(v), veh/h	489	174	437	999					
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1770					
Q Serve(g_s), s	3.2	2.5	4.1	1.6					
Cycle Q Clear(g_c), s	3.2	2.5	4.1	1.6					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	1770	792	1032	3185					
V/C Ratio(X)	0.28	0.22	0.42	0.31					
Avail Cap(c_a), veh/h	1770	792	1032	3185					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	5.8	5.6	11.2	0.3					
Incr Delay (d2), s/veh	0.4	0.6	1.3	0.3					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	1.7	1.2	2.1	0.8					
LnGrp Delay(d),s/veh	6.2	6.3	12.5	0.5					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	663			1436					
Approach Delay, s/veh	6.2			4.2					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			16.0	24.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			12.0	20.0				36.0	
Max Q Clear Time (g_c+I1), s			6.1	5.2				3.6	
Green Ext Time (p_c), s			0.9	3.4				8.7	
Intersection Summary									
HCM 2010 Ctrl Delay			4.8						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/11/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↖	↑↑	↖	↗		
Traffic Volume (veh/h)	576	59	717	1772	59	1		
Future Volume (veh/h)	576	59	717	1772	59	1		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	626	64	779	1926	64	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	944	422	918	2124	473	422		
Arrive On Green	0.27	0.27	0.27	0.60	0.27	0.00		
Sat Flow, veh/h	3632	1583	3442	3632	1774	1583		
Grp Volume(v), veh/h	626	64	779	1926	64	0		
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1770	1774	1583		
Q Serve(g_s), s	9.5	1.9	12.9	28.7	1.6	0.0		
Cycle Q Clear(g_c), s	9.5	1.9	12.9	28.7	1.6	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	944	422	918	2124	473	422		
V/C Ratio(X)	0.66	0.15	0.85	0.91	0.14	0.00		
Avail Cap(c_a), veh/h	944	422	918	2124	473	422		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	19.6	16.8	20.9	10.5	16.7	0.0		
Incr Delay (d2), s/veh	3.7	0.8	9.6	7.1	0.6	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.1	0.9	7.3	15.7	0.9	0.0		
LnGrp Delay(d),s/veh	23.3	17.6	30.5	17.6	17.3	0.0		
LnGrp LOS	C	B	C	B	B			
Approach Vol, veh/h	690			2705	64			
Approach Delay, s/veh	22.7			21.3	17.3			
Approach LOS	C			C	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	20.0	20.0				40.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	16.0	16.0				36.0
Max Q Clear Time (g_c+I1), s		3.6	14.9	11.5				30.7
Green Ext Time (p_c), s		0.1	0.4	1.8				4.7
Intersection Summary								
HCM 2010 Ctrl Delay			21.5					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary
 51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	297	4	95	516	168	10	0	113	21	32	33
Future Volume (veh/h)	0	297	4	95	516	168	10	0	113	21	32	33
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	1863	1863	0	1863	1863	1863	1863
Adj Flow Rate, veh/h	0	323	4	103	561	0	11	0	123	23	35	36
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1102	14	273	1906	853	0	0	0	546	573	487
Arrive On Green	0.00	0.31	0.31	0.15	0.54	0.00	0.00	0.00	0.00	0.31	0.31	0.31
Sat Flow, veh/h	0	3673	44	1774	3539	1583		0		1774	1863	1583
Grp Volume(v), veh/h	0	160	167	103	561	0		0.0		23	35	36
Grp Sat Flow(s),veh/h/ln	0	1770	1855	1774	1770	1583				1774	1863	1583
Q Serve(g_s), s	0.0	3.6	3.6	2.7	4.5	0.0				0.5	0.7	0.8
Cycle Q Clear(g_c), s	0.0	3.6	3.6	2.7	4.5	0.0				0.5	0.7	0.8
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	544	571	273	1906	853				546	573	487
V/C Ratio(X)	0.00	0.29	0.29	0.38	0.29	0.00				0.04	0.06	0.07
Avail Cap(c_a), veh/h	0	544	571	273	1906	853				546	573	487
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	13.7	13.7	19.8	6.6	0.0				12.6	12.7	12.8
Incr Delay (d2), s/veh	0.0	1.4	1.3	3.9	0.4	0.0				0.1	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.9	2.0	1.6	2.3	0.0				0.3	0.4	0.4
LnGrp Delay(d),s/veh	0.0	15.1	15.0	23.7	7.0	0.0				12.8	12.9	13.0
LnGrp LOS		B	B	C	A					B	B	B
Approach Vol, veh/h		327			664						94	
Approach Delay, s/veh		15.0			9.6						12.9	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			12.0	20.0		20.0		32.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			8.0	16.0		16.0		28.0				
Max Q Clear Time (g_c+I1), s			4.7	5.6		2.8		6.5				
Green Ext Time (p_c), s			0.1	1.3		0.2		3.8				
Intersection Summary												
HCM 2010 Ctrl Delay			11.5									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	211	440	5	9	579	314	10	10	19	122	2	52
Future Volume (veh/h)	211	440	5	9	579	314	10	10	19	122	2	52
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	229	478	5	10	629	341	11	11	21	96	54	57
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	260	1100	12	95	755	338	194	194	338	378	177	187
Arrive On Green	0.15	0.31	0.31	0.05	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1774	3588	38	1774	3539	1583	909	909	1583	1774	831	877
Grp Volume(v), veh/h	229	236	247	10	629	341	22	0	21	96	0	111
Grp Sat Flow(s),veh/h/ln	1774	1770	1856	1774	1770	1583	1817	0	1583	1774	0	1708
Q Serve(g_s), s	9.5	8.0	8.0	0.4	12.8	16.0	0.7	0.0	0.8	3.4	0.0	4.1
Cycle Q Clear(g_c), s	9.5	8.0	8.0	0.4	12.8	16.0	0.7	0.0	0.8	3.4	0.0	4.1
Prop In Lane	1.00		0.02	1.00		1.00	0.50		1.00	1.00		0.51
Lane Grp Cap(c), veh/h	260	543	569	95	755	338	388	0	338	378	0	364
V/C Ratio(X)	0.88	0.43	0.43	0.11	0.83	1.01	0.06	0.00	0.06	0.25	0.00	0.30
Avail Cap(c_a), veh/h	260	543	569	95	755	338	388	0	338	378	0	364
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.4	20.8	20.8	33.8	28.2	29.5	23.5	0.0	23.5	24.5	0.0	24.8
Incr Delay (d2), s/veh	31.9	2.5	2.4	2.2	10.4	51.4	0.3	0.0	0.4	1.6	0.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	4.2	4.4	0.3	7.3	11.8	0.4	0.0	0.4	1.8	0.0	2.2
LnGrp Delay(d),s/veh	63.3	23.3	23.2	36.0	38.7	80.9	23.8	0.0	23.9	26.1	0.0	27.0
LnGrp LOS	E	C	C	D	D	F	C		C	C		C
Approach Vol, veh/h		712			980			43			207	
Approach Delay, s/veh		36.1			53.4			23.8			26.6	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	8.0	27.0		20.0	15.0	20.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	4.0	23.0		16.0	11.0	16.0				
Max Q Clear Time (g_c+I1), s		2.8	2.4	10.0		6.1	11.5	18.0				
Green Ext Time (p_c), s		0.1	0.0	2.3		0.6	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				43.5								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	68	397	283	82	787	164	251	124	78	202	259	177
Future Volume (veh/h)	68	397	283	82	787	164	251	124	78	202	259	177
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	74	432	308	89	855	178	204	232	85	220	282	192
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	101	481	341	127	910	407	405	426	362	405	426	362
Arrive On Green	0.06	0.24	0.24	0.07	0.26	0.26	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1774	1982	1403	1774	3539	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	74	385	355	89	855	178	204	232	85	220	282	192
Grp Sat Flow(s),veh/h/ln	1774	1770	1615	1774	1770	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	2.9	14.8	14.9	3.4	16.6	6.6	7.0	7.7	3.1	7.6	9.6	7.5
Cycle Q Clear(g_c), s	2.9	14.8	14.9	3.4	16.6	6.6	7.0	7.7	3.1	7.6	9.6	7.5
Prop In Lane	1.00		0.87	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	101	430	392	127	910	407	405	426	362	405	426	362
V/C Ratio(X)	0.73	0.90	0.90	0.70	0.94	0.44	0.50	0.54	0.23	0.54	0.66	0.53
Avail Cap(c_a), veh/h	101	430	392	127	910	407	405	426	362	405	426	362
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.5	25.7	25.7	31.8	25.5	21.8	23.5	23.8	22.0	23.8	24.5	23.7
Incr Delay (d2), s/veh	36.8	24.0	26.7	27.8	18.3	3.4	4.4	4.9	1.5	5.1	7.9	5.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	10.0	9.5	2.7	10.4	3.3	3.9	4.5	1.5	4.3	5.9	3.8
LnGrp Delay(d),s/veh	69.3	49.7	52.4	59.5	43.8	25.1	27.9	28.7	23.5	28.9	32.4	29.2
LnGrp LOS	E	D	D	E	D	C	C	C	C	C	C	C
Approach Vol, veh/h		814			1122			521			694	
Approach Delay, s/veh		52.6			42.1			27.6			30.4	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	9.0	21.0		20.0	8.0	22.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	5.0	17.0		16.0	4.0	18.0				
Max Q Clear Time (g_c+I1), s		9.7	5.4	16.9		11.6	4.9	18.6				
Green Ext Time (p_c), s		1.3	0.0	0.0		1.3	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			39.8									
HCM 2010 LOS			D									
Notes												

Intersection

Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	80	6	13	60	36	1	2	5	0	0	0
Future Vol, veh/h	23	80	6	13	60	36	1	2	5	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	87	7	14	65	39	1	2	5	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.7	7.5	7.1
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	12%	21%	12%
Vol Thru, %	25%	73%	55%
Vol Right, %	62%	6%	33%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	8	109	109
LT Vol	1	23	13
Through Vol	2	80	60
RT Vol	5	6	36
Lane Flow Rate	9	118	118
Geometry Grp	1	1	1
Degree of Util (X)	0.01	0.133	0.127
Departure Headway (Hd)	3.986	4.047	3.863
Convergence, Y/N	Yes	Yes	Yes
Cap	883	886	928
Service Time	2.079	2.069	1.89
HCM Lane V/C Ratio	0.01	0.133	0.127
HCM Control Delay	7.1	7.7	7.5
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	0.5	0.4

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖						↖	↗
Traffic Vol, veh/h	0	126	60	42	51	0	0	0	0	15	0	49
Future Vol, veh/h	0	126	60	42	51	0	0	0	0	15	0	49
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	137	65	46	55	0	0	0	0	16	0	53
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	137	0	0				284	284	55
Stage 1	-	-	-	-	-	-				147	147	-
Stage 2	-	-	-	-	-	-				137	137	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1447	-	0				706	625	1012
Stage 1	0	-	-	-	-	0				880	775	-
Stage 2	0	-	-	-	-	0				890	783	-
Platoon blocked, %	-	-	-	-	-	-				-	-	-
Mov Cap-1 Maneuver	-	-	-	1447	-	-				683	0	1012
Mov Cap-2 Maneuver	-	-	-	-	-	-				683	0	-
Stage 1	-	-	-	-	-	-				851	0	-
Stage 2	-	-	-	-	-	-				890	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.4			9.2					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2						
Capacity (veh/h)	-	-	1447	-	683	1012						
HCM Lane V/C Ratio	-	-	0.032	-	0.024	0.053						
HCM Control Delay (s)	-	-	7.6	0	10.4	8.8						
HCM Lane LOS	-	-	A	A	B	A						
HCM 95th %tile Q(veh)	-	-	0.1	-	0.1	0.2						

HCM 2010 Signalized Intersection Summary

56: I-5 SB On/Off-Ramp & Vista Way

06/29/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑	↑	↑↑		
Traffic Volume (veh/h)	392	145	174	930	12	166		
Future Volume (veh/h)	392	145	174	930	12	166		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	426	0	189	1011	13	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1475	660	402	1118	473	743		
Arrive On Green	0.42	0.00	0.12	0.60	0.27	0.00		
Sat Flow, veh/h	3632	1583	3442	1863	1774	2787		
Grp Volume(v), veh/h	426	0	189	1011	13	0		
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1863	1774	1393		
Q Serve(g_s), s	4.8	0.0	3.1	28.5	0.3	0.0		
Cycle Q Clear(g_c), s	4.8	0.0	3.1	28.5	0.3	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1475	660	402	1118	473	743		
V/C Ratio(X)	0.29	0.00	0.47	0.90	0.03	0.00		
Avail Cap(c_a), veh/h	1475	660	402	1118	473	743		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	11.6	0.0	24.8	10.5	16.3	0.0		
Incr Delay (d2), s/veh	0.5	0.0	3.9	11.9	0.1	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	2.4	0.0	1.7	18.0	0.2	0.0		
LnGrp Delay(d),s/veh	12.1	0.0	28.7	22.4	16.4	0.0		
LnGrp LOS	B		C	C	B			
Approach Vol, veh/h	426			1200	13			
Approach Delay, s/veh	12.1			23.4	16.4			
Approach LOS	B			C	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	11.0	29.0				40.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	7.0	25.0				36.0
Max Q Clear Time (g_c+I1), s		2.3	5.1	6.8				30.5
Green Ext Time (p_c), s		0.0	0.1	2.6				3.4
Intersection Summary								
HCM 2010 Ctrl Delay			20.4					
HCM 2010 LOS			C					

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	273	118	218	560	338	1754	241	41	211	126	81	78
Future Volume (vph)	273	118	218	560	338	1754	241	41	211	126	81	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3023	1441		1787	1583		1808	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3023	1441		1787	1583		1808	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	297	128	237	609	367	1907	262	45	229	137	88	85
RTOR Reduction (vph)	0	0	203	0	423	423	0	0	131	0	0	73
Lane Group Flow (vph)	297	128	34	609	898	530	0	307	98	0	225	12
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	18.0	16.0	16.0	37.0	38.6	38.6		20.2	20.2		16.0	16.0
Effective Green, g (s)	18.0	16.0	16.0	37.0	38.6	38.6		20.2	20.2		16.0	16.0
Actuated g/C Ratio	0.16	0.15	0.15	0.34	0.35	0.35		0.18	0.18		0.15	0.15
Clearance Time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	289	270	230	595	1060	505		328	290		262	230
v/s Ratio Prot	0.17	0.07		c0.34	0.30			c0.17			c0.12	
v/s Ratio Perm			0.02			c0.37			0.06			0.01
v/c Ratio	1.03	0.47	0.15	1.02	1.00dr	1.05		0.94	0.34		0.86	0.05
Uniform Delay, d1	46.0	43.1	41.1	36.5	33.0	35.7		44.3	39.1		45.9	40.5
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	60.3	0.5	0.1	43.0	6.1	53.5		35.8	3.1		28.8	0.4
Delay (s)	106.3	43.6	41.2	79.5	39.1	89.2		80.0	42.2		74.7	40.9
Level of Service	F	D	D	E	D	F		F	D		E	D
Approach Delay (s)		70.8			64.2			63.9			65.4	
Approach LOS		E			E			E			E	
Intersection Summary												
HCM 2000 Control Delay			65.3			HCM 2000 Level of Service			E			
HCM 2000 Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			110.0			Sum of lost time (s)			20.8			
Intersection Capacity Utilization			114.4%			ICU Level of Service			H			
Analysis Period (min)			15									
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Coast Hwy & Driveway/SR-76 ramps

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔		↔	↔		↔	
Traffic Volume (vph)	0	0	6	667	0	274	6	345	680	471	442	3
Future Volume (vph)	0	0	6	667	0	274	6	345	680	471	442	3
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6		4.6	4.6	4.0		4.6	4.0		4.6	
Lane Util. Factor		1.00		0.95	0.95	1.00		0.95	1.00		0.95	
Frt		0.86		1.00	1.00	0.85		1.00	0.85		1.00	
Flt Protected		1.00		0.95	0.95	1.00		1.00	1.00		0.97	
Satd. Flow (prot)		1611		1681	1681	1583		3536	1583		3449	
Flt Permitted		1.00		0.95	0.95	1.00		1.00	1.00		0.97	
Satd. Flow (perm)		1611		1681	1681	1583		3536	1583		3449	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	7	725	0	298	7	375	739	512	480	3
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	362	363	298	0	382	739	0	995	0
Turn Type		NA		Split	NA	Free	Split	NA	Free	Split	NA	
Protected Phases		4		8	8		2	2		6	6	
Permitted Phases	4					Free			Free			
Actuated Green, G (s)		1.0		23.4	23.4	93.1		18.8	93.1		31.5	
Effective Green, g (s)		1.0		23.4	23.4	93.1		18.8	93.1		31.5	
Actuated g/C Ratio		0.01		0.25	0.25	1.00		0.20	1.00		0.34	
Clearance Time (s)		4.6		4.6	4.6			4.6			4.6	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		17		422	422	1583		714	1583		1166	
v/s Ratio Prot		0.00		0.22	c0.22			0.11			c0.29	
v/s Ratio Perm						0.19			c0.47			
v/c Ratio		0.00		0.86	0.86	0.19		0.54	0.47		0.85	
Uniform Delay, d1		45.6		33.3	33.3	0.0		33.2	0.0		28.7	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		0.1		15.7	16.2	0.3		2.9	1.0		8.0	
Delay (s)		45.7		49.0	49.5	0.3		36.1	1.0		36.7	
Level of Service		D		D	D	A		D	A		D	
Approach Delay (s)		45.7			35.0			13.0			36.7	
Approach LOS		D			C			B			D	
Intersection Summary												
HCM 2000 Control Delay			27.7			HCM 2000 Level of Service				C		
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			93.1			Sum of lost time (s)			18.4			
Intersection Capacity Utilization			72.4%			ICU Level of Service			C			
Analysis Period (min)			15									
Description: SR-76 & Coast Hwy												
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	50	33	83	85	126	52	95	87	145	129	31
Future Volume (vph)	1	50	33	83	85	126	52	95	87	145	129	31
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	54	36	90	92	137	57	103	95	158	140	34
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	91	319	255	332								
Volume Left (vph)	1	90	57	158								
Volume Right (vph)	36	137	95	34								
Hadj (s)	-0.20	-0.17	-0.14	0.07								
Departure Headway (s)	6.0	5.6	5.5	5.6								
Degree Utilization, x	0.15	0.49	0.39	0.52								
Capacity (veh/h)	497	600	591	603								
Control Delay (s)	10.1	13.8	12.1	14.5								
Approach Delay (s)	10.1	13.8	12.1	14.5								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay				13.3								
Level of Service				B								
Intersection Capacity Utilization				62.6%	ICU Level of Service		B					
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	168	65	71	15	57	37	50	636	23	60	643	122
Future Volume (vph)	168	65	71	15	57	37	50	636	23	60	643	122
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.95		1.00	0.99		1.00	0.98	
Flt Protected		0.97	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1798	1583		1766		1770	3521		1770	3454	
Flt Permitted		0.76	1.00		0.96		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1408	1583		1705		1770	3521		1770	3454	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	183	71	77	16	62	40	54	691	25	65	699	133
RTOR Reduction (vph)	0	0	53	0	25	0	0	3	0	0	16	0
Lane Group Flow (vph)	0	254	24	0	93	0	54	713	0	65	816	0
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		19.3	19.3		19.3		5.5	20.9		10.3	30.5	
Effective Green, g (s)		19.3	19.3		19.3		5.5	20.9		10.3	30.5	
Actuated g/C Ratio		0.31	0.31		0.31		0.09	0.34		0.17	0.50	
Clearance Time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		3.0	7.0	
Lane Grp Cap (vph)		443	498		536		158	1200		297	1718	
v/s Ratio Prot							c0.03	c0.20		0.04	c0.24	
v/s Ratio Perm		c0.18	0.02		0.05							
v/c Ratio		0.57	0.05		0.17		0.34	0.59		0.22	0.47	
Uniform Delay, d1		17.6	14.6		15.2		26.2	16.7		22.0	10.1	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.2	0.1		0.6		1.3	0.8		0.4	0.7	
Delay (s)		21.8	14.8		15.8		27.5	17.5		22.4	10.9	
Level of Service		C	B		B		C	B		C	B	
Approach Delay (s)		20.2			15.8			18.2			11.7	
Approach LOS		C			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			15.6									
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			61.3									
Intersection Capacity Utilization			59.4%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Coast Hwy & Civic Center Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	42	35	38	50	82	29	667	70	46	696	33
Future Volume (vph)	39	42	35	38	50	82	29	667	70	46	696	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2			4.6			4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.93		1.00	0.91			0.99			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1736		1770	1689			3484			3506	
Flt Permitted	0.67	1.00		0.70	1.00			0.90			0.83	
Satd. Flow (perm)	1240	1736		1308	1689			3136			2906	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	46	38	41	54	89	32	725	76	50	757	36
RTOR Reduction (vph)	0	20	0	0	46	0	0	15	0	0	6	0
Lane Group Flow (vph)	42	64	0	41	97	0	0	818	0	0	837	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	33.8	33.8		33.8	33.8			27.4			27.4	
Effective Green, g (s)	33.8	33.8		33.8	33.8			27.4			27.4	
Actuated g/C Ratio	0.48	0.48		0.48	0.48			0.39			0.39	
Clearance Time (s)	4.2	4.2		4.2	4.2			4.6			4.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	
Lane Grp Cap (vph)	598	838		631	815			1227			1137	
v/s Ratio Prot		0.04			c0.06							
v/s Ratio Perm	0.03			0.03				0.26			c0.29	
v/c Ratio	0.07	0.08		0.06	0.12			0.67			0.74	
Uniform Delay, d1	9.7	9.7		9.7	9.9			17.5			18.2	
Progression Factor	1.00	1.00		1.00	1.00			0.49			1.00	
Incremental Delay, d2	0.2	0.2		0.2	0.3			1.3			2.7	
Delay (s)	9.9	9.9		9.9	10.2			9.9			20.9	
Level of Service	A	A		A	B			A			C	
Approach Delay (s)		9.9			10.1			9.9			20.9	
Approach LOS		A			B			A			C	
Intersection Summary												
HCM 2000 Control Delay			14.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.40									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			8.8			
Intersection Capacity Utilization			68.8%			ICU Level of Service			C			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

6: Coast Hwy & Pier View Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								 			 	
Traffic Volume (vph)	60	49	67	29	49	81	51	763	67	37	763	114
Future Volume (vph)	60	49	67	29	49	81	51	763	67	37	763	114
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		5.0	5.0			5.0			4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98			1.00			0.99	
Flpb, ped/bikes	0.98	1.00		0.99	1.00			1.00			1.00	
Frt	1.00	0.91		1.00	0.91			0.99			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1741	1676		1751	1654			3480			3448	
Flt Permitted	0.67	1.00		0.68	1.00			0.77			0.87	
Satd. Flow (perm)	1222	1676		1246	1654			2704			3020	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	65	53	73	32	53	88	55	829	73	40	829	124
RTOR Reduction (vph)	0	41	0	0	50	0	0	11	0	0	21	0
Lane Group Flow (vph)	65	85	0	32	91	0	0	946	0	0	972	0
Confl. Peds. (#/hr)	16		11	11		16	10		17	17		10
Confl. Bikes (#/hr)			2			2						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	30.9	30.9		30.1	30.1			29.9			30.4	
Effective Green, g (s)	30.9	30.9		30.1	30.1			29.9			30.4	
Actuated g/C Ratio	0.44	0.44		0.43	0.43			0.43			0.43	
Clearance Time (s)	4.2	4.2		5.0	5.0			5.0			4.5	
Vehicle Extension (s)	3.0	3.0		3.5	3.5			3.0			3.5	
Lane Grp Cap (vph)	539	739		535	711			1154			1311	
v/s Ratio Prot		0.05			c0.05							
v/s Ratio Perm	0.05			0.03				c0.35			0.32	
v/c Ratio	0.12	0.12		0.06	0.13			0.82			0.74	
Uniform Delay, d1	11.5	11.5		11.7	12.0			17.7			16.5	
Progression Factor	1.00	1.00		1.00	1.00			0.73			0.35	
Incremental Delay, d2	0.5	0.3		0.2	0.4			4.4			2.2	
Delay (s)	12.0	11.8		11.9	12.4			17.3			8.0	
Level of Service	B	B		B	B			B			A	
Approach Delay (s)		11.9			12.3			17.3			8.0	
Approach LOS		B			B			B			A	
Intersection Summary												
HCM 2000 Control Delay			12.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.47									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)			10.0			
Intersection Capacity Utilization			87.2%			ICU Level of Service			E			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

11/17/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	16	16	133	146	16	27	46	394	68	27	354	13
Future Volume (vph)	16	16	133	146	16	27	46	394	68	27	354	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	17	145	159	17	29	50	428	74	29	385	14
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	34	145	205	264	288	222	207					
Volume Left (vph)	17	0	159	50	0	29	0					
Volume Right (vph)	0	145	29	0	74	0	14					
Hadj (s)	0.28	-0.67	0.10	0.13	-0.15	0.10	-0.01					
Departure Headway (s)	7.9	6.9	7.4	6.8	6.5	6.9	6.8					
Degree Utilization, x	0.07	0.28	0.42	0.50	0.52	0.42	0.39					
Capacity (veh/h)	418	465	460	508	539	501	509					
Control Delay (s)	10.3	11.4	15.6	15.0	15.0	13.7	12.8					
Approach Delay (s)	11.2		15.6	15.0		13.3						
Approach LOS	B		C	C		B						
Intersection Summary												
Delay			14.1									
Level of Service			B									
Intersection Capacity Utilization			52.6%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	290	106	176	202	77	206
Future Volume (vph)	290	106	176	202	77	206
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	315	115	191	220	84	224
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	315	115	411	308		
Volume Left (vph)	315	0	0	84		
Volume Right (vph)	0	115	220	0		
Hadj (s)	0.53	-0.67	-0.29	0.09		
Departure Headway (s)	7.0	5.8	5.5	6.0		
Degree Utilization, x	0.61	0.19	0.63	0.51		
Capacity (veh/h)	483	590	626	571		
Control Delay (s)	19.4	8.9	17.3	15.2		
Approach Delay (s)	16.6		17.3	15.2		
Approach LOS	C		C	C		
Intersection Summary						
Delay			16.5			
Level of Service			C			
Intersection Capacity Utilization			62.8%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	0	350	92	322	88	0	0	0	0	130	94
Future Volume (vph)	45	0	350	92	322	88	0	0	0	0	130	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0						4.0	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.97						0.94	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3425						3316	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3425						3316	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	0	380	100	350	96	0	0	0	0	141	102
RTOR Reduction (vph)	0	0	339	79	41	0	0	0	0	0	50	0
Lane Group Flow (vph)	49	0	41	21	405	0	0	0	0	0	193	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	7.6		7.6	14.4	14.4						36.0	
Effective Green, g (s)	7.6		7.6	14.4	14.4						36.0	
Actuated g/C Ratio	0.11		0.11	0.21	0.21						0.51	
Clearance Time (s)	4.0		4.0	4.0	4.0						4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	192		302	364	704						1705	
v/s Ratio Prot	c0.03		0.01	0.01	c0.12						c0.06	
v/s Ratio Perm												
v/c Ratio	0.26		0.14	0.06	0.57						0.11	
Uniform Delay, d1	28.6		28.2	22.3	25.0						8.8	
Progression Factor	1.00		1.00	0.36	0.62						1.00	
Incremental Delay, d2	0.7		0.2	0.0	0.8						0.1	
Delay (s)	29.3		28.4	8.2	16.5						8.9	
Level of Service	C		C	A	B						A	
Approach Delay (s)		28.5			14.9			0.0			8.9	
Approach LOS		C			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			18.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			70.0			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			33.9%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

9/1/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	241	509	88	274	748	0	0	606	195
Future Volume (vph)	0	0	0	241	509	88	274	748	0	0	606	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.0	5.0		5.0	5.0			5.0	
Lane Util. Factor				1.00	0.95		1.00	0.95			0.95	
Frpb, ped/bikes				1.00	1.00		1.00	1.00			0.99	
Flpb, ped/bikes				0.99	1.00		1.00	1.00			1.00	
Frt				1.00	0.98		1.00	1.00			0.96	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1747	3449		1770	3539			3384	
Flt Permitted				0.95	1.00		0.29	1.00			1.00	
Satd. Flow (perm)				1747	3449		533	3539			3384	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	262	553	96	298	813	0	0	659	212
RTOR Reduction (vph)	0	0	0	0	20	0	0	0	0	0	23	0
Lane Group Flow (vph)	0	0	0	262	629	0	298	813	0	0	848	0
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					
Actuated Green, G (s)				19.2	19.2		40.8	40.8			40.8	
Effective Green, g (s)				19.2	19.2		40.8	40.8			40.8	
Actuated g/C Ratio				0.27	0.27		0.58	0.58			0.58	
Clearance Time (s)				5.0	5.0		5.0	5.0			5.0	
Vehicle Extension (s)				3.0	3.0		4.0	4.0			4.0	
Lane Grp Cap (vph)				479	946		310	2062			1972	
v/s Ratio Prot					c0.18			0.23			0.25	
v/s Ratio Perm				0.15			c0.56					
v/c Ratio				0.55	0.67		0.96	0.39			0.43	
Uniform Delay, d1				21.7	22.5		13.9	7.9			8.1	
Progression Factor				1.00	1.00		0.62	0.39			0.24	
Incremental Delay, d2				4.4	3.7		32.0	0.1			0.2	
Delay (s)				26.1	26.2		40.5	3.2			2.2	
Level of Service				C	C		D	A			A	
Approach Delay (s)		0.0			26.2			13.2			2.2	
Approach LOS		A			C			B			A	
Intersection Summary												
HCM 2000 Control Delay			14.0									
HCM 2000 Volume to Capacity ratio			0.87									
Actuated Cycle Length (s)			70.0									
Intersection Capacity Utilization			68.1%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	203	0	186	999	326	22	103	446	455	68	27
Future Volume (vph)	23	203	0	186	999	326	22	103	446	455	68	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.97	
Satd. Flow (prot)	1770	3539		1770	3539	1583		1846	1583	1681	1688	
Flt Permitted	0.19	1.00		0.61	1.00	1.00		0.91	1.00	0.67	0.72	
Satd. Flow (perm)	355	3539		1143	3539	1583		1704	1583	1186	1254	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	221	0	202	1086	354	24	112	485	495	74	29
RTOR Reduction (vph)	0	0	0	0	0	200	0	0	308	0	8	0
Lane Group Flow (vph)	25	221	0	202	1086	154	0	136	177	292	298	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	21.0	21.0		20.6	20.6	20.6		17.3	17.3	17.3	17.3	
Effective Green, g (s)	21.0	21.0		20.6	20.6	20.6		17.3	17.3	17.3	17.3	
Actuated g/C Ratio	0.44	0.44		0.43	0.43	0.43		0.36	0.36	0.36	0.36	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	156	1564		495	1534	686		620	576	431	456	
v/s Ratio Prot		0.06			c0.31							
v/s Ratio Perm	0.07			0.18		0.10		0.08	0.11	c0.25	0.24	
v/c Ratio	0.16	0.14		0.41	0.71	0.22		0.22	0.31	0.68	0.65	
Uniform Delay, d1	8.0	7.9		9.3	11.0	8.4		10.4	10.8	12.7	12.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.7	0.1		0.7	1.6	0.2		0.2	0.4	4.6	3.7	
Delay (s)	8.6	7.9		9.9	12.6	8.6		10.7	11.2	17.3	16.3	
Level of Service	A	A		A	B	A		B	B	B	B	
Approach Delay (s)		8.0			11.4			11.1			16.8	
Approach LOS		A			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.69									
Actuated Cycle Length (s)			47.5				Sum of lost time (s)			9.6		
Intersection Capacity Utilization			64.7%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

9/1/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↙	
Traffic Volume (veh/h)	512	49	72	105	77	90
Future Volume (Veh/h)	512	49	72	105	77	90
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	557	53	78	114	84	98
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				248		
pX, platoon unblocked						
vC, conflicting volume			610		854	584
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			610		854	584
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			92		72	81
cM capacity (veh/h)			969		303	512
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	610	192	182			
Volume Left	0	78	84			
Volume Right	53	0	98			
cSH	1700	969	388			
Volume to Capacity	0.36	0.08	0.47			
Queue Length 95th (ft)	0	7	61			
Control Delay (s)	0.0	4.1	22.2			
Lane LOS		A	C			
Approach Delay (s)	0.0	4.1	22.2			
Approach LOS			C			
Intersection Summary						
Average Delay		4.9				
Intersection Capacity Utilization		59.2%	ICU Level of Service	B		
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr/Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	396	222	263	0	0	0	109	609	162	168	523	129
Future Volume (vph)	396	222	263	0	0	0	109	609	162	168	523	129
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2					4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	1.00					1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98					1.00	1.00		1.00	0.99	
Flpb, ped/bikes	1.00	1.00					1.00	1.00		1.00	1.00	
Frt	1.00	0.92					1.00	0.97		1.00	0.97	
Flt Protected	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1676					1770	3413		1770	3402	
Flt Permitted	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1676					1770	3413		1770	3402	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	430	241	286	0	0	0	118	662	176	183	568	140
RTOR Reduction (vph)	0	61	0	0	0	0	0	34	0	0	33	0
Lane Group Flow (vph)	430	466	0	0	0	0	118	804	0	183	675	0
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA					Prot	NA		Prot	NA	
Protected Phases	4	4					5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	24.8	24.8					10.3	21.4		10.8	21.9	
Effective Green, g (s)	24.8	24.8					10.3	21.4		10.8	21.9	
Actuated g/C Ratio	0.35	0.35					0.15	0.31		0.15	0.31	
Clearance Time (s)	4.2	4.2					4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0					3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	627	593					260	1043		273	1064	
v/s Ratio Prot	0.24	c0.28					0.07	c0.24		0.10	c0.20	
v/s Ratio Perm												
v/c Ratio	0.69	0.79					0.45	0.77		0.67	0.63	
Uniform Delay, d1	19.3	20.2					27.3	22.1		27.9	20.6	
Progression Factor	1.00	1.00					0.80	0.74		0.88	0.72	
Incremental Delay, d2	6.0	10.1					5.3	5.2		11.3	2.6	
Delay (s)	25.3	30.3					27.0	21.5		36.0	17.5	
Level of Service	C	C					C	C		D	B	
Approach Delay (s)		28.0			0.0			22.2			21.3	
Approach LOS		C			A			C			C	
Intersection Summary												
HCM 2000 Control Delay		23.9			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		70.0			Sum of lost time (s)			13.0				
Intersection Capacity Utilization		71.2%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	532	32	0	0	0	0	10	32	32	27	0
Future Volume (Veh/h)	17	532	32	0	0	0	0	10	32	32	27	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	578	35	0	0	0	0	11	35	35	29	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage veh												
Upstream signal (ft)		255										
pX, platoon unblocked												
vC, conflicting volume	0			613			646	632	306	366	649	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			613			646	632	306	366	649	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	97	95	93	92	100
cM capacity (veh/h)	1622			962			333	392	689	521	383	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	307	324	46	64								
Volume Left	18	0	0	35								
Volume Right	0	35	35	0								
cSH	1622	1700	583	448								
Volume to Capacity	0.01	0.19	0.08	0.14								
Queue Length 95th (ft)	1	0	6	12								
Control Delay (s)	0.5	0.0	11.7	14.4								
Lane LOS	A		B	B								
Approach Delay (s)	0.3		11.7	14.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			32.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	69	962	30	0	0	0	0	32	31	81	116	0
Future Volume (vph)	69	962	30	0	0	0	0	32	31	81	116	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	75	1046	33	0	0	0	0	35	34	88	126	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	598	556	69	214								
Volume Left (vph)	75	0	0	88								
Volume Right (vph)	0	33	34	0								
Hadj (s)	0.10	-0.01	-0.26	0.12								
Departure Headway (s)	5.5	5.4	6.0	6.0								
Degree Utilization, x	0.91	0.83	0.11	0.36								
Capacity (veh/h)	598	556	590	588								
Control Delay (s)	38.5	27.8	9.7	12.4								
Approach Delay (s)	33.3		9.7	12.4								
Approach LOS	D		A	B								
Intersection Summary												
Delay			29.1									
Level of Service			D									
Intersection Capacity Utilization			53.5%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Yield				Stop			Stop			Stop	
Traffic Volume (vph)	158	470	17	52	0	11	0	17	14	0	0	0
Future Volume (vph)	158	470	17	52	0	11	0	17	14	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	172	511	18	57	0	12	0	18	15	0	0	0
Direction, Lane #	EB 1	EB 2	WB 1	NB 1								
Volume Total (vph)	172	529	69	33								
Volume Left (vph)	172	0	57	0								
Volume Right (vph)	0	18	12	15								
Hadj (s)	0.53	0.01	0.09	-0.24								
Departure Headway (s)	5.2	4.7	4.8	5.2								
Degree Utilization, x	0.25	0.68	0.09	0.05								
Capacity (veh/h)	689	768	725	631								
Control Delay (s)	8.7	15.9	8.3	8.5								
Approach Delay (s)	14.1		8.3	8.5								
Approach LOS	B		A	A								
Intersection Summary												
Delay			13.4									
Level of Service			B									
Intersection Capacity Utilization			42.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	3	43	19	7	19	19	727	27	14	665	20
Future Volume (Veh/h)	13	3	43	19	7	19	19	727	27	14	665	20
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	3	47	21	8	21	21	790	29	15	723	22
Pedestrians		7			7						1	
Lane Width (ft)		12.0			12.0						12.0	
Walking Speed (ft/s)		4.0			4.0						4.0	
Percent Blockage		1			1						0	
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								1261			414	
pX, platoon unblocked	0.93	0.93	0.93	0.93	0.93		0.93					
vC, conflicting volume	1234	1639	380	1294	1636	418	752			826		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1098	1534	178	1162	1530	418	579			826		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	90	97	94	83	92	96	98			98		
cM capacity (veh/h)	134	101	770	122	102	580	915			796		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	64	50	416	424	376	384						
Volume Left	14	21	21	0	15	0						
Volume Right	47	21	0	29	0	22						
cSH	328	174	915	1700	796	1700						
Volume to Capacity	0.19	0.29	0.02	0.25	0.02	0.23						
Queue Length 95th (ft)	18	28	2	0	1	0						
Control Delay (s)	18.6	33.7	0.7	0.0	0.6	0.0						
Lane LOS	C	D	A		A							
Approach Delay (s)	18.6	33.7	0.4		0.3							
Approach LOS	C	D										
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			46.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

18: Coast Hwy & Washington Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	32	14	0	12	21	816	19	24	741	27
Future Volume (Veh/h)	6	0	32	14	0	12	21	816	19	24	741	27
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	0	35	15	0	13	23	887	21	26	805	29
Pedestrians	11			7						12		
Lane Width (ft)	12.0			12.0						12.0		
Walking Speed (ft/s)	4.0			4.0						4.0		
Percent Blockage	1			1						1		
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							831			844		
pX, platoon unblocked	0.91	0.91		0.91	0.91	0.91				0.91		
vC, conflicting volume	1397	1844	428	1440	1848	473	845			915		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1242	1732	428	1289	1736	229	845			714		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	94	100	94	85	100	98	97			97		
cM capacity (veh/h)	108	73	570	97	73	694	780			800		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	42	28	466	464	428	432						
Volume Left	7	15	23	0	26	0						
Volume Right	35	13	0	21	0	29						
cSH	333	161	780	1700	800	1700						
Volume to Capacity	0.13	0.17	0.03	0.27	0.03	0.25						
Queue Length 95th (ft)	11	15	2	0	3	0						
Control Delay (s)	17.4	31.9	0.9	0.0	1.0	0.0						
Lane LOS	C	D	A		A							
Approach Delay (s)	17.4	31.9	0.4		0.5							
Approach LOS	C	D										
Intersection Summary												
Average Delay				1.3								
Intersection Capacity Utilization				52.9%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	114	169	82	79	14	126	12	225	63	150	138	6
Future Volume (vph)	114	169	82	79	14	126	12	225	63	150	138	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	124	184	89	86	15	137	13	245	68	163	150	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	397	238	326	320								
Volume Left (vph)	124	86	13	163								
Volume Right (vph)	89	137	68	7								
Hadj (s)	-0.04	-0.24	-0.08	0.12								
Departure Headway (s)	6.9	7.2	7.1	7.3								
Degree Utilization, x	0.76	0.48	0.64	0.65								
Capacity (veh/h)	493	426	464	454								
Control Delay (s)	28.7	16.6	21.7	22.5								
Approach Delay (s)	28.7	16.6	21.7	22.5								
Approach LOS	D	C	C	C								
Intersection Summary												
Delay				23.1								
Level of Service				C								
Intersection Capacity Utilization				67.4%	ICU Level of Service		C					
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	292	27	12	203	30	26	42	42	24	56	11
Future Volume (Veh/h)	10	292	27	12	203	30	26	42	42	24	56	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	317	29	13	221	33	28	46	46	26	61	12
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked												
vC, conflicting volume	268			353			668	654	338	700	652	252
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	268			353			668	654	338	700	652	252
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			91	88	93	91	84	98
cM capacity (veh/h)	1281			1199			310	372	700	288	373	776
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	357	267	120	99								
Volume Left	11	13	28	26								
Volume Right	29	33	46	12								
cSH	1281	1199	429	367								
Volume to Capacity	0.01	0.01	0.28	0.27								
Queue Length 95th (ft)	1	1	28	27								
Control Delay (s)	0.3	0.5	16.6	18.4								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.3	0.5	16.6	18.4								
Approach LOS			C	C								
Intersection Summary												
Average Delay			4.8									
Intersection Capacity Utilization			35.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

21: Coast Hwy & Wisconsin Ave

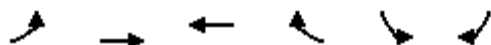
9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	95	84	170	77	68	13	149	722	83	15	722	47
Future Volume (vph)	95	84	170	77	68	13	149	722	83	15	722	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2			4.2		4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.90			0.99		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1675			1798		1770	3485		1770	3507	
Flt Permitted	0.62	1.00			0.45		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1161	1675			827		1770	3485		1770	3507	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	103	91	185	84	74	14	162	785	90	16	785	51
RTOR Reduction (vph)	0	118	0	0	6	0	0	9	0	0	5	0
Lane Group Flow (vph)	103	158	0	0	166	0	162	866	0	16	831	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	14.6	14.6			14.6		10.8	41.6		0.8	31.6	
Effective Green, g (s)	14.6	14.6			14.6		10.8	41.6		0.8	31.6	
Actuated g/C Ratio	0.21	0.21			0.21		0.15	0.59		0.01	0.45	
Clearance Time (s)	4.2	4.2			4.2		4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	242	349			172		273	2071		20	1583	
v/s Ratio Prot		0.09					c0.09	0.25		0.01	c0.24	
v/s Ratio Perm	0.09				c0.20							
v/c Ratio	0.43	0.45			0.97		0.59	0.42		0.80	0.52	
Uniform Delay, d1	24.1	24.2			27.5		27.6	7.7		34.5	13.8	
Progression Factor	1.00	1.00			1.00		1.00	1.00		0.78	0.64	
Incremental Delay, d2	1.2	0.9			58.5		3.4	0.6		108.1	1.2	
Delay (s)	25.3	25.1			85.9		31.0	8.3		135.0	10.0	
Level of Service	C	C			F		C	A		F	B	
Approach Delay (s)		25.2			85.9			11.8			12.4	
Approach LOS		C			F			B			B	
Intersection Summary												
HCM 2000 Control Delay			19.3				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			70.0				Sum of lost time (s)			13.0		
Intersection Capacity Utilization			67.5%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

9/1/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	5	101	75	14	21	21
Future Volume (Veh/h)	5	101	75	14	21	21
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	110	82	15	23	23
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	105				218	98
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	105				218	98
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	100				97	98
cM capacity (veh/h)	1476				761	950
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	115	97	46			
Volume Left	5	0	23			
Volume Right	0	15	23			
cSH	1476	1700	845			
Volume to Capacity	0.00	0.06	0.05			
Queue Length 95th (ft)	0	0	4			
Control Delay (s)	0.3	0.0	9.5			
Lane LOS	A		A			
Approach Delay (s)	0.3	0.0	9.5			
Approach LOS			A			
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization			19.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	118	2	1	79	13	1	1	2	19	0	14
Future Volume (Veh/h)	10	118	2	1	79	13	1	1	2	19	0	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	128	2	1	86	14	1	1	2	21	0	15
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	102			130			263	255	129	250	249	97
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	102			130			263	255	129	250	249	97
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	100	100	97	100	98
cM capacity (veh/h)	1488			1455			673	642	921	694	647	956
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	141	101	4	36								
Volume Left	11	1	1	21								
Volume Right	2	14	2	15								
cSH	1488	1455	767	784								
Volume to Capacity	0.01	0.00	0.01	0.05								
Queue Length 95th (ft)	1	0	0	4								
Control Delay (s)	0.6	0.1	9.7	9.8								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.6	0.1	9.7	9.8								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			24.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	79	63	21	57	1	38	1	29	0	1	0
Future Volume (vph)	1	79	63	21	57	1	38	1	29	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	86	68	23	62	1	41	1	32	0	1	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	155	86	74	1								
Volume Left (vph)	1	23	41	0								
Volume Right (vph)	68	1	32	0								
Hadj (s)	-0.23	0.08	-0.11	0.03								
Departure Headway (s)	3.9	4.3	4.3	4.5								
Degree Utilization, x	0.17	0.10	0.09	0.00								
Capacity (veh/h)	892	815	789	737								
Control Delay (s)	7.7	7.8	7.7	7.5								
Approach Delay (s)	7.7	7.8	7.7	7.5								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.7								
Level of Service				A								
Intersection Capacity Utilization				35.6%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	51	106	147	75	77	143
Future Volume (vph)	51	106	147	75	77	143
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	115	160	82	84	155
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	170	242	239			
Volume Left (vph)	55	0	84			
Volume Right (vph)	115	82	0			
Hadj (s)	-0.31	-0.17	0.10			
Departure Headway (s)	4.7	4.4	4.7			
Degree Utilization, x	0.22	0.30	0.31			
Capacity (veh/h)	702	774	729			
Control Delay (s)	9.0	9.3	9.8			
Approach Delay (s)	9.0	9.3	9.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay			9.4			
Level of Service			A			
Intersection Capacity Utilization			43.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	375	22	20	310	69	30	42	40	75	26	21
Future Volume (Veh/h)	14	375	22	20	310	69	30	42	40	75	26	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	408	24	22	337	75	33	46	43	82	28	23
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					253							
pX, platoon unblocked	0.88						0.88	0.88		0.88	0.88	0.88
vC, conflicting volume	415			443			920	920	439	946	894	382
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	264			443			840	839	439	868	810	225
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			84	82	93	55	89	97
cM capacity (veh/h)	1138			1107			212	253	608	183	263	710
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	447	434	122	133								
Volume Left	15	22	33	82								
Volume Right	24	75	43	23								
cSH	1138	1107	299	227								
Volume to Capacity	0.01	0.02	0.41	0.59								
Queue Length 95th (ft)	1	2	48	83								
Control Delay (s)	0.4	0.6	25.1	41.1								
Lane LOS	A	A	D	E								
Approach Delay (s)	0.4	0.6	25.1	41.1								
Approach LOS			D	E								
Intersection Summary												
Average Delay			7.9									
Intersection Capacity Utilization			49.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↖	↗	↖	↖↗		↖	↖↗	
Traffic Volume (vph)	51	196	74	286	190	276	78	740	184	285	628	27
Future Volume (vph)	51	196	74	286	190	276	78	740	184	285	628	27
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.97	1.00	1.00	0.96	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.99	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1844	1534	1681	1751	1521	1770	3421		1770	3508	
Flt Permitted		0.99	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1844	1534	1681	1751	1521	1770	3421		1770	3508	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	55	213	80	311	207	300	85	804	200	310	683	29
RTOR Reduction (vph)	0	0	66	0	0	245	0	24	0	0	3	0
Lane Group Flow (vph)	0	268	14	255	263	55	85	980	0	310	709	0
Confl. Peds. (#/hr)	14		10	10		14			3			15
Confl. Bikes (#/hr)			4			5			3			3
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		15.6	15.6	16.1	16.1	16.1	5.3	24.4		12.8	31.9	
Effective Green, g (s)		15.6	15.6	16.1	16.1	16.1	5.3	24.4		12.8	31.9	
Actuated g/C Ratio		0.18	0.18	0.18	0.18	0.18	0.06	0.28		0.15	0.36	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)		328	272	308	321	279	106	951		258	1276	
v/s Ratio Prot		c0.15		c0.15	0.15		0.05	c0.29		c0.18	0.20	
v/s Ratio Perm			0.01			0.04						
v/c Ratio		0.82	0.05	0.83	0.82	0.20	0.80	1.03		1.20	0.56	
Uniform Delay, d1		34.7	29.9	34.5	34.4	30.3	40.7	31.7		37.5	22.2	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		13.8	0.0	16.9	15.3	0.4	32.3	37.3		121.7	0.6	
Delay (s)		48.5	29.9	51.4	49.7	30.7	73.0	69.0		159.1	22.8	
Level of Service		D	C	D	D	C	E	E		F	C	
Approach Delay (s)		44.2			43.3			69.3			64.2	
Approach LOS		D			D			E			E	
Intersection Summary												
HCM 2000 Control Delay			58.5									HCM 2000 Level of Service E
HCM 2000 Volume to Capacity ratio			0.97									
Actuated Cycle Length (s)			87.7									Sum of lost time (s) 18.8
Intersection Capacity Utilization			84.9%									ICU Level of Service E
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	672	8	30	746	94	12	14	78	176	11	45
Future Volume (vph)	22	672	8	30	746	94	12	14	78	176	11	45
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.97
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98			0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.96	1.00
Satd. Flow (prot)	1770	3531		1764	3474			3088			1778	1539
Flt Permitted	0.26	1.00		0.35	1.00			0.91			0.65	1.00
Satd. Flow (perm)	490	3531		652	3474			2826			1219	1539
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	730	9	33	811	102	13	15	85	191	12	49
RTOR Reduction (vph)	0	2	0	0	17	0	0	61	0	0	0	35
Lane Group Flow (vph)	24	737	0	33	896	0	0	52	0	0	203	14
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	16.4	16.4		16.4	16.4			10.0			10.0	10.0
Effective Green, g (s)	16.4	16.4		16.4	16.4			10.0			10.0	10.0
Actuated g/C Ratio	0.46	0.46		0.46	0.46			0.28			0.28	0.28
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	223	1613		297	1587			787			339	428
v/s Ratio Prot		0.21			c0.26							
v/s Ratio Perm	0.05			0.05				0.02			c0.17	0.01
v/c Ratio	0.11	0.46		0.11	0.56			0.07			0.60	0.03
Uniform Delay, d1	5.6	6.7		5.6	7.1			9.5			11.2	9.4
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.2	0.2		0.2	0.5			0.0			3.3	0.0
Delay (s)	5.8	6.9		5.7	7.6			9.6			14.5	9.5
Level of Service	A	A		A	A			A			B	A
Approach Delay (s)		6.9			7.5			9.6			13.5	
Approach LOS		A			A			A			B	
Intersection Summary												
HCM 2000 Control Delay		8.1			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.58										
Actuated Cycle Length (s)		35.9			Sum of lost time (s)			9.5				
Intersection Capacity Utilization		58.5%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (vph)	44	15	16	40	15	134	21	675	73	171	703	20
Future Volume (vph)	44	15	16	40	15	134	21	675	73	171	703	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		0.99			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	0.99		1.00	1.00	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1743			1793	1550	1770	3478		1770	3521	
Flt Permitted		0.83			0.80	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1487			1478	1550	1770	3478		1770	3521	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	16	17	43	16	146	23	734	79	186	764	22
RTOR Reduction (vph)	0	12	0	0	0	104	0	14	0	0	3	0
Lane Group Flow (vph)	0	69	0	0	59	42	23	799	0	186	783	0
Confl. Peds. (#/hr)	10		4	4		10			3			4
Confl. Bikes (#/hr)			1						2			3
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		19.9			19.9	19.9	1.5	19.4		17.0	34.9	
Effective Green, g (s)		19.9			19.9	19.9	1.5	19.4		17.0	34.9	
Actuated g/C Ratio		0.28			0.28	0.28	0.02	0.28		0.24	0.50	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		422			420	440	37	963		429	1755	
v/s Ratio Prot							0.01	c0.23		0.11	c0.22	
v/s Ratio Perm		c0.05			0.04	0.03						
v/c Ratio		0.16			0.14	0.09	0.62	0.83		0.43	0.45	
Uniform Delay, d1		18.8			18.7	18.4	34.0	23.7		22.4	11.3	
Progression Factor		1.00			1.00	1.00	1.32	0.41		1.00	1.00	
Incremental Delay, d2		0.8			0.7	0.4	24.3	5.1		0.7	0.2	
Delay (s)		19.6			19.4	18.8	69.0	14.8		23.1	11.5	
Level of Service		B			B	B	E	B		C	B	
Approach Delay (s)		19.6			19.0			16.2			13.7	
Approach LOS		B			B			B			B	
Intersection Summary												
HCM 2000 Control Delay		15.5										
HCM 2000 Volume to Capacity ratio		0.49										
Actuated Cycle Length (s)		70.0										
Intersection Capacity Utilization		69.4%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	246	26	29	149	0	58	0	51	0	0	0
Future Volume (Veh/h)	4	246	26	29	149	0	58	0	51	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	267	28	32	162	0	63	0	55	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		252										
pX, platoon unblocked												
vC, conflicting volume	162			295			515	515	281	570	529	162
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	162			295			515	515	281	570	529	162
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			86	100	93	100	100	100
cM capacity (veh/h)	1417			1266			460	451	758	392	442	883
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	299	194	118	0								
Volume Left	4	32	63	0								
Volume Right	28	0	55	0								
cSH	1417	1266	563	1700								
Volume to Capacity	0.00	0.03	0.21	0.00								
Queue Length 95th (ft)	0	2	20	0								
Control Delay (s)	0.1	1.5	13.1	0.0								
Lane LOS	A	A	B	A								
Approach Delay (s)	0.1	1.5	13.1	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			3.1									
Intersection Capacity Utilization			38.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	128	37	0	49	0	37	2	11	0	0	0
Future Volume (Veh/h)	0	128	37	0	49	0	37	2	11	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	139	40	0	53	0	40	2	12	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	53			179			212	212	159	225	232	53
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	53			179			212	212	159	225	232	53
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			95	100	99	100	100	100
cM capacity (veh/h)	1553			1397			745	685	886	719	668	1014
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	179	53	54	0								
Volume Left	0	0	40	0								
Volume Right	40	0	12	0								
cSH	1553	1397	770	1700								
Volume to Capacity	0.00	0.00	0.07	0.00								
Queue Length 95th (ft)	0	0	6	0								
Control Delay (s)	0.0	0.0	10.0	0.0								
Lane LOS			B	A								
Approach Delay (s)	0.0	0.0	10.0	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization			19.0%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	72	204	22	41	244	22
Future Volume (vph)	72	204	22	41	244	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	78	222	24	45	265	24
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	300	69	289			
Volume Left (vph)	78	0	265			
Volume Right (vph)	222	45	0			
Hadj (s)	-0.36	-0.36	0.22			
Departure Headway (s)	4.4	4.6	4.9			
Degree Utilization, x	0.37	0.09	0.40			
Capacity (veh/h)	762	712	694			
Control Delay (s)	10.0	8.1	11.1			
Approach Delay (s)	10.0	8.1	11.1			
Approach LOS	B	A	B			
Intersection Summary						
Delay			10.3			
Level of Service			B			
Intersection Capacity Utilization			44.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	267	100	15	209	14	136	17	21	4	12	21
Future Volume (Veh/h)	8	267	100	15	209	14	136	17	21	4	12	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	290	109	16	227	15	148	18	23	4	13	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	576											
pX, platoon unblocked												
vC, conflicting volume	242			399			658	636	344	661	684	234
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	242			399			658	636	344	661	684	234
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			58	95	97	99	96	97
cM capacity (veh/h)	1324			1160			351	387	698	345	364	805
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	408	258	189	40								
Volume Left	9	16	148	4								
Volume Right	109	15	23	23								
cSH	1324	1160	377	527								
Volume to Capacity	0.01	0.01	0.50	0.08								
Queue Length 95th (ft)	1	1	68	6								
Control Delay (s)	0.2	0.6	23.8	12.4								
Lane LOS	A	A	C	B								
Approach Delay (s)	0.2	0.6	23.8	12.4								
Approach LOS			C	B								
Intersection Summary												
Average Delay				5.9								
Intersection Capacity Utilization				45.5%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	233	6	17	194	29	3	8	16	13	3	3
Future Volume (Veh/h)	3	233	6	17	194	29	3	8	16	13	3	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	253	7	18	211	32	3	9	17	14	3	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					249							
pX, platoon unblocked												
vC, conflicting volume	243			260			530	542	256	547	529	227
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	243			260			530	542	256	547	529	227
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	98	98	97	99	100
cM capacity (veh/h)	1323			1304			450	441	782	426	448	812
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	263	261	29	20								
Volume Left	3	18	3	14								
Volume Right	7	32	17	3								
cSH	1323	1304	594	462								
Volume to Capacity	0.00	0.01	0.05	0.04								
Queue Length 95th (ft)	0	1	4	3								
Control Delay (s)	0.1	0.7	11.4	13.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.7	11.4	13.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			33.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (vph)	61	137	123	56	79	25	135	702	82	102	557	47
Future Volume (vph)	61	137	123	56	79	25	135	702	82	102	557	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.95			0.98		1.00	0.98		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1750			1792		1770	3484		1770	3498	
Flt Permitted		0.91			0.66		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1611			1203		1770	3484		1770	3498	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	66	149	134	61	86	27	147	763	89	111	605	51
RTOR Reduction (vph)	0	32	0	0	10	0	0	12	0	0	8	0
Lane Group Flow (vph)	0	317	0	0	164	0	147	840	0	111	648	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		17.5			17.1		12.9	29.3		8.6	25.8	
Effective Green, g (s)		17.5			17.1		12.9	29.3		8.6	25.8	
Actuated g/C Ratio		0.25			0.24		0.18	0.42		0.12	0.37	
Clearance Time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.5		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		402			293		326	1458		217	1289	
v/s Ratio Prot							c0.08	c0.24		0.06	0.19	
v/s Ratio Perm		c0.20			0.14							
v/c Ratio		0.79			0.56		0.45	0.58		0.51	0.50	
Uniform Delay, d1		24.5			23.2		25.4	15.6		28.7	17.1	
Progression Factor		1.00			1.00		1.00	1.00		0.96	0.51	
Incremental Delay, d2		9.8			2.7		0.4	1.7		1.9	1.3	
Delay (s)		34.4			25.8		25.8	17.3		29.4	10.1	
Level of Service		C			C		C	B		C	B	
Approach Delay (s)		34.4			25.8			18.5			12.9	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			19.6									
HCM 2000 Volume to Capacity ratio			0.65									
Actuated Cycle Length (s)			70.0									
Intersection Capacity Utilization			62.8%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	451	25	25	203	10	28	35	12	15	14	17
Future Volume (Veh/h)	17	451	25	25	203	10	28	35	12	15	14	17
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	490	27	27	221	11	30	38	13	16	15	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		280										
pX, platoon unblocked												
vC, conflicting volume	232			517			846	826	504	852	834	226
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	232			517			846	826	504	852	834	226
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			97			88	87	98	93	95	98
cM capacity (veh/h)	1336			1049			258	296	568	239	292	813
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	535	259	81	49								
Volume Left	18	27	30	16								
Volume Right	27	11	13	18								
cSH	1336	1049	302	349								
Volume to Capacity	0.01	0.03	0.27	0.14								
Queue Length 95th (ft)	1	2	26	12								
Control Delay (s)	0.4	1.1	21.2	17.0								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.4	1.1	21.2	17.0								
Approach LOS			C	C								
Intersection Summary												
Average Delay			3.3									
Intersection Capacity Utilization			41.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	333	18	22	158	3	24	35	22	5	15	7
Future Volume (vph)	10	333	18	22	158	3	24	35	22	5	15	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	362	20	24	172	3	26	38	24	5	16	8
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	393	199	88	29								
Volume Left (vph)	11	24	26	5								
Volume Right (vph)	20	3	24	8								
Hadj (s)	0.01	0.05	-0.07	-0.10								
Departure Headway (s)	4.5	4.7	5.2	5.3								
Degree Utilization, x	0.49	0.26	0.13	0.04								
Capacity (veh/h)	786	729	616	590								
Control Delay (s)	11.6	9.4	9.0	8.6								
Approach Delay (s)	11.6	9.4	9.0	8.6								
Approach LOS	B	A	A	A								
Intersection Summary												
Delay				10.5								
Level of Service				B								
Intersection Capacity Utilization				34.4%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	28	343	19	73	148	55	19	120	165	106	25	7
Future Volume (vph)	28	343	19	73	148	55	19	120	165	106	25	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	30	373	21	79	161	60	21	130	179	115	27	8
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	424	300	330	150								
Volume Left (vph)	30	79	21	115								
Volume Right (vph)	21	60	179	8								
Hadj (s)	0.02	-0.03	-0.28	0.16								
Departure Headway (s)	6.2	6.5	6.3	7.3								
Degree Utilization, x	0.73	0.54	0.58	0.30								
Capacity (veh/h)	424	509	520	409								
Control Delay (s)	24.5	16.7	17.7	13.4								
Approach Delay (s)	24.5	16.7	17.7	13.4								
Approach LOS	C	C	C	B								
Intersection Summary												
Delay				19.3								
Level of Service				C								
Intersection Capacity Utilization				70.6%	ICU Level of Service	C						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	110	92	7	73	35
Future Volume (vph)	0	110	92	7	73	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	120	100	8	79	38
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	120	108	117			
Volume Left (vph)	0	0	79			
Volume Right (vph)	120	8	0			
Hadj (s)	-0.57	-0.01	0.17			
Departure Headway (s)	3.8	4.3	4.4			
Degree Utilization, x	0.13	0.13	0.14			
Capacity (veh/h)	886	811	777			
Control Delay (s)	7.4	7.9	8.2			
Approach Delay (s)	7.4	7.9	8.2			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.8			
Level of Service			A			
Intersection Capacity Utilization			18.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	21	140	45	208	112	359	51	580	276	300	487	25
Future Volume (vph)	21	140	45	208	112	359	51	580	276	300	487	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.95		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1538		1804	1583	1770	3328		1770	3506	
Flt Permitted	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1538		1804	1583	1770	3328		1770	3506	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	23	152	49	226	122	390	55	630	300	326	529	27
RTOR Reduction (vph)	0	0	44	0	0	316	0	55	0	0	4	0
Lane Group Flow (vph)	23	152	5	0	348	74	55	875	0	326	552	0
Confl. Peds. (#/hr)	7		2	2		7			5			8
Confl. Bikes (#/hr)						2			4			8
Turn Type	Split	NA	Perm	Split	NA	Over	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	10.5	10.5	10.5		20.1	17.8	5.7	26.9		17.8	39.0	
Effective Green, g (s)	10.5	10.5	10.5		20.1	17.8	5.7	26.9		17.8	39.0	
Actuated g/C Ratio	0.11	0.11	0.11		0.21	0.19	0.06	0.28		0.19	0.41	
Clearance Time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	196	207	171		384	298	106	948		333	1448	
v/s Ratio Prot	0.01	c0.08			c0.19	0.05	0.03	c0.26		c0.18	0.16	
v/s Ratio Perm			0.00									
v/c Ratio	0.12	0.73	0.03		0.91	0.25	0.52	0.92		0.98	0.38	
Uniform Delay, d1	37.8	40.6	37.4		36.2	32.6	43.0	32.7		38.1	19.3	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	11.0	0.0		24.2	0.2	1.8	14.1		43.0	0.2	
Delay (s)	37.9	51.6	37.4		60.4	32.8	44.8	46.8		81.1	19.5	
Level of Service	D	D	D		E	C	D	D		F	B	
Approach Delay (s)		47.1			45.8			46.7			42.2	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			45.1									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.90									
Actuated Cycle Length (s)			94.4									Sum of lost time (s) 19.1
Intersection Capacity Utilization			82.4%									ICU Level of Service E
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	712	12	16	684	51	8	0	16	24	6	54
Future Volume (Veh/h)	9	712	12	16	684	51	8	0	16	24	6	54
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	774	13	17	743	55	9	0	17	26	7	59
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage (veh)					2							
Upstream signal (ft)		279										
pX, platoon unblocked				0.92			0.92	0.92	0.92	0.92	0.92	
vC, conflicting volume	798			787			1668	1632	780	1622	1612	770
vC1, stage 1 conf vol							800	800		804	804	
vC2, stage 2 conf vol							867	832		818	807	
vCu, unblocked vol	798			728			1681	1643	721	1632	1621	770
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			96	100	96	90	97	85
cM capacity (veh/h)	824			809			221	273	395	249	274	400
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	797	815	26	92								
Volume Left	10	17	9	26								
Volume Right	13	55	17	59								
cSH	824	809	310	332								
Volume to Capacity	0.01	0.02	0.08	0.28								
Queue Length 95th (ft)	1	2	7	28								
Control Delay (s)	0.3	0.6	17.7	20.0								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.3	0.6	17.7	20.0								
Approach LOS			C	C								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			61.5%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

9/1/2016

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (veh/h)	6	913	6	15	898	37	1	1	23	15	1	9		
Future Volume (Veh/h)	6	913	6	15	898	37	1	1	23	15	1	9		
Sign Control	Free			Free			Stop			Stop				
Grade	0%			0%			0%			0%				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	7	992	7	16	976	40	1	1	25	16	1	10		
Pedestrians	1						1							
Lane Width (ft)	12.0						12.0							
Walking Speed (ft/s)	4.0						4.0							
Percent Blockage	0						0							
Right turn flare (veh)														
Median type	TWLTL			TWLTL										
Median storage veh	2			2										
Upstream signal (ft)	687													
pX, platoon unblocked				0.94			0.94			0.94	0.94	0.94		
vC, conflicting volume	1016			1000			2030			2058	996	2060	2042	997
vC1, stage 1 conf vol							1010			1010		1028	1028	
vC2, stage 2 conf vol							1020			1048		1032	1014	
vCu, unblocked vol	1016			970			2062			2092	966	2093	2074	997
tC, single (s)	4.1			4.1			7.1			6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1			5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5			4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			99			100	91	91	100	97
cM capacity (veh/h)	683			670			187			209	291	174	208	296
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1								
Volume Total	7	999	16	1016	27	27								
Volume Left	7	0	16	0	1	16								
Volume Right	0	7	0	40	25	10								
cSH	683	1700	670	1700	281	207								
Volume to Capacity	0.01	0.59	0.02	0.60	0.10	0.13								
Queue Length 95th (ft)	1	0	2	0	8	11								
Control Delay (s)	10.3	0.0	10.5	0.0	19.2	25.0								
Lane LOS	B		B		C	D								
Approach Delay (s)	0.1		0.2		19.2	25.0								
Approach LOS					C	D								
Intersection Summary														
Average Delay				0.7										
Intersection Capacity Utilization				64.3%			ICU Level of Service			C				
Analysis Period (min)				15										

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	813	0	12	836	332	0	0	7	0	0	23
Future Volume (Veh/h)	13	813	0	12	836	332	0	0	7	0	0	23
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	884	0	13	909	361	0	0	8	0	0	25
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage veh	2			2								
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1270			884			1872	2208	884	2036	2028	1090
vC1, stage 1 conf vol							912	912		1116	1116	
vC2, stage 2 conf vol							960	1296		920	912	
vCu, unblocked vol	1270			884			1872	2208	884	2036	2028	1090
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			98			100	100	98	100	100	90
cM capacity (veh/h)	547			765			201	180	344	188	214	262
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	14	884	13	1270	8	25						
Volume Left	14	0	13	0	0	0						
Volume Right	0	0	0	361	8	25						
cSH	547	1700	765	1700	344	262						
Volume to Capacity	0.03	0.52	0.02	0.75	0.02	0.10						
Queue Length 95th (ft)	2	0	1	0	2	8						
Control Delay (s)	11.8	0.0	9.8	0.0	15.7	20.2						
Lane LOS	B		A		C	C						
Approach Delay (s)	0.2		0.1		15.7	20.2						
Approach LOS					C	C						
Intersection Summary												
Average Delay				0.4								
Intersection Capacity Utilization				80.9%	ICU Level of Service				D			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	63	0	0	21	66	824	5	20	660	6
Future Volume (Veh/h)	0	0	63	0	0	21	66	824	5	20	660	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	68	0	0	23	72	896	5	22	717	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLTL			TWLTL	
Median storage (veh)								2			2	
Upstream signal (ft)											621	
pX, platoon unblocked	0.84	0.84	0.84	0.84	0.84		0.84					
vC, conflicting volume	1380	1810	720	1872	1810	450	724			901		
vC1, stage 1 conf vol	764	764		1042	1042							
vC2, stage 2 conf vol	615	1045		829	768							
vCu, unblocked vol	1357	1867	575	1941	1869	450	579			901		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	83	100	100	96	91			97		
cM capacity (veh/h)	262	213	389	143	209	556	835			750		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	68	23	72	597	304	22	724					
Volume Left	0	0	72	0	0	22	0					
Volume Right	68	23	0	0	5	0	7					
cSH	389	556	835	1700	1700	750	1700					
Volume to Capacity	0.17	0.04	0.09	0.35	0.18	0.03	0.43					
Queue Length 95th (ft)	16	3	7	0	0	2	0					
Control Delay (s)	16.2	11.8	9.7	0.0	0.0	9.9	0.0					
Lane LOS	C	B	A			A						
Approach Delay (s)	16.2	11.8	0.7			0.3						
Approach LOS	C	B										
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			45.7%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

45: Coast Hwy & Michigan Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	121	56	55	36	8	17	18	754	31	13	754	33
Future Volume (vph)	121	56	55	36	8	17	18	754	31	13	754	33
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5		4.5			4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00		0.95			0.95	
Frt		1.00	0.85		1.00	0.85		0.99			0.99	
Flt Protected		0.97	1.00		0.96	1.00		1.00			1.00	
Satd. Flow (prot)		1801	1583		1790	1583		3515			3514	
Flt Permitted		0.77	1.00		0.71	1.00		0.93			0.94	
Satd. Flow (perm)		1426	1583		1316	1583		3268			3303	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	132	61	60	39	9	18	20	820	34	14	820	36
RTOR Reduction (vph)	0	0	47	0	0	14	0	3	0	0	3	0
Lane Group Flow (vph)	0	193	13	0	48	4	0	871	0	0	867	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		14.7	14.7		14.7	14.7		46.3			46.3	
Effective Green, g (s)		14.7	14.7		14.7	14.7		46.3			46.3	
Actuated g/C Ratio		0.21	0.21		0.21	0.21		0.66			0.66	
Clearance Time (s)		4.5	4.5		4.5	4.5		4.5			4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		299	332		276	332		2161			2184	
v/s Ratio Prot												
v/s Ratio Perm		c0.14	0.01		0.04	0.00		c0.27			0.26	
v/c Ratio		0.65	0.04		0.17	0.01		0.40			0.40	
Uniform Delay, d1		25.3	22.0		22.7	21.9		5.5			5.4	
Progression Factor		1.00	1.00		1.00	1.00		0.54			0.33	
Incremental Delay, d2		4.7	0.0		0.3	0.0		0.5			0.4	
Delay (s)		30.0	22.1		23.0	21.9		3.5			2.2	
Level of Service		C	C		C	C		A			A	
Approach Delay (s)		28.1			22.7			3.5			2.2	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		6.6										
HCM 2000 Level of Service											A	
HCM 2000 Volume to Capacity ratio		0.46										
Actuated Cycle Length (s)		70.0									9.0	
Intersection Capacity Utilization		58.6%									B	
ICU Level of Service												
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

46: Coast Hwy

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	15	7	0	3	15	501	7	3	501	6
Future Volume (Veh/h)	6	0	15	7	0	3	15	501	7	3	501	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	0	16	8	0	3	16	545	8	3	545	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage (veh)												
Upstream signal (ft)								933			1003	
pX, platoon unblocked												
vC, conflicting volume	862	1140	276	876	1139	276	552			553		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	862	1140	276	876	1139	276	552			553		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	100	98	97	100	100	98			100		
cM capacity (veh/h)	244	196	721	234	196	721	1014			1013		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	23	11	288	280	276	280						
Volume Left	7	8	16	0	3	0						
Volume Right	16	3	0	8	0	7						
cSH	452	287	1014	1700	1013	1700						
Volume to Capacity	0.05	0.04	0.02	0.17	0.00	0.16						
Queue Length 95th (ft)	4	3	1	0	0	0						
Control Delay (s)	13.4	18.0	0.6	0.0	0.1	0.0						
Lane LOS	B	C	A		A							
Approach Delay (s)	13.4	18.0	0.3		0.1							
Approach LOS	B	C										
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			34.9%		ICU Level of Service		A					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

47: Coast Hwy

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	8	15	22	11	56	14	284	23	55	270	34
Future Volume (Veh/h)	6	8	15	22	11	56	14	284	23	55	270	34
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	9	16	24	12	61	15	309	25	60	293	37
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)								558			706	
pX, platoon unblocked												
vC, conflicting volume	683	796	165	638	802	167	330			334		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	683	796	165	638	802	167	330			334		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	98	97	98	93	96	93	99			95		
cM capacity (veh/h)	288	299	850	330	297	848	1226			1222		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	32	97	170	180	206	184						
Volume Left	7	24	15	0	60	0						
Volume Right	16	61	0	25	0	37						
cSH	437	524	1226	1700	1222	1700						
Volume to Capacity	0.07	0.19	0.01	0.11	0.05	0.11						
Queue Length 95th (ft)	6	17	1	0	4	0						
Control Delay (s)	13.9	13.4	0.8	0.0	2.7	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s)	13.9	13.4	0.4		1.4							
Approach LOS	B	B										
Intersection Summary												
Average Delay			2.8									
Intersection Capacity Utilization			36.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

06/29/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	106	0	14	13	1056	14	25	2207	16
Future Volume (veh/h)	0	0	0	106	0	14	13	1056	14	25	2207	16
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h				115	0	0	14	1148	0	27	2399	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				631	0	281	79	3221	1003	99	2281	1020
Arrive On Green				0.18	0.00	0.00	0.04	0.63	0.00	0.06	0.64	0.00
Sat Flow, veh/h				3548	0	1583	1774	5085	1583	1774	3539	1583
Grp Volume(v), veh/h				115	0	0	14	1148	0	27	2399	0
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1695	1583	1774	1770	1583
Q Serve(g_s), s				2.5	0.0	0.0	0.7	9.6	0.0	1.3	58.0	0.0
Cycle Q Clear(g_c), s				2.5	0.0	0.0	0.7	9.6	0.0	1.3	58.0	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				631	0	281	79	3221	1003	99	2281	1020
V/C Ratio(X)				0.18	0.00	0.00	0.18	0.36	0.00	0.27	1.05	0.00
Avail Cap(c_a), veh/h				631	0	281	79	3221	1003	99	2281	1020
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				31.4	0.0	0.0	41.4	7.8	0.0	40.8	16.0	0.0
Incr Delay (d2), s/veh				0.6	0.0	0.0	4.9	0.3	0.0	6.8	34.2	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.3	0.0	0.0	0.4	4.6	0.0	0.8	38.7	0.0
LnGrp Delay(d),s/veh				32.1	0.0	0.0	46.3	8.1	0.0	47.5	50.2	0.0
LnGrp LOS				C			D	A		D	F	
Approach Vol, veh/h					115			1162			2426	
Approach Delay, s/veh					32.1			8.6			50.2	
Approach LOS					C			A			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	9.0	61.0			8.0	62.0		20.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	5.0	57.0			4.0	58.0		16.0				
Max Q Clear Time (g_c+I1), s	3.3	11.6			2.7	60.0		4.5				
Green Ext Time (p_c), s	0.0	11.0			0.0	0.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				36.6								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑↑				
Traffic Volume (veh/h)	953	178	266	1092	0	0		
Future Volume (veh/h)	953	178	266	1092	0	0		
Number	4	14	3	8				
Initial Q (Qb), veh	0	0	0	0				
Ped-Bike Adj(A_pbT)		1.00	1.00					
Parking Bus, Adj	1.00	1.00	1.00	1.00				
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863				
Adj Flow Rate, veh/h	1036	193	289	1187				
Adj No. of Lanes	2	1	2	2				
Peak Hour Factor	0.92	0.92	0.92	0.92				
Percent Heavy Veh, %	2	2	2	2				
Cap, veh/h	2035	910	774	3185				
Arrive On Green	0.57	0.57	0.22	0.90				
Sat Flow, veh/h	3632	1583	3442	3632				
Grp Volume(v), veh/h	1036	193	289	1187				
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1770				
Q Serve(g_s), s	7.0	2.4	2.8	2.0				
Cycle Q Clear(g_c), s	7.0	2.4	2.8	2.0				
Prop In Lane		1.00	1.00					
Lane Grp Cap(c), veh/h	2035	910	774	3185				
V/C Ratio(X)	0.51	0.21	0.37	0.37				
Avail Cap(c_a), veh/h	2035	910	774	3185				
HCM Platoon Ratio	1.00	1.00	1.00	1.00				
Upstream Filter(I)	1.00	1.00	1.00	1.00				
Uniform Delay (d), s/veh	5.1	4.1	13.1	0.3				
Incr Delay (d2), s/veh	0.9	0.5	1.4	0.3				
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0				
%ile BackOfQ(50%),veh/ln	3.6	1.2	1.5	1.0				
LnGrp Delay(d),s/veh	6.0	4.6	14.5	0.6				
LnGrp LOS	A	A	B	A				
Approach Vol, veh/h	1229			1476				
Approach Delay, s/veh	5.8			3.3				
Approach LOS	A			A				
Timer	1	2	3	4	5	6	7	8
Assigned Phs			3	4				8
Phs Duration (G+Y+Rc), s			13.0	27.0				40.0
Change Period (Y+Rc), s			4.0	4.0				4.0
Max Green Setting (Gmax), s			9.0	23.0				36.0
Max Q Clear Time (g_c+I1), s			4.8	9.0				4.0
Green Ext Time (p_c), s			0.4	6.8				10.9
Intersection Summary								
HCM 2010 Ctrl Delay			4.5					
HCM 2010 LOS			A					

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/11/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑↑	↑	↑		
Traffic Volume (veh/h)	1566	85	271	1191	136	0		
Future Volume (veh/h)	1566	85	271	1191	136	0		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	1702	92	295	1295	148	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1809	809	612	2595	315	281		
Arrive On Green	0.51	0.51	0.18	0.73	0.18	0.00		
Sat Flow, veh/h	3632	1583	3442	3632	1774	1583		
Grp Volume(v), veh/h	1702	92	295	1295	148	0		
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1770	1774	1583		
Q Serve(g_s), s	40.8	2.7	6.9	13.8	6.7	0.0		
Cycle Q Clear(g_c), s	40.8	2.7	6.9	13.8	6.7	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1809	809	612	2595	315	281		
V/C Ratio(X)	0.94	0.11	0.48	0.50	0.47	0.00		
Avail Cap(c_a), veh/h	1809	809	612	2595	315	281		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	20.7	11.4	33.3	5.0	33.2	0.0		
Incr Delay (d2), s/veh	11.2	0.3	2.7	0.7	4.9	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	22.4	1.2	3.5	6.9	3.7	0.0		
LnGrp Delay(d),s/veh	31.9	11.7	36.0	5.7	38.1	0.0		
LnGrp LOS	C	B	D	A	D			
Approach Vol, veh/h	1794			1590	148			
Approach Delay, s/veh	30.8			11.3	38.1			
Approach LOS	C			B	D			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	20.0	50.0				70.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	16.0	46.0				66.0
Max Q Clear Time (g_c+I1), s		8.7	8.9	42.8				15.8
Green Ext Time (p_c), s		0.2	0.6	2.8				14.1
Intersection Summary								
HCM 2010 Ctrl Delay			22.4					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary

51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	648	6	84	603	105	5	0	32	76	8	50
Future Volume (veh/h)	0	648	6	84	603	105	5	0	32	76	8	50
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	1863	1863	0	1863	1863	1863	1863
Adj Flow Rate, veh/h	0	704	7	91	655	0	5	0	35	89	0	54
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1243	12	205	1906	853	0	0	0	1092	0	487
Arrive On Green	0.00	0.35	0.35	0.12	0.54	0.00	0.00	0.00	0.00	0.31	0.00	0.31
Sat Flow, veh/h	0	3683	36	1774	3539	1583		0		3548	0	1583
Grp Volume(v), veh/h	0	347	364	91	655	0		0.0		89	0	54
Grp Sat Flow(s),veh/h/ln	0	1770	1856	1774	1770	1583				1774	0	1583
Q Serve(g_s), s	0.0	8.3	8.3	2.5	5.5	0.0				0.9	0.0	1.3
Cycle Q Clear(g_c), s	0.0	8.3	8.3	2.5	5.5	0.0				0.9	0.0	1.3
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	613	643	205	1906	853				1092	0	487
V/C Ratio(X)	0.00	0.57	0.57	0.44	0.34	0.00				0.08	0.00	0.11
Avail Cap(c_a), veh/h	0	613	643	205	1906	853				1092	0	487
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	13.8	13.8	21.4	6.8	0.0				12.8	0.0	12.9
Incr Delay (d2), s/veh	0.0	3.8	3.6	6.9	0.5	0.0				0.1	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.7	4.9	1.6	2.8	0.0				0.5	0.0	0.6
LnGrp Delay(d),s/veh	0.0	17.6	17.4	28.3	7.3	0.0				12.9	0.0	13.4
LnGrp LOS		B	B	C	A					B		B
Approach Vol, veh/h		711			746						143	
Approach Delay, s/veh		17.5			9.9						13.1	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			10.0	22.0		20.0		32.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			6.0	18.0		16.0		28.0				
Max Q Clear Time (g_c+I1), s			4.5	10.3		3.3		7.5				
Green Ext Time (p_c), s			0.0	2.7		0.3		4.5				
Intersection Summary												
HCM 2010 Ctrl Delay			13.5									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	163	654	9	27	959	265	8	2	14	259	6	67
Future Volume (veh/h)	163	654	9	27	959	265	8	2	14	259	6	67
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	177	711	10	29	1042	288	9	2	15	181	148	73
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	177	1161	16	111	1018	455	311	69	336	355	236	116
Arrive On Green	0.10	0.32	0.32	0.13	0.57	0.57	0.21	0.21	0.21	0.20	0.20	0.20
Sat Flow, veh/h	1774	3573	50	1774	3539	1583	1464	325	1583	1774	1179	581
Grp Volume(v), veh/h	177	352	369	29	1042	288	11	0	15	181	0	221
Grp Sat Flow(s),veh/h/ln	1774	1770	1854	1774	1770	1583	1790	0	1583	1774	0	1760
Q Serve(g_s), s	8.0	13.4	13.4	1.2	23.0	9.7	0.4	0.0	0.6	7.3	0.0	9.2
Cycle Q Clear(g_c), s	8.0	13.4	13.4	1.2	23.0	9.7	0.4	0.0	0.6	7.3	0.0	9.2
Prop In Lane	1.00		0.03	1.00		1.00	0.82		1.00	1.00		0.33
Lane Grp Cap(c), veh/h	177	575	603	111	1018	455	380	0	336	355	0	352
V/C Ratio(X)	1.00	0.61	0.61	0.26	1.02	0.63	0.03	0.00	0.04	0.51	0.00	0.63
Avail Cap(c_a), veh/h	177	575	603	111	1018	455	380	0	336	355	0	352
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.0	22.8	22.8	33.3	17.0	14.2	25.0	0.0	25.0	28.5	0.0	29.3
Incr Delay (d2), s/veh	67.0	4.8	4.6	5.7	34.5	6.6	0.1	0.0	0.2	5.2	0.0	8.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.2	7.3	7.6	0.8	15.6	5.0	0.2	0.0	0.3	4.1	0.0	5.3
LnGrp Delay(d),s/veh	103.0	27.6	27.4	39.0	51.5	20.7	25.1	0.0	25.3	33.7	0.0	37.5
LnGrp LOS	F	C	C	D	F	C	C		C	C		D
Approach Vol, veh/h		898			1359			26			402	
Approach Delay, s/veh		42.3			44.7			25.2			35.8	
Approach LOS		D			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.0	9.0	30.0		20.0	12.0	27.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	5.0	26.0		16.0	8.0	23.0				
Max Q Clear Time (g_c+I1), s		2.6	3.2	15.4		11.2	10.0	25.0				
Green Ext Time (p_c), s		0.0	0.0	3.3		0.8	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			42.4									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	56	877	275	86	773	165	350	94	137	391	227	357
Future Volume (veh/h)	56	877	275	86	773	165	350	94	137	391	227	357
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	61	953	299	93	840	179	241	297	149	336	372	388
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	138	944	295	99	1180	528	375	393	334	355	373	317
Arrive On Green	0.08	0.36	0.36	0.06	0.33	0.33	0.21	0.21	0.21	0.20	0.20	0.20
Sat Flow, veh/h	1774	2656	830	1774	3539	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	61	634	618	93	840	179	241	297	149	336	372	388
Grp Sat Flow(s),veh/h/ln	1774	1770	1716	1774	1770	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	3.0	32.0	32.0	4.7	18.7	7.6	11.2	13.5	7.4	16.8	18.0	18.0
Cycle Q Clear(g_c), s	3.0	32.0	32.0	4.7	18.7	7.6	11.2	13.5	7.4	16.8	18.0	18.0
Prop In Lane	1.00		0.48	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	138	629	610	99	1180	528	375	393	334	355	373	317
V/C Ratio(X)	0.44	1.01	1.01	0.94	0.71	0.34	0.64	0.76	0.45	0.95	1.00	1.23
Avail Cap(c_a), veh/h	138	629	610	99	1180	528	375	393	334	355	373	317
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.6	29.0	29.0	42.4	26.2	22.5	32.4	33.3	30.9	35.5	36.0	36.0
Incr Delay (d2), s/veh	9.9	37.6	39.8	76.3	3.7	1.7	8.3	12.7	4.3	36.1	46.3	126.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	22.1	21.8	4.4	9.7	3.6	6.3	8.3	3.6	11.8	14.0	18.9
LnGrp Delay(d),s/veh	49.6	66.6	68.8	118.6	29.9	24.3	40.7	46.0	35.2	71.6	82.3	162.2
LnGrp LOS	D	F	F	F	C	C	D	D	D	E	F	F
Approach Vol, veh/h		1313			1112			687			1096	
Approach Delay, s/veh		66.9			36.4			41.8			107.3	
Approach LOS		E			D			D			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		23.0	9.0	36.0		22.0	11.0	34.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		19.0	5.0	32.0		18.0	7.0	30.0				
Max Q Clear Time (g_c+I1), s		15.5	6.7	34.0		20.0	5.0	20.7				
Green Ext Time (p_c), s		1.1	0.0	0.0		0.0	0.0	4.3				
Intersection Summary												
HCM 2010 Ctrl Delay				65.3								
HCM 2010 LOS				E								
Notes												

Intersection

Intersection Delay, s/veh	7.5
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	21	73	6	6	80	9	3	2	7	0	0	0
Future Vol, veh/h	21	73	6	6	80	9	3	2	7	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	23	79	7	7	87	10	3	2	8	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.6	7.5	7.1
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	25%	21%	6%
Vol Thru, %	17%	73%	84%
Vol Right, %	58%	6%	9%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	12	100	95
LT Vol	3	21	6
Through Vol	2	73	80
RT Vol	7	6	9
Lane Flow Rate	13	109	103
Geometry Grp	1	1	1
Degree of Util (X)	0.014	0.122	0.115
Departure Headway (Hd)	3.996	4.041	3.995
Convergence, Y/N	Yes	Yes	Yes
Cap	881	887	897
Service Time	2.086	2.064	2.02
HCM Lane V/C Ratio	0.015	0.123	0.115
HCM Control Delay	7.1	7.6	7.5
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	0.4	0.4

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖						↖	↗
Traffic Vol, veh/h	0	166	48	26	30	0	0	0	0	25	0	40
Future Vol, veh/h	0	166	48	26	30	0	0	0	0	25	0	40
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	180	52	28	33	0	0	0	0	27	0	43
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	180	0	0				269	269	33
Stage 1	-	-	-	-	-	-				89	89	-
Stage 2	-	-	-	-	-	-				180	180	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1396	-	0				720	637	1041
Stage 1	0	-	-	-	-	0				934	821	-
Stage 2	0	-	-	-	-	0				851	750	-
Platoon blocked, %	-	-	-	-	-	-				-	-	-
Mov Cap-1 Maneuver	-	-	-	1396	-	-				706	0	1041
Mov Cap-2 Maneuver	-	-	-	-	-	-				706	0	-
Stage 1	-	-	-	-	-	-				915	0	-
Stage 2	-	-	-	-	-	-				851	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.5			9.3					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2						
Capacity (veh/h)	-	-	1396	-	706	1041						
HCM Lane V/C Ratio	-	-	0.02	-	0.038	0.042						
HCM Control Delay (s)	-	-	7.6	0	10.3	8.6						
HCM Lane LOS	-	-	A	A	B	A						
HCM 95th %tile Q(veh)	-	-	0.1	-	0.1	0.1						

HCM 2010 Signalized Intersection Summary

56: I-5 SB On/Off-Ramp & Vista Way

06/29/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↖	↑	↘	↗↗		
Traffic Volume (veh/h)	715	99	160	1235	40	244		
Future Volume (veh/h)	715	99	160	1235	40	244		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	777	0	174	1342	43	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	2124	950	306	1366	315	495		
Arrive On Green	0.60	0.00	0.09	0.73	0.18	0.00		
Sat Flow, veh/h	3632	1583	3442	1863	1774	2787		
Grp Volume(v), veh/h	777	0	174	1342	43	0		
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1863	1774	1393		
Q Serve(g_s), s	10.1	0.0	4.4	61.8	1.8	0.0		
Cycle Q Clear(g_c), s	10.1	0.0	4.4	61.8	1.8	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	2124	950	306	1366	315	495		
V/C Ratio(X)	0.37	0.00	0.57	0.98	0.14	0.00		
Avail Cap(c_a), veh/h	2124	950	306	1366	315	495		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	9.2	0.0	39.3	11.4	31.2	0.0		
Incr Delay (d2), s/veh	0.5	0.0	7.5	20.5	0.9	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.0	0.0	2.4	38.7	1.0	0.0		
LnGrp Delay(d),s/veh	9.7	0.0	46.8	31.9	32.1	0.0		
LnGrp LOS	A		D	C	C			
Approach Vol, veh/h	777			1516	43			
Approach Delay, s/veh	9.7			33.7	32.1			
Approach LOS	A			C	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	12.0	58.0				70.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	8.0	54.0				66.0
Max Q Clear Time (g_c+I1), s		3.8	6.4	12.1				63.8
Green Ext Time (p_c), s		0.0	0.1	6.5				1.9
Intersection Summary								
HCM 2010 Ctrl Delay			25.7					
HCM 2010 LOS			C					

Appendix I.2 – Analysis Output Sheets (Future No Project Existing SR-78)

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	91	87	60	98	323	629	168	18	148	92	24	71
Future Volume (vph)	91	87	60	98	323	629	168	18	148	92	24	71
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3139	1441		1782	1583		1792	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3139	1441		1782	1583		1792	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	99	95	65	107	351	684	183	20	161	100	26	77
RTOR Reduction (vph)	0	0	55	0	233	274	0	0	116	0	0	60
Lane Group Flow (vph)	99	95	10	107	460	68	0	203	45	0	126	17
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	5.4	11.0	11.0	5.4	14.6	14.6		20.4	20.4		16.1	16.1
Effective Green, g (s)	5.4	11.0	11.0	5.4	14.6	14.6		20.4	20.4		16.1	16.1
Actuated g/C Ratio	0.07	0.15	0.15	0.07	0.20	0.20		0.28	0.28		0.22	0.22
Clearance Time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	129	278	236	129	621	285		493	438		391	345
v/s Ratio Prot	0.06	0.05		c0.06	c0.15			c0.11			c0.07	
v/s Ratio Perm			0.01			0.05			0.03			0.01
v/c Ratio	0.77	0.34	0.04	0.83	0.74	0.24		0.41	0.10		0.32	0.05
Uniform Delay, d1	33.5	28.1	26.8	33.7	27.8	24.9		21.8	19.8		24.2	22.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	23.5	0.3	0.0	33.6	4.1	0.2		2.5	0.5		2.2	0.3
Delay (s)	57.0	28.4	26.9	67.3	31.9	25.0		24.3	20.3		26.4	23.0
Level of Service	E	C	C	E	C	C		C	C		C	C
Approach Delay (s)		38.9			33.2			22.5			25.1	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			31.1				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			73.7				Sum of lost time (s)		20.8			
Intersection Capacity Utilization			52.6%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Coast Hwy & Driveway/SR-76 ramps

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔		↔	↔	↔		↔	↔		↔	
Traffic Volume (vph)	0	0	2	359	0	299	1	128	408	95	119	0
Future Volume (vph)	0	0	2	359	0	299	1	128	408	95	119	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6		4.6	4.6	4.0		4.6	4.0		4.6	
Lane Util. Factor		1.00		0.95	0.95	1.00		0.95	1.00		0.95	
Frt		0.86		1.00	1.00	0.85		1.00	0.85		1.00	
Flt Protected		1.00		0.95	0.95	1.00		1.00	1.00		0.98	
Satd. Flow (prot)		1611		1681	1681	1583		3538	1583		3462	
Flt Permitted		1.00		0.95	0.95	1.00		1.00	1.00		0.98	
Satd. Flow (perm)		1611		1681	1681	1583		3538	1583		3462	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	2	390	0	325	1	139	443	103	129	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	195	195	325	0	140	443	0	232	0
Turn Type		NA		Split	NA	Free	Split	NA	Free	Split	NA	
Protected Phases		4		8	8		2	2		6	6	
Permitted Phases	4					Free			Free			
Actuated Green, G (s)		0.9		12.8	12.8	68.7		18.4	68.7		18.2	
Effective Green, g (s)		0.9		12.8	12.8	68.7		18.4	68.7		18.2	
Actuated g/C Ratio		0.01		0.19	0.19	1.00		0.27	1.00		0.26	
Clearance Time (s)		4.6		4.6	4.6			4.6			4.6	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		21		313	313	1583		947	1583		917	
v/s Ratio Prot		0.00		c0.12	0.12			0.04			0.07	
v/s Ratio Perm						0.21			c0.28			
v/c Ratio		0.00		0.62	0.62	0.21		0.15	0.28		0.25	
Uniform Delay, d1		33.5		25.7	25.7	0.0		19.2	0.0		19.9	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		0.0		3.8	3.8	0.3		0.3	0.4		0.7	
Delay (s)		33.5		29.6	29.6	0.3		19.5	0.4		20.6	
Level of Service		C		C	C	A		B	A		C	
Approach Delay (s)		33.5			16.3			5.0			20.6	
Approach LOS		C			B			A			C	
Intersection Summary												
HCM 2000 Control Delay			12.7				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			68.7				Sum of lost time (s)		18.4			
Intersection Capacity Utilization			37.7%				ICU Level of Service		A			
Analysis Period (min)			15									
Description: SR-76 & Coast Hwy												
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	6	60	13	45	77	77	41	59	66	115	81	17
Future Volume (vph)	6	60	13	45	77	77	41	59	66	115	81	17
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	65	14	49	84	84	45	64	72	125	88	18
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	86	217	181	231								
Volume Left (vph)	7	49	45	125								
Volume Right (vph)	14	84	72	18								
Hadj (s)	-0.05	-0.15	-0.15	0.10								
Departure Headway (s)	5.2	4.9	4.9	5.0								
Degree Utilization, x	0.12	0.30	0.24	0.32								
Capacity (veh/h)	616	674	687	671								
Control Delay (s)	9.0	10.0	9.4	10.4								
Approach Delay (s)	9.0	10.0	9.4	10.4								
Approach LOS	A	A	A	B								
Intersection Summary												
Delay			9.8									
Level of Service			A									
Intersection Capacity Utilization			47.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	87	13	23	7	24	51	22	124	15	20	170	50
Future Volume (vph)	87	13	23	7	24	51	22	124	15	20	170	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.92		1.00	0.98		1.00	0.97	
Flt Protected		0.96	1.00		1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1785	1583		1700		1770	3483		1770	3419	
Flt Permitted		0.73	1.00		0.98		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1354	1583		1676		1770	3483		1770	3419	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	95	14	25	8	26	55	24	135	16	22	185	54
RTOR Reduction (vph)	0	0	21	0	46	0	0	7	0	0	22	0
Lane Group Flow (vph)	0	109	4	0	43	0	24	144	0	22	217	0
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		12.8	12.8		12.8		11.7	41.4		10.0	44.5	
Effective Green, g (s)		12.8	12.8		12.8		11.7	41.4		10.0	44.5	
Actuated g/C Ratio		0.17	0.17		0.17		0.16	0.55		0.13	0.59	
Clearance Time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		3.0	7.0	
Lane Grp Cap (vph)		231	270		286		276	1922		236	2028	
v/s Ratio Prot							c0.01	0.04		0.01	c0.06	
v/s Ratio Perm		c0.08	0.00		0.03							
v/c Ratio		0.47	0.02		0.15		0.09	0.07		0.09	0.11	
Uniform Delay, d1		28.1	25.9		26.5		27.1	7.9		28.5	6.6	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.3	0.1		0.9		0.1	0.1		0.2	0.1	
Delay (s)		33.4	25.9		27.4		27.2	7.9		28.7	6.7	
Level of Service		C	C		C		C	A		C	A	
Approach Delay (s)		32.0			27.4			10.6			8.6	
Approach LOS		C			C			B			A	
Intersection Summary												
HCM 2000 Control Delay		16.4			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.18										
Actuated Cycle Length (s)		75.0			Sum of lost time (s)			10.8				
Intersection Capacity Utilization		32.5%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Coast Hwy & Civic Center Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	13	9	9	15	13	15	7	120	19	43	142	13
Future Volume (vph)	13	9	9	15	13	15	7	120	19	43	142	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2			4.6			4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.93		1.00	0.92			0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.99	
Satd. Flow (prot)	1770	1723		1770	1714			3460			3467	
Flt Permitted	0.74	1.00		0.74	1.00			0.94			0.86	
Satd. Flow (perm)	1374	1723		1386	1714			3244			3001	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	14	10	10	16	14	16	8	130	21	47	154	14
RTOR Reduction (vph)	0	4	0	0	6	0	0	17	0	0	11	0
Lane Group Flow (vph)	14	16	0	16	24	0	0	142	0	0	204	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	30.7	30.7		30.7	30.7			10.5			10.5	
Effective Green, g (s)	30.7	30.7		30.7	30.7			10.5			10.5	
Actuated g/C Ratio	0.61	0.61		0.61	0.61			0.21			0.21	
Clearance Time (s)	4.2	4.2		4.2	4.2			4.6			4.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	
Lane Grp Cap (vph)	843	1057		851	1052			681			630	
v/s Ratio Prot		0.01			c0.01							
v/s Ratio Perm	0.01			0.01				0.04			c0.07	
v/c Ratio	0.02	0.02		0.02	0.02			0.21			0.32	
Uniform Delay, d1	3.8	3.8		3.8	3.8			16.3			16.7	
Progression Factor	1.00	1.00		1.00	1.00			0.76			1.00	
Incremental Delay, d2	0.0	0.0		0.0	0.0			0.2			0.4	
Delay (s)	3.8	3.8		3.8	3.8			12.7			17.2	
Level of Service	A	A		A	A			B			B	
Approach Delay (s)		3.8			3.8			12.7			17.2	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		13.2			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.10										
Actuated Cycle Length (s)		50.0			Sum of lost time (s)			8.8				
Intersection Capacity Utilization		35.3%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

6: Coast Hwy & Pier View Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	14	12	15	21	22	9	142	16	16	154	23
Future Volume (vph)	8	14	12	15	21	22	9	142	16	16	154	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		5.0	5.0			5.0			4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.99			1.00			1.00	
Flpb, ped/bikes	0.99	1.00		0.99	1.00			1.00			1.00	
Frt	1.00	0.93		1.00	0.92			0.99			0.98	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1746	1716		1754	1697			3469			3443	
Flt Permitted	0.73	1.00		0.74	1.00			0.93			0.92	
Satd. Flow (perm)	1335	1716		1364	1697			3226			3176	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	9	15	13	16	23	24	10	154	17	17	167	25
RTOR Reduction (vph)	0	5	0	0	9	0	0	14	0	0	21	0
Lane Group Flow (vph)	9	23	0	16	38	0	0	167	0	0	188	0
Confl. Peds. (#/hr)	16		11	11		16	10		17	17		10
Confl. Bikes (#/hr)			2			2						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	32.5	32.5		31.7	31.7			8.3			8.8	
Effective Green, g (s)	32.5	32.5		31.7	31.7			8.3			8.8	
Actuated g/C Ratio	0.65	0.65		0.63	0.63			0.17			0.18	
Clearance Time (s)	4.2	4.2		5.0	5.0			5.0			4.5	
Vehicle Extension (s)	3.0	3.0		3.5	3.5			3.0			3.5	
Lane Grp Cap (vph)	867	1115		864	1075			535			558	
v/s Ratio Prot		0.01			c0.02							
v/s Ratio Perm	0.01			0.01				0.05			c0.06	
v/c Ratio	0.01	0.02		0.02	0.04			0.31			0.34	
Uniform Delay, d1	3.1	3.1		3.4	3.4			18.3			18.0	
Progression Factor	1.00	1.00		1.00	1.00			1.84			0.75	
Incremental Delay, d2	0.0	0.0		0.0	0.1			0.3			0.4	
Delay (s)	3.1	3.1		3.4	3.5			34.1			13.9	
Level of Service	A	A		A	A			C			B	
Approach Delay (s)		3.1			3.5			34.1			13.9	
Approach LOS		A			A			C			B	
Intersection Summary												
HCM 2000 Control Delay			19.2									B
HCM 2000 Volume to Capacity ratio			0.10									
Actuated Cycle Length (s)			50.0								10.0	
Intersection Capacity Utilization			39.9%								A	
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	3	7	25	25	13	8	115	230	9	11	158	9
Future Volume (vph)	3	7	25	25	13	8	115	230	9	11	158	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	8	27	27	14	9	125	250	10	12	172	10
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	11	27	50	250	135	98	96					
Volume Left (vph)	3	0	27	125	0	12	0					
Volume Right (vph)	0	27	9	0	10	0	10					
Hadj (s)	0.17	-0.67	0.03	0.28	-0.02	0.10	-0.04					
Departure Headway (s)	6.1	5.2	5.9	5.2	4.9	5.2	5.1					
Degree Utilization, x	0.02	0.04	0.08	0.36	0.18	0.14	0.14					
Capacity (veh/h)	541	624	565	677	714	666	685					
Control Delay (s)	8.0	7.2	9.4	9.9	7.8	7.9	7.7					
Approach Delay (s)	7.5		9.4	9.2		7.8						
Approach LOS	A		A	A		A						
Intersection Summary												
Delay			8.7									
Level of Service			A									
Intersection Capacity Utilization			34.2%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	128	58	139	89	34	122
Future Volume (vph)	128	58	139	89	34	122
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	139	63	151	97	37	133
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	139	63	248	170		
Volume Left (vph)	139	0	0	37		
Volume Right (vph)	0	63	97	0		
Hadj (s)	0.53	-0.67	-0.20	0.08		
Departure Headway (s)	6.0	4.8	4.5	4.8		
Degree Utilization, x	0.23	0.08	0.31	0.23		
Capacity (veh/h)	562	697	770	706		
Control Delay (s)	9.6	7.1	9.5	9.3		
Approach Delay (s)	8.8		9.5	9.3		
Approach LOS	A		A	A		
Intersection Summary						
Delay			9.2			
Level of Service			A			
Intersection Capacity Utilization			38.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			 		 						 	
Traffic Volume (vph)	18	0	122	35	163	35	0	0	0	0	31	42
Future Volume (vph)	18	0	122	35	163	35	0	0	0	0	31	42
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0						4.0	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.97						0.91	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3445						3234	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3445						3234	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	0	133	38	177	38	0	0	0	0	34	46
RTOR Reduction (vph)	0	0	124	32	32	0	0	0	0	0	21	0
Lane Group Flow (vph)	20	0	9	6	183	0	0	0	0	0	59	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	3.2		3.2	8.1	8.1						26.7	
Effective Green, g (s)	3.2		3.2	8.1	8.1						26.7	
Actuated g/C Ratio	0.06		0.06	0.16	0.16						0.53	
Clearance Time (s)	4.0		4.0	4.0	4.0						4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	113		178	286	558						1726	
v/s Ratio Prot	c0.01		0.00	0.00	c0.05						c0.02	
v/s Ratio Perm												
v/c Ratio	0.18		0.05	0.02	0.33						0.03	
Uniform Delay, d1	22.2		22.0	17.6	18.5						5.5	
Progression Factor	1.00		1.00	1.00	1.15						1.00	
Incremental Delay, d2	0.8		0.1	0.0	0.3						0.0	
Delay (s)	22.9		22.1	17.6	21.6						5.6	
Level of Service	C		C	B	C						A	
Approach Delay (s)		22.2			21.0			0.0			5.6	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			18.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.11									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			22.3%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

07/02/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	122	213	60	57	256	0	0	146	25
Future Volume (vph)	0	0	0	122	213	60	57	256	0	0	146	25
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.0	5.0		5.0	5.0			5.0	
Lane Util. Factor				1.00	0.95		1.00	0.95			0.95	
Frpb, ped/bikes				1.00	1.00		1.00	1.00			1.00	
Flpb, ped/bikes				0.99	1.00		1.00	1.00			1.00	
Frt				1.00	0.97		1.00	1.00			0.98	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1753	3408		1770	3539			3449	
Flt Permitted				0.95	1.00		0.63	1.00			1.00	
Satd. Flow (perm)				1753	3408		1182	3539			3449	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	133	232	65	62	278	0	0	159	27
RTOR Reduction (vph)	0	0	0	0	28	0	0	0	0	0	21	0
Lane Group Flow (vph)	0	0	0	133	269	0	62	278	0	0	165	0
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					
Actuated Green, G (s)				28.7	28.7		11.3	11.3			11.3	
Effective Green, g (s)				28.7	28.7		11.3	11.3			11.3	
Actuated g/C Ratio				0.57	0.57		0.23	0.23			0.23	
Clearance Time (s)				5.0	5.0		5.0	5.0			5.0	
Vehicle Extension (s)				3.0	3.0		4.0	4.0			4.0	
Lane Grp Cap (vph)				1006	1956		267	799			779	
v/s Ratio Prot					c0.08			c0.08			0.05	
v/s Ratio Perm				0.08			0.05					
v/c Ratio				0.13	0.14		0.23	0.35			0.21	
Uniform Delay, d1				4.9	4.9		15.8	16.3			15.7	
Progression Factor				1.00	1.00		1.00	1.00			1.23	
Incremental Delay, d2				0.3	0.1		0.6	0.4			0.2	
Delay (s)				5.2	5.1		16.4	16.6			19.6	
Level of Service				A	A		B	B			B	
Approach Delay (s)		0.0			5.1			16.6			19.6	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.0									B
HCM 2000 Volume to Capacity ratio			0.20									
Actuated Cycle Length (s)			50.0									
Intersection Capacity Utilization			46.9%									A
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	119	1	144	448	215	12	27	217	144	54	7
Future Volume (vph)	24	119	1	144	448	215	12	27	217	144	54	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.98	
Satd. Flow (prot)	1770	3535		1770	3539	1583		1834	1583	1681	1716	
Flt Permitted	0.47	1.00		0.67	1.00	1.00		0.88	1.00	0.73	0.85	
Satd. Flow (perm)	884	3535		1247	3539	1583		1644	1583	1291	1489	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	129	1	157	487	234	13	29	236	157	59	8
RTOR Reduction (vph)	0	1	0	0	0	133	0	0	176	0	6	0
Lane Group Flow (vph)	26	129	0	157	487	101	0	42	60	110	108	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	13.5	13.5		13.1	13.1	13.1		7.7	7.7	7.7	7.7	
Effective Green, g (s)	13.5	13.5		13.1	13.1	13.1		7.7	7.7	7.7	7.7	
Actuated g/C Ratio	0.44	0.44		0.43	0.43	0.43		0.25	0.25	0.25	0.25	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	392	1569		537	1525	682		416	400	326	377	
v/s Ratio Prot		0.04			c0.14							
v/s Ratio Perm	0.03			0.13		0.06		0.03	0.04	c0.09	0.07	
v/c Ratio	0.07	0.08		0.29	0.32	0.15		0.10	0.15	0.34	0.29	
Uniform Delay, d1	4.8	4.9		5.6	5.7	5.3		8.7	8.8	9.3	9.1	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	0.0		0.4	0.1	0.1		0.1	0.2	0.8	0.6	
Delay (s)	4.9	4.9		6.0	5.9	5.4		8.8	9.0	10.1	9.7	
Level of Service	A	A		A	A	A		A	A	B	A	
Approach Delay (s)		4.9			5.8			9.0			9.9	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay		6.9			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.33										
Actuated Cycle Length (s)		30.4			Sum of lost time (s)			9.6				
Intersection Capacity Utilization		39.8%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

07/02/2018

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	122	16	54	43	14	21
Future Volume (Veh/h)	122	16	54	43	14	21
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	133	17	59	47	15	23
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)	248					
pX, platoon unblocked						
vC, conflicting volume			150		306	142
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			150		306	142
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			96		98	97
cM capacity (veh/h)			1431		657	906
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	150	106	38			
Volume Left	0	59	15			
Volume Right	17	0	23			
cSH	1700	1431	788			
Volume to Capacity	0.09	0.04	0.05			
Queue Length 95th (ft)	0	3	4			
Control Delay (s)	0.0	4.4	9.8			
Lane LOS		A	A			
Approach Delay (s)	0.0	4.4	9.8			
Approach LOS			A			
Intersection Summary						
Average Delay	2.8					
Intersection Capacity Utilization	26.0%		ICU Level of Service		A	
Analysis Period (min)	15					

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr/Seagaze St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	57	93	0	0	0	26	126	59	69	122	50
Future Volume (vph)	86	57	93	0	0	0	26	126	59	69	122	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2					4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	1.00					1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98					1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00					1.00	1.00		1.00	1.00	
Frt	1.00	0.91					1.00	0.95		1.00	0.96	
Flt Protected	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1656					1770	3348		1770	3345	
Flt Permitted	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1656					1770	3348		1770	3345	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	62	101	0	0	0	28	137	64	75	133	54
RTOR Reduction (vph)	0	68	0	0	0	0	0	52	0	0	34	0
Lane Group Flow (vph)	93	95	0	0	0	0	28	149	0	75	153	0
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA					Prot	NA		Prot	NA	
Protected Phases	4	4					5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	18.0	18.0					4.0	10.4		13.6	20.0	
Effective Green, g (s)	18.0	18.0					4.0	10.4		13.6	20.0	
Actuated g/C Ratio	0.33	0.33					0.07	0.19		0.25	0.36	
Clearance Time (s)	4.2	4.2					4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0					3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	579	541					128	633		437	1216	
v/s Ratio Prot	0.05	c0.06					0.02	c0.04		c0.04	0.05	
v/s Ratio Perm												
v/c Ratio	0.16	0.18					0.22	0.24		0.17	0.13	
Uniform Delay, d1	13.1	13.2					24.0	18.9		16.3	11.7	
Progression Factor	1.00	1.00					1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.6	0.7					3.9	0.9		0.9	0.2	
Delay (s)	13.7	13.9					27.9	19.8		17.1	11.9	
Level of Service	B	B					C	B		B	B	
Approach Delay (s)		13.8			0.0			20.8			13.4	
Approach LOS		B			A			C			B	
Intersection Summary												
HCM 2000 Control Delay		15.8					HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio		0.19										
Actuated Cycle Length (s)		55.0					Sum of lost time (s)			13.0		
Intersection Capacity Utilization		44.7%					ICU Level of Service			A		
Analysis Period (min)		15										

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	200	9	0	0	0	0	4	15	23	8	0
Future Volume (Veh/h)	12	200	9	0	0	0	0	4	15	23	8	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	217	10	0	0	0	0	4	16	25	9	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		255										
pX, platoon unblocked												
vC, conflicting volume	0			227			252	248	114	152	253	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			227			252	248	114	152	253	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	99	98	97	99	100
cM capacity (veh/h)	1622			1339			669	648	918	777	644	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	122	118	20	34								
Volume Left	13	0	0	25								
Volume Right	0	10	16	0								
cSH	1622	1700	847	737								
Volume to Capacity	0.01	0.07	0.02	0.05								
Queue Length 95th (ft)	1	0	2	4								
Control Delay (s)	0.8	0.0	9.4	10.1								
Lane LOS	A		A	B								
Approach Delay (s)	0.4		9.4	10.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			21.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	44	353	5	0	0	0	0	8	16	19	26	0
Future Volume (vph)	44	353	5	0	0	0	0	8	16	19	26	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	48	384	5	0	0	0	0	9	17	21	28	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	240	197	26	49								
Volume Left (vph)	48	0	0	21								
Volume Right (vph)	0	5	17	0								
Hadj (s)	0.13	0.02	-0.36	0.12								
Departure Headway (s)	4.8	4.7	4.6	5.0								
Degree Utilization, x	0.32	0.26	0.03	0.07								
Capacity (veh/h)	736	750	735	671								
Control Delay (s)	8.9	8.1	7.7	8.4								
Approach Delay (s)	8.6		7.7	8.4								
Approach LOS	A		A	A								
Intersection Summary												
Delay			8.5									
Level of Service			A									
Intersection Capacity Utilization			26.9%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

07/02/2018

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	57	191	10	44	0	59	0	38	33	0	0	0								
Future Volume (vph)	57	191	10	44	0	59	0	38	33	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	62	208	11	48	0	64	0	41	36	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	62	219	112	77																
Volume Left (vph)	62	0	48	0																
Volume Right (vph)	0	11	64	36																
Hadj (s)	0.53	0.00	-0.22	-0.25																
Departure Headway (s)	5.3	4.8	4.3	4.5																
Degree Utilization, x	0.09	0.29	0.13	0.10																
Capacity (veh/h)	667	738	812	736																
Control Delay (s)	7.6	8.5	7.9	8.0																
Approach Delay (s)	8.3		7.9	8.0																
Approach LOS	A		A	A																
Intersection Summary																				
Delay			8.2																	
Level of Service			A																	
Intersection Capacity Utilization			30.7%	ICU Level of Service					A											
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	2	25	20	6	18	25	126	12	8	131	11
Future Volume (Veh/h)	15	2	25	20	6	18	25	126	12	8	131	11
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	2	27	22	7	20	27	137	13	9	142	12
Pedestrians	7			7						1		
Lane Width (ft)	12.0			12.0						12.0		
Walking Speed (ft/s)	4.0			4.0						4.0		
Percent Blockage	1			1						0		
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			414		
pX, platoon unblocked												
vC, conflicting volume	320	384	84	322	384	83	161				157	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	320	384	84	322	384	83	161				157	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	97	100	97	96	99	98	98				99	
cM capacity (veh/h)	570	528	953	569	528	953	1407				1412	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	45	49	96	82	80	83						
Volume Left	16	22	27	0	9	0						
Volume Right	27	20	0	13	0	12						
cSH	748	672	1407	1700	1412	1700						
Volume to Capacity	0.06	0.07	0.02	0.05	0.01	0.05						
Queue Length 95th (ft)	5	6	1	0	0	0						
Control Delay (s)	10.1	10.8	2.3	0.0	0.9	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s)	10.1	10.8	1.2		0.4							
Approach LOS	B	B										
Intersection Summary												
Average Delay	2.9											
Intersection Capacity Utilization	26.6%			ICU Level of Service			A					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

18: Coast Hwy & Washington Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	1	13	3	0	3	10	140	8	2	146	10
Future Volume (Veh/h)	8	1	13	3	0	3	10	140	8	2	146	10
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	1	14	3	0	3	11	152	9	2	159	11
Pedestrians	11			7						12		
Lane Width (ft)	12.0			12.0						12.0		
Walking Speed (ft/s)	4.0			4.0						4.0		
Percent Blockage	1			1						1		
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							831			844		
pX, platoon unblocked												
vC, conflicting volume	292	370	96	284	370	100	181				168	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	292	370	96	284	370	100	181				168	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	99	100	98	100	100	100	99				100	
cM capacity (veh/h)	612	545	933	621	544	922	1379				1399	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	24	6	87	85	82	90						
Volume Left	9	3	11	0	2	0						
Volume Right	14	3	0	9	0	11						
cSH	761	742	1379	1700	1399	1700						
Volume to Capacity	0.03	0.01	0.01	0.05	0.00	0.05						
Queue Length 95th (ft)	2	1	1	0	0	0						
Control Delay (s)	9.9	9.9	1.0	0.0	0.2	0.0						
Lane LOS	A	A	A		A							
Approach Delay (s)	9.9	9.9	0.5		0.1							
Approach LOS	A	A										
Intersection Summary												
Average Delay				1.1								
Intersection Capacity Utilization				25.4%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	55	64	57	23	8	71	10	150	36	84	102	2
Future Volume (vph)	55	64	57	23	8	71	10	150	36	84	102	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	60	70	62	25	9	77	11	163	39	91	111	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	192	111	213	204								
Volume Left (vph)	60	25	11	91								
Volume Right (vph)	62	77	39	2								
Hadj (s)	-0.10	-0.34	-0.07	0.12								
Departure Headway (s)	5.0	4.9	4.9	5.1								
Degree Utilization, x	0.27	0.15	0.29	0.29								
Capacity (veh/h)	656	654	684	657								
Control Delay (s)	9.9	8.8	9.9	10.1								
Approach Delay (s)	9.9	8.8	9.9	10.1								
Approach LOS	A	A	A	B								
Intersection Summary												
Delay			9.8									
Level of Service			A									
Intersection Capacity Utilization			45.8%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	120	12	2	55	15	6	17	15	20	24	10
Future Volume (Veh/h)	7	120	12	2	55	15	6	17	15	20	24	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	130	13	2	60	16	7	18	16	22	26	11
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked												
vC, conflicting volume	90			150			256	254	144	264	252	83
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	90			150			256	254	144	264	252	83
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			99	97	98	97	96	99
cM capacity (veh/h)	1488			1423			651	634	899	643	636	964
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	151	78	41	59								
Volume Left	8	2	7	22								
Volume Right	13	16	16	11								
cSH	1488	1423	720	682								
Volume to Capacity	0.01	0.00	0.06	0.09								
Queue Length 95th (ft)	0	0	5	7								
Control Delay (s)	0.4	0.2	10.3	10.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.4	0.2	10.3	10.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.5									
Intersection Capacity Utilization			23.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

21: Coast Hwy & Wisconsin Ave

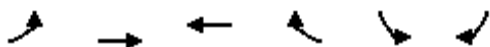
07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	34	53	88	95	28	29	43	115	68	18	127	11
Future Volume (vph)	34	53	88	95	28	29	43	115	68	18	127	11
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2			4.2		4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.91			0.97		1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1689			1759		1770	3342		1770	3497	
Flt Permitted	0.78	1.00			0.72		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1459	1689			1308		1770	3342		1770	3497	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	37	58	96	103	30	32	47	125	74	20	138	12
RTOR Reduction (vph)	0	81	0	0	18	0	0	40	0	0	7	0
Lane Group Flow (vph)	37	73	0	0	147	0	47	159	0	20	143	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	5.7	5.7			5.7		1.7	16.5		0.6	15.4	
Effective Green, g (s)	5.7	5.7			5.7		1.7	16.5		0.6	15.4	
Actuated g/C Ratio	0.16	0.16			0.16		0.05	0.46		0.02	0.43	
Clearance Time (s)	4.2	4.2			4.2		4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	232	268			208		84	1540		29	1504	
v/s Ratio Prot		0.04					c0.03	c0.05		0.01	0.04	
v/s Ratio Perm	0.03				c0.11							
v/c Ratio	0.16	0.27			0.70		0.56	0.10		0.69	0.10	
Uniform Delay, d1	13.0	13.2			14.3		16.7	5.5		17.5	6.1	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.3	0.6			10.3		7.9	0.0		51.3	0.0	
Delay (s)	13.3	13.8			24.6		24.5	5.5		68.8	6.1	
Level of Service	B	B			C		C	A		E	A	
Approach Delay (s)		13.7			24.6			9.1			13.5	
Approach LOS		B			C			A			B	
Intersection Summary												
HCM 2000 Control Delay			14.5				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.29									
Actuated Cycle Length (s)			35.8				Sum of lost time (s)			13.0		
Intersection Capacity Utilization			42.7%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

07/02/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↕	↕		↕	
Traffic Volume (veh/h)	19	202	195	12	38	34
Future Volume (Veh/h)	19	202	195	12	38	34
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	220	212	13	41	37
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	233				490	228
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	233				490	228
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				92	95
cM capacity (veh/h)	1326				525	806
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	241	225	78			
Volume Left	21	0	41			
Volume Right	0	13	37			
cSH	1326	1700	629			
Volume to Capacity	0.02	0.13	0.12			
Queue Length 95th (ft)	1	0	11			
Control Delay (s)	0.8	0.0	11.5			
Lane LOS	A		B			
Approach Delay (s)	0.8	0.0	11.5			
Approach LOS			B			
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			37.6%		ICU Level of Service	
Analysis Period (min)			15		A	

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	203	9	20	192	9	6	4	13	29	1	5
Future Volume (Veh/h)	6	203	9	20	192	9	6	4	13	29	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	221	10	22	209	10	7	4	14	32	1	5
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	221			231			506	505	226	516	505	218
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	221			231			506	505	226	516	505	218
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			98	99	98	93	100	99
cM capacity (veh/h)	1346			1337			464	459	813	450	459	819
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	238	241	25	38								
Volume Left	7	22	7	32								
Volume Right	10	10	14	5								
cSH	1346	1337	610	478								
Volume to Capacity	0.01	0.02	0.04	0.08								
Queue Length 95th (ft)	0	1	3	6								
Control Delay (s)	0.3	0.8	11.2	13.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.8	11.2	13.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization			32.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	103	180	65	131	0	97	0	33	0	2	0
Future Volume (vph)	0	103	180	65	131	0	97	0	33	0	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	112	196	71	142	0	105	0	36	0	2	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	308	213	141	2								
Volume Left (vph)	0	71	105	0								
Volume Right (vph)	196	0	36	0								
Hadj (s)	-0.35	0.10	0.03	0.03								
Departure Headway (s)	4.2	4.7	5.1	5.3								
Degree Utilization, x	0.36	0.28	0.20	0.00								
Capacity (veh/h)	828	728	647	588								
Control Delay (s)	9.5	9.5	9.4	8.4								
Approach Delay (s)	9.5	9.5	9.4	8.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.5								
Level of Service				A								
Intersection Capacity Utilization				51.9%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	48	65	99	30	77	119
Future Volume (vph)	48	65	99	30	77	119
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	71	108	33	84	129
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	123	141	213			
Volume Left (vph)	52	0	84			
Volume Right (vph)	71	33	0			
Hadj (s)	-0.23	-0.11	0.11			
Departure Headway (s)	4.5	4.3	4.5			
Degree Utilization, x	0.15	0.17	0.26			
Capacity (veh/h)	743	797	775			
Control Delay (s)	8.3	8.2	9.1			
Approach Delay (s)	8.3	8.2	9.1			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.6			
Level of Service			A			
Intersection Capacity Utilization			34.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	211	2	11	170	50	11	15	20	50	24	11
Future Volume (Veh/h)	9	211	2	11	170	50	11	15	20	50	24	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	229	2	12	185	54	12	16	22	54	26	12
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					253							
pX, platoon unblocked	0.94						0.94	0.94		0.94	0.94	0.94
vC, conflicting volume	242			242			526	527	249	527	501	219
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	159			242			462	463	249	463	435	134
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			97	96	97	88	94	99
cM capacity (veh/h)	1329			1312			437	452	777	438	469	853
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	241	251	50	92								
Volume Left	10	12	12	54								
Volume Right	2	54	22	12								
cSH	1329	1312	549	477								
Volume to Capacity	0.01	0.01	0.09	0.19								
Queue Length 95th (ft)	1	1	7	18								
Control Delay (s)	0.4	0.5	12.2	14.3								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.4	0.5	12.2	14.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			33.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗	↗	↖	↖↗		↖	↖↗	
Traffic Volume (vph)	19	120	69	86	121	70	36	159	46	76	201	14
Future Volume (vph)	19	120	69	86	121	70	36	159	46	76	201	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.97	1.00	1.00	0.96	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1850	1534	1681	1764	1522	1770	3407		1770	3491	
Flt Permitted		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1850	1534	1681	1764	1522	1770	3407		1770	3491	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	130	75	93	132	76	39	173	50	83	218	15
RTOR Reduction (vph)	0	0	65	0	0	65	0	31	0	0	5	0
Lane Group Flow (vph)	0	151	10	84	141	11	39	192	0	83	228	0
Confl. Peds. (#/hr)	14		10	10		14			3			15
Confl. Bikes (#/hr)			4			5			3			3
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		10.9	10.9	12.1	12.1	12.1	6.0	26.8		11.4	32.2	
Effective Green, g (s)		10.9	10.9	12.1	12.1	12.1	6.0	26.8		11.4	32.2	
Actuated g/C Ratio		0.14	0.14	0.15	0.15	0.15	0.08	0.34		0.14	0.40	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)		252	209	254	266	230	132	1141		252	1405	
v/s Ratio Prot		c0.08		0.05	c0.08		0.02	0.06		c0.05	c0.07	
v/s Ratio Perm			0.01			0.01						
v/c Ratio		0.60	0.05	0.33	0.53	0.05	0.30	0.17		0.33	0.16	
Uniform Delay, d1		32.5	30.0	30.3	31.3	29.0	35.0	18.7		30.9	15.3	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.5	0.0	0.9	2.3	0.1	0.5	0.3		0.3	0.2	
Delay (s)		35.0	30.1	31.2	33.6	29.1	35.5	19.1		31.1	15.5	
Level of Service		D	C	C	C	C	D	B		C	B	
Approach Delay (s)		33.4			31.8			21.5			19.6	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			26.2									
HCM 2000 Volume to Capacity ratio			0.35									
Actuated Cycle Length (s)			80.0									
Intersection Capacity Utilization			56.4%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	281	0	27	362	77	13	11	57	238	17	43
Future Volume (vph)	11	281	0	27	362	77	13	11	57	238	17	43
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.96
Flpb, ped/bikes	1.00	1.00		0.99	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.97			0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.96	1.00
Satd. Flow (prot)	1770	3539		1754	3436			3104			1778	1527
Flt Permitted	0.38	1.00		0.57	1.00			0.91			0.67	1.00
Satd. Flow (perm)	717	3539		1045	3436			2852			1254	1527
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	305	0	29	393	84	14	12	62	259	18	47
RTOR Reduction (vph)	0	0	0	0	44	0	0	25	0	0	0	19
Lane Group Flow (vph)	12	305	0	29	433	0	0	63	0	0	277	28
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	12.3	12.3		12.3	12.3			33.2			33.2	33.2
Effective Green, g (s)	12.3	12.3		12.3	12.3			33.2			33.2	33.2
Actuated g/C Ratio	0.22	0.22		0.22	0.22			0.60			0.60	0.60
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	160	791		233	768			1721			756	921
v/s Ratio Prot		0.09			c0.13							
v/s Ratio Perm	0.02			0.03				0.02			c0.22	0.02
v/c Ratio	0.07	0.39		0.12	0.56			0.04			0.37	0.03
Uniform Delay, d1	16.9	18.1		17.0	19.0			4.4			5.5	4.4
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.2	0.3		0.2	1.0			0.0			1.4	0.1
Delay (s)	17.1	18.5		17.3	19.9			4.5			6.9	4.5
Level of Service	B	B		B	B			A			A	A
Approach Delay (s)		18.4			19.8			4.5			6.6	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		14.9			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.42										
Actuated Cycle Length (s)		55.0			Sum of lost time (s)			9.5				
Intersection Capacity Utilization		59.5%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Traffic Volume (vph)	25	16	17	41	10	156	3	226	82	130	305	17
Future Volume (vph)	25	16	17	41	10	156	3	226	82	130	305	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.96			1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected		0.98			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1737			1786	1550	1770	3371		1770	3506	
Flt Permitted		0.90			0.80	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1596			1495	1550	1770	3371		1770	3506	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	17	18	45	11	170	3	246	89	141	332	18
RTOR Reduction (vph)	0	11	0	0	0	103	0	76	0	0	6	0
Lane Group Flow (vph)	0	51	0	0	56	67	3	259	0	141	344	0
Confl. Peds. (#/hr)	10		4	4		10			3			4
Confl. Bikes (#/hr)			1						2			3
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		27.6			27.6	27.6	0.8	10.3		18.4	27.9	
Effective Green, g (s)		27.6			27.6	27.6	0.8	10.3		18.4	27.9	
Actuated g/C Ratio		0.39			0.39	0.39	0.01	0.15		0.26	0.40	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		629			589	611	20	496		465	1397	
v/s Ratio Prot							0.00	c0.08		c0.08	0.10	
v/s Ratio Perm		0.03			0.04	c0.04						
v/c Ratio		0.08			0.10	0.11	0.15	0.52		0.30	0.25	
Uniform Delay, d1		13.3			13.3	13.4	34.3	27.6		20.7	14.0	
Progression Factor		1.00			1.00	1.00	0.99	1.03		1.00	1.00	
Incremental Delay, d2		0.3			0.3	0.4	3.5	1.0		0.4	0.1	
Delay (s)		13.5			13.7	13.8	37.4	29.5		21.0	14.1	
Level of Service		B			B	B	D	C		C	B	
Approach Delay (s)		13.5			13.8			29.5			16.1	
Approach LOS		B			B			C			B	
Intersection Summary												
HCM 2000 Control Delay		19.6										
HCM 2000 Volume to Capacity ratio		0.25										
Actuated Cycle Length (s)		70.0										
Intersection Capacity Utilization		58.0%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	183	53	81	158	0	45	0	67	0	0	0
Future Volume (Veh/h)	0	183	53	81	158	0	45	0	67	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	199	58	88	172	0	49	0	73	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	252											
pX, platoon unblocked												
vC, conflicting volume	172			257			576	576	228	649	605	172
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	172			257			576	576	228	649	605	172
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			88	100	91	100	100	100
cM capacity (veh/h)	1405			1308			406	399	811	330	384	872
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	257	260	122	0								
Volume Left	0	88	49	0								
Volume Right	58	0	73	0								
cSH	1405	1308	579	1700								
Volume to Capacity	0.00	0.07	0.21	0.00								
Queue Length 95th (ft)	0	5	20	0								
Control Delay (s)	0.0	3.1	12.9	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	3.1	12.9	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			3.7									
Intersection Capacity Utilization			42.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	75	16	4	54	3	28	0	11	3	0	3
Future Volume (Veh/h)	3	75	16	4	54	3	28	0	11	3	0	3
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	82	17	4	59	3	30	0	12	3	0	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	643											
pX, platoon unblocked												
vC, conflicting volume	62			99			168	166	90	177	174	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	62			99			168	166	90	177	174	60
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			96	100	99	100	100	100
cM capacity (veh/h)	1541			1494			791	723	967	773	716	1005
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	102	66	42	6								
Volume Left	3	4	30	3								
Volume Right	17	3	12	3								
cSH	1541	1494	834	874								
Volume to Capacity	0.00	0.00	0.05	0.01								
Queue Length 95th (ft)	0	0	4	1								
Control Delay (s)	0.2	0.5	9.5	9.1								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.2	0.5	9.5	9.1								
Approach LOS			A	A								
Intersection Summary												
Average Delay				2.4								
Intersection Capacity Utilization				15.8%	ICU Level of Service			A				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	33	107	13	33	133	13
Future Volume (vph)	33	107	13	33	133	13
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	116	14	36	145	14
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	152	50	159			
Volume Left (vph)	36	0	145			
Volume Right (vph)	116	36	0			
Hadj (s)	-0.38	-0.40	0.22			
Departure Headway (s)	4.0	4.0	4.5			
Degree Utilization, x	0.17	0.06	0.20			
Capacity (veh/h)	857	850	765			
Control Delay (s)	7.8	7.2	8.6			
Approach Delay (s)	7.8	7.2	8.6			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.1			
Level of Service			A			
Intersection Capacity Utilization			29.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	206	129	25	137	5	98	13	25	22	16	7
Future Volume (Veh/h)	5	206	129	25	137	5	98	13	25	22	16	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	224	140	27	149	5	107	14	27	24	17	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	576											
pX, platoon unblocked												
vC, conflicting volume	154			364			526	512	294	544	580	152
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	154			364			526	512	294	544	580	152
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			75	97	96	94	96	99
cM capacity (veh/h)	1426			1195			435	453	745	415	415	895
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	369	181	148	49								
Volume Left	5	27	107	24								
Volume Right	140	5	27	8								
cSH	1426	1195	473	455								
Volume to Capacity	0.00	0.02	0.31	0.11								
Queue Length 95th (ft)	0	2	33	9								
Control Delay (s)	0.1	1.4	16.0	13.9								
Lane LOS	A	A	C	B								
Approach Delay (s)	0.1	1.4	16.0	13.9								
Approach LOS			C	B								
Intersection Summary												
Average Delay				4.5								
Intersection Capacity Utilization				41.0%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	130	8	6	81	11	2	3	16	4	4	3
Future Volume (Veh/h)	0	130	8	6	81	11	2	3	16	4	4	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	141	9	7	88	12	2	3	17	4	4	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	249											
pX, platoon unblocked												
vC, conflicting volume	100			150			258	260	146	272	258	94
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	100			150			258	260	146	272	258	94
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	98	99	99	100
cM capacity (veh/h)	1493			1431			686	642	902	663	643	963
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	150	107	22	11								
Volume Left	0	7	2	4								
Volume Right	9	12	17	3								
cSH	1493	1431	832	716								
Volume to Capacity	0.00	0.00	0.03	0.02								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.0	0.5	9.4	10.1								
Lane LOS		A	A	B								
Approach Delay (s)	0.0	0.5	9.4	10.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay	1.3											
Intersection Capacity Utilization	19.9%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	51	41	42	24	8	52	159	15	19	175	10
Future Volume (vph)	49	51	41	42	24	8	52	159	15	19	175	10
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.96			0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.98			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1758			1784		1770	3494		1770	3510	
Flt Permitted		0.88			0.71		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1573			1299		1770	3494		1770	3510	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	53	55	45	46	26	9	57	173	16	21	190	11
RTOR Reduction (vph)	0	24	0	0	8	0	0	6	0	0	4	0
Lane Group Flow (vph)	0	129	0	0	73	0	57	183	0	21	197	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		10.9			10.5		8.8	42.5		2.0	36.5	
Effective Green, g (s)		10.9			10.5		8.8	42.5		2.0	36.5	
Actuated g/C Ratio		0.16			0.15		0.13	0.61		0.03	0.52	
Clearance Time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.5		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		244			194		222	2121		50	1830	
v/s Ratio Prot							c0.03	0.05		c0.01	c0.06	
v/s Ratio Perm		c0.08			0.06							
v/c Ratio		0.53			0.38		0.26	0.09		0.42	0.11	
Uniform Delay, d1		27.2			26.8		27.6	5.7		33.4	8.5	
Progression Factor		1.00			1.00		1.00	1.00		1.32	1.43	
Incremental Delay, d2		2.0			1.5		0.2	0.1		5.6	0.1	
Delay (s)		29.2			28.3		27.9	5.8		49.8	12.3	
Level of Service		C			C		C	A		D	B	
Approach Delay (s)		29.2			28.3			10.9			15.8	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			18.5				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.22									
Actuated Cycle Length (s)			70.0				Sum of lost time (s)			15.0		
Intersection Capacity Utilization			37.3%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	35	398	28	37	225	32	11	39	31	25	33	40
Future Volume (Veh/h)	35	398	28	37	225	32	11	39	31	25	33	40
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	38	433	30	40	245	35	12	42	34	27	36	43
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		280										
pX, platoon unblocked												
vC, conflicting volume	280			463			928	884	448	922	882	262
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	280			463			928	884	448	922	882	262
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			96			94	84	94	86	87	94
cM capacity (veh/h)	1283			1098			200	266	611	198	267	776
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	501	320	88	106								
Volume Left	38	40	12	27								
Volume Right	30	35	34	43								
cSH	1283	1098	322	324								
Volume to Capacity	0.03	0.04	0.27	0.33								
Queue Length 95th (ft)	2	3	27	35								
Control Delay (s)	0.9	1.4	20.4	21.4								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.9	1.4	20.4	21.4								
Approach LOS			C	C								
Intersection Summary												
Average Delay			4.9									
Intersection Capacity Utilization			45.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	75	17	10	46	1	13	17	23	5	9	3
Future Volume (vph)	2	75	17	10	46	1	13	17	23	5	9	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	82	18	11	50	1	14	18	25	5	10	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	102	62	57	18								
Volume Left (vph)	2	11	14	5								
Volume Right (vph)	18	1	25	3								
Hadj (s)	-0.07	0.06	-0.18	-0.01								
Departure Headway (s)	4.1	4.2	4.1	4.3								
Degree Utilization, x	0.11	0.07	0.06	0.02								
Capacity (veh/h)	865	830	837	798								
Control Delay (s)	7.6	7.6	7.4	7.4								
Approach Delay (s)	7.6	7.6	7.4	7.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.5								
Level of Service				A								
Intersection Capacity Utilization				18.5%	ICU Level of Service		A					
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	6	106	4	28	48	16	4	51	116	127	9	6
Future Volume (vph)	6	106	4	28	48	16	4	51	116	127	9	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	115	4	30	52	17	4	55	126	138	10	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	126	99	185	155								
Volume Left (vph)	7	30	4	138								
Volume Right (vph)	4	17	126	7								
Hadj (s)	0.03	-0.01	-0.37	0.18								
Departure Headway (s)	4.9	4.9	4.3	4.9								
Degree Utilization, x	0.17	0.13	0.22	0.21								
Capacity (veh/h)	682	679	788	694								
Control Delay (s)	8.9	8.6	8.5	9.2								
Approach Delay (s)	8.9	8.6	8.5	9.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.8								
Level of Service				A								
Intersection Capacity Utilization				39.6%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	78	41	17	92	83
Future Volume (vph)	0	78	41	17	92	83
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	85	45	18	100	90
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	85	63	190			
Volume Left (vph)	0	0	100			
Volume Right (vph)	85	18	0			
Hadj (s)	-0.57	-0.14	0.14			
Departure Headway (s)	3.9	4.1	4.3			
Degree Utilization, x	0.09	0.07	0.23			
Capacity (veh/h)	868	837	822			
Control Delay (s)	7.3	7.5	8.5			
Approach Delay (s)	7.3	7.5	8.5			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.0			
Level of Service			A			
Intersection Capacity Utilization			19.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	166	51	285	68	246	37	142	136	208	200	8
Future Volume (vph)	20	166	51	285	68	246	37	142	136	208	200	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97		1.00	0.99	1.00	0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.93		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1540		1790	1562	1770	3218		1770	3511	
Flt Permitted	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1540		1790	1562	1770	3218		1770	3511	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	180	55	310	74	267	40	154	148	226	217	9
RTOR Reduction (vph)	0	0	48	0	0	147	0	117	0	0	3	0
Lane Group Flow (vph)	22	180	7	0	384	120	40	185	0	226	223	0
Confl. Peds. (#/hr)	7		2	2		7			5			8
Confl. Bikes (#/hr)						2			4			8
Turn Type	Split	NA	Perm	Split	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	1	5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	11.6	11.6	11.6		24.8	40.5	7.2	18.8		15.7	27.3	
Effective Green, g (s)	11.6	11.6	11.6		24.8	40.5	7.2	18.8		15.7	27.3	
Actuated g/C Ratio	0.13	0.13	0.13		0.28	0.45	0.08	0.21		0.17	0.30	
Clearance Time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	228	240	198		493	702	141	672		308	1065	
v/s Ratio Prot	0.01	c0.10			c0.21	0.03	0.02	c0.06		c0.13	0.06	
v/s Ratio Perm			0.00			0.05						
v/c Ratio	0.10	0.75	0.04		0.78	0.17	0.28	0.28		0.73	0.21	
Uniform Delay, d1	34.6	37.8	34.3		30.1	14.7	39.0	29.9		35.2	23.3	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	11.1	0.0		7.6	0.0	0.4	1.0		7.6	0.4	
Delay (s)	34.6	48.9	34.3		37.7	14.8	39.4	30.9		42.7	23.8	
Level of Service	C	D	C		D	B	D	C		D	C	
Approach Delay (s)		44.5			28.3			31.9			33.3	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			32.8									
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			90.0									
Intersection Capacity Utilization			72.2%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St & Vista Way

07/02/2018

															
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR			
Lane Configurations															
Traffic Volume (veh/h)	17	601	3	8	896	105	0	0	14	58	0	63			
Future Volume (Veh/h)	17	601	3	8	896	105	0	0	14	58	0	63			
Sign Control		Free			Free			Stop			Stop				
Grade		0%			0%			0%			0%				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Hourly flow rate (vph)	18	653	3	9	974	114	0	0	15	63	0	68			
Pedestrians															
Lane Width (ft)															
Walking Speed (ft/s)															
Percent Blockage															
Right turn flare (veh)															
Median type	None			TWLTL											
Median storage veh				2											
Upstream signal (ft)	279														
pX, platoon unblocked				0.91			0.91			0.91	0.91	0.91			
vC, conflicting volume	1088				656			1808			1796	654	1754	1741	1031
vC1, stage 1 conf vol							690			690	1049			1049	
vC2, stage 2 conf vol							1117			1106	706			692	
vCu, unblocked vol	1088				571			1838			1826	570	1780	1765	1031
tC, single (s)	4.1				4.1			7.1			6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1			5.5	6.1			5.5	
tF (s)	2.2				2.2			3.5			4.0	3.3	3.5	4.0	3.3
p0 queue free %	97				99			100			100	97	72	100	76
cM capacity (veh/h)	641				910			157			228	474	223	248	283
Direction, Lane #	EB 1	WB 1	NB 1	SB 1											
Volume Total	674	1097	15	131											
Volume Left	18	9	0	63											
Volume Right	3	114	15	68											
cSH	641	910	474	251											
Volume to Capacity	0.03	0.01	0.03	0.52											
Queue Length 95th (ft)	2	1	2	69											
Control Delay (s)	0.8	0.3	12.8	34.0											
Lane LOS	A	A	B	D											
Approach Delay (s)	0.8	0.3	12.8	34.0											
Approach LOS				B	D										
Intersection Summary															
Average Delay				2.9											
Intersection Capacity Utilization				77.5%	ICU Level of Service			D							
Analysis Period (min)				15											

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

07/02/2018

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (veh/h)	5	695	4	11	1095	12	4	2	24	14	2	7		
Future Volume (Veh/h)	5	695	4	11	1095	12	4	2	24	14	2	7		
Sign Control	Free			Free			Stop			Stop				
Grade	0%			0%			0%			0%				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	5	755	4	12	1190	13	4	2	26	15	2	8		
Pedestrians	1						1							
Lane Width (ft)	12.0						12.0							
Walking Speed (ft/s)	4.0						4.0							
Percent Blockage	0						0							
Right turn flare (veh)														
Median type	TWLTL			TWLTL										
Median storage veh	2			2										
Upstream signal (ft)	687													
pX, platoon unblocked				0.93				0.93	0.93	0.93	0.93	0.93		
vC, conflicting volume	1203				760				1992	1995	758	2012	1990	1198
vC1, stage 1 conf vol							768	768				1220	1220	
vC2, stage 2 conf vol							1224	1227				792	770	
vCu, unblocked vol	1203				702				2031	2034	700	2053	2029	1198
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5				6.1	5.5	
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99				99				98	99	94	92	99	96
cM capacity (veh/h)	580				829				176	206	407	179	209	226
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1								
Volume Total	5	759	12	1203	32	25								
Volume Left	5	0	12	0	4	15								
Volume Right	0	4	0	13	26	8								
cSH	580	1700	829	1700	332	194								
Volume to Capacity	0.01	0.45	0.01	0.71	0.10	0.13								
Queue Length 95th (ft)	1	0	1	0	8	11								
Control Delay (s)	11.3	0.0	9.4	0.0	17.0	26.2								
Lane LOS	B		A		C	D								
Approach Delay (s)	0.1		0.1		17.0	26.2								
Approach LOS					C	D								
Intersection Summary														
Average Delay				0.7										
Intersection Capacity Utilization				69.3%	ICU Level of Service				C					
Analysis Period (min)				15										

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	758	2	13	978	162	0	0	11	0	0	27
Future Volume (Veh/h)	34	758	2	13	978	162	0	0	11	0	0	27
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	37	824	2	14	1063	176	0	0	12	0	0	29
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL				TWLTL							
Median storage veh	2				2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1239			826			2019	2166	825	2089	2079	1151
vC1, stage 1 conf vol							899	899		1179	1179	
vC2, stage 2 conf vol							1120	1267		910	900	
vCu, unblocked vol	1239			826			2019	2166	825	2089	2079	1151
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			98			100	100	97	100	100	88
cM capacity (veh/h)	562			805			154	170	372	175	201	241
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	37	826	14	1239	12	29						
Volume Left	37	0	14	0	0	0						
Volume Right	0	2	0	176	12	29						
cSH	562	1700	805	1700	372	241						
Volume to Capacity	0.07	0.49	0.02	0.73	0.03	0.12						
Queue Length 95th (ft)	5	0	1	0	2	10						
Control Delay (s)	11.9	0.0	9.6	0.0	15.0	22.0						
Lane LOS	B		A		B	C						
Approach Delay (s)	0.5		0.1		15.0	22.0						
Approach LOS					B	C						
Intersection Summary												
Average Delay				0.6								
Intersection Capacity Utilization				78.0%	ICU Level of Service				D			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

07/02/2018

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Traffic Volume (veh/h)	0	0	94	0	0	10	40	238	4	7	538	14								
Future Volume (Veh/h)	0	0	94	0	0	10	40	238	4	7	538	14								
Sign Control	Stop				Stop				Free											
Grade	0%				0%				0%											
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	0	0	102	0	0	11	43	259	4	8	585	15								
Pedestrians																				
Lane Width (ft)																				
Walking Speed (ft/s)																				
Percent Blockage																				
Right turn flare (veh)																				
Median type							TWLTL		TWLTL											
Median storage veh							2		2											
Upstream signal (ft)									621											
pX, platoon unblocked	0.93	0.93	0.93	0.93	0.93	0.93														
vC, conflicting volume	835	958	592	1050	963	132	600	263												
vC1, stage 1 conf vol	608	608	347		347															
vC2, stage 2 conf vol	226	349	703		616															
vCu, unblocked vol	783	915	521	1015	921	132	529	263												
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1	4.1												
tC, 2 stage (s)	6.5	5.5	6.5		5.5															
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2												
p0 queue free %	100	100	78	100	100	99	96	99												
cM capacity (veh/h)	420	418	464	252	392	894	959	1298												
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2													
Volume Total	102	11	43	173	90	8	600													
Volume Left	0	0	43	0	0	8	0													
Volume Right	102	11	0	0	4	0	15													
cSH	464	894	959	1700	1700	1298	1700													
Volume to Capacity	0.22	0.01	0.04	0.10	0.05	0.01	0.35													
Queue Length 95th (ft)	21	1	4	0	0	0	0													
Control Delay (s)	14.9	9.1	8.9	0.0	0.0	7.8	0.0													
Lane LOS	B	A	A					A												
Approach Delay (s)	14.9	9.1	1.3					0.1												
Approach LOS	B	A																		
Intersection Summary																				
Average Delay			2.0																	
Intersection Capacity Utilization			41.7%	ICU Level of Service				A												
Analysis Period (min)			15																	

HCM Signalized Intersection Capacity Analysis

45: Coast Hwy & Michigan Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	3	11	15	4	2	7	149	2	2	146	8
Future Volume (vph)	24	3	11	15	4	2	7	149	2	2	146	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5		4.5			4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00		0.95			0.95	
Frt		1.00	0.85		1.00	0.85		1.00			0.99	
Flt Protected		0.96	1.00		0.96	1.00		1.00			1.00	
Satd. Flow (prot)		1783	1583		1791	1583		3525			3509	
Flt Permitted		1.00	1.00		1.00	1.00		0.95			0.95	
Satd. Flow (perm)		1863	1583		1863	1583		3344			3348	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	3	12	16	4	2	8	162	2	2	159	9
RTOR Reduction (vph)	0	0	11	0	0	2	0	1	0	0	2	0
Lane Group Flow (vph)	0	29	1	0	20	0	0	171	0	0	168	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		3.0	3.0		3.0	3.0		33.0			33.0	
Effective Green, g (s)		3.0	3.0		3.0	3.0		33.0			33.0	
Actuated g/C Ratio		0.07	0.07		0.07	0.07		0.73			0.73	
Clearance Time (s)		4.5	4.5		4.5	4.5		4.5			4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		124	105		124	105		2452			2455	
v/s Ratio Prot												
v/s Ratio Perm		c0.02	0.00		0.01	0.00		c0.05			0.05	
v/c Ratio		0.23	0.01		0.16	0.00		0.07			0.07	
Uniform Delay, d1		19.9	19.6		19.8	19.6		1.7			1.7	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		1.0	0.0		0.6	0.0		0.1			0.1	
Delay (s)		20.9	19.6		20.4	19.6		1.7			1.7	
Level of Service		C	B		C	B		A			A	
Approach Delay (s)		20.5			20.4			1.7			1.7	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			4.7									
HCM 2000 Level of Service											A	
HCM 2000 Volume to Capacity ratio			0.08									
Actuated Cycle Length (s)			45.0								9.0	
Intersection Capacity Utilization			25.0%								A	
ICU Level of Service												
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

46: Coast Hwy

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	2	5	6	2	9	5	91	6	9	91	7
Future Volume (Veh/h)	7	2	5	6	2	9	5	91	6	9	91	7
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	2	5	7	2	10	5	99	7	10	99	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							836			1100		
pX, platoon unblocked												
vC, conflicting volume	194	239	54	188	240	53	107				106	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	194	239	54	188	240	53	107				106	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	99	100	100	99	100	99	100				99	
cM capacity (veh/h)	734	654	1002	744	654	1003	1482				1483	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	15	19	54	56	60	58						
Volume Left	8	7	5	0	10	0						
Volume Right	5	10	0	7	0	8						
cSH	792	847	1482	1700	1483	1700						
Volume to Capacity	0.02	0.02	0.00	0.03	0.01	0.03						
Queue Length 95th (ft)	1	2	0	0	1	0						
Control Delay (s)	9.6	9.3	0.7	0.0	1.3	0.0						
Lane LOS	A	A	A		A							
Approach Delay (s)	9.6	9.3	0.3		0.7							
Approach LOS	A	A										
Intersection Summary												
Average Delay				1.7								
Intersection Capacity Utilization				17.2%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

47: Coast Hwy

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	19	22	11	15	25	11	76	11	21	65	22
Future Volume (Veh/h)	8	19	22	11	15	25	11	76	11	21	65	22
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	21	24	12	16	27	12	83	12	23	71	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage (veh)												
Upstream signal (ft)	538								726			
pX, platoon unblocked												
vC, conflicting volume	230	248	48	229	254	48	95	95				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	230	248	48	229	254	48	95	95				
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	99	97	98	98	97	97	99	98				
cM capacity (veh/h)	662	638	1011	661	633	1011	1497	1497				
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	54	55	54	54	58	60						
Volume Left	9	12	12	0	23	0						
Volume Right	24	27	0	12	0	24						
cSH	769	784	1497	1700	1497	1700						
Volume to Capacity	0.07	0.07	0.01	0.03	0.02	0.04						
Queue Length 95th (ft)	6	6	1	0	1	0						
Control Delay (s)	10.0	9.9	1.7	0.0	3.0	0.0						
Lane LOS	B	A	A		A							
Approach Delay (s)	10.0	9.9	0.9		1.5							
Approach LOS	B	A										
Intersection Summary												
Average Delay	4.1											
Intersection Capacity Utilization	18.8%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	150	7	33	7	66	8	22	737	18
Future Volume (veh/h)	0	0	0	150	7	33	7	66	8	22	737	18
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h				169	0	0	8	72	0	24	801	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				1135	0	507	142	1831	570	142	1274	570
Arrive On Green				0.32	0.00	0.00	0.08	0.36	0.00	0.08	0.36	0.00
Sat Flow, veh/h				3548	0	1583	1774	5085	1583	1774	3539	1583
Grp Volume(v), veh/h				169	0	0	8	72	0	24	801	0
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1695	1583	1774	1770	1583
Q Serve(g_s), s				1.7	0.0	0.0	0.2	0.5	0.0	0.6	9.4	0.0
Cycle Q Clear(g_c), s				1.7	0.0	0.0	0.2	0.5	0.0	0.6	9.4	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				1135	0	507	142	1831	570	142	1274	570
V/C Ratio(X)				0.15	0.00	0.00	0.06	0.04	0.00	0.17	0.63	0.00
Avail Cap(c_a), veh/h				1135	0	507	142	1831	570	142	1274	570
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				12.1	0.0	0.0	21.3	10.4	0.0	21.5	13.2	0.0
Incr Delay (d2), s/veh				0.3	0.0	0.0	0.8	0.0	0.0	2.6	2.4	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.9	0.0	0.0	0.1	0.2	0.0	0.4	5.0	0.0
LnGrp Delay(d),s/veh				12.4	0.0	0.0	22.0	10.4	0.0	24.0	15.6	0.0
LnGrp LOS				B			C	B		C	B	
Approach Vol, veh/h					169			80			825	
Approach Delay, s/veh					12.4			11.6			15.8	
Approach LOS					B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	8.0	22.0			8.0	22.0		20.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	18.0			4.0	18.0		16.0				
Max Q Clear Time (g_c+I1), s	2.6	2.5			2.2	11.4		3.7				
Green Ext Time (p_c), s	0.0	0.3			0.0	2.9		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				15.0								
HCM 2010 LOS				B								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↑	↑↑	↑↑					
Traffic Volume (veh/h)	451	157	423	921	0	0			
Future Volume (veh/h)	451	157	423	921	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863					
Adj Flow Rate, veh/h	490	171	460	1001					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	1681	752	1119	3185					
Arrive On Green	0.47	0.47	0.32	0.90					
Sat Flow, veh/h	3632	1583	3442	3632					
Grp Volume(v), veh/h	490	171	460	1001					
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1770					
Q Serve(g_s), s	3.4	2.5	4.2	1.6					
Cycle Q Clear(g_c), s	3.4	2.5	4.2	1.6					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	1681	752	1119	3185					
V/C Ratio(X)	0.29	0.23	0.41	0.31					
Avail Cap(c_a), veh/h	1681	752	1119	3185					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	6.4	6.2	10.5	0.3					
Incr Delay (d2), s/veh	0.4	0.7	1.1	0.3					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	1.7	1.2	2.2	0.8					
LnGrp Delay(d),s/veh	6.8	6.9	11.6	0.5					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	661			1461					
Approach Delay, s/veh	6.8			4.0					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			17.0	23.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			13.0	19.0				36.0	
Max Q Clear Time (g_c+l1), s			6.2	5.4				3.6	
Green Ext Time (p_c), s			1.0	3.3				8.7	
Intersection Summary									
HCM 2010 Ctrl Delay			4.9						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/11/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↖	↑↑	↖	↗		
Traffic Volume (veh/h)	611	60	727	1882	60	1		
Future Volume (veh/h)	611	60	727	1882	60	1		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	664	65	790	2046	65	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	944	422	918	2124	473	422		
Arrive On Green	0.27	0.27	0.27	0.60	0.27	0.00		
Sat Flow, veh/h	3632	1583	3442	3632	1774	1583		
Grp Volume(v), veh/h	664	65	790	2046	65	0		
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1770	1774	1583		
Q Serve(g_s), s	10.2	1.9	13.1	32.9	1.7	0.0		
Cycle Q Clear(g_c), s	10.2	1.9	13.1	32.9	1.7	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	944	422	918	2124	473	422		
V/C Ratio(X)	0.70	0.15	0.86	0.96	0.14	0.00		
Avail Cap(c_a), veh/h	944	422	918	2124	473	422		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	19.9	16.8	20.9	11.4	16.7	0.0		
Incr Delay (d2), s/veh	4.4	0.8	10.4	12.6	0.6	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.5	0.9	7.5	19.4	0.9	0.0		
LnGrp Delay(d),s/veh	24.2	17.6	31.3	24.0	17.4	0.0		
LnGrp LOS	C	B	C	C	B			
Approach Vol, veh/h	729			2836	65			
Approach Delay, s/veh	23.6			26.1	17.4			
Approach LOS	C			C	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	20.0	20.0				40.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	16.0	16.0				36.0
Max Q Clear Time (g_c+I1), s		3.7	15.1	12.2				34.9
Green Ext Time (p_c), s		0.1	0.4	1.7				1.0
Intersection Summary								
HCM 2010 Ctrl Delay			25.4					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary

51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	310	4	99	538	190	10	0	119	24	34	35
Future Volume (veh/h)	0	310	4	99	538	190	10	0	119	24	34	35
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	1863	1863	0	1863	1863	1863	1863
Adj Flow Rate, veh/h	0	337	4	108	585	0	11	0	129	26	37	38
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1102	13	273	1906	853	0	0	0	546	573	487
Arrive On Green	0.00	0.31	0.31	0.15	0.54	0.00	0.00	0.00	0.00	0.31	0.31	0.31
Sat Flow, veh/h	0	3676	42	1774	3539	1583		0		1774	1863	1583
Grp Volume(v), veh/h	0	166	175	108	585	0		0.0		26	37	38
Grp Sat Flow(s),veh/h/ln	0	1770	1855	1774	1770	1583				1774	1863	1583
Q Serve(g_s), s	0.0	3.7	3.7	2.9	4.8	0.0				0.5	0.7	0.9
Cycle Q Clear(g_c), s	0.0	3.7	3.7	2.9	4.8	0.0				0.5	0.7	0.9
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	544	571	273	1906	853				546	573	487
V/C Ratio(X)	0.00	0.31	0.31	0.40	0.31	0.00				0.05	0.06	0.08
Avail Cap(c_a), veh/h	0	544	571	273	1906	853				546	573	487
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	13.8	13.8	19.8	6.6	0.0				12.6	12.7	12.8
Incr Delay (d2), s/veh	0.0	1.4	1.4	4.3	0.4	0.0				0.2	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.0	2.1	1.7	2.4	0.0				0.3	0.4	0.4
LnGrp Delay(d),s/veh	0.0	15.2	15.1	24.1	7.1	0.0				12.8	12.9	13.1
LnGrp LOS		B	B	C	A					B	B	B
Approach Vol, veh/h		341			693						101	
Approach Delay, s/veh		15.2			9.7						13.0	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			12.0	20.0		20.0		32.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			8.0	16.0		16.0		28.0				
Max Q Clear Time (g_c+I1), s			4.9	5.7		2.9		6.8				
Green Ext Time (p_c), s			0.1	1.4		0.2		4.0				
Intersection Summary												
HCM 2010 Ctrl Delay			11.6									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	218	435	5	9	573	344	10	10	19	134	2	54
Future Volume (veh/h)	218	435	5	9	573	344	10	10	19	134	2	54
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	237	473	5	10	623	374	11	11	21	104	61	59
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	260	1100	12	95	755	338	194	194	338	378	186	180
Arrive On Green	0.15	0.31	0.31	0.05	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1774	3588	38	1774	3539	1583	909	909	1583	1774	871	843
Grp Volume(v), veh/h	237	233	245	10	623	374	22	0	21	104	0	120
Grp Sat Flow(s),veh/h/ln	1774	1770	1856	1774	1770	1583	1817	0	1583	1774	0	1714
Q Serve(g_s), s	9.9	7.9	7.9	0.4	12.6	16.0	0.7	0.0	0.8	3.7	0.0	4.4
Cycle Q Clear(g_c), s	9.9	7.9	7.9	0.4	12.6	16.0	0.7	0.0	0.8	3.7	0.0	4.4
Prop In Lane	1.00		0.02	1.00		1.00	0.50		1.00	1.00		0.49
Lane Grp Cap(c), veh/h	260	543	569	95	755	338	388	0	338	378	0	366
V/C Ratio(X)	0.91	0.43	0.43	0.11	0.83	1.11	0.06	0.00	0.06	0.27	0.00	0.33
Avail Cap(c_a), veh/h	260	543	569	95	755	338	388	0	338	378	0	366
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.5	20.8	20.8	33.8	28.2	29.5	23.5	0.0	23.5	24.7	0.0	25.0
Incr Delay (d2), s/veh	36.8	2.5	2.4	2.2	10.0	81.0	0.3	0.0	0.4	1.8	0.0	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	4.2	4.4	0.3	7.2	14.5	0.4	0.0	0.4	2.0	0.0	2.3
LnGrp Delay(d),s/veh	68.4	23.2	23.1	36.0	38.1	110.5	23.8	0.0	23.9	26.4	0.0	27.3
LnGrp LOS	E	C	C	D	D	F	C		C	C		C
Approach Vol, veh/h		715			1007			43			224	
Approach Delay, s/veh		38.2			65.0			23.8			26.9	
Approach LOS		D			E			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	8.0	27.0		20.0	15.0	20.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	4.0	23.0		16.0	11.0	16.0				
Max Q Clear Time (g_c+I1), s		2.8	2.4	9.9		6.4	11.9	18.0				
Green Ext Time (p_c), s		0.1	0.0	2.3		0.6	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				50.2								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	377	283	82	746	182	251	128	78	223	268	190
Future Volume (veh/h)	73	377	283	82	746	182	251	128	78	223	268	190
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	79	410	308	89	811	198	206	233	85	242	291	207
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	101	470	350	127	910	407	405	426	362	405	426	362
Arrive On Green	0.06	0.24	0.24	0.07	0.26	0.26	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1774	1936	1442	1774	3539	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	79	374	344	89	811	198	206	233	85	242	291	207
Grp Sat Flow(s),veh/h/ln	1774	1770	1608	1774	1770	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	3.1	14.2	14.4	3.4	15.5	7.4	7.1	7.7	3.1	8.5	10.0	8.1
Cycle Q Clear(g_c), s	3.1	14.2	14.4	3.4	15.5	7.4	7.1	7.7	3.1	8.5	10.0	8.1
Prop In Lane	1.00		0.90	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	101	430	391	127	910	407	405	426	362	405	426	362
V/C Ratio(X)	0.78	0.87	0.88	0.70	0.89	0.49	0.51	0.55	0.23	0.60	0.68	0.57
Avail Cap(c_a), veh/h	101	430	391	127	910	407	405	426	362	405	426	362
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.6	25.4	25.5	31.8	25.1	22.1	23.6	23.8	22.0	24.1	24.7	24.0
Incr Delay (d2), s/veh	43.6	20.9	23.5	27.8	12.8	4.1	4.5	5.0	1.5	6.3	8.6	6.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	9.4	8.9	2.7	9.2	3.7	3.9	4.5	1.5	4.9	6.1	4.2
LnGrp Delay(d),s/veh	76.1	46.3	49.0	59.5	37.9	26.2	28.1	28.8	23.5	30.5	33.3	30.4
LnGrp LOS	E	D	D	E	D	C	C	C	C	C	C	C
Approach Vol, veh/h		797			1098			524			740	
Approach Delay, s/veh		50.4			37.5			27.7			31.6	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	9.0	21.0		20.0	8.0	22.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	5.0	17.0		16.0	4.0	18.0				
Max Q Clear Time (g_c+I1), s		9.7	5.4	16.4		12.0	5.1	17.5				
Green Ext Time (p_c), s		1.3	0.0	0.3		1.3	0.0	0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			37.7									
HCM 2010 LOS			D									
Notes												

Intersection

Intersection Delay, s/veh 7.6

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	86	7	15	65	39	2	3	5	0	0	0
Future Vol, veh/h	25	86	7	15	65	39	2	3	5	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	93	8	16	71	42	2	3	5	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.8	7.5	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	20%	21%	13%
Vol Thru, %	30%	73%	55%
Vol Right, %	50%	6%	33%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	10	118	119
LT Vol	2	25	15
Through Vol	3	86	65
RT Vol	5	7	39
Lane Flow Rate	11	128	129
Geometry Grp	1	1	1
Degree of Util (X)	0.013	0.145	0.139
Departure Headway (Hd)	4.214	4.057	3.878
Convergence, Y/N	Yes	Yes	Yes
Cap	854	884	922
Service Time	2.214	2.083	1.909
HCM Lane V/C Ratio	0.013	0.145	0.14
HCM Control Delay	7.3	7.8	7.5
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	0.5	0.5

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑		↑						↑	↑
Traffic Vol, veh/h	0	147	67	50	59	0	0	0	0	17	0	55
Future Vol, veh/h	0	147	67	50	59	0	0	0	0	17	0	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	160	73	54	64	0	0	0	0	18	0	60
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	160	0	0				332	332	64
Stage 1	-	-	-	-	-	-				172	172	-
Stage 2	-	-	-	-	-	-				160	160	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1419	-	0				663	588	1000
Stage 1	0	-	-	-	-	0				858	756	-
Stage 2	0	-	-	-	-	0				869	766	-
Platoon blocked, %	-	-	-	-	-	-				-	-	-
Mov Cap-1 Maneuver	-	-	-	1419	-	-				637	0	1000
Mov Cap-2 Maneuver	-	-	-	-	-	-				637	0	-
Stage 1	-	-	-	-	-	-				825	0	-
Stage 2	-	-	-	-	-	-				869	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.5			9.3					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT		EBR	WBL	WBT	SBLn1	SBLn2					
Capacity (veh/h)	-		-	1419	-	637	1000					
HCM Lane V/C Ratio	-		-	0.038	-	0.029	0.06					
HCM Control Delay (s)	-		-	7.6	0	10.8	8.8					
HCM Lane LOS	-		-	A	A	B	A					
HCM 95th %tile Q(veh)	-		-	0.1	-	0.1	0.2					

HCM 2010 Signalized Intersection Summary

56: I-5 SB On/Off-Ramp & Vista Way

07/02/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑	↑	↑↑		
Traffic Volume (veh/h)	476	186	1010	1130	16	960		
Future Volume (veh/h)	476	186	1010	1130	16	960		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	517	0	1098	1228	17	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	841	376	1420	1304	355	557		
Arrive On Green	0.24	0.00	0.41	0.70	0.20	0.00		
Sat Flow, veh/h	3632	1583	3442	1863	1774	2787		
Grp Volume(v), veh/h	517	0	1098	1228	17	0		
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1863	1774	1393		
Q Serve(g_s), s	10.4	0.0	22.0	46.4	0.6	0.0		
Cycle Q Clear(g_c), s	10.4	0.0	22.0	46.4	0.6	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	841	376	1420	1304	355	557		
V/C Ratio(X)	0.62	0.00	0.77	0.94	0.05	0.00		
Avail Cap(c_a), veh/h	841	376	1420	1304	355	557		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	27.2	0.0	20.3	10.6	25.8	0.0		
Incr Delay (d2), s/veh	3.4	0.0	4.2	14.4	0.3	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.5	0.0	11.2	28.4	0.3	0.0		
LnGrp Delay(d),s/veh	30.6	0.0	24.4	25.0	26.1	0.0		
LnGrp LOS	C		C	C	C			
Approach Vol, veh/h	517			2326	17			
Approach Delay, s/veh	30.6			24.7	26.1			
Approach LOS	C			C	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	37.0	23.0				60.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	33.0	19.0				56.0
Max Q Clear Time (g_c+I1), s		2.6	24.0	12.4				48.4
Green Ext Time (p_c), s		0.0	3.2	1.8				5.5
Intersection Summary								
HCM 2010 Ctrl Delay			25.8					
HCM 2010 LOS			C					

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	277	115	193	501	328	1848	213	38	188	133	75	79
Future Volume (vph)	277	115	193	501	328	1848	213	38	188	133	75	79
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3015	1441		1787	1583		1805	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3015	1441		1787	1583		1805	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	301	125	210	545	357	2009	232	41	204	145	82	86
RTOR Reduction (vph)	0	0	166	0	403	403	0	0	120	0	0	75
Lane Group Flow (vph)	301	125	44	545	959	601	0	273	84	0	227	11
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	20.0	21.3	21.3	40.1	45.0	45.0		21.8	21.8		16.0	16.0
Effective Green, g (s)	20.0	21.3	21.3	40.1	45.0	45.0		21.8	21.8		16.0	16.0
Actuated g/C Ratio	0.17	0.18	0.18	0.33	0.38	0.38		0.18	0.18		0.13	0.13
Clearance Time (s)	4.0	5.6	5.6	4.0	2.0	2.0		5.6	5.6		5.6	5.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	295	330	280	591	1130	540		324	287		240	211
v/s Ratio Prot	c0.17	0.07		0.31	0.32			c0.15			c0.13	
v/s Ratio Perm			0.03			c0.42			0.05			0.01
v/c Ratio	1.02	0.38	0.16	0.92	1.04dr	1.11		0.84	0.29		0.95	0.05
Uniform Delay, d1	50.0	43.5	41.8	38.4	34.4	37.5		47.4	42.4		51.6	45.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	57.7	0.3	0.1	20.0	5.9	73.5		22.6	2.6		45.6	0.5
Delay (s)	107.7	43.8	41.8	58.5	40.2	111.0		70.0	45.0		97.2	45.9
Level of Service	F	D	D	E	D	F		E	D		F	D
Approach Delay (s)		73.4			68.0			59.3			83.1	
Approach LOS		E			E			E			F	
Intersection Summary												
HCM 2000 Control Delay			68.9				HCM 2000 Level of Service		E			
HCM 2000 Volume to Capacity ratio			1.04									
Actuated Cycle Length (s)			120.0				Sum of lost time (s)		20.8			
Intersection Capacity Utilization			116.8%				ICU Level of Service		H			
Analysis Period (min)			15									
dr Defacto Right Lane. Recode with 1 though lane as a right lane.												
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

2: Coast Hwy & Driveway/SR-76 ramps

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	6	582	0	257	6	318	593	442	408	2
Future Volume (vph)	0	0	6	582	0	257	6	318	593	442	408	2
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6		4.6	4.6	4.0		4.6	4.0		4.6	
Lane Util. Factor		1.00		0.95	0.95	1.00		0.95	1.00		0.95	
Frt		0.86		1.00	1.00	0.85		1.00	0.85		1.00	
Flt Protected		1.00		0.95	0.95	1.00		1.00	1.00		0.97	
Satd. Flow (prot)		1611		1681	1681	1583		3536	1583		3449	
Flt Permitted		1.00		0.95	0.95	1.00		1.00	1.00		0.97	
Satd. Flow (perm)		1611		1681	1681	1583		3536	1583		3449	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	7	633	0	279	7	346	645	480	443	2
RTOR Reduction (vph)	0	7	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	0	0	316	317	279	0	353	645	0	925	0
Turn Type		NA		Split	NA	Free	Split	NA	Free	Split	NA	
Protected Phases		4		8	8		2	2		6	6	
Permitted Phases	4					Free			Free			
Actuated Green, G (s)		1.0		18.4	18.4	83.1		18.7	83.1		26.6	
Effective Green, g (s)		1.0		18.4	18.4	83.1		18.7	83.1		26.6	
Actuated g/C Ratio		0.01		0.22	0.22	1.00		0.23	1.00		0.32	
Clearance Time (s)		4.6		4.6	4.6			4.6			4.6	
Vehicle Extension (s)		3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)		19		372	372	1583		795	1583		1104	
v/s Ratio Prot		0.00		0.19	c0.19			0.10			c0.27	
v/s Ratio Perm						0.18			c0.41			
v/c Ratio		0.00		0.85	0.85	0.18		0.44	0.41		0.84	
Uniform Delay, d1		40.6		31.0	31.0	0.0		27.7	0.0		26.2	
Progression Factor		1.00		1.00	1.00	1.00		1.00	1.00		1.00	
Incremental Delay, d2		0.1		16.4	16.9	0.2		1.8	0.8		7.6	
Delay (s)		40.7		47.4	47.9	0.2		29.5	0.8		33.9	
Level of Service		D		D	D	A		C	A		C	
Approach Delay (s)		40.7			33.2			10.9			33.9	
Approach LOS		D			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			25.6				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.77									
Actuated Cycle Length (s)			83.1				Sum of lost time (s)			18.4		
Intersection Capacity Utilization			67.7%				ICU Level of Service			C		
Analysis Period (min)			15									
Description: SR-76 & Coast Hwy												
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	58	38	97	100	146	60	107	102	168	146	35
Future Volume (vph)	1	58	38	97	100	146	60	107	102	168	146	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	63	41	105	109	159	65	116	111	183	159	38
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	105	373	292	380								
Volume Left (vph)	1	105	65	183								
Volume Right (vph)	41	159	111	38								
Hadj (s)	-0.20	-0.17	-0.15	0.07								
Departure Headway (s)	6.7	6.0	6.1	6.1								
Degree Utilization, x	0.20	0.62	0.49	0.65								
Capacity (veh/h)	431	559	542	550								
Control Delay (s)	11.3	18.5	14.9	19.5								
Approach Delay (s)	11.3	18.5	14.9	19.5								
Approach LOS	B	C	B	C								
Intersection Summary												
Delay			17.3									
Level of Service			C									
Intersection Capacity Utilization			70.3%	ICU Level of Service				C				
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	126	58	51	13	51	32	36	315	20	51	319	91
Future Volume (vph)	126	58	51	13	51	32	36	315	20	51	319	91
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	
Lane Util. Factor		1.00	1.00		1.00		1.00	0.95		1.00	0.95	
Frt		1.00	0.85		0.95		1.00	0.99		1.00	0.97	
Flt Protected		0.97	1.00		0.99		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1801	1583		1766		1770	3507		1770	3421	
Flt Permitted		0.76	1.00		0.96		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1414	1583		1712		1770	3507		1770	3421	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	137	63	55	14	55	35	39	342	22	55	347	99
RTOR Reduction (vph)	0	0	41	0	26	0	0	5	0	0	27	0
Lane Group Flow (vph)	0	200	14	0	78	0	39	359	0	55	419	0
Turn Type	Perm	NA	Perm	Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4		4	8								
Actuated Green, G (s)		18.8	18.8		18.8		13.7	35.3		10.1	36.5	
Effective Green, g (s)		18.8	18.8		18.8		13.7	35.3		10.1	36.5	
Actuated g/C Ratio		0.25	0.25		0.25		0.18	0.47		0.13	0.49	
Clearance Time (s)		2.0	2.0		2.0		2.0	4.2		4.6	2.0	
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		3.0	7.0	
Lane Grp Cap (vph)		354	396		429		323	1650		238	1664	
v/s Ratio Prot							0.02	c0.10		0.03	c0.12	
v/s Ratio Perm		c0.14	0.01		0.05							
v/c Ratio		0.56	0.03		0.18		0.12	0.22		0.23	0.25	
Uniform Delay, d1		24.5	21.2		22.1		25.6	11.7		29.0	11.3	
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.1	0.1		0.7		0.2	0.3		0.5	0.3	
Delay (s)		29.6	21.4		22.8		25.8	12.0		29.5	11.5	
Level of Service		C	C		C		C	B		C	B	
Approach Delay (s)		27.8			22.8			13.3			13.5	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay			17.1									
HCM 2000 Volume to Capacity ratio			0.35									
Actuated Cycle Length (s)			75.0									
Intersection Capacity Utilization			46.8%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

5: Coast Hwy & Civic Center Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	38	39	34	25	45	54	28	312	45	30	326	32
Future Volume (vph)	38	39	34	25	45	54	28	312	45	30	326	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		4.2	4.2			4.6			4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frt	1.00	0.93		1.00	0.92			0.98			0.99	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1770	1732		1770	1710			3465			3482	
Flt Permitted	0.69	1.00		0.71	1.00			0.90			0.89	
Satd. Flow (perm)	1280	1732		1314	1710			3131			3127	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	41	42	37	27	49	59	30	339	49	33	354	35
RTOR Reduction (vph)	0	16	0	0	25	0	0	26	0	0	17	0
Lane Group Flow (vph)	41	63	0	27	83	0	0	392	0	0	405	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	28.4	28.4		28.4	28.4			12.8			12.8	
Effective Green, g (s)	28.4	28.4		28.4	28.4			12.8			12.8	
Actuated g/C Ratio	0.57	0.57		0.57	0.57			0.26			0.26	
Clearance Time (s)	4.2	4.2		4.2	4.2			4.6			4.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	
Lane Grp Cap (vph)	727	983		746	971			801			800	
v/s Ratio Prot		0.04			c0.05							
v/s Ratio Perm	0.03			0.02				0.13			c0.13	
v/c Ratio	0.06	0.06		0.04	0.08			0.49			0.51	
Uniform Delay, d1	4.8	4.8		4.8	4.9			15.8			15.9	
Progression Factor	1.00	1.00		1.00	1.00			1.29			1.00	
Incremental Delay, d2	0.1	0.1		0.1	0.2			0.6			0.7	
Delay (s)	5.0	5.0		4.9	5.1			21.0			16.6	
Level of Service	A	A		A	A			C			B	
Approach Delay (s)		5.0			5.0			21.0			16.6	
Approach LOS		A			A			C			B	
Intersection Summary												
HCM 2000 Control Delay			15.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.22									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)			8.8			
Intersection Capacity Utilization			41.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

6: Coast Hwy & Pier View Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	45	55	27	45	75	42	347	62	34	347	94
Future Volume (vph)	49	45	55	27	45	75	42	347	62	34	347	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2		5.0	5.0			5.0			4.5	
Lane Util. Factor	1.00	1.00		1.00	1.00			0.95			0.95	
Frpb, ped/bikes	1.00	0.99		1.00	0.98			1.00			0.99	
Flpb, ped/bikes	0.99	1.00		0.99	1.00			1.00			1.00	
Frt	1.00	0.92		1.00	0.91			0.98			0.97	
Flt Protected	0.95	1.00		0.95	1.00			1.00			1.00	
Satd. Flow (prot)	1749	1688		1756	1660			3436			3396	
Flt Permitted	0.67	1.00		0.69	1.00			0.85			0.89	
Satd. Flow (perm)	1239	1688		1269	1660			2932			3035	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	53	49	60	29	49	82	46	377	67	37	377	102
RTOR Reduction (vph)	0	26	0	0	37	0	0	31	0	0	54	0
Lane Group Flow (vph)	53	83	0	29	94	0	0	459	0	0	462	0
Confl. Peds. (#/hr)	16		11	11		16	10		17	17		10
Confl. Bikes (#/hr)			2			2						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	28.0	28.0		27.2	27.2			12.8			13.3	
Effective Green, g (s)	28.0	28.0		27.2	27.2			12.8			13.3	
Actuated g/C Ratio	0.56	0.56		0.54	0.54			0.26			0.27	
Clearance Time (s)	4.2	4.2		5.0	5.0			5.0			4.5	
Vehicle Extension (s)	3.0	3.0		3.5	3.5			3.0			3.5	
Lane Grp Cap (vph)	693	945		690	903			750			807	
v/s Ratio Prot		0.05			c0.06							
v/s Ratio Perm	0.04			0.02				c0.16			0.15	
v/c Ratio	0.08	0.09		0.04	0.10			0.61			0.57	
Uniform Delay, d1	5.1	5.1		5.3	5.5			16.4			15.9	
Progression Factor	1.00	1.00		1.00	1.00			0.54			0.52	
Incremental Delay, d2	0.2	0.2		0.1	0.2			1.5			1.0	
Delay (s)	5.3	5.3		5.4	5.7			10.3			9.3	
Level of Service	A	A		A	A			B			A	
Approach Delay (s)		5.3			5.7			10.3			9.3	
Approach LOS		A			A			B			A	
Intersection Summary												
HCM 2000 Control Delay		8.7			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.27										
Actuated Cycle Length (s)		50.0			Sum of lost time (s)			10.0				
Intersection Capacity Utilization		54.2%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	18	18	151	158	18	29	52	419	74	29	377	15
Future Volume (vph)	18	18	151	158	18	29	52	419	74	29	377	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	20	164	172	20	32	57	455	80	32	410	16
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	40	164	224	285	308	237	221					
Volume Left (vph)	20	0	172	57	0	32	0					
Volume Right (vph)	0	164	32	0	80	0	16					
Hadj (s)	0.28	-0.67	0.10	0.13	-0.15	0.10	-0.02					
Departure Headway (s)	8.2	7.2	7.7	7.1	6.8	7.2	7.1					
Degree Utilization, x	0.09	0.33	0.48	0.56	0.58	0.48	0.44					
Capacity (veh/h)	404	457	444	488	507	479	487					
Control Delay (s)	10.8	12.6	17.4	17.5	17.6	15.5	14.3					
Approach Delay (s)	12.2		17.4	17.6		14.9						
Approach LOS	B		C	C		B						
Intersection Summary												
Delay			16.0									
Level of Service			C									
Intersection Capacity Utilization			55.3%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	289	103	199	201	75	233
Future Volume (vph)	289	103	199	201	75	233
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	314	112	216	218	82	253
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	314	112	434	335		
Volume Left (vph)	314	0	0	82		
Volume Right (vph)	0	112	218	0		
Hadj (s)	0.53	-0.67	-0.27	0.08		
Departure Headway (s)	7.2	6.0	5.6	6.1		
Degree Utilization, x	0.63	0.19	0.67	0.57		
Capacity (veh/h)	472	575	618	567		
Control Delay (s)	20.2	9.1	19.4	16.7		
Approach Delay (s)	17.3		19.4	16.7		
Approach LOS	C		C	C		
Intersection Summary						
Delay			17.9			
Level of Service			C			
Intersection Capacity Utilization			65.2%	ICU Level of Service	C	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	47	0	320	82	300	95	0	0	0	0	137	99
Future Volume (vph)	47	0	320	82	300	95	0	0	0	0	137	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0		4.0	4.0	4.0						4.0	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.96						0.94	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3412						3316	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3412						3316	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	51	0	348	89	326	103	0	0	0	0	149	108
RTOR Reduction (vph)	0	0	307	69	69	0	0	0	0	0	63	0
Lane Group Flow (vph)	51	0	41	20	360	0	0	0	0	0	194	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	5.9		5.9	11.3	11.3						20.8	
Effective Green, g (s)	5.9		5.9	11.3	11.3						20.8	
Actuated g/C Ratio	0.12		0.12	0.23	0.23						0.42	
Clearance Time (s)	4.0		4.0	4.0	4.0						4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	208		328	400	771						1379	
v/s Ratio Prot	c0.03		0.01	0.01	c0.11						c0.06	
v/s Ratio Perm												
v/c Ratio	0.25		0.13	0.05	0.47						0.14	
Uniform Delay, d1	20.0		19.7	15.1	16.7						9.1	
Progression Factor	1.00		1.00	1.66	1.11						1.00	
Incremental Delay, d2	0.6		0.2	0.0	0.4						0.2	
Delay (s)	20.6		19.9	25.1	18.9						9.3	
Level of Service	C		B	C	B						A	
Approach Delay (s)		20.0			20.0			0.0			9.3	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			17.7			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)				12.0		
Intersection Capacity Utilization			32.7%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

07/02/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	170	418	60	227	375	0	0	304	157
Future Volume (vph)	0	0	0	170	418	60	227	375	0	0	304	157
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)				5.0	5.0		5.0	5.0			5.0	
Lane Util. Factor				1.00	0.95		1.00	0.95			0.95	
Frpb, ped/bikes				1.00	1.00		1.00	1.00			0.99	
Flpb, ped/bikes				0.99	1.00		1.00	1.00			1.00	
Frt				1.00	0.98		1.00	1.00			0.95	
Flt Protected				0.95	1.00		0.95	1.00			1.00	
Satd. Flow (prot)				1753	3464		1770	3539			3328	
Flt Permitted				0.95	1.00		0.46	1.00			1.00	
Satd. Flow (perm)				1753	3464		856	3539			3328	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	185	454	65	247	408	0	0	330	171
RTOR Reduction (vph)	0	0	0	0	20	0	0	0	0	0	107	0
Lane Group Flow (vph)	0	0	0	185	499	0	247	408	0	0	394	0
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Perm	NA		Perm	NA			NA	
Protected Phases					8			2			6	
Permitted Phases				8			2					
Actuated Green, G (s)				21.2	21.2		18.8	18.8			18.8	
Effective Green, g (s)				21.2	21.2		18.8	18.8			18.8	
Actuated g/C Ratio				0.42	0.42		0.38	0.38			0.38	
Clearance Time (s)				5.0	5.0		5.0	5.0			5.0	
Vehicle Extension (s)				3.0	3.0		4.0	4.0			4.0	
Lane Grp Cap (vph)				743	1468		321	1330			1251	
v/s Ratio Prot					c0.14			0.12			0.12	
v/s Ratio Perm				0.11			c0.29					
v/c Ratio				0.25	0.34		0.77	0.31			0.32	
Uniform Delay, d1				9.3	9.7		13.7	11.0			11.0	
Progression Factor				1.00	1.00		1.00	1.00			1.06	
Incremental Delay, d2				0.8	0.6		11.2	0.2			0.2	
Delay (s)				10.1	10.3		24.9	11.2			11.9	
Level of Service				B	B		C	B			B	
Approach Delay (s)		0.0			10.3			16.4			11.9	
Approach LOS		A			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.8									HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio			0.54									
Actuated Cycle Length (s)			50.0									Sum of lost time (s) 10.0
Intersection Capacity Utilization			54.5%									ICU Level of Service A
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	156	0	155	769	314	18	95	372	438	62	23
Future Volume (vph)	20	156	0	155	769	314	18	95	372	438	62	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.97	
Satd. Flow (prot)	1770	3539		1770	3539	1583		1848	1583	1681	1689	
Flt Permitted	0.27	1.00		0.64	1.00	1.00		0.93	1.00	0.68	0.72	
Satd. Flow (perm)	512	3539		1200	3539	1583		1727	1583	1200	1261	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	170	0	168	836	341	20	103	404	476	67	25
RTOR Reduction (vph)	0	0	0	0	0	201	0	0	254	0	7	0
Lane Group Flow (vph)	22	170	0	168	836	140	0	123	150	281	280	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	18.6	18.6		18.2	18.2	18.2		16.5	16.5	16.5	16.5	
Effective Green, g (s)	18.6	18.6		18.2	18.2	18.2		16.5	16.5	16.5	16.5	
Actuated g/C Ratio	0.42	0.42		0.41	0.41	0.41		0.37	0.37	0.37	0.37	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	214	1485		493	1453	650		643	589	446	469	
v/s Ratio Prot		0.05			c0.24							
v/s Ratio Perm	0.04			0.14		0.09		0.07	0.10	c0.23	0.22	
v/c Ratio	0.10	0.11		0.34	0.58	0.22		0.19	0.26	0.63	0.60	
Uniform Delay, d1	7.8	7.8		8.9	10.1	8.4		9.4	9.6	11.4	11.2	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.0		0.5	0.6	0.2		0.2	0.3	3.2	2.4	
Delay (s)	8.1	7.9		9.4	10.7	8.6		9.6	10.0	14.6	13.6	
Level of Service	A	A		A	B	A		A	A	B	B	
Approach Delay (s)		7.9			10.0			9.9			14.1	
Approach LOS		A			A			A			B	
Intersection Summary												
HCM 2000 Control Delay			10.7				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			44.3				Sum of lost time (s)			9.6		
Intersection Capacity Utilization			57.6%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

07/02/2018

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↗	
Traffic Volume (veh/h)	441	42	61	91	65	77
Future Volume (Veh/h)	441	42	61	91	65	77
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	479	46	66	99	71	84
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				248		
pX, platoon unblocked						
vC, conflicting volume			525		733	502
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			525		733	502
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			94		80	85
cM capacity (veh/h)			1042		363	569
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	525	165	155			
Volume Left	0	66	71			
Volume Right	46	0	84			
cSH	1700	1042	452			
Volume to Capacity	0.31	0.06	0.34			
Queue Length 95th (ft)	0	5	38			
Control Delay (s)	0.0	3.8	17.1			
Lane LOS		A	C			
Approach Delay (s)	0.0	3.8	17.1			
Approach LOS			C			
Intersection Summary						
Average Delay			3.9			
Intersection Capacity Utilization			52.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr/Seagaze St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	340	228	219	0	0	0	91	288	148	156	247	111
Future Volume (vph)	340	228	219	0	0	0	91	288	148	156	247	111
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2					4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	1.00					1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	0.98					1.00	0.99		1.00	0.99	
Flpb, ped/bikes	1.00	1.00					1.00	1.00		1.00	1.00	
Frt	1.00	0.93					1.00	0.95		1.00	0.95	
Flt Protected	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1697					1770	3335		1770	3329	
Flt Permitted	0.95	1.00					0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1697					1770	3335		1770	3329	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	370	248	238	0	0	0	99	313	161	170	268	121
RTOR Reduction (vph)	0	58	0	0	0	0	0	121	0	0	80	0
Lane Group Flow (vph)	370	428	0	0	0	0	99	353	0	170	309	0
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA					Prot	NA		Prot	NA	
Protected Phases	4	4					5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	19.8	19.8					7.0	14.0		13.2	20.2	
Effective Green, g (s)	19.8	19.8					7.0	14.0		13.2	20.2	
Actuated g/C Ratio	0.33	0.33					0.12	0.23		0.22	0.34	
Clearance Time (s)	4.2	4.2					4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0					3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	584	560					206	778		389	1120	
v/s Ratio Prot	0.21	c0.25					0.06	c0.11		c0.10	0.09	
v/s Ratio Perm												
v/c Ratio	0.63	0.76					0.48	0.45		0.44	0.28	
Uniform Delay, d1	17.0	18.0					24.8	19.7		20.2	14.6	
Progression Factor	1.00	1.00					1.00	1.00		1.00	1.00	
Incremental Delay, d2	5.2	9.6					7.8	1.9		3.5	0.6	
Delay (s)	22.2	27.6					32.6	21.6		23.7	15.2	
Level of Service	C	C					C	C		C	B	
Approach Delay (s)		25.3			0.0			23.5			17.8	
Approach LOS		C			A			C			B	
Intersection Summary												
HCM 2000 Control Delay		22.7					HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio		0.58										
Actuated Cycle Length (s)		60.0					Sum of lost time (s)			13.0		
Intersection Capacity Utilization		60.9%					ICU Level of Service			B		
Analysis Period (min)		15										

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	562	34	0	0	0	0	10	33	33	28	0
Future Volume (Veh/h)	18	562	34	0	0	0	0	10	33	33	28	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	611	37	0	0	0	0	11	36	36	30	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	255											
pX, platoon unblocked												
vC, conflicting volume	0			648			684	670	324	387	688	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			648			684	670	324	387	688	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	97	95	93	92	100
cM capacity (veh/h)	1622			934			310	372	672	500	363	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	326	342	47	66								
Volume Left	20	0	0	36								
Volume Right	0	37	36	0								
cSH	1622	1700	565	427								
Volume to Capacity	0.01	0.20	0.08	0.15								
Queue Length 95th (ft)	1	0	7	14								
Control Delay (s)	0.5	0.0	11.9	15.0								
Lane LOS	A		B	B								
Approach Delay (s)	0.3		11.9	15.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			33.8%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	71	954	26	0	0	0	0	28	25	78	102	0
Future Volume (vph)	71	954	26	0	0	0	0	28	25	78	102	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	77	1037	28	0	0	0	0	30	27	85	111	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	596	547	57	196								
Volume Left (vph)	77	0	0	85								
Volume Right (vph)	0	28	27	0								
Hadj (s)	0.10	0.00	-0.25	0.12								
Departure Headway (s)	5.4	5.3	5.9	6.0								
Degree Utilization, x	0.89	0.80	0.09	0.33								
Capacity (veh/h)	661	672	593	590								
Control Delay (s)	35.1	24.9	9.5	11.9								
Approach Delay (s)	30.2		9.5	11.9								
Approach LOS	D		A	B								
Intersection Summary												
Delay			26.8									
Level of Service			D									
Intersection Capacity Utilization			52.3%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Yield				Stop			Stop			Stop	
Traffic Volume (vph)	171	535	15	48	0	13	0	16	13	0	0	0
Future Volume (vph)	171	535	15	48	0	13	0	16	13	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	186	582	16	52	0	14	0	17	14	0	0	0
Direction, Lane #	EB 1	EB 2	WB 1	NB 1								
Volume Total (vph)	186	598	66	31								
Volume Left (vph)	186	0	52	0								
Volume Right (vph)	0	16	14	14								
Hadj (s)	0.53	0.02	0.06	-0.24								
Departure Headway (s)	5.2	4.7	4.8	5.3								
Degree Utilization, x	0.27	0.77	0.09	0.05								
Capacity (veh/h)	691	761	722	628								
Control Delay (s)	8.9	20.4	8.3	8.6								
Approach Delay (s)	17.7		8.3	8.6								
Approach LOS	C		A	A								
Intersection Summary												
Delay			16.7									
Level of Service			C									
Intersection Capacity Utilization			45.9%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

07/02/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	21	4	71	19	9	18	31	310	27	13	283	32	
Future Volume (Veh/h)	21	4	71	19	9	18	31	310	27	13	283	32	
Sign Control	Stop				Stop				Free				
Grade	0%				0%				0%				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	23	4	77	21	10	20	34	337	29	14	308	35	
Pedestrians	7				7						1		
Lane Width (ft)	12.0				12.0						12.0		
Walking Speed (ft/s)	4.0				4.0						4.0		
Percent Blockage	1				1						0		
Right turn flare (veh)													
Median type								None					None
Median storage (veh)													
Upstream signal (ft)								1261					414
pX, platoon unblocked													
vC, conflicting volume	623	802	178	688	804	191	350			373			
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	623	802	178	688	804	191	350			373			
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1			
tC, 2 stage (s)													
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2			
p0 queue free %	93	99	91	93	97	98	97			99			
cM capacity (veh/h)	336	300	829	286	299	813	1198			1175			
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2							
Volume Total	104	51	202	198	168	189							
Volume Left	23	21	34	0	14	0							
Volume Right	77	20	0	29	0	35							
cSH	595	387	1198	1700	1175	1700							
Volume to Capacity	0.17	0.13	0.03	0.12	0.01	0.11							
Queue Length 95th (ft)	16	11	2	0	1	0							
Control Delay (s)	12.3	15.7	1.6	0.0	0.8	0.0							
Lane LOS	B	C	A	A									
Approach Delay (s)	12.3	15.7	0.8	0.4									
Approach LOS	B	C											
Intersection Summary													
Average Delay	2.8												
Intersection Capacity Utilization	37.4%			ICU Level of Service			A						
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis

18: Coast Hwy & Washington Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	0	38	10	0	9	25	335	14	18	304	33
Future Volume (Veh/h)	8	0	38	10	0	9	25	335	14	18	304	33
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	0	41	11	0	10	27	364	15	20	330	36
Pedestrians	11			7						12		
Lane Width (ft)	12.0			12.0						12.0		
Walking Speed (ft/s)	4.0			4.0						4.0		
Percent Blockage	1			1						1		
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							831			844		
pX, platoon unblocked												
vC, conflicting volume	657	839	194	678	850	208	377				386	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	657	839	194	678	850	208	377				386	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	97	100	95	96	100	99	98				98	
cM capacity (veh/h)	325	284	807	306	280	785	1167				1162	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	50	21	209	197	185	201						
Volume Left	9	11	27	0	20	0						
Volume Right	41	10	0	15	0	36						
cSH	637	431	1167	1700	1162	1700						
Volume to Capacity	0.08	0.05	0.02	0.12	0.02	0.12						
Queue Length 95th (ft)	6	4	2	0	1	0						
Control Delay (s)	11.1	13.8	1.2	0.0	1.0	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s)	11.1	13.8	0.6		0.5							
Approach LOS	B	B										
Intersection Summary												
Average Delay				1.5								
Intersection Capacity Utilization				38.8%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	126	164	97	81	14	121	14	283	65	144	174	7
Future Volume (vph)	126	164	97	81	14	121	14	283	65	144	174	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	137	178	105	88	15	132	15	308	71	157	189	8
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	420	235	394	354								
Volume Left (vph)	137	88	15	157								
Volume Right (vph)	105	132	71	8								
Hadj (s)	-0.05	-0.23	-0.07	0.11								
Departure Headway (s)	7.8	8.4	7.9	8.2								
Degree Utilization, x	0.91	0.55	0.86	0.81								
Capacity (veh/h)	420	384	441	415								
Control Delay (s)	51.3	21.4	43.5	37.3								
Approach Delay (s)	51.3	21.4	43.5	37.3								
Approach LOS	F	C	E	E								
Intersection Summary												
Delay				40.6								
Level of Service				E								
Intersection Capacity Utilization				73.9%	ICU Level of Service				D			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	197	23	10	137	35	22	46	35	28	61	13
Future Volume (Veh/h)	12	197	23	10	137	35	22	46	35	28	61	13
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	214	25	11	149	38	24	50	38	30	66	14
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	265											
pX, platoon unblocked												
vC, conflicting volume	201			246			498	482	234	520	476	183
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	201			246			498	482	234	520	476	183
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			94	89	95	92	86	98
cM capacity (veh/h)	1355			1312			410	467	801	393	471	849
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	252	198	112	110								
Volume Left	13	11	24	30								
Volume Right	25	38	38	14								
cSH	1355	1312	526	472								
Volume to Capacity	0.01	0.01	0.21	0.23								
Queue Length 95th (ft)	1	1	20	22								
Control Delay (s)	0.5	0.5	13.7	14.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.5	0.5	13.7	14.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay			5.1									
Intersection Capacity Utilization			30.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

21: Coast Hwy & Wisconsin Ave

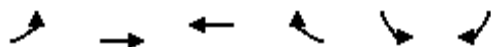
07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	65	124	118	128	99	22	104	261	140	24	261	32
Future Volume (vph)	65	124	118	128	99	22	104	261	140	24	261	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.2	4.2			4.2		4.2	4.6		4.2	4.6	
Lane Util. Factor	1.00	1.00			1.00		1.00	0.95		1.00	0.95	
Frt	1.00	0.93			0.99		1.00	0.95		1.00	0.98	
Flt Protected	0.95	1.00			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1727			1794		1770	3354		1770	3481	
Flt Permitted	0.60	1.00			0.60		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1119	1727			1113		1770	3354		1770	3481	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	71	135	128	139	108	24	113	284	152	26	284	35
RTOR Reduction (vph)	0	66	0	0	7	0	0	84	0	0	15	0
Lane Group Flow (vph)	71	197	0	0	264	0	113	352	0	26	304	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)	11.4	11.4			11.4		4.8	20.5		0.6	16.3	
Effective Green, g (s)	11.4	11.4			11.4		4.8	20.5		0.6	16.3	
Actuated g/C Ratio	0.25	0.25			0.25		0.11	0.45		0.01	0.36	
Clearance Time (s)	4.2	4.2			4.2		4.2	4.6		4.2	4.6	
Vehicle Extension (s)	3.0	3.0			3.0		3.0	4.0		3.0	4.0	
Lane Grp Cap (vph)	280	432			278		186	1511		23	1247	
v/s Ratio Prot		0.11					c0.06	c0.11		0.01	0.09	
v/s Ratio Perm	0.06				c0.24							
v/c Ratio	0.25	0.46			0.95		0.61	0.23		1.13	0.24	
Uniform Delay, d1	13.6	14.4			16.8		19.4	7.7		22.4	10.3	
Progression Factor	1.00	1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.5	0.8			40.6		5.5	0.1		231.0	0.1	
Delay (s)	14.1	15.2			57.3		25.0	7.8		253.5	10.4	
Level of Service	B	B			E		C	A		F	B	
Approach Delay (s)		15.0			57.3			11.3			28.7	
Approach LOS		B			E			B			C	
Intersection Summary												
HCM 2000 Control Delay			24.5				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			45.5				Sum of lost time (s)			13.0		
Intersection Capacity Utilization			56.7%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

07/02/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	19	420	312	54	81	82
Future Volume (Veh/h)	19	420	312	54	81	82
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	457	339	59	88	89
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	406				876	378
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	406				876	378
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				72	87
cM capacity (veh/h)	1145				311	664
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	478	398	177			
Volume Left	21	0	88			
Volume Right	0	59	89			
cSH	1145	1700	424			
Volume to Capacity	0.02	0.23	0.42			
Queue Length 95th (ft)	1	0	50			
Control Delay (s)	0.6	0.0	19.4			
Lane LOS	A		C			
Approach Delay (s)	0.6	0.0	19.4			
Approach LOS			C			
Intersection Summary						
Average Delay			3.5			
Intersection Capacity Utilization			53.9%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	467	4	2	311	24	2	1	3	35	0	30
Future Volume (Veh/h)	22	467	4	2	311	24	2	1	3	35	0	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	508	4	2	338	26	2	1	3	38	0	33
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	366			512			948	928	510	918	917	355
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	366			512			948	928	510	918	917	355
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			99	100	99	84	100	95
cM capacity (veh/h)	1191			1053			225	262	563	245	266	687
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	536	366	6	71								
Volume Left	24	2	2	38								
Volume Right	4	26	3	33								
cSH	1191	1053	332	350								
Volume to Capacity	0.02	0.00	0.02	0.20								
Queue Length 95th (ft)	2	0	1	19								
Control Delay (s)	0.6	0.1	16.0	17.9								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.6	0.1	16.0	17.9								
Approach LOS			C	C								
Intersection Summary												
Average Delay			1.7									
Intersection Capacity Utilization			53.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	1	246	273	75	177	1	163	1	105	0	1	0
Future Volume (vph)	1	246	273	75	177	1	163	1	105	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	267	297	82	192	1	177	1	114	0	1	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	565	275	292	1								
Volume Left (vph)	1	82	177	0								
Volume Right (vph)	297	1	114	0								
Hadj (s)	-0.28	0.09	-0.08	0.03								
Departure Headway (s)	5.0	5.7	5.9	6.9								
Degree Utilization, x	0.78	0.44	0.48	0.00								
Capacity (veh/h)	699	593	556	440								
Control Delay (s)	23.7	13.1	14.4	9.9								
Approach Delay (s)	23.7	13.1	14.4	9.9								
Approach LOS	C	B	B	A								
Intersection Summary												
Delay				18.7								
Level of Service				C								
Intersection Capacity Utilization				76.0%	ICU Level of Service	D						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	64	128	216	94	92	210
Future Volume (vph)	64	128	216	94	92	210
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	70	139	235	102	100	228
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	209	337	328			
Volume Left (vph)	70	0	100			
Volume Right (vph)	139	102	0			
Hadj (s)	-0.30	-0.15	0.09			
Departure Headway (s)	5.2	4.8	5.0			
Degree Utilization, x	0.30	0.45	0.46			
Capacity (veh/h)	630	724	689			
Control Delay (s)	10.4	11.5	12.1			
Approach Delay (s)	10.4	11.5	12.1			
Approach LOS	B	B	B			
Intersection Summary						
Delay			11.5			
Level of Service			B			
Intersection Capacity Utilization			54.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	322	33	34	266	95	46	68	66	104	41	27
Future Volume (Veh/h)	18	322	33	34	266	95	46	68	66	104	41	27
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	350	36	37	289	103	50	74	72	113	45	29
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					253							
pX, platoon unblocked	0.89						0.89	0.89		0.89	0.89	0.89
vC, conflicting volume	395			397			889	888	387	942	854	348
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	256			397			812	811	387	873	774	203
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			76	72	89	29	84	96
cM capacity (veh/h)	1160			1151			209	262	651	158	275	740
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	406	429	196	187								
Volume Left	20	37	50	113								
Volume Right	36	103	72	29								
cSH	1160	1151	310	204								
Volume to Capacity	0.02	0.03	0.63	0.92								
Queue Length 95th (ft)	1	2	101	184								
Control Delay (s)	0.6	1.0	34.6	91.0								
Lane LOS	A	A	D	F								
Approach Delay (s)	0.6	1.0	34.6	91.0								
Approach LOS			D	F								
Intersection Summary												
Average Delay			20.1									
Intersection Capacity Utilization			59.2%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔	↔	↔	↔		↔	↔	
Traffic Volume (vph)	50	198	79	201	192	151	83	454	129	155	386	26
Future Volume (vph)	50	198	79	201	192	151	83	454	129	155	386	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00	0.97	1.00	1.00	0.96	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1844	1536	1681	1761	1524	1770	3409		1770	3492	
Flt Permitted		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1844	1536	1681	1761	1524	1770	3409		1770	3492	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	215	86	218	209	164	90	493	140	168	420	28
RTOR Reduction (vph)	0	0	70	0	0	134	0	32	0	0	6	0
Lane Group Flow (vph)	0	269	16	196	231	30	90	602	0	168	442	0
Confl. Peds. (#/hr)	14		10	10		14			3			15
Confl. Bikes (#/hr)			4			5			3			3
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		15.1	15.1	14.8	14.8	14.8	7.9	24.0		7.3	23.4	
Effective Green, g (s)		15.1	15.1	14.8	14.8	14.8	7.9	24.0		7.3	23.4	
Actuated g/C Ratio		0.19	0.19	0.19	0.19	0.19	0.10	0.30		0.09	0.29	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)		348	289	310	325	281	174	1022		161	1021	
v/s Ratio Prot		c0.15		0.12	c0.13		0.05	c0.18		c0.09	0.13	
v/s Ratio Perm			0.01			0.02						
v/c Ratio		0.77	0.06	0.63	0.71	0.11	0.52	0.59		1.04	0.43	
Uniform Delay, d1		30.8	26.6	30.1	30.6	27.1	34.2	23.8		36.4	22.9	
Progression Factor		1.00	1.00	1.00	1.00	1.00	0.73	0.38		1.00	1.00	
Incremental Delay, d2		9.4	0.0	4.4	7.4	0.2	1.0	2.2		82.9	1.3	
Delay (s)		40.2	26.6	34.4	38.0	27.3	26.0	11.2		119.2	24.3	
Level of Service		D	C	C	D	C	C	B		F	C	
Approach Delay (s)		36.9			33.8			13.1			50.2	
Approach LOS		D			C			B			D	
Intersection Summary												
HCM 2000 Control Delay			32.1									
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			80.0									
Intersection Capacity Utilization			68.2%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	526	10	37	585	174	15	21	95	326	17	80
Future Volume (vph)	40	526	10	37	585	174	15	21	95	326	17	80
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.96
Flpb, ped/bikes	1.00	1.00		0.99	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.97			0.89			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1770	3527		1760	3406			3103			1777	1527
Flt Permitted	0.22	1.00		0.36	1.00			0.91			0.63	1.00
Satd. Flow (perm)	409	3527		666	3406			2841			1177	1527
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	572	11	40	636	189	16	23	103	354	18	87
RTOR Reduction (vph)	0	3	0	0	58	0	0	52	0	0	0	44
Lane Group Flow (vph)	43	580	0	40	767	0	0	90	0	0	372	43
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	18.2	18.2		18.2	18.2			27.3			27.3	27.3
Effective Green, g (s)	18.2	18.2		18.2	18.2			27.3			27.3	27.3
Actuated g/C Ratio	0.33	0.33		0.33	0.33			0.50			0.50	0.50
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	135	1167		220	1127			1410			584	757
v/s Ratio Prot		0.16			c0.23							
v/s Ratio Perm	0.11			0.06				0.03			c0.32	0.03
v/c Ratio	0.32	0.50		0.18	0.68			0.06			0.64	0.06
Uniform Delay, d1	13.8	14.7		13.1	15.9			7.2			10.2	7.2
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	1.4	0.3		0.4	1.7			0.1			5.2	0.1
Delay (s)	15.1	15.1		13.5	17.6			7.3			15.4	7.3
Level of Service	B	B		B	B			A			B	A
Approach Delay (s)		15.1			17.4			7.3			13.9	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay		15.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.65										
Actuated Cycle Length (s)		55.0			Sum of lost time (s)			9.5				
Intersection Capacity Utilization		68.8%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	20	16	76	20	260	21	505	139	332	526	20
Future Volume (vph)	44	20	16	76	20	260	21	505	139	332	526	20
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	0.98	1.00	0.99		1.00	1.00	
Flpb, ped/bikes		0.99			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1750			1787	1547	1770	3403		1770	3515	
Flt Permitted		0.81			0.76	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1460			1410	1547	1770	3403		1770	3515	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	22	17	83	22	283	23	549	151	361	572	22
RTOR Reduction (vph)	0	11	0	0	0	212	0	38	0	0	3	0
Lane Group Flow (vph)	0	76	0	0	105	71	23	662	0	361	591	0
Confl. Peds. (#/hr)	10		4	4		10			3			4
Confl. Bikes (#/hr)			1						2			3
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		20.1			20.1	20.1	1.9	18.5		27.7	44.3	
Effective Green, g (s)		20.1			20.1	20.1	1.9	18.5		27.7	44.3	
Actuated g/C Ratio		0.25			0.25	0.25	0.02	0.23		0.35	0.55	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		366			354	388	42	786		612	1946	
v/s Ratio Prot							0.01	c0.19		c0.20	0.17	
v/s Ratio Perm		0.05			c0.07	0.05						
v/c Ratio		0.21			0.30	0.18	0.55	0.84		0.59	0.30	
Uniform Delay, d1		23.7			24.2	23.5	38.6	29.4		21.5	9.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00		0.86	0.51	
Incremental Delay, d2		1.3			2.1	1.0	13.8	8.1		1.4	0.1	
Delay (s)		24.9			26.4	24.5	52.4	37.5		19.8	4.9	
Level of Service		C			C	C	D	D		B	A	
Approach Delay (s)		24.9			25.0			38.0			10.5	
Approach LOS		C			C			D			B	
Intersection Summary												
HCM 2000 Control Delay		22.9										
HCM 2000 Volume to Capacity ratio		0.57										
Actuated Cycle Length (s)		80.0										
Intersection Capacity Utilization		66.9%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	411	76	81	250	0	166	0	141	0	0	0
Future Volume (Veh/h)	10	411	76	81	250	0	166	0	141	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	447	83	88	272	0	180	0	153	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	252											
pX, platoon unblocked												
vC, conflicting volume	272			530			958	958	488	1112	1000	272
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	272			530			958	958	488	1112	1000	272
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			92			18	100	74	100	100	100
cM capacity (veh/h)	1291			1037			220	233	579	127	221	767
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	541	360	333	0								
Volume Left	11	88	180	0								
Volume Right	83	0	153	0								
cSH	1291	1037	308	1700								
Volume to Capacity	0.01	0.08	1.08	0.00								
Queue Length 95th (ft)	1	7	322	0								
Control Delay (s)	0.3	2.8	112.9	0.0								
Lane LOS	A	A	F	A								
Approach Delay (s)	0.3	2.8	112.9	0.0								
Approach LOS			F	A								
Intersection Summary												
Average Delay			31.4									
Intersection Capacity Utilization			72.3%	ICU Level of Service					C			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	201	63	0	78	0	63	3	19	0	0	0
Future Volume (Veh/h)	0	201	63	0	78	0	63	3	19	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	218	68	0	85	0	68	3	21	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)	643											
pX, platoon unblocked												
vC, conflicting volume	85			286			337	337	252	360	371	85
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	85			286			337	337	252	360	371	85
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			89	99	97	100	100	100
cM capacity (veh/h)	1512			1276			617	584	787	578	559	974
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	286	85	92	0								
Volume Left	0	0	68	0								
Volume Right	68	0	21	0								
cSH	1512	1276	647	1700								
Volume to Capacity	0.00	0.00	0.14	0.00								
Queue Length 95th (ft)	0	0	12	0								
Control Delay (s)	0.0	0.0	11.5	0.0								
Lane LOS			B	A								
Approach Delay (s)	0.0	0.0	11.5	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay	2.3											
Intersection Capacity Utilization	25.9%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	76	306	23	43	365	23
Future Volume (vph)	76	306	23	43	365	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	83	333	25	47	397	25
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	416	72	422			
Volume Left (vph)	83	0	397			
Volume Right (vph)	333	47	0			
Hadj (s)	-0.41	-0.36	0.22			
Departure Headway (s)	4.8	5.3	5.3			
Degree Utilization, x	0.56	0.11	0.63			
Capacity (veh/h)	708	610	650			
Control Delay (s)	13.8	8.9	16.8			
Approach Delay (s)	13.8	8.9	16.8			
Approach LOS	B	A	C			
Intersection Summary						
Delay			14.8			
Level of Service			B			
Intersection Capacity Utilization			57.8%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	414	175	28	325	25	239	29	37	7	21	36
Future Volume (Veh/h)	14	414	175	28	325	25	239	29	37	7	21	36
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	450	190	30	353	27	260	32	40	8	23	39
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	380			640			1052	1015	545	1058	1096	366
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	380			640			1052	1015	545	1058	1096	366
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			97			0	86	93	95	89	94
cM capacity (veh/h)	1178			944			170	228	538	162	204	679
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	655	410	332	70								
Volume Left	15	30	260	8								
Volume Right	190	27	40	39								
cSH	1178	944	191	319								
Volume to Capacity	0.01	0.03	1.74	0.22								
Queue Length 95th (ft)	1	2	577	21								
Control Delay (s)	0.3	1.0	397.4	19.5								
Lane LOS	A	A	F	C								
Approach Delay (s)	0.3	1.0	397.4	19.5								
Approach LOS			F	C								
Intersection Summary												
Average Delay												
Intersection Capacity Utilization												
Analysis Period (min)												
ICU Level of Service												
C												

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	233	6	17	194	29	3	8	16	13	3	3
Future Volume (Veh/h)	3	233	6	17	194	29	3	8	16	13	3	3
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	253	7	18	211	32	3	9	17	14	3	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					249							
pX, platoon unblocked												
vC, conflicting volume	243			260			530	542	256	547	529	227
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	243			260			530	542	256	547	529	227
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	98	98	97	99	100
cM capacity (veh/h)	1323			1304			450	441	782	426	448	812
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	263	261	29	20								
Volume Left	3	18	3	14								
Volume Right	7	32	17	3								
cSH	1323	1304	594	462								
Volume to Capacity	0.00	0.01	0.05	0.04								
Queue Length 95th (ft)	0	1	4	3								
Control Delay (s)	0.1	0.7	11.4	13.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	0.7	11.4	13.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			33.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	103	88	96	76	51	11	106	412	35	43	327	37
Future Volume (vph)	103	88	96	76	51	11	106	412	35	43	327	37
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.95			0.99		1.00	0.99		1.00	0.98	
Flt Protected		0.98			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1748			1793		1770	3498		1770	3485	
Flt Permitted		0.83			0.63		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1484			1153		1770	3498		1770	3485	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	112	96	104	83	55	12	115	448	38	47	355	40
RTOR Reduction (vph)	0	27	0	0	4	0	0	8	0	0	10	0
Lane Group Flow (vph)	0	285	0	0	146	0	115	478	0	47	385	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		18.3			17.9		10.6	31.1		6.0	27.3	
Effective Green, g (s)		18.3			17.9		10.6	31.1		6.0	27.3	
Actuated g/C Ratio		0.26			0.26		0.15	0.44		0.09	0.39	
Clearance Time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.5		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		387			294		268	1554		151	1359	
v/s Ratio Prot							c0.06	c0.14		0.03	c0.11	
v/s Ratio Perm		c0.19			0.13							
v/c Ratio		0.74			0.50		0.43	0.31		0.31	0.28	
Uniform Delay, d1		23.7			22.2		27.0	12.5		30.1	14.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		7.2			1.5		0.4	0.5		1.2	0.5	
Delay (s)		30.8			23.7		27.4	13.0		31.2	15.2	
Level of Service		C			C		C	B		C	B	
Approach Delay (s)		30.8			23.7			15.8			16.9	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay		20.0			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.48										
Actuated Cycle Length (s)		70.0			Sum of lost time (s)			15.0				
Intersection Capacity Utilization		50.7%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	52	761	73	81	343	32	84	118	37	50	46	52
Future Volume (Veh/h)	52	761	73	81	343	32	84	118	37	50	46	52
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	57	827	79	88	373	35	91	128	40	54	50	57
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		280										
pX, platoon unblocked												
vC, conflicting volume	408			906			1629	1564	866	1651	1586	390
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	408			906			1629	1564	866	1651	1586	390
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			88			0	0	89	0	45	91
cM capacity (veh/h)	1151			751			37	94	353	0	91	658
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	963	496	259	161								
Volume Left	57	88	91	54								
Volume Right	79	35	40	57								
cSH	1151	751	66	0								
Volume to Capacity	0.05	0.12	3.92	Err								
Queue Length 95th (ft)	4	10	Err	Err								
Control Delay (s)	1.3	3.2	Err	Err								
Lane LOS	A	A	F	F								
Approach Delay (s)	1.3	3.2	Err	Err								
Approach LOS			F	F								
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			75.8%		ICU Level of Service				D			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	124	30	37	59	3	40	50	37	4	22	6
Future Volume (vph)	10	124	30	37	59	3	40	50	37	4	22	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	135	33	40	64	3	43	54	40	4	24	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	179	107	137	35								
Volume Left (vph)	11	40	43	4								
Volume Right (vph)	33	3	40	7								
Hadj (s)	-0.06	0.09	-0.08	-0.06								
Departure Headway (s)	4.4	4.6	4.5	4.7								
Degree Utilization, x	0.22	0.14	0.17	0.05								
Capacity (veh/h)	789	737	746	707								
Control Delay (s)	8.6	8.3	8.5	7.9								
Approach Delay (s)	8.6	8.3	8.5	7.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.4								
Level of Service				A								
Intersection Capacity Utilization				37.9%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	163	18	90	70	45	18	124	203	86	26	5
Future Volume (vph)	20	163	18	90	70	45	18	124	203	86	26	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	177	20	98	76	49	20	135	221	93	28	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	219	223	376	126								
Volume Left (vph)	22	98	20	93								
Volume Right (vph)	20	49	221	5								
Hadj (s)	0.00	-0.01	-0.31	0.16								
Departure Headway (s)	5.7	5.7	5.1	6.0								
Degree Utilization, x	0.35	0.35	0.53	0.21								
Capacity (veh/h)	573	576	660	522								
Control Delay (s)	11.7	11.7	13.8	10.6								
Approach Delay (s)	11.7	11.7	13.8	10.6								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay				12.4								
Level of Service				B								
Intersection Capacity Utilization				61.9%	ICU Level of Service				B			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	178	171	12	118	65
Future Volume (vph)	0	178	171	12	118	65
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	193	186	13	128	71
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	193	199	199			
Volume Left (vph)	0	0	128			
Volume Right (vph)	193	13	0			
Hadj (s)	-0.57	-0.01	0.16			
Departure Headway (s)	4.3	4.6	4.7			
Degree Utilization, x	0.23	0.25	0.26			
Capacity (veh/h)	776	748	721			
Control Delay (s)	8.5	9.1	9.4			
Approach Delay (s)	8.5	9.1	9.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			9.0			
Level of Service			A			
Intersection Capacity Utilization			27.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	30	212	65	266	169	465	73	494	352	389	415	36
Future Volume (vph)	30	212	65	266	169	465	73	494	352	389	415	36
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.97		1.00	1.00	1.00	0.98		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.94		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1863	1540		1808	1583	1770	3260		1770	3481	
Flt Permitted	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1863	1540		1808	1583	1770	3260		1770	3481	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	33	230	71	289	184	505	79	537	383	423	451	39
RTOR Reduction (vph)	0	0	62	0	0	266	0	99	0	0	6	0
Lane Group Flow (vph)	33	230	9	0	473	239	79	821	0	423	484	0
Confl. Peds. (#/hr)	7		2	2		7			5			8
Confl. Bikes (#/hr)						2			4			8
Turn Type	Split	NA	Perm	Split	NA	pm+ov	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	1	5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)	16.7	16.7	16.7		33.4	28.8	26.7	32.0		28.8	34.1	
Effective Green, g (s)	16.7	16.7	16.7		33.4	28.8	26.7	32.0		28.8	34.1	
Actuated g/C Ratio	0.13	0.13	0.13		0.26	0.22	0.21	0.25		0.22	0.26	
Clearance Time (s)	5.0	5.0	5.0		4.9	4.2	4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0	2.0	2.0	3.0		2.0	3.0	
Lane Grp Cap (vph)	227	239	197		464	350	363	802		392	913	
v/s Ratio Prot	0.02	c0.12			c0.26	0.15	0.04	c0.25		c0.24	0.14	
v/s Ratio Perm			0.01									
v/c Ratio	0.15	0.96	0.05		1.02	0.68	0.22	1.02		1.08	0.53	
Uniform Delay, d1	50.3	56.3	49.7		48.3	46.4	43.0	49.0		50.6	41.1	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	47.2	0.0		46.8	4.3	0.1	38.0		68.3	2.2	
Delay (s)	50.4	103.5	49.7		95.1	50.7	43.1	87.0		118.9	43.3	
Level of Service	D	F	D		F	D	D	F		F	D	
Approach Delay (s)		86.8			72.2			83.5			78.3	
Approach LOS		F			E			F			E	
Intersection Summary												
HCM 2000 Control Delay			78.9				HCM 2000 Level of Service			E		
HCM 2000 Volume to Capacity ratio			1.03									
Actuated Cycle Length (s)			130.0				Sum of lost time (s)			19.1		
Intersection Capacity Utilization			97.4%				ICU Level of Service			F		
Analysis Period (min)			15									

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	1239	17	22	1191	163	11	0	22	76	11	173
Future Volume (Veh/h)	29	1239	17	22	1191	163	11	0	22	76	11	173
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	1347	18	24	1295	177	12	0	24	83	12	188
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh					2							
Upstream signal (ft)		279										
pX, platoon unblocked				0.88			0.88	0.88	0.88	0.88	0.88	
vC, conflicting volume	1472			1365			3046	2940	1356	2876	2860	1384
vC1, stage 1 conf vol							1420	1420		1432	1432	
vC2, stage 2 conf vol							1626	1520		1444	1429	
vCu, unblocked vol	1472			1346			3258	3138	1336	3065	3048	1384
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			95			0	100	85	0	89	0
cM capacity (veh/h)	458			450			0	101	165	75	108	176
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	1397	1496	36	283								
Volume Left	32	24	12	83								
Volume Right	18	177	24	188								
cSH	458	450	0	124								
Volume to Capacity	0.07	0.05	Err	2.28								
Queue Length 95th (ft)	6	4	Err	607								
Control Delay (s)	5.0	5.5	Err	659.9								
Lane LOS	A	A	F	F								
Approach Delay (s)	5.0	5.5	Err	659.9								
Approach LOS			F	F								
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			109.4%		ICU Level of Service				H			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	1611	9	22	1585	38	2	2	35	15	2	9
Future Volume (Veh/h)	6	1611	9	22	1585	38	2	2	35	15	2	9
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	1751	10	24	1723	41	2	2	38	16	2	10
Pedestrians	1						1					
Lane Width (ft)	12.0						12.0					
Walking Speed (ft/s)	4.0						4.0					
Percent Blockage	0						0					
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage veh	2			2								
Upstream signal (ft)	687											
pX, platoon unblocked				0.89				0.89	0.89	0.89	0.89	0.89
vC, conflicting volume	1764				1762				3554	3583	1757	3596
vC1, stage 1 conf vol							1771	1771				1792
vC2, stage 2 conf vol							1783	1812				1804
vCu, unblocked vol	1764				1795				3816	3848	1790	3862
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1
tC, 2 stage (s)							6.1	5.5				6.1
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5
p0 queue free %	98				92				96	97	57	26
cM capacity (veh/h)	354				305				54	75	89	22
											67	107
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	7	1761	24	1764	42	28						
Volume Left	7	0	24	0	2	16						
Volume Right	0	10	0	41	38	10						
cSH	354	1700	305	1700	86	33						
Volume to Capacity	0.02	1.04	0.08	1.04	0.49	0.86						
Queue Length 95th (ft)	2	0	6	0	52	74						
Control Delay (s)	15.4	0.0	17.8	0.0	82.0	294.2						
Lane LOS	C		C		F	F						
Approach Delay (s)	0.1		0.2		82.0	294.2						
Approach LOS					F	F						
Intersection Summary												
Average Delay				3.4								
Intersection Capacity Utilization				100.1%	ICU Level of Service			G				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1417	0	19	1459	503	0	0	11	0	0	34
Future Volume (Veh/h)	20	1417	0	19	1459	503	0	0	11	0	0	34
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	1540	0	21	1586	547	0	0	12	0	0	37
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL				TWLTL							
Median storage (veh)	2				2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2133			1540			3249	3759	1540	3498	3486	1860
vC1, stage 1 conf vol							1584	1584		1902	1902	
vC2, stage 2 conf vol							1665	2175		1596	1584	
vCu, unblocked vol	2133			1540			3249	3759	1540	3498	3486	1860
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			95			100	100	92	100	100	59
cM capacity (veh/h)	254			431			42	53	142	58	80	91
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	22	1540	21	2133	12	37						
Volume Left	22	0	21	0	0	0						
Volume Right	0	0	0	547	12	37						
cSH	254	1700	431	1700	142	91						
Volume to Capacity	0.09	0.91	0.05	1.25	0.08	0.41						
Queue Length 95th (ft)	7	0	4	0	7	41						
Control Delay (s)	20.5	0.0	13.8	0.0	32.7	69.1						
Lane LOS	C		B		D	F						
Approach Delay (s)	0.3		0.1		32.7	69.1						
Approach LOS					D	F						
Intersection Summary												
Average Delay				1.0								
Intersection Capacity Utilization				124.1%	ICU Level of Service			H				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	117	0	0	19	122	773	4	19	620	11
Future Volume (Veh/h)	0	0	117	0	0	19	122	773	4	19	620	11
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	127	0	0	21	133	840	4	21	674	12
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL			TWLTL		
Median storage (veh)							2			2		
Upstream signal (ft)										621		
pX, platoon unblocked	0.85	0.85	0.85	0.85	0.85	0.85						
vC, conflicting volume	1429	1832	680	1951	1836	422	686			844		
vC1, stage 1 conf vol	722	722	1108		1108							
vC2, stage 2 conf vol	707	1110	843		728							
vCu, unblocked vol	1417	1889	538	2029	1894	422	545			844		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5	6.5		5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	69	100	100	96	85			97		
cM capacity (veh/h)	239	192	416	77	182	580	870			788		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	127	21	133	560	284	21	686					
Volume Left	0	0	133	0	0	21	0					
Volume Right	127	21	0	0	4	0	12					
cSH	416	580	870	1700	1700	788	1700					
Volume to Capacity	0.31	0.04	0.15	0.33	0.17	0.03	0.40					
Queue Length 95th (ft)	32	3	13	0	0	2	0					
Control Delay (s)	17.4	11.4	9.9	0.0	0.0	9.7	0.0					
Lane LOS	C	B	A			A						
Approach Delay (s)	17.4	11.4	1.3			0.3						
Approach LOS	C	B										
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			47.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

45: Coast Hwy & Michigan Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	55	25	25	16	3	8	8	342	14	6	342	15
Future Volume (vph)	55	25	25	16	3	8	8	342	14	6	342	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5		4.5			4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00		0.95			0.95	
Frt		1.00	0.85		1.00	0.85		0.99			0.99	
Flt Protected		0.97	1.00		0.96	1.00		1.00			1.00	
Satd. Flow (prot)		1801	1583		1787	1583		3515			3515	
Flt Permitted		0.78	1.00		0.70	1.00		0.95			0.95	
Satd. Flow (perm)		1456	1583		1300	1583		3334			3340	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	60	27	27	17	3	9	9	372	15	7	372	16
RTOR Reduction (vph)	0	0	24	0	0	8	0	4	0	0	4	0
Lane Group Flow (vph)	0	87	3	0	20	1	0	392	0	0	391	0
Turn Type	Perm	NA	Perm	Perm	NA	Perm	Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8		8	2			6		
Actuated Green, G (s)		5.6	5.6		5.6	5.6		30.4			30.4	
Effective Green, g (s)		5.6	5.6		5.6	5.6		30.4			30.4	
Actuated g/C Ratio		0.12	0.12		0.12	0.12		0.68			0.68	
Clearance Time (s)		4.5	4.5		4.5	4.5		4.5			4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0		3.0			3.0	
Lane Grp Cap (vph)		181	196		161	196		2252			2256	
v/s Ratio Prot												
v/s Ratio Perm		c0.06	0.00		0.02	0.00		c0.12			0.12	
v/c Ratio		0.48	0.02		0.12	0.01		0.17			0.17	
Uniform Delay, d1		18.3	17.3		17.5	17.3		2.7			2.7	
Progression Factor		1.00	1.00		1.00	1.00		1.00			1.00	
Incremental Delay, d2		2.0	0.0		0.3	0.0		0.2			0.2	
Delay (s)		20.4	17.3		17.9	17.3		2.9			2.9	
Level of Service		C	B		B	B		A			A	
Approach Delay (s)		19.6			17.7			2.9			2.9	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		5.4										
HCM 2000 Volume to Capacity ratio		0.22										
Actuated Cycle Length (s)		45.0										
Intersection Capacity Utilization		34.2%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

46: Coast Hwy

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	4	10	12	4	18	10	183	12	18	183	14
Future Volume (Veh/h)	14	4	10	12	4	18	10	183	12	18	183	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	4	11	13	4	20	11	199	13	20	199	15
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)								836			1100	
pX, platoon unblocked												
vC, conflicting volume	390	480	107	380	482	106	214			212		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	390	480	107	380	482	106	214			212		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	97	99	99	98	99	98	99			99		
cM capacity (veh/h)	519	472	926	533	472	928	1353			1356		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	30	37	110	112	120	114						
Volume Left	15	13	11	0	20	0						
Volume Right	11	20	0	13	0	15						
cSH	609	680	1353	1700	1356	1700						
Volume to Capacity	0.05	0.05	0.01	0.07	0.01	0.07						
Queue Length 95th (ft)	4	4	1	0	1	0						
Control Delay (s)	11.2	10.6	0.8	0.0	1.4	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s)	11.2	10.6	0.4		0.7							
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization			25.1%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

47: Coast Hwy

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	38	44	22	30	51	23	153	21	43	132	46
Future Volume (Veh/h)	17	38	44	22	30	51	23	153	21	43	132	46
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	41	48	24	33	55	25	166	23	47	143	50
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None								None			
Median storage veh												
Upstream signal (ft)	538								726			
pX, platoon unblocked												
vC, conflicting volume	466	501	96	462	514	94	193	189				
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	466	501	96	462	514	94	193	189				
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1	4.1				
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2	2.2				
p0 queue free %	96	91	95	94	92	94	98	97				
cM capacity (veh/h)	409	446	941	410	439	944	1378	1382				
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	107	112	108	106	118	122						
Volume Left	18	24	25	0	47	0						
Volume Right	48	55	0	23	0	50						
cSH	573	583	1378	1700	1382	1700						
Volume to Capacity	0.19	0.19	0.02	0.06	0.03	0.07						
Queue Length 95th (ft)	17	18	1	0	3	0						
Control Delay (s)	12.7	12.6	1.9	0.0	3.2	0.0						
Lane LOS	B	B	A	A								
Approach Delay (s)	12.7	12.6	1.0	1.6								
Approach LOS	B	B										
Intersection Summary												
Average Delay	5.0											
Intersection Capacity Utilization	30.5%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	103	0	14	13	1059	13	24	2214	16
Future Volume (veh/h)	0	0	0	103	0	14	13	1059	13	24	2214	16
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h				112	0	0	14	1151	0	26	2407	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				631	0	281	79	3221	1003	99	2281	1020
Arrive On Green				0.18	0.00	0.00	0.04	0.63	0.00	0.06	0.64	0.00
Sat Flow, veh/h				3548	0	1583	1774	5085	1583	1774	3539	1583
Grp Volume(v), veh/h				112	0	0	14	1151	0	26	2407	0
Grp Sat Flow(s),veh/h/ln				1774	0	1583	1774	1695	1583	1774	1770	1583
Q Serve(g_s), s				2.4	0.0	0.0	0.7	9.7	0.0	1.3	58.0	0.0
Cycle Q Clear(g_c), s				2.4	0.0	0.0	0.7	9.7	0.0	1.3	58.0	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				631	0	281	79	3221	1003	99	2281	1020
V/C Ratio(X)				0.18	0.00	0.00	0.18	0.36	0.00	0.26	1.06	0.00
Avail Cap(c_a), veh/h				631	0	281	79	3221	1003	99	2281	1020
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				31.4	0.0	0.0	41.4	7.8	0.0	40.7	16.0	0.0
Incr Delay (d2), s/veh				0.6	0.0	0.0	4.9	0.3	0.0	6.4	35.5	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.2	0.0	0.0	0.4	4.6	0.0	0.8	39.1	0.0
LnGrp Delay(d),s/veh				32.0	0.0	0.0	46.3	8.1	0.0	47.2	51.5	0.0
LnGrp LOS				C			D	A		D	F	
Approach Vol, veh/h					112			1165			2433	
Approach Delay, s/veh					32.0			8.6			51.4	
Approach LOS					C			A			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	9.0	61.0			8.0	62.0		20.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	5.0	57.0			4.0	58.0		16.0				
Max Q Clear Time (g_c+I1), s	3.3	11.7			2.7	60.0		4.4				
Green Ext Time (p_c), s	0.0	11.0			0.0	0.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				37.4								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↑	↔	↑↑					
Traffic Volume (veh/h)	955	175	280	1095	0	0			
Future Volume (veh/h)	955	175	280	1095	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863					
Adj Flow Rate, veh/h	1038	190	304	1190					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	2035	910	774	3185					
Arrive On Green	0.57	0.57	0.22	0.90					
Sat Flow, veh/h	3632	1583	3442	3632					
Grp Volume(v), veh/h	1038	190	304	1190					
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1770					
Q Serve(g_s), s	7.1	2.3	3.0	2.0					
Cycle Q Clear(g_c), s	7.1	2.3	3.0	2.0					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	2035	910	774	3185					
V/C Ratio(X)	0.51	0.21	0.39	0.37					
Avail Cap(c_a), veh/h	2035	910	774	3185					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	5.1	4.1	13.2	0.3					
Incr Delay (d2), s/veh	0.9	0.5	1.5	0.3					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	3.6	1.1	1.6	1.0					
LnGrp Delay(d),s/veh	6.0	4.6	14.7	0.6					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	1228			1494					
Approach Delay, s/veh	5.8			3.5					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			13.0	27.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			9.0	23.0				36.0	
Max Q Clear Time (g_c+l1), s			5.0	9.1				4.0	
Green Ext Time (p_c), s			0.4	6.8				11.0	
Intersection Summary									
HCM 2010 Ctrl Delay			4.5						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/11/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↖	↑↑	↖	↗		
Traffic Volume (veh/h)	1662	86	274	1265	138	0		
Future Volume (veh/h)	1662	86	274	1265	138	0		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	1807	93	298	1375	150	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1809	809	612	2595	315	281		
Arrive On Green	0.51	0.51	0.18	0.73	0.18	0.00		
Sat Flow, veh/h	3632	1583	3442	3632	1774	1583		
Grp Volume(v), veh/h	1807	93	298	1375	150	0		
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1770	1774	1583		
Q Serve(g_s), s	45.9	2.7	7.0	15.2	6.8	0.0		
Cycle Q Clear(g_c), s	45.9	2.7	7.0	15.2	6.8	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1809	809	612	2595	315	281		
V/C Ratio(X)	1.00	0.11	0.49	0.53	0.48	0.00		
Avail Cap(c_a), veh/h	1809	809	612	2595	315	281		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	22.0	11.4	33.3	5.2	33.2	0.0		
Incr Delay (d2), s/veh	20.9	0.3	2.8	0.8	5.1	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	27.3	1.3	3.5	7.5	3.8	0.0		
LnGrp Delay(d),s/veh	42.9	11.7	36.1	6.0	38.3	0.0		
LnGrp LOS	D	B	D	A	D			
Approach Vol, veh/h	1900			1673	150			
Approach Delay, s/veh	41.4			11.4	38.3			
Approach LOS	D			B	D			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	20.0	50.0				70.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	16.0	46.0				66.0
Max Q Clear Time (g_c+I1), s		8.8	9.0	47.9				17.2
Green Ext Time (p_c), s		0.2	0.6	0.0				15.5
Intersection Summary								
HCM 2010 Ctrl Delay			27.8					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary
51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	676	6	88	629	119	5	0	34	85	9	54
Future Volume (veh/h)	0	676	6	88	629	119	5	0	34	85	9	54
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1900	1863	1863	1863	1863	0	1863	1863	1863	1863
Adj Flow Rate, veh/h	0	735	7	96	684	0	5	0	37	99	0	59
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1268	12	174	1874	838	0	0	0	1113	0	497
Arrive On Green	0.00	0.35	0.35	0.10	0.53	0.00	0.00	0.00	0.00	0.31	0.00	0.31
Sat Flow, veh/h	0	3685	34	1774	3539	1583		0		3548	0	1583
Grp Volume(v), veh/h	0	362	380	96	684	0		0.0		99	0	59
Grp Sat Flow(s),veh/h/ln	0	1770	1857	1774	1770	1583				1774	0	1583
Q Serve(g_s), s	0.0	8.5	8.5	2.6	5.7	0.0				1.0	0.0	1.4
Cycle Q Clear(g_c), s	0.0	8.5	8.5	2.6	5.7	0.0				1.0	0.0	1.4
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	625	655	174	1874	838				1113	0	497
V/C Ratio(X)	0.00	0.58	0.58	0.55	0.37	0.00				0.09	0.00	0.12
Avail Cap(c_a), veh/h	0	625	655	174	1874	838				1113	0	497
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	13.4	13.4	21.9	7.0	0.0				12.4	0.0	12.5
Incr Delay (d2), s/veh	0.0	3.9	3.7	12.0	0.6	0.0				0.2	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.8	5.0	1.9	2.9	0.0				0.5	0.0	0.7
LnGrp Delay(d),s/veh	0.0	17.3	17.1	34.0	7.6	0.0				12.5	0.0	13.0
LnGrp LOS		B	B	C	A					B		B
Approach Vol, veh/h		742			780						158	
Approach Delay, s/veh		17.2			10.8						12.7	
Approach LOS		B			B						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			9.0	22.0		20.0		31.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			5.0	18.0		16.0		27.0				
Max Q Clear Time (g_c+I1), s			4.6	10.5		3.4		7.7				
Green Ext Time (p_c), s			0.0	2.7		0.4		4.6				
Intersection Summary												
HCM 2010 Ctrl Delay			13.8									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	169	647	9	27	950	290	8	2	15	284	6	69
Future Volume (veh/h)	169	647	9	27	950	290	8	2	15	284	6	69
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1863	1863	1863	1900
Adj Flow Rate, veh/h	184	703	10	29	1033	315	9	2	16	196	166	75
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	177	1161	17	111	1018	455	311	69	336	355	243	110
Arrive On Green	0.10	0.32	0.32	0.13	0.57	0.57	0.21	0.21	0.21	0.20	0.20	0.20
Sat Flow, veh/h	1774	3573	51	1774	3539	1583	1464	325	1583	1774	1216	550
Grp Volume(v), veh/h	184	348	365	29	1033	315	11	0	16	196	0	241
Grp Sat Flow(s),veh/h/ln	1774	1770	1854	1774	1770	1583	1790	0	1583	1774	0	1766
Q Serve(g_s), s	8.0	13.2	13.2	1.2	23.0	11.2	0.4	0.0	0.6	7.9	0.0	10.1
Cycle Q Clear(g_c), s	8.0	13.2	13.2	1.2	23.0	11.2	0.4	0.0	0.6	7.9	0.0	10.1
Prop In Lane	1.00		0.03	1.00		1.00	0.82		1.00	1.00		0.31
Lane Grp Cap(c), veh/h	177	575	602	111	1018	455	380	0	336	355	0	353
V/C Ratio(X)	1.04	0.61	0.61	0.26	1.02	0.69	0.03	0.00	0.05	0.55	0.00	0.68
Avail Cap(c_a), veh/h	177	575	602	111	1018	455	380	0	336	355	0	353
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.0	22.7	22.7	33.3	17.0	14.5	25.0	0.0	25.1	28.8	0.0	29.6
Incr Delay (d2), s/veh	77.7	4.7	4.5	5.7	32.1	8.4	0.1	0.0	0.3	6.1	0.0	10.2
Initial Q Delay(d3),s/veh	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.7	7.1	7.4	0.8	15.3	5.8	0.2	0.0	0.3	4.5	0.0	5.9
LnGrp Delay(d),s/veh	113.8	27.4	27.2	39.0	49.1	22.9	25.1	0.0	25.3	34.9	0.0	39.9
LnGrp LOS	F	C	C	D	F	C	C		C	C		D
Approach Vol, veh/h		897			1377			27			437	
Approach Delay, s/veh		45.0			42.9			25.2			37.6	
Approach LOS		D			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.0	9.0	30.0		20.0	12.0	27.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	5.0	26.0		16.0	8.0	23.0				
Max Q Clear Time (g_c+I1), s		2.6	3.2	15.2		12.1	10.0	25.0				
Green Ext Time (p_c), s		0.0	0.0	3.3		0.8	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				42.6								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	832	275	86	733	183	350	97	138	433	235	382
Future Volume (veh/h)	60	832	275	86	733	183	350	97	138	433	235	382
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	65	904	299	93	797	199	242	297	150	363	406	415
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	118	872	288	99	1140	510	375	393	334	394	414	352
Arrive On Green	0.07	0.33	0.33	0.06	0.32	0.32	0.21	0.21	0.21	0.22	0.22	0.22
Sat Flow, veh/h	1774	2617	863	1774	3539	1583	1774	1863	1583	1774	1863	1583
Grp Volume(v), veh/h	65	610	593	93	797	199	242	297	150	363	406	415
Grp Sat Flow(s),veh/h/ln	1774	1770	1710	1774	1770	1583	1774	1863	1583	1774	1863	1583
Q Serve(g_s), s	3.2	30.0	30.0	4.7	17.7	8.8	11.2	13.5	7.4	18.0	19.5	20.0
Cycle Q Clear(g_c), s	3.2	30.0	30.0	4.7	17.7	8.8	11.2	13.5	7.4	18.0	19.5	20.0
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	118	590	570	99	1140	510	375	393	334	394	414	352
V/C Ratio(X)	0.55	1.03	1.04	0.94	0.70	0.39	0.65	0.76	0.45	0.92	0.98	1.18
Avail Cap(c_a), veh/h	118	590	570	99	1140	510	375	393	334	394	414	352
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.7	30.0	30.0	42.4	26.7	23.6	32.4	33.3	30.9	34.2	34.8	35.0
Incr Delay (d2), s/veh	17.1	46.3	48.3	76.3	3.6	2.2	8.3	12.7	4.3	29.2	39.7	106.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	22.2	21.7	4.4	9.2	4.1	6.4	8.3	3.7	12.0	14.6	19.1
LnGrp Delay(d),s/veh	57.8	76.3	78.3	118.6	30.2	25.9	40.8	46.0	35.2	63.4	74.5	141.3
LnGrp LOS	E	F	F	F	C	C	D	D	D	E	E	F
Approach Vol, veh/h	1268				1089				689			
Approach Delay, s/veh	76.3				37.0				41.8			
Approach LOS	E				D				D			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	23.0		9.0	34.0	24.0		10.0	33.0				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	19.0		5.0	30.0	20.0		6.0	29.0				
Max Q Clear Time (g_c+I1), s	15.5		6.7	32.0	22.0		5.2	19.7				
Green Ext Time (p_c), s	1.1		0.0	0.0	0.0		0.0	4.2				
Intersection Summary												
HCM 2010 Ctrl Delay	65.7											
HCM 2010 LOS	E											
Notes												

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	79	6	7	86	9	4	3	8	0	0	0
Future Vol, veh/h	23	79	6	7	86	9	4	3	8	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	86	7	8	93	10	4	3	9	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.7	7.6	7.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	27%	21%	7%
Vol Thru, %	20%	73%	84%
Vol Right, %	53%	6%	9%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	15	108	102
LT Vol	4	23	7
Through Vol	3	79	86
RT Vol	8	6	9
Lane Flow Rate	16	117	111
Geometry Grp	1	1	1
Degree of Util (X)	0.018	0.132	0.123
Departure Headway (Hd)	4.056	4.054	4.01
Convergence, Y/N	Yes	Yes	Yes
Cap	867	884	893
Service Time	2.153	2.082	2.041
HCM Lane V/C Ratio	0.018	0.132	0.124
HCM Control Delay	7.2	7.7	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.5	0.4

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑		↑						↑	↑
Traffic Vol, veh/h	0	193	54	31	35	0	0	0	0	28	0	45
Future Vol, veh/h	0	193	54	31	35	0	0	0	0	28	0	45
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	210	59	34	38	0	0	0	0	30	0	49
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	210	0	0				316	316	38
Stage 1	-	-	-	-	-	-				106	106	-
Stage 2	-	-	-	-	-	-				210	210	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1361	-	0				677	600	1034
Stage 1	0	-	-	-	-	0				918	807	-
Stage 2	0	-	-	-	-	0				825	728	-
Platoon blocked, %	-	-	-	-	-	-				-	-	-
Mov Cap-1 Maneuver	-	-	-	1361	-	-				659	0	1034
Mov Cap-2 Maneuver	-	-	-	-	-	-				659	0	-
Stage 1	-	-	-	-	-	-				894	0	-
Stage 2	-	-	-	-	-	-				825	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.6			9.5					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2						
Capacity (veh/h)	-	-	1361	-	659	1034						
HCM Lane V/C Ratio	-	-	0.025	-	0.046	0.047						
HCM Control Delay (s)	-	-	7.7	0	10.7	8.7						
HCM Lane LOS	-	-	A	A	B	A						
HCM 95th %tile Q(veh)	-	-	0.1	-	0.1	0.1						

HCM 2010 Signalized Intersection Summary 56: I-5 SB On/Off-Ramp & Vista Way

07/02/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↔	↑	↔	↑↑		
Traffic Volume (veh/h)	869	127	928	1501	52	1417		
Future Volume (veh/h)	869	127	928	1501	52	1417		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1863	1863	1863	1863	1863	1863		
Adj Flow Rate, veh/h	945	0	1009	1632	57	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1126	504	1158	1287	419	659		
Arrive On Green	0.32	0.00	0.34	0.69	0.24	0.00		
Sat Flow, veh/h	3632	1583	3442	1863	1774	2787		
Grp Volume(v), veh/h	945	0	1009	1632	57	0		
Grp Sat Flow(s),veh/h/ln	1770	1583	1721	1863	1774	1393		
Q Serve(g_s), s	27.3	0.0	30.3	76.0	2.8	0.0		
Cycle Q Clear(g_c), s	27.3	0.0	30.3	76.0	2.8	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1126	504	1158	1287	419	659		
V/C Ratio(X)	0.84	0.00	0.87	1.27	0.14	0.00		
Avail Cap(c_a), veh/h	1126	504	1158	1287	419	659		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	34.9	0.0	34.3	17.0	33.1	0.0		
Incr Delay (d2), s/veh	7.6	0.0	9.1	126.9	0.7	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	14.4	0.0	15.8	83.6	1.4	0.0		
LnGrp Delay(d),s/veh	42.4	0.0	43.4	143.9	33.8	0.0		
LnGrp LOS	D		D	F	C			
Approach Vol, veh/h	945			2641	57			
Approach Delay, s/veh	42.4			105.5	33.8			
Approach LOS	D			F	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		30.0	41.0	39.0				80.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		26.0	37.0	35.0				76.0
Max Q Clear Time (g_c+I1), s		4.8	32.3	29.3				78.0
Green Ext Time (p_c), s		0.1	1.9	3.0				0.0
Intersection Summary								
HCM 2010 Ctrl Delay			88.0					
HCM 2010 LOS			F					

Appendix J.1 – Analysis Output Sheets (Future with Project)

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	81	61	93	301	570	169	18	141	83	23	70
Future Volume (vph)	90	81	61	93	301	570	169	18	141	83	23	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3143	1441		1782	1583		1793	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3143	1441		1782	1583		1793	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	88	66	101	327	620	184	20	153	90	25	76
RTOR Reduction (vph)	0	0	58	0	229	256	0	0	91	0	0	58
Lane Group Flow (vph)	98	88	8	101	408	54	0	204	62	0	115	18
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	5.5	8.4	8.4	8.3	12.8	12.8		21.4	21.4		17.2	17.2
Effective Green, g (s)	5.5	8.4	8.4	8.3	12.8	12.8		21.4	21.4		17.2	17.2
Actuated g/C Ratio	0.07	0.11	0.11	0.11	0.17	0.17		0.29	0.29		0.23	0.23
Clearance Time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	132	212	180	199	546	250		518	460		419	369
v/s Ratio Prot	c0.06	0.05		c0.06	c0.13			c0.11			c0.06	
v/s Ratio Perm			0.00			0.04			0.04			0.01
v/c Ratio	0.74	0.42	0.04	0.51	0.75	0.22		0.39	0.13		0.27	0.05
Uniform Delay, d1	33.4	30.3	29.0	30.7	28.9	26.1		20.9	19.3		23.1	21.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	20.0	0.5	0.0	2.0	4.9	0.2		2.2	0.6		1.6	0.2
Delay (s)	53.3	30.8	29.1	32.8	33.7	26.2		23.1	19.9		24.7	22.1
Level of Service	D	C	C	C	C	C		C	B		C	C
Approach Delay (s)		39.1			31.4			21.7			23.7	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			29.8				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			73.6				Sum of lost time (s)		18.3			
Intersection Capacity Utilization			49.7%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				T				L			
Volume (V), veh/h	0	0	0	0	0	413	0	377	0	0	176	469	0	120	164	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	0	0	0	0	458	0	410	0	0	195	520	0	133	182	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929		4.2929	4.1129			4.1129		4.2929	4.1129	
Follow-Up Headway (sec)		3.1858		3.1858	3.1858			3.1858		3.1858	3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		0		0	458	410		195	520	133	182	
Entry Volume veh/h		0		0	449	410		191	510	130	178	
Circulating Flow (Vc), pc/h	773			195			133			458		
Exiting Flow (Vex), pc/h	133			0			195			640		
Capacity (cPCE), pc/h		522		976	986			1030		802	820	
Capacity (c), veh/h		511		957	967			1009		786	804	
v/c Ratio (X)		0.00		0.00	0.46			0.19		0.17	0.22	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.0		3.8	9.2	0.0		5.3	0.0	6.3	6.9	
Lane LOS		A		A	A	A		A	A	A	A	
95% Queue		0.0		0.0	2.5			0.7		0.6	0.8	
Approach Delay, s/veh				4.8			1.5			6.6		
Approach LOS				A			A			A		
Intersection Delay, s/veh / LOS	3.9						A					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	22	4	43	28	84	12	56	62	125	77	6
Future Volume (vph)	2	22	4	43	28	84	12	56	62	125	77	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	24	4	47	30	91	13	61	67	136	84	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	30	168	141	227								
Volume Left (vph)	2	47	13	136								
Volume Right (vph)	4	91	67	7								
Hadj (s)	-0.03	-0.24	-0.23	0.14								
Departure Headway (s)	5.0	4.6	4.4	4.7								
Degree Utilization, x	0.04	0.21	0.17	0.30								
Capacity (veh/h)	652	727	766	731								
Control Delay (s)	8.2	8.8	8.4	9.6								
Approach Delay (s)	8.2	8.8	8.4	9.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.0									
Level of Service			A									
Intersection Capacity Utilization			40.3%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection		Coast Highway - Surfrider Way		
Agency or Co.	IBI Group				E/W Street Name		Surfrider Way		
Date Performed	05/23/2016				N/S Street Name		Coast Highway		
Analysis Year	2016				Analysis Time Period (hrs)		0.25		
Time Period	AM Peak Hour				Peak Hour Factor		0.92		
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1
Lane Assignment				LTR				LTR				LTR	LT		R	
Volume (V), veh/h	0	173	17	47	0	9	33	67	0	44	287	20	0	26	394	99
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	192	19	52	0	10	37	74	0	49	318	22	0	29	437	110
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929		5.1929	5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858		3.1858	3.1858	

Flow Computations, Capacity and v/c Ratios												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		263			121			389		466	110	
Entry Volume veh/h		258			119			381		457	108	
Circulating Flow (Vc), pc/h	476			559			240			96		
Exiting Flow (Vex), pc/h	70			196			584			499		
Capacity (cPCE), pc/h		702			646			889		1027	1027	
Capacity (c), veh/h		688			633			871		1006	1006	
v/c Ratio (X)		0.37			0.19			0.44		0.45	0.11	

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		10.2			7.9			9.5		8.8	4.5	
Lane LOS		B			A			A		A	A	
95% Queue		1.7			0.7			2.3		2.4	0.4	
Approach Delay, s/veh	10.2			7.9			9.5			8.0		
Approach LOS	B			A			A			A		
Intersection Delay, s/veh / LOS	8.8						A					

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Civic Center Drive
E/W Street Name	Civic Center Drive
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	13	10	9	0	23	14	22	0	7	281	28	0	63	334	13
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	14	11	10	0	26	16	24	0	8	312	31	0	70	370	14
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		35			66			351			454	
Entry Volume veh/h		34			65			344			445	
Circulating Flow (Vc), pc/h	466			334			95			50		
Exiting Flow (Vex), pc/h	112			38			350			406		
Capacity (cPCE), pc/h		709			809			1028			1075	
Capacity (c), veh/h		695			793			1007			1054	
v/c Ratio (X)		0.05			0.08			0.34			0.42	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.7			5.3			7.1			8.0	
Lane LOS		A			A			A			A	
95% Queue		0.2			0.3			1.5			2.1	
Approach Delay, s/veh	5.7			5.3			7.1			8.0		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	7.4						A					

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	7/12/2016
Analysis Year	2016
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Pier View Way
E/W Street Name	Pier View Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	7	11	11	0	12	17	18	0	8	326	13	0	13	284	22
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	8	12	12	0	13	19	20	0	9	361	14	0	14	315	24
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		32			52			384			353	
Entry Volume veh/h		31			51			376			346	
Circulating Flow (Vc), pc/h	342			378			34			41		
Exiting Flow (Vex), pc/h	40			52			389			340		
Capacity (cPCE), pc/h		803			774			1092			1085	
Capacity (c), veh/h		787			759			1071			1063	
v/c Ratio (X)		0.04			0.07			0.35			0.33	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.0			5.4			6.9			6.6	
Lane LOS		A			A			A			A	
95% Queue		0.1			0.2			1.6			1.4	
Approach Delay, s/veh	5.0			5.4			6.9			6.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	6.6						A					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

11/17/2016

																	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR					
Lane Configurations																	
Sign Control		Stop			Stop			Stop			Stop						
Traffic Volume (vph)	2	3	19	9	5	4	86	216	3	5	148	7					
Future Volume (vph)	2	3	19	9	5	4	86	216	3	5	148	7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92					
Hourly flow rate (vph)	2	3	21	10	5	4	93	235	3	5	161	8					
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2										
Volume Total (vph)	5	21	19	211	121	86	89										
Volume Left (vph)	2	0	10	93	0	5	0										
Volume Right (vph)	0	21	4	0	3	0	8										
Hadj (s)	0.23	-0.67	0.01	0.25	0.02	0.06	-0.03										
Departure Headway (s)	5.9	5.0	5.6	5.0	4.8	5.0	4.9										
Degree Utilization, x	0.01	0.03	0.03	0.29	0.16	0.12	0.12										
Capacity (veh/h)	563	660	588	705	737	704	720										
Control Delay (s)	7.7	6.9	8.8	8.9	7.5	7.4	7.3										
Approach Delay (s)	7.1		8.8	8.4		7.4											
Approach LOS	A		A	A		A											
Intersection Summary																	
Delay			8.0														
Level of Service			A														
Intersection Capacity Utilization			30.7%	ICU Level of Service						A							
Analysis Period (min)			15														

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	129	57	126	91	33	111
Future Volume (vph)	129	57	126	91	33	111
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	140	62	137	99	36	121
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	140	62	236	157		
Volume Left (vph)	140	0	0	36		
Volume Right (vph)	0	62	99	0		
Hadj (s)	0.53	-0.67	-0.22	0.08		
Departure Headway (s)	6.0	4.8	4.4	4.8		
Degree Utilization, x	0.23	0.08	0.29	0.21		
Capacity (veh/h)	569	708	776	708		
Control Delay (s)	9.5	7.0	9.3	9.1		
Approach Delay (s)	8.8		9.3	9.1		
Approach LOS	A		A	A		
Intersection Summary						
Delay			9.0			
Level of Service			A			
Intersection Capacity Utilization			37.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	0	132	38	169	33	0	0	0	0	31	41
Future Volume (vph)	18	0	132	38	169	33	0	0	0	0	31	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5		4.5	4.5	4.5						4.5	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.98						0.91	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3452						3237	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3452						3237	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	0	143	41	184	36	0	0	0	0	34	45
RTOR Reduction (vph)	0	0	130	16	14	0	0	0	0	0	42	0
Lane Group Flow (vph)	20	0	13	25	206	0	0	0	0	0	37	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	5.3		5.3	37.1	37.1						4.1	
Effective Green, g (s)	5.3		5.3	37.1	37.1						4.1	
Actuated g/C Ratio	0.09		0.09	0.62	0.62						0.07	
Clearance Time (s)	4.5		4.5	4.5	4.5						4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	156		246	1094	2134						221	
v/s Ratio Prot	c0.01		0.00	0.01	c0.06						c0.01	
v/s Ratio Perm												
v/c Ratio	0.13		0.05	0.02	0.10						0.17	
Uniform Delay, d1	25.2		25.0	4.4	4.6						26.3	
Progression Factor	1.00		1.00	1.00	1.00						1.00	
Incremental Delay, d2	0.4		0.1	0.0	0.1						0.4	
Delay (s)	25.6		25.1	4.5	4.7						26.7	
Level of Service	C		C	A	A						C	
Approach Delay (s)		25.2			4.7			0.0			26.7	
Approach LOS		C			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			14.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.11									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)			13.5			
Intersection Capacity Utilization			23.2%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↱	↱	↰	↱			↰	↱
Traffic Volume (vph)	0	0	0	144	213	73	67	585	0	0	333	30
Future Volume (vph)	0	0	0	144	213	73	67	585	0	0	333	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	0.95
Frpb, ped/bikes				1.00	1.00	0.96	1.00	1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	3539	1525	1770	1863			1767	1460
Flt Permitted				0.95	1.00	1.00	0.37	1.00			1.00	1.00
Satd. Flow (perm)				1770	3539	1525	686	1863			1767	1460
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	157	232	79	73	636	0	0	362	33
RTOR Reduction (vph)	0	0	0	0	0	55	0	0	0	0	1	22
Lane Group Flow (vph)	0	0	0	157	232	24	73	636	0	0	364	8
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					6
Actuated Green, G (s)				18.1	18.1	18.1	32.7	32.7			17.1	17.1
Effective Green, g (s)				18.1	18.1	18.1	32.7	32.7			17.1	17.1
Actuated g/C Ratio				0.30	0.30	0.30	0.54	0.54			0.28	0.28
Clearance Time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				526	1053	453	557	1001			496	410
v/s Ratio Prot				c0.09	0.07		0.02	c0.34			c0.21	
v/s Ratio Perm						0.02	0.05					0.01
v/c Ratio				0.30	0.22	0.05	0.13	0.64			0.73	0.02
Uniform Delay, d1				16.5	16.0	15.2	10.8	9.9			19.8	15.8
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				1.4	0.5	0.2	0.1	1.5			5.9	0.0
Delay (s)				17.9	16.5	15.4	11.0	11.4			25.7	15.8
Level of Service				B	B	B	B	B			C	B
Approach Delay (s)		0.0			16.8			11.3			25.0	
Approach LOS		A			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			16.4									HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			60.8								15.0	Sum of lost time (s)
Intersection Capacity Utilization			54.1%									ICU Level of Service A
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	115	1	124	433	199	11	24	188	134	47	6
Future Volume (vph)	23	115	1	124	433	199	11	24	188	134	47	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.98	
Satd. Flow (prot)	1770	3535		1770	3539	1583		1834	1583	1681	1714	
Flt Permitted	0.42	1.00		0.67	1.00	1.00		0.94	1.00	0.73	0.90	
Satd. Flow (perm)	779	3535		1252	3539	1583		1754	1583	1296	1572	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	125	1	135	471	216	12	26	204	146	51	7
RTOR Reduction (vph)	0	1	0	0	0	160	0	0	85	0	3	0
Lane Group Flow (vph)	25	125	0	135	471	56	0	38	119	101	100	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	15.9	15.9		15.5	15.5	15.5		34.9	34.9	34.9	34.9	
Effective Green, g (s)	15.9	15.9		15.5	15.5	15.5		34.9	34.9	34.9	34.9	
Actuated g/C Ratio	0.27	0.27		0.26	0.26	0.26		0.58	0.58	0.58	0.58	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	206	936		323	914	408		1020	920	753	914	
v/s Ratio Prot		0.04			c0.13							
v/s Ratio Perm	0.03			0.11		0.04		0.02	0.07	c0.08	0.06	
v/c Ratio	0.12	0.13		0.42	0.52	0.14		0.04	0.13	0.13	0.11	
Uniform Delay, d1	16.7	16.8		18.5	19.0	17.1		5.4	5.7	5.7	5.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.1		1.0	0.6	0.2		0.1	0.3	0.4	0.2	
Delay (s)	17.1	16.9		19.5	19.6	17.3		5.4	6.0	6.1	5.8	
Level of Service	B	B		B	B	B		A	A	A	A	
Approach Delay (s)		16.9			19.0			5.9			6.0	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			14.7				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			9.6		
Intersection Capacity Utilization			38.6%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

9/1/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↙	
Traffic Volume (veh/h)	89	6	21	31	6	8
Future Volume (Veh/h)	89	6	21	31	6	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	7	23	34	7	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				238		
pX, platoon unblocked						
vC, conflicting volume			104		180	100
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			104		180	100
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		99	99
cM capacity (veh/h)			1488		796	955
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	104	57	16			
Volume Left	0	23	7			
Volume Right	7	0	9			
cSH	1700	1488	878			
Volume to Capacity	0.06	0.02	0.02			
Queue Length 95th (ft)	0	1	1			
Control Delay (s)	0.0	3.1	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.1	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			19.5%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	55	96	0	0	0	27	222	64	75	215	53
Future Volume (vph)	89	55	96	0	0	0	27	222	64	75	215	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.94				1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1494				1770	1863	1551	1770	1863	1515
Flt Permitted	0.95	1.00	1.00				0.61	1.00	1.00	0.42	1.00	1.00
Satd. Flow (perm)	1770	1863	1494				1142	1863	1551	783	1863	1515
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	60	104	0	0	0	29	241	70	82	234	58
RTOR Reduction (vph)	0	0	55	0	0	0	0	0	51	0	0	36
Lane Group Flow (vph)	97	60	49	0	0	0	29	241	19	82	234	22
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA	Perm				Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4					2	2		1	6	
Permitted Phases			4				2		2	6		6
Actuated Green, G (s)	28.0	28.0	28.0				16.0	16.0	16.0	23.2	23.2	23.2
Effective Green, g (s)	28.0	28.0	28.0				16.0	16.0	16.0	23.2	23.2	23.2
Actuated g/C Ratio	0.47	0.47	0.47				0.27	0.27	0.27	0.39	0.39	0.39
Clearance Time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0				4.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	826	869	697				304	496	413	355	720	585
v/s Ratio Prot	c0.05	0.03						c0.13		0.01	c0.13	
v/s Ratio Perm			0.03				0.03		0.01	0.08		0.01
v/c Ratio	0.12	0.07	0.07				0.10	0.49	0.05	0.23	0.33	0.04
Uniform Delay, d1	9.0	8.8	8.8				16.6	18.5	16.3	12.2	12.9	11.5
Progression Factor	1.00	1.00	1.00				0.71	0.70	0.27	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.2	0.2				0.6	3.4	0.2	0.3	1.2	0.1
Delay (s)	9.3	9.0	9.0				12.4	16.3	4.6	12.5	14.1	11.6
Level of Service	A	A	A				B	B	A	B	B	B
Approach Delay (s)		9.1			0.0			13.6			13.4	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.3				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.27									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			12.8		
Intersection Capacity Utilization			49.5%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	209	10	0	0	0	0	4	17	20	7	0
Future Volume (Veh/h)	10	209	10	0	0	0	0	4	17	20	7	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	227	11	0	0	0	0	4	18	22	8	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		218										
pX, platoon unblocked												
vC, conflicting volume	0			238			258	254	119	156	260	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			238			258	254	119	156	260	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	99	98	97	99	100
cM capacity (veh/h)	1622			1326			664	644	910	773	639	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	124	124	22	30								
Volume Left	11	0	0	22								
Volume Right	0	11	18	0								
cSH	1622	1700	846	732								
Volume to Capacity	0.01	0.07	0.03	0.04								
Queue Length 95th (ft)	1	0	2	3								
Control Delay (s)	0.7	0.0	9.4	10.1								
Lane LOS	A		A	B								
Approach Delay (s)	0.3		9.4	10.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			21.2%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	24	473	5	0	0	0	0	4	21	14	12	0
Future Volume (vph)	24	473	5	0	0	0	0	4	21	14	12	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	514	5	0	0	0	0	4	23	15	13	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	283	262	27	28								
Volume Left (vph)	26	0	0	15								
Volume Right (vph)	0	5	23	0								
Hadj (s)	0.08	0.02	-0.48	0.14								
Departure Headway (s)	4.7	4.7	4.6	5.2								
Degree Utilization, x	0.37	0.34	0.03	0.04								
Capacity (veh/h)	755	761	730	643								
Control Delay (s)	9.3	8.8	7.7	8.4								
Approach Delay (s)	9.1		7.7	8.4								
Approach LOS	A		A	A								
Intersection Summary												
Delay			9.0									
Level of Service			A									
Intersection Capacity Utilization			28.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

9/1/2016

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	97	187	9	40	0	97	0	47	29	0	0	0								
Future Volume (vph)	97	187	9	40	0	97	0	47	29	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	105	203	10	43	0	105	0	51	32	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	105	213	148	83																
Volume Left (vph)	105	0	43	0																
Volume Right (vph)	0	10	105	32																
Hadj (s)	0.53	0.00	-0.33	-0.20																
Departure Headway (s)	5.4	4.8	4.2	4.7																
Degree Utilization, x	0.16	0.29	0.17	0.11																
Capacity (veh/h)	660	730	821	703																
Control Delay (s)	8.1	8.5	8.1	8.3																
Approach Delay (s)	8.4		8.1	8.3																
Approach LOS	A		A	A																
Intersection Summary																				
Delay			8.3																	
Level of Service			A																	
Intersection Capacity Utilization			32.8%	ICU Level of Service					A											
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	14	0	0	51	14	224	32	23	232	6
Future Volume (Veh/h)	0	0	14	0	0	51	14	224	32	23	232	6
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	15	0	0	55	15	243	35	25	252	7
Pedestrians	7				7							
Lane Width (ft)	12.0				16.0							
Walking Speed (ft/s)	4.0				4.0							
Percent Blockage	1				1							
Right turn flare (veh)												
Median type							None			None		
Median storage veh												
Upstream signal (ft)							1261			455		
pX, platoon unblocked												
vC, conflicting volume	640	628	262	614	614	268	266				285	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	640	628	262	614	614	268	266				285	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	98	100	100	93	99				98	
cM capacity (veh/h)	346	382	772	380	389	765	1290				1267	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	15	55	15	278	25	259						
Volume Left	0	0	15	0	25	0						
Volume Right	15	55	0	35	0	7						
cSH	772	765	1290	1700	1267	1700						
Volume to Capacity	0.02	0.07	0.01	0.16	0.02	0.15						
Queue Length 95th (ft)	1	6	1	0	2	0						
Control Delay (s)	9.8	10.1	7.8	0.0	7.9	0.0						
Lane LOS	A	B	A	A								
Approach Delay (s)	9.8	10.1	0.4	0.7								
Approach LOS	A	B										
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			23.8%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Washington Avenue			
Agency or Co.	IBI Group				E/W Street Name	Washington Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	AM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	14	2	25	0	59	9	4	0	18	226	11	0	3	235	18
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	16	2	28	0	65	10	4	0	20	251	12	0	3	261	20
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		46			79			283			284	
Entry Volume veh/h		45			77			277			278	
Circulating Flow (Vc), pc/h	329			287			21			95		
Exiting Flow (Vex), pc/h	17			50			271			354		
Capacity (cPCE), pc/h		813			848			1107			1028	
Capacity (c), veh/h		797			831			1085			1007	
v/c Ratio (X)		0.06			0.09			0.26			0.28	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.1			5.2			5.7			6.3	
Lane LOS		A			A			A			A	
95% Queue		0.2			0.3			1.0			1.1	
Approach Delay, s/veh	5.1			5.2			5.7			6.3		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	5.9						A					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	30	16	25	4	79	3	136	39	93	93	1
Future Volume (vph)	20	30	16	25	4	79	3	136	39	93	93	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	33	17	27	4	86	3	148	42	101	101	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	72	117	193	203								
Volume Left (vph)	22	27	3	101								
Volume Right (vph)	17	86	42	1								
Hadj (s)	-0.05	-0.36	-0.09	0.13								
Departure Headway (s)	5.0	4.6	4.5	4.7								
Degree Utilization, x	0.10	0.15	0.24	0.27								
Capacity (veh/h)	657	713	756	722								
Control Delay (s)	8.5	8.4	9.0	9.4								
Approach Delay (s)	8.5	8.4	9.0	9.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.0									
Level of Service			A									
Intersection Capacity Utilization			37.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	202	22	4	93	15	11	23	27	20	32	11
Future Volume (Veh/h)	8	202	22	4	93	15	11	23	27	20	32	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	220	24	4	101	16	12	25	29	22	35	12
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked												
vC, conflicting volume	131			251			404	396	239	422	400	124
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	131			251			404	396	239	422	400	124
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			98	95	96	95	93	99
cM capacity (veh/h)	1437			1307			507	527	795	487	524	915
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	253	121	66	69								
Volume Left	9	4	12	22								
Volume Right	24	16	29	12								
cSH	1437	1307	613	552								
Volume to Capacity	0.01	0.00	0.11	0.13								
Queue Length 95th (ft)	0	0	9	11								
Control Delay (s)	0.3	0.3	11.6	12.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.3	11.6	12.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			28.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Wisconsin Avenue			
Agency or Co.	IBI Group				E/W Street Name	Wisconsin Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	AM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	51	56	131	0	93	30	29	0	64	234	67	0	18	257	17
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	57	62	145	0	103	33	32	0	71	259	74	0	20	285	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		264			168			404			324	
Entry Volume veh/h		259			165			396			318	
Circulating Flow (Vc), pc/h	408			387			139			207		
Exiting Flow (Vex), pc/h	156			123			348			533		
Capacity (cPCE), pc/h		751			767			983			919	
Capacity (c), veh/h		737			752			964			901	
v/c Ratio (X)		0.35			0.22			0.41			0.35	

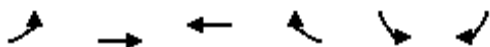
Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.3			7.2			8.4			7.9	
Lane LOS		A			A			A			A	
95% Queue		1.6			0.8			2.0			1.6	
Approach Delay, s/veh	9.3			7.2			8.4			7.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	8.3						A					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

9/1/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	221	214	5	17	15
Future Volume (Veh/h)	9	221	214	5	17	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	240	233	5	18	16
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	246				504	244
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	246				504	244
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	98
cM capacity (veh/h)	1311				519	788
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	250	238	34			
Volume Left	10	0	18			
Volume Right	0	5	16			
cSH	1311	1700	619			
Volume to Capacity	0.01	0.14	0.05			
Queue Length 95th (ft)	1	0	4			
Control Delay (s)	0.4	0.0	11.2			
Lane LOS	A		B			
Approach Delay (s)	0.4	0.0	11.2			
Approach LOS			B			
Intersection Summary						
Average Delay		0.9				
Intersection Capacity Utilization		29.3%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	206	9	20	195	11	6	5	14	36	1	6
Future Volume (Veh/h)	7	206	9	20	195	11	6	5	14	36	1	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	224	10	22	212	12	7	5	15	39	1	7
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	226			234			516	515	229	526	514	222
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	226			234			516	515	229	526	514	222
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			98	99	98	91	100	99
cM capacity (veh/h)	1340			1333			455	452	810	441	453	815
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	242	246	27	47								
Volume Left	8	22	7	39								
Volume Right	10	12	15	7								
cSH	1340	1333	601	473								
Volume to Capacity	0.01	0.02	0.04	0.10								
Queue Length 95th (ft)	0	1	4	8								
Control Delay (s)	0.3	0.8	11.3	13.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.8	11.3	13.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			33.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	114	188	71	144	0	101	0	36	0	0	0
Future Volume (vph)	0	114	188	71	144	0	101	0	36	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	124	204	77	157	0	110	0	39	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	328	234	149	0								
Volume Left (vph)	0	77	110	0								
Volume Right (vph)	204	0	39	0								
Hadj (s)	-0.34	0.10	0.02	0.00								
Departure Headway (s)	4.3	4.8	5.2	5.4								
Degree Utilization, x	0.39	0.31	0.21	0.00								
Capacity (veh/h)	815	720	634	900								
Control Delay (s)	9.9	9.9	9.6	8.4								
Approach Delay (s)	9.9	9.9	9.6	0.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.8								
Level of Service				A								
Intersection Capacity Utilization				51.4%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	48	67	85	30	78	102
Future Volume (vph)	48	67	85	30	78	102
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	73	92	33	85	111
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	125	125	196			
Volume Left (vph)	52	0	85			
Volume Right (vph)	73	33	0			
Hadj (s)	-0.23	-0.12	0.12			
Departure Headway (s)	4.4	4.3	4.5			
Degree Utilization, x	0.15	0.15	0.24			
Capacity (veh/h)	760	803	776			
Control Delay (s)	8.2	8.0	8.9			
Approach Delay (s)	8.2	8.0	8.9			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.4			
Level of Service			A			
Intersection Capacity Utilization			29.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	246	1	6	198	36	7	9	12	36	15	9
Future Volume (Veh/h)	7	246	1	6	198	36	7	9	12	36	15	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	267	1	7	215	39	8	10	13	39	16	10
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					213							
pX, platoon unblocked	0.93						0.93	0.93		0.93	0.93	0.93
vC, conflicting volume	257			279			565	566	286	561	546	242
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	168			279			498	499	286	494	478	152
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			98	98	98	91	96	99
cM capacity (veh/h)	1312			1272			420	432	741	426	443	830
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	276	261	31	65								
Volume Left	8	7	8	39								
Volume Right	1	39	13	10								
cSH	1312	1272	519	465								
Volume to Capacity	0.01	0.01	0.06	0.14								
Queue Length 95th (ft)	0	0	5	12								
Control Delay (s)	0.3	0.3	12.4	14.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.3	12.4	14.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			30.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection		Coast Hwy - Oceanside Blvd		
Agency or Co.	IBI Group				E/W Street Name		Oceanside Boulevard		
Date Performed	05/23/2016				N/S Street Name		Coast Highway		
Analysis Year	2016				Analysis Time Period (hrs)		0.25		
Time Period	AM Peak Hour				Peak Hour Factor		0.92		
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	22	139	78	0	108	141	98	0	40	202	57	0	107	256	16
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	24	154	86	0	120	156	109	0	44	224	63	0	119	284	18
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929		
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (Ve), pc/h		264			385			331			421		
Entry Volume veh/h		259			377			325			413		
Circulating Flow (Vc), pc/h	523			292			297			320			
Exiting Flow (Vex), pc/h	336			218			357			490			
Capacity (cPCE), pc/h		670			844			840			821		
Capacity (c), veh/h		657			827			823			804		
v/c Ratio (X)		0.39			0.46			0.39			0.51		

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		11.0			10.2			9.2			11.7	
Lane LOS		B			B			A			B	
95% Queue		1.9			2.4			1.9			3.0	
Approach Delay, s/veh	11.0			10.2			9.2			11.7		
Approach LOS	B			B			A			B		
Intersection Delay, s/veh / LOS	10.5						B					

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	345	0	16	445	87	8	9	35	267	14	48
Future Volume (vph)	12	345	0	16	445	87	8	9	35	267	14	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.96
Flpb, ped/bikes	1.00	1.00		0.99	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1770	3539		1755	3443			3125			1777	1524
Flt Permitted	0.30	1.00		0.49	1.00			0.92			0.69	1.00
Satd. Flow (perm)	557	3539		909	3443			2887			1290	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	375	0	17	484	95	9	10	38	290	15	52
RTOR Reduction (vph)	0	0	0	0	34	0	0	16	0	0	0	21
Lane Group Flow (vph)	13	375	0	17	545	0	0	41	0	0	305	31
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	15.0	15.0		15.0	15.0			35.5			35.5	35.5
Effective Green, g (s)	15.0	15.0		15.0	15.0			35.5			35.5	35.5
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.59			0.59	0.59
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	139	884		227	860			1708			763	901
v/s Ratio Prot		0.11			c0.16							
v/s Ratio Perm	0.02			0.02				0.01			c0.24	0.02
v/c Ratio	0.09	0.42		0.07	0.63			0.02			0.40	0.03
Uniform Delay, d1	17.3	18.9		17.2	20.1			5.1			6.6	5.1
Progression Factor	0.82	0.84		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.3	0.3		0.1	1.5			0.0			1.6	0.1
Delay (s)	14.4	16.1		17.3	21.6			5.1			8.1	5.2
Level of Service	B	B		B	C			A			A	A
Approach Delay (s)		16.0			21.5			5.1			7.7	
Approach LOS		B			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		15.8			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.47										
Actuated Cycle Length (s)		60.0			Sum of lost time (s)			9.5				
Intersection Capacity Utilization		62.2%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2035
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Morse Street
E/W Street Name	Morse Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	23	12	16	0	27	8	100	0	2	330	54	0	84	445	16
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	26	13	18	0	30	9	111	0	2	366	60	0	93	493	18
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		57			150			428			604	
Entry Volume veh/h		56			147			420			592	
Circulating Flow (Vc), pc/h	616			394			132			41		
Exiting Flow (Vex), pc/h	166			29			503			541		
Capacity (cPCE), pc/h		610			762			990			1085	
Capacity (c), veh/h		598			747			971			1063	
v/c Ratio (X)		0.09			0.20			0.43			0.56	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.1			7.0			8.7			10.3	
Lane LOS		A			A			A			B	
95% Queue		0.3			0.7			2.2			3.6	
Approach Delay, s/veh	7.1			7.0			8.7			10.3		
Approach LOS	A			A			A			B		
Intersection Delay, s/veh / LOS	9.2						A					

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	130	22	34	112	0	19	0	28	0	0	0
Future Volume (Veh/h)	0	130	22	34	112	0	19	0	28	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	141	24	37	122	0	21	0	30	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)	252											
pX, platoon unblocked												
vC, conflicting volume	122			165			349	349	153	379	361	122
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	122			165			349	349	153	379	361	122
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			96	100	97	100	100	100
cM capacity (veh/h)	1465			1413			594	560	893	548	551	929
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	165	159	51	0								
Volume Left	0	37	21	0								
Volume Right	24	0	30	0								
cSH	1465	1413	739	1700								
Volume to Capacity	0.00	0.03	0.07	0.00								
Queue Length 95th (ft)	0	2	6	0								
Control Delay (s)	0.0	1.9	10.2	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	1.9	10.2	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay	2.2											
Intersection Capacity Utilization	29.3%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

31: Dittmar St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	63	10	2	45	1	17	0	7	1	0	1
Future Volume (Veh/h)	1	63	10	2	45	1	17	0	7	1	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	68	11	2	49	1	18	0	8	1	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	50			79			130	130	74	137	134	50
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	50			79			130	130	74	137	134	50
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	99	100	100	100
cM capacity (veh/h)	1557			1519			841	760	988	826	755	1019
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	80	52	26	2								
Volume Left	1	2	18	1								
Volume Right	11	1	8	1								
cSH	1557	1519	881	912								
Volume to Capacity	0.00	0.00	0.03	0.00								
Queue Length 95th (ft)	0	0	2	0								
Control Delay (s)	0.1	0.3	9.2	9.0								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.1	0.3	9.2	9.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			14.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	36	87	14	36	108	14
Future Volume (vph)	36	87	14	36	108	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	95	15	39	117	15
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	134	54	132			
Volume Left (vph)	39	0	117			
Volume Right (vph)	95	39	0			
Hadj (s)	-0.33	-0.40	0.21			
Departure Headway (s)	4.0	3.9	4.4			
Degree Utilization, x	0.15	0.06	0.16			
Capacity (veh/h)	864	870	783			
Control Delay (s)	7.7	7.2	8.3			
Approach Delay (s)	7.7	7.2	8.3			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.9			
Level of Service			A			
Intersection Capacity Utilization			27.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	101	76	12	67	3	57	8	12	12	9	4
Future Volume (Veh/h)	3	101	76	12	67	3	57	8	12	12	9	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	110	83	13	73	3	62	9	13	13	10	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					576							
pX, platoon unblocked												
vC, conflicting volume	76			193			267	260	152	276	300	74
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			193			267	260	152	276	300	74
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			91	99	99	98	98	100
cM capacity (veh/h)	1523			1380			668	638	895	654	606	987
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	196	89	84	27								
Volume Left	3	13	62	13								
Volume Right	83	3	13	4								
cSH	1523	1380	692	668								
Volume to Capacity	0.00	0.01	0.12	0.04								
Queue Length 95th (ft)	0	1	10	3								
Control Delay (s)	0.1	1.2	10.9	10.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	1.2	10.9	10.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			24.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	127	4	3	79	2	1	1	8	1	1	1
Future Volume (Veh/h)	0	127	4	3	79	2	1	1	8	1	1	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	138	4	3	86	2	1	1	9	1	1	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)	249											
pX, platoon unblocked												
vC, conflicting volume	88			142			234	234	140	242	235	87
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	88			142			234	234	140	242	235	87
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	100	100	100
cM capacity (veh/h)	1508			1441			717	665	908	702	664	971
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	142	91	11	3								
Volume Left	0	3	1	1								
Volume Right	4	2	9	1								
cSH	1508	1441	859	758								
Volume to Capacity	0.00	0.00	0.01	0.00								
Queue Length 95th (ft)	0	0	1	0								
Control Delay (s)	0.0	0.3	9.2	9.8								
Lane LOS		A	A	A								
Approach Delay (s)	0.0	0.3	9.2	9.8								
Approach LOS			A	A								
Intersection Summary												
Average Delay				0.6								
Intersection Capacity Utilization	16.9%			ICU Level of Service					A			
Analysis Period (min)	15											

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection		Coast Highway - Cassidy Street		
Agency or Co.	IBI Group				E/W Street Name		Cassidy Street		
Date Performed	05/23/2016				N/S Street Name		Coast Highway		
Analysis Year	2035				Analysis Time Period (hrs)		0.25		
Time Period	AM Peak Hour				Peak Hour Factor		0.92		
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	44	127	82	0	55	59	27	0	103	304	51	0	63	333	20
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	49	141	91	0	61	65	30	0	114	337	57	0	70	369	22
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929		
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (Ve), pc/h		281			156			508			461		
Entry Volume veh/h		275			153			498			452		
Circulating Flow (Vc), pc/h	500			500			260			240			
Exiting Flow (Vex), pc/h	268			201			416			521			
Capacity (cPCE), pc/h		685			685			871			889		
Capacity (c), veh/h		672			672			854			871		
v/c Ratio (X)		0.41			0.23			0.58			0.52		

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		11.1			8.1			12.8			11.1	
Lane LOS		B			A			B			B	
95% Queue		2.0			0.9			3.9			3.1	
Approach Delay, s/veh	11.1			8.1			12.8			11.1		
Approach LOS	B			A			B			B		
Intersection Delay, s/veh / LOS	11.4						B					

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	87	22	26	50	12	9	23	22	9	19	17
Future Volume (Veh/h)	15	87	22	26	50	12	9	23	22	9	19	17
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	95	24	28	54	13	10	25	24	10	21	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	280											
pX, platoon unblocked												
vC, conflicting volume	67			119			284	262	107	292	268	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	67			119			284	262	107	292	268	60
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			98	96	97	98	97	98
cM capacity (veh/h)	1535			1469			625	624	947	610	620	1005
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	135	95	59	49								
Volume Left	16	28	10	10								
Volume Right	24	13	24	18								
cSH	1535	1469	725	719								
Volume to Capacity	0.01	0.02	0.08	0.07								
Queue Length 95th (ft)	1	1	7	5								
Control Delay (s)	0.9	2.3	10.4	10.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.9	2.3	10.4	10.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			20.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	51	6	4	31	1	5	8	8	4	4	2
Future Volume (vph)	2	51	6	4	31	1	5	8	8	4	4	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	55	7	4	34	1	5	9	9	4	4	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	64	39	23	10								
Volume Left (vph)	2	4	5	4								
Volume Right (vph)	7	1	9	2								
Hadj (s)	-0.03	0.04	-0.16	-0.01								
Departure Headway (s)	4.0	4.1	4.0	4.1								
Degree Utilization, x	0.07	0.04	0.03	0.01								
Capacity (veh/h)	889	871	873	844								
Control Delay (s)	7.3	7.3	7.1	7.2								
Approach Delay (s)	7.3	7.3	7.1	7.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.2									
Level of Service			A									
Intersection Capacity Utilization			13.5%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	6	100	3	20	46	16	3	43	82	124	8	6
Future Volume (vph)	6	100	3	20	46	16	3	43	82	124	8	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	109	3	22	50	17	3	47	89	135	9	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	119	89	139	151								
Volume Left (vph)	7	22	3	135								
Volume Right (vph)	3	17	89	7								
Hadj (s)	0.03	-0.03	-0.35	0.18								
Departure Headway (s)	4.7	4.7	4.3	4.8								
Degree Utilization, x	0.16	0.12	0.16	0.20								
Capacity (veh/h)	707	707	796	714								
Control Delay (s)	8.6	8.3	8.1	8.9								
Approach Delay (s)	8.6	8.3	8.1	8.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.5								
Level of Service				A								
Intersection Capacity Utilization				36.2%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	45	27	11	50	54
Future Volume (vph)	0	45	27	11	50	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	49	29	12	54	59
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	49	41	113			
Volume Left (vph)	0	0	54			
Volume Right (vph)	49	12	0			
Hadj (s)	-0.57	-0.14	0.13			
Departure Headway (s)	3.7	4.0	4.2			
Degree Utilization, x	0.05	0.05	0.13			
Capacity (veh/h)	938	881	850			
Control Delay (s)	6.9	7.2	7.8			
Approach Delay (s)	6.9	7.2	7.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.4			
Level of Service			A			
Intersection Capacity Utilization			15.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

11/17/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	116	38	231	47	195	28	198	110	166	279	6
Future Volume (vph)	15	116	38	231	47	195	28	198	110	166	279	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	16	16	16
Total Lost time (s)	5.0	5.0	5.0		4.9	4.9	4.2	5.0	5.0	4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	2006	1863	1554		1788	1794	1770	2111	1527	2006	3998	
Flt Permitted	0.95	1.00	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	2006	1863	1554		1788	1794	1770	2111	1527	2006	3998	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	126	41	251	51	212	30	215	120	180	303	7
RTOR Reduction (vph)	0	0	37	0	0	143	0	0	84	0	2	0
Lane Group Flow (vph)	16	126	4	0	302	69	30	215	36	180	308	0
Confl. Peds. (#/hr)			2	2					5			
Confl. Bikes (#/hr)									4			
Turn Type	Split	NA	Perm	Split	NA	pt+ov	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	6.4	6.4	6.4		15.5	22.2	1.3	20.6	20.6	6.7	26.0	
Effective Green, g (s)	6.4	6.4	6.4		15.5	22.2	1.3	20.6	20.6	6.7	26.0	
Actuated g/C Ratio	0.09	0.09	0.09		0.23	0.33	0.02	0.30	0.30	0.10	0.38	
Clearance Time (s)	5.0	5.0	5.0		4.9		4.2	5.0	5.0	4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0		2.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	187	174	145		405	583	33	636	460	196	1521	
v/s Ratio Prot	0.01	c0.07			c0.17	0.04	0.02	c0.10		c0.09	0.08	
v/s Ratio Perm			0.00						0.02			
v/c Ratio	0.09	0.72	0.03		0.75	0.12	0.91	0.34	0.08	0.92	0.20	
Uniform Delay, d1	28.3	30.1	28.1		24.6	16.2	33.4	18.5	17.1	30.5	14.2	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	11.9	0.0		7.3	0.1	116.4	1.4	0.3	41.5	0.3	
Delay (s)	28.3	42.0	28.1		31.9	16.3	149.8	20.0	17.4	72.0	14.5	
Level of Service	C	D	C		C	B	F	B	B	E	B	
Approach Delay (s)		37.7			25.4			29.8			35.6	
Approach LOS		D			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			31.1									
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			68.3									
Intersection Capacity Utilization			56.2%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St

12/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	389	5	16	579	33	0	0	26	18	0	20
Future Volume (Veh/h)	5	389	5	16	579	33	0	0	26	18	0	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	423	5	17	629	36	0	0	28	20	0	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh					2							
Upstream signal (ft)		312										
pX, platoon unblocked				0.94			0.94	0.94	0.94	0.94	0.94	
vC, conflicting volume	665			428			1138	1134	426	1144	1119	647
vC1, stage 1 conf vol							436	436		681	681	
vC2, stage 2 conf vol							703	699		464	438	
vCu, unblocked vol	665			365			1117	1113	362	1124	1097	647
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			100	100	96	94	100	95
cM capacity (veh/h)	924			1127			353	376	645	363	382	471
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	433	682	28	42								
Volume Left	5	17	0	20								
Volume Right	5	36	28	22								
cSH	924	1127	645	413								
Volume to Capacity	0.01	0.02	0.04	0.10								
Queue Length 95th (ft)	0	1	3	8								
Control Delay (s)	0.2	0.4	10.8	14.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.4	10.8	14.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			57.5%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

12/21/2016

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	7	481	10	31	758	18	10	4	66	22	4	11	
Future Volume (Veh/h)	7	481	10	31	758	18	10	4	66	22	4	11	
Sign Control	Free			Free			Stop			Stop			
Grade	0%			0%			0%			0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	8	523	11	34	824	20	11	4	72	24	4	12	
Pedestrians	1						1						
Lane Width (ft)	12.0						12.0						
Walking Speed (ft/s)	4.0						4.0						
Percent Blockage	0						0						
Right turn flare (veh)													
Median type	TWLTL			TWLTL									
Median storage veh	2			2									
Upstream signal (ft)	687												
pX, platoon unblocked				0.99			0.99			0.99	0.99	0.99	
vC, conflicting volume	844			535				1452	1458	530	1515	1453	835
vC1, stage 1 conf vol							546		546	902		902	
vC2, stage 2 conf vol							907		912	613		551	
vCu, unblocked vol	844			523				1452	1457	517	1515	1452	835
tC, single (s)	4.1			4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1		5.5	6.1		5.5	
tF (s)	2.2			2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			97				96	99	87	90	99	97
cM capacity (veh/h)	792			1030				264	292	551	251	294	367
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1							
Volume Total	8	534	34	844	87	40							
Volume Left	8	0	34	0	11	24							
Volume Right	0	11	0	20	72	12							
cSH	792	1700	1030	1700	468	282							
Volume to Capacity	0.01	0.31	0.03	0.50	0.19	0.14							
Queue Length 95th (ft)	1	0	3	0	17	12							
Control Delay (s)	9.6	0.0	8.6	0.0	14.4	19.9							
Lane LOS	A		A		B	C							
Approach Delay (s)	0.1		0.3		14.4	19.9							
Approach LOS					B	C							
Intersection Summary													
Average Delay				1.6									
Intersection Capacity Utilization				54.6%		ICU Level of Service			A				
Analysis Period (min)				15									

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

12/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	650	0	0	838	106	0	0	0	0	0	18
Future Volume (Veh/h)	22	650	0	0	838	106	0	0	0	0	0	18
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	707	0	0	911	115	0	0	0	0	0	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL				TWLTL							
Median storage veh	2				2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1026			707			1686	1781	707	1724	1724	968
vC1, stage 1 conf vol							755	755		968	968	
vC2, stage 2 conf vol							931	1026		755	755	
vCu, unblocked vol	1026			707			1686	1781	707	1724	1724	968
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			100	100	100	100	100	94
cM capacity (veh/h)	677			891			227	240	435	242	263	308
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	24	707	0	1026	0	20						
Volume Left	24	0	0	0	0	0						
Volume Right	0	0	0	115	0	20						
cSH	677	1700	1700	1700	1700	308						
Volume to Capacity	0.04	0.42	0.00	0.60	0.00	0.06						
Queue Length 95th (ft)	3	0	0	0	0	5						
Control Delay (s)	10.5	0.0	0.0	0.0	0.0	17.5						
Lane LOS	B				A	C						
Approach Delay (s)	0.3		0.0		0.0	17.5						
Approach LOS					A	C						
Intersection Summary												
Average Delay	0.3											
Intersection Capacity Utilization	60.5%			ICU Level of Service					B			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	67	0	0	58	28	270	23	41	612	10
Future Volume (Veh/h)	0	0	67	0	0	58	28	270	23	41	612	10
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	73	0	0	63	30	293	25	45	665	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh												
Upstream signal (ft)											621	
pX, platoon unblocked												
vC, conflicting volume	1176	1138	670	1194	1132	306	676			318		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1176	1138	670	1194	1132	306	676			318		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	84	100	100	91	97			96		
cM capacity (veh/h)	146	188	457	130	189	734	915			1242		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	73	63	30	318	45	676						
Volume Left	0	0	30	0	45	0						
Volume Right	73	63	0	25	0	11						
cSH	457	734	915	1700	1242	1700						
Volume to Capacity	0.16	0.09	0.03	0.19	0.04	0.40						
Queue Length 95th (ft)	14	7	3	0	3	0						
Control Delay (s)	14.4	10.4	9.1	0.0	8.0	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s)	14.4	10.4	0.8		0.5							
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization			43.6%		ICU Level of Service					A		
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Michigan Avenue
E/W Street Name	Michigan Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	84	15	36	0	48	15	8	0	22	243	6	0	6	238	26
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	93	17	40	0	53	17	9	0	24	269	7	0	7	264	29
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		150			79			300			300	
Entry Volume veh/h		147			77			294			294	
Circulating Flow (Vc), pc/h	324			386			117			94		
Exiting Flow (Vex), pc/h	31			70			371			357		
Capacity (cPCE), pc/h		817			768			1005			1029	
Capacity (c), veh/h		801			753			986			1008	
v/c Ratio (X)		0.18			0.10			0.30			0.29	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.4			5.8			6.7			6.5	
Lane LOS		A			A			A			A	
95% Queue		0.7			0.3			1.3			1.2	
Approach Delay, s/veh	6.4			5.8			6.7			6.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	6.5						A					

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - West
E/W Street Name	West Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	17	10	14	0	18	10	21	0	14	120	18	0	21	120	16
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	19	11	16	0	20	11	23	0	16	133	20	0	23	133	18
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		46			54			169			174	
Entry Volume veh/h		45			53			166			171	
Circulating Flow (Vc), pc/h	176			168			53			47		
Exiting Flow (Vex), pc/h	54			45			175			169		
Capacity (cPCE), pc/h		948			955			1072			1078	
Capacity (c), veh/h		929			937			1051			1057	
v/c Ratio (X)		0.05			0.06			0.16			0.16	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.3			4.4			4.9			4.9	
Lane LOS		A			A			A			A	
95% Queue		0.2			0.2			0.6			0.6	
Approach Delay, s/veh	4.3			4.4			4.9			4.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	4.7						A					

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Kelly
E/W Street Name	Kelly Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	13	17	11	0	12	10	89	0	4	141	12	0	81	134	27
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	14	19	12	0	13	11	99	0	4	156	13	0	90	149	30
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		45			123			173			269	
Entry Volume veh/h		44			121			170			264	
Circulating Flow (Vc), pc/h	252			174			123			28		
Exiting Flow (Vex), pc/h	122			45			269			174		
Capacity (cPCE), pc/h		878			950			999			1099	
Capacity (c), veh/h		861			931			980			1077	
v/c Ratio (X)		0.05			0.13			0.17			0.24	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.7			5.1			5.3			5.6	
Lane LOS		A			A			A			A	
95% Queue		0.2			0.4			0.6			1.0	
Approach Delay, s/veh	4.7			5.1			5.3			5.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	5.4						A					

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

06/29/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	150	6	32	7	66	8	22	737	18
Future Volume (veh/h)	0	0	0	150	6	32	7	66	8	22	737	18
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h				168	0	0	8	72	0	24	801	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				1328	0	593	148	1692	527	148	1178	527
Arrive On Green				0.36	0.00	0.00	0.08	0.32	0.00	0.08	0.32	0.00
Sat Flow, veh/h				3690	0	1647	1845	5289	1647	1845	3681	1647
Grp Volume(v), veh/h				168	0	0	8	72	0	24	801	0
Grp Sat Flow(s),veh/h/ln				1845	0	1647	1845	1763	1647	1845	1840	1647
Q Serve(g_s), s				1.5	0.0	0.0	0.2	0.5	0.0	0.6	9.5	0.0
Cycle Q Clear(g_c), s				1.5	0.0	0.0	0.2	0.5	0.0	0.6	9.5	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				1328	0	593	148	1692	527	148	1178	527
V/C Ratio(X)				0.13	0.00	0.00	0.05	0.04	0.00	0.16	0.68	0.00
Avail Cap(c_a), veh/h				1328	0	593	148	1692	527	148	1178	527
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				10.7	0.0	0.0	21.3	11.7	0.0	21.4	14.8	0.0
Incr Delay (d2), s/veh				0.2	0.0	0.0	0.7	0.0	0.0	2.4	3.2	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.8	0.0	0.0	0.1	0.2	0.0	0.4	5.3	0.0
LnGrp Delay(d),s/veh				10.9	0.0	0.0	21.9	11.8	0.0	23.8	18.0	0.0
LnGrp LOS				B			C	B		C	B	
Approach Vol, veh/h					168			80			825	
Approach Delay, s/veh					10.9			12.8			18.1	
Approach LOS					B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	8.0	20.0			8.0	20.0		22.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	16.0			4.0	16.0		18.0				
Max Q Clear Time (g_c+I1), s	2.6	2.5			2.2	11.5		3.5				
Green Ext Time (p_c), s	0.0	0.2			0.0	2.2		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				16.6								
HCM 2010 LOS				B								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↗	↖↖	↑↑					
Traffic Volume (veh/h)	531	188	479	1082	0	0			
Future Volume (veh/h)	531	188	479	1082	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937					
Adj Flow Rate, veh/h	577	204	521	1176					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	1840	823	1074	3313					
Arrive On Green	0.50	0.50	0.30	0.90					
Sat Flow, veh/h	3778	1647	3579	3778					
Grp Volume(v), veh/h	577	204	521	1176					
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840					
Q Serve(g_s), s	3.7	2.8	4.8	1.9					
Cycle Q Clear(g_c), s	3.7	2.8	4.8	1.9					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	1840	823	1074	3313					
V/C Ratio(X)	0.31	0.25	0.49	0.35					
Avail Cap(c_a), veh/h	1840	823	1074	3313					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	5.9	5.7	11.5	0.3					
Incr Delay (d2), s/veh	0.4	0.7	1.6	0.3					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	2.0	1.4	2.5	1.0					
LnGrp Delay(d),s/veh	6.4	6.4	13.0	0.6					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	781			1697					
Approach Delay, s/veh	6.4			4.4					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			16.0	24.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			12.0	20.0				36.0	
Max Q Clear Time (g_c+l1), s			6.8	5.7				3.9	
Green Ext Time (p_c), s			1.0	4.0				10.8	
Intersection Summary									
HCM 2010 Ctrl Delay			5.0						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/11/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↖	↑↑	↖	↗		
Traffic Volume (veh/h)	640	67	807	1970	67	1		
Future Volume (veh/h)	640	67	807	1970	67	1		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	696	73	877	2141	73	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	982	439	954	2208	492	439		
Arrive On Green	0.27	0.27	0.27	0.60	0.27	0.00		
Sat Flow, veh/h	3778	1647	3579	3778	1845	1647		
Grp Volume(v), veh/h	696	73	877	2141	73	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840	1845	1647		
Q Serve(g_s), s	10.3	2.0	14.3	33.4	1.8	0.0		
Cycle Q Clear(g_c), s	10.3	2.0	14.3	33.4	1.8	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	982	439	954	2208	492	439		
V/C Ratio(X)	0.71	0.17	0.92	0.97	0.15	0.00		
Avail Cap(c_a), veh/h	982	439	954	2208	492	439		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	19.9	16.9	21.4	11.5	16.8	0.0		
Incr Delay (d2), s/veh	4.3	0.8	15.1	13.2	0.6	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.8	1.0	8.9	20.4	1.0	0.0		
LnGrp Delay(d),s/veh	24.2	17.7	36.5	24.7	17.4	0.0		
LnGrp LOS	C	B	D	C	B			
Approach Vol, veh/h	769			3018	73			
Approach Delay, s/veh	23.6			28.1	17.4			
Approach LOS	C			C	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	20.0	20.0				40.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	16.0	16.0				36.0
Max Q Clear Time (g_c+I1), s		3.8	16.3	12.3				35.4
Green Ext Time (p_c), s		0.1	0.0	1.7				0.6
Intersection Summary								
HCM 2010 Ctrl Delay			27.0					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary
 51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	287	3	92	499	172	10	0	111	22	31	32
Future Volume (veh/h)	0	287	3	92	499	172	10	0	111	22	31	32
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1937	1976	1937	1937	1937	1937	0	1937	1937	1937	1937
Adj Flow Rate, veh/h	0	312	3	100	542	0	11	0	121	24	34	35
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1149	11	284	1982	887	0	0	0	568	596	507
Arrive On Green	0.00	0.31	0.31	0.15	0.54	0.00	0.00	0.00	0.00	0.31	0.31	0.31
Sat Flow, veh/h	0	3832	36	1845	3681	1647		0		1845	1937	1647
Grp Volume(v), veh/h	0	154	161	100	542	0		0.0		24	34	35
Grp Sat Flow(s),veh/h/ln	0	1840	1931	1845	1840	1647				1845	1937	1647
Q Serve(g_s), s	0.0	3.3	3.3	2.5	4.1	0.0				0.5	0.6	0.8
Cycle Q Clear(g_c), s	0.0	3.3	3.3	2.5	4.1	0.0				0.5	0.6	0.8
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	566	594	284	1982	887				568	596	507
V/C Ratio(X)	0.00	0.27	0.27	0.35	0.27	0.00				0.04	0.06	0.07
Avail Cap(c_a), veh/h	0	566	594	284	1982	887				568	596	507
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	13.6	13.6	19.7	6.5	0.0				12.6	12.7	12.7
Incr Delay (d2), s/veh	0.0	1.2	1.1	3.4	0.3	0.0				0.1	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.8	1.9	1.5	2.1	0.0				0.3	0.4	0.4
LnGrp Delay(d),s/veh	0.0	14.8	14.7	23.1	6.8	0.0				12.8	12.9	13.0
LnGrp LOS		B	B	C	A					B	B	B
Approach Vol, veh/h		315			642						93	
Approach Delay, s/veh		14.7			9.4						12.9	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			12.0	20.0		20.0		32.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			8.0	16.0		16.0		28.0				
Max Q Clear Time (g_c+I1), s			4.5	5.3		2.8		6.1				
Green Ext Time (p_c), s			0.1	1.3		0.2		3.7				
Intersection Summary												
HCM 2010 Ctrl Delay			11.3									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/13/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	465	5	9	612	355	10	10	19	138	2	57
Future Volume (veh/h)	230	465	5	9	612	355	10	10	19	138	2	57
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1976	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	250	505	5	10	665	386	11	11	21	107	62	62
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	158	960	10	105	841	376	216	216	376	422	203	203
Arrive On Green	0.09	0.26	0.26	0.04	0.15	0.15	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	3734	37	1845	3681	1647	945	945	1647	1845	890	890
Grp Volume(v), veh/h	250	249	261	10	665	386	22	0	21	107	0	124
Grp Sat Flow(s),veh/h/ln	1845	1840	1931	1845	1840	1647	1890	0	1647	1845	0	1780
Q Serve(g_s), s	6.0	8.1	8.1	0.4	12.2	16.0	0.6	0.0	0.7	3.3	0.0	4.0
Cycle Q Clear(g_c), s	6.0	8.1	8.1	0.4	12.2	16.0	0.6	0.0	0.7	3.3	0.0	4.0
Prop In Lane	1.00		0.02	1.00		1.00	0.50		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	158	473	496	105	841	376	432	0	376	422	0	407
V/C Ratio(X)	1.58	0.53	0.53	0.09	0.79	1.03	0.05	0.00	0.06	0.25	0.00	0.30
Avail Cap(c_a), veh/h	158	473	496	105	841	376	432	0	376	422	0	407
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.0	22.3	22.3	31.9	28.0	29.6	21.1	0.0	21.1	22.1	0.0	22.4
Incr Delay (d2), s/veh	289.4	4.1	4.0	1.8	7.5	53.1	0.2	0.0	0.3	1.4	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.7	4.6	4.8	0.2	7.1	12.8	0.4	0.0	0.3	1.9	0.0	2.2
LnGrp Delay(d),s/veh	321.4	26.5	26.3	33.7	35.5	82.7	21.3	0.0	21.4	23.6	0.0	24.3
LnGrp LOS	F	C	C	C	D	F	C		C	C		C
Approach Vol, veh/h		760			1061			43			231	
Approach Delay, s/veh		123.4			52.7			21.3			24.0	
Approach LOS		F			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	8.0	22.0		20.0	10.0	20.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	4.0	18.0		16.0	6.0	16.0				
Max Q Clear Time (g_c+I1), s		2.7	2.4	10.1		6.0	8.0	18.0				
Green Ext Time (p_c), s		0.1	0.0	1.9		0.7	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				74.5								
HCM 2010 LOS				E								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Future Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	82	427	316	91	846	199	210	238	87	246	297	211
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	492	362	132	894	400	422	443	376	422	443	376
Arrive On Green	0.07	0.24	0.24	0.07	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	2026	1489	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	82	388	355	91	846	199	210	238	87	246	297	211
Grp Sat Flow(s),veh/h/ln	1845	1840	1674	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	3.0	14.1	14.3	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Cycle Q Clear(g_c), s	3.0	14.1	14.3	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Prop In Lane	1.00		0.89	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	132	447	407	132	894	400	422	443	376	422	443	376
V/C Ratio(X)	0.62	0.87	0.87	0.69	0.95	0.50	0.50	0.54	0.23	0.58	0.67	0.56
Avail Cap(c_a), veh/h	132	447	407	132	894	400	422	443	376	422	443	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.6	25.4	25.5	31.7	26.1	22.8	23.5	23.7	22.0	24.0	24.6	23.9
Incr Delay (d2), s/veh	20.1	19.8	22.1	25.7	19.6	4.4	4.2	4.6	1.4	5.8	7.9	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	9.6	9.1	2.7	10.4	3.8	4.0	4.6	1.5	4.9	6.2	4.2
LnGrp Delay(d),s/veh	51.7	45.2	47.5	57.5	45.7	27.2	27.7	28.4	23.4	29.8	32.5	29.8
LnGrp LOS	D	D	D	E	D	C	C	C	C	C	C	C
Approach Vol, veh/h		825			1136			535			754	
Approach Delay, s/veh		46.9			43.4			27.3			30.9	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	9.0	21.0		20.0	9.0	21.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	5.0	17.0		16.0	5.0	17.0				
Max Q Clear Time (g_c+I1), s		9.6	5.4	16.3		11.8	5.0	17.8				
Green Ext Time (p_c), s		1.3	0.0	0.4		1.4	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				38.7								
HCM 2010 LOS				D								
Notes												

Intersection

Intersection Delay, s/veh 7.7

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	86	7	16	65	39	2	5	6	0	0	0
Future Vol, veh/h	25	86	7	16	65	39	2	5	6	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	93	8	17	71	42	2	5	7	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.8	7.6	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	15%	21%	13%
Vol Thru, %	38%	73%	54%
Vol Right, %	46%	6%	33%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	13	118	120
LT Vol	2	25	16
Through Vol	5	86	65
RT Vol	6	7	39
Lane Flow Rate	14	128	130
Geometry Grp	1	1	1
Degree of Util (X)	0.017	0.145	0.141
Departure Headway (Hd)	4.232	4.064	3.887
Convergence, Y/N	Yes	Yes	Yes
Cap	851	881	920
Service Time	2.232	2.093	1.921
HCM Lane V/C Ratio	0.016	0.145	0.141
HCM Control Delay	7.3	7.8	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.5	0.5

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖						↖	↗
Traffic Vol, veh/h	0	148	69	50	59	0	0	0	0	17	0	55
Future Vol, veh/h	0	148	69	50	59	0	0	0	0	17	0	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	161	75	54	64	0	0	0	0	18	0	60
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	161	0	0				333	333	64
Stage 1	-	-	-	-	-	-				172	172	-
Stage 2	-	-	-	-	-	-				161	161	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1418	-	0				662	587	1000
Stage 1	0	-	-	-	-	0				858	756	-
Stage 2	0	-	-	-	-	0				868	765	-
Platoon blocked, %	-	-	-	-	-	-				-	-	-
Mov Cap-1 Maneuver	-	-	-	1418	-	-				636	0	1000
Mov Cap-2 Maneuver	-	-	-	-	-	-				636	0	-
Stage 1	-	-	-	-	-	-				825	0	-
Stage 2	-	-	-	-	-	-				868	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.5			9.3					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2						
Capacity (veh/h)	-	-	1418	-	636	1000						
HCM Lane V/C Ratio	-	-	0.038	-	0.029	0.06						
HCM Control Delay (s)	-	-	7.6	0	10.8	8.8						
HCM Lane LOS	-	-	A	A	B	A						
HCM 95th %tile Q(veh)	-	-	0.1	-	0.1	0.2						

HCM 2010 Signalized Intersection Summary

56: Vista Way

06/29/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑	↑	↑↑		
Traffic Volume (veh/h)	518	201	1018	1229	17	967		
Future Volume (veh/h)	518	201	1018	1229	17	967		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	563	0	1107	1336	18	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	883	395	1384	1317	394	618		
Arrive On Green	0.24	0.00	0.39	0.68	0.21	0.00		
Sat Flow, veh/h	3778	1647	3579	1937	1845	2898		
Grp Volume(v), veh/h	563	0	1107	1336	18	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1937	1845	1449		
Q Serve(g_s), s	10.3	0.0	20.6	51.0	0.6	0.0		
Cycle Q Clear(g_c), s	10.3	0.0	20.6	51.0	0.6	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	883	395	1384	1317	394	618		
V/C Ratio(X)	0.64	0.00	0.80	1.01	0.05	0.00		
Avail Cap(c_a), veh/h	883	395	1384	1317	394	618		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	25.6	0.0	20.4	12.0	23.4	0.0		
Incr Delay (d2), s/veh	3.5	0.0	4.9	28.4	0.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.7	0.0	11.1	36.7	0.3	0.0		
LnGrp Delay(d),s/veh	29.1	0.0	25.4	40.4	23.7	0.0		
LnGrp LOS	C		C	F	C			
Approach Vol, veh/h	563			2443	18			
Approach Delay, s/veh	29.1			33.6	23.7			
Approach LOS	C			C	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	33.0	22.0				55.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	29.0	18.0				51.0
Max Q Clear Time (g_c+I1), s		2.6	22.6	12.3				53.0
Green Ext Time (p_c), s		0.0	2.6	1.8				0.0
Intersection Summary								
HCM 2010 Ctrl Delay			32.7					
HCM 2010 LOS			C					

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	273	107	194	477	306	1676	214	38	179	121	74	78
Future Volume (vph)	273	107	194	477	306	1676	214	38	179	121	74	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3018	1441		1787	1583		1807	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3018	1441		1787	1583		1807	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	297	116	211	518	333	1822	233	41	195	132	80	85
RTOR Reduction (vph)	0	0	189	0	477	481	0	0	122	0	0	73
Lane Group Flow (vph)	297	116	22	518	767	430	0	274	73	0	212	12
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	17.0	9.6	9.6	34.2	28.4	28.4		16.3	16.3		13.1	13.1
Effective Green, g (s)	17.0	9.6	9.6	34.2	28.4	28.4		16.3	16.3		13.1	13.1
Actuated g/C Ratio	0.19	0.10	0.10	0.37	0.31	0.31		0.18	0.18		0.14	0.14
Clearance Time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	328	195	166	661	936	447		318	281		258	226
v/s Ratio Prot	c0.17	0.06		0.29	0.25			c0.15			c0.12	
v/s Ratio Perm			0.01			c0.30			0.05			0.01
v/c Ratio	0.91	0.59	0.13	0.78	0.97dr	0.96		0.86	0.26		0.82	0.05
Uniform Delay, d1	36.5	39.1	37.2	25.4	29.2	31.0		36.5	32.4		38.1	33.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	27.0	3.2	0.1	6.1	7.9	34.2		20.0	0.2		17.8	0.0
Delay (s)	63.5	42.3	37.3	31.4	37.1	65.2		56.5	32.6		55.9	33.9
Level of Service	E	D	D	C	D	E		E	C		E	C
Approach Delay (s)		50.7			45.6			46.5			49.6	
Approach LOS		D			D			D			D	

Intersection Summary

HCM 2000 Control Delay	46.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	91.5	Sum of lost time (s)	18.3
Intersection Capacity Utilization	109.1%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	PM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				T				L			
Volume (V), veh/h	0	0	0	0	0	669	0	323	0	0	437	681	0	557	561	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	0	0	0	0	742	0	351	0	0	484	755	0	618	622	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929		4.2929	4.1129			4.1129		4.2929	4.1129	
Follow-Up Headway (sec)		3.1858		3.1858	3.1858			3.1858		3.1858	3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		0		0	742	351		484	755	618	622	
Entry Volume veh/h		0		0	727	351		475	740	606	610	
Circulating Flow (Vc), pc/h	1982			484			618			742		
Exiting Flow (Vex), pc/h	618			0			484			1364		
Capacity (cPCE), pc/h		156		786	805			733		648	672	
Capacity (c), veh/h		153		771	789			719		635	659	
v/c Ratio (X)		0.00		0.00	0.92			0.66		0.95	0.93	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		23.6		4.7	38.4	0.0		17.5	0.0	50.5	43.8	
Lane LOS		C		A	E	A		C	A	F	E	
95% Queue		0.0		0.0	13.1			5.0		13.4	12.4	
Approach Delay, s/veh				25.9			6.8			47.2		
Approach LOS				D			A			E		
Intersection Delay, s/veh / LOS	26.7						D					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	21	11	91	36	158	17	102	95	182	139	12
Future Volume (vph)	0	21	11	91	36	158	17	102	95	182	139	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	23	12	99	39	172	18	111	103	198	151	13
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	35	310	232	362								
Volume Left (vph)	0	99	18	198								
Volume Right (vph)	12	172	103	13								
Hadj (s)	-0.17	-0.24	-0.22	0.12								
Departure Headway (s)	5.9	5.3	5.2	5.4								
Degree Utilization, x	0.06	0.46	0.34	0.54								
Capacity (veh/h)	496	629	630	640								
Control Delay (s)	9.3	12.7	10.9	14.4								
Approach Delay (s)	9.3	12.7	10.9	14.4								
Approach LOS	A	B	B	B								
Intersection Summary												
Delay			12.8									
Level of Service			B									
Intersection Capacity Utilization			63.5%	ICU Level of Service					B			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	PM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				T				L			
Volume (V), veh/h	0	0	0	0	0	669	0	323	0	0	437	681	0	557	561	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	0	0	0	0	742	0	351	0	0	484	755	0	618	622	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929		4.2929	4.1129			4.1129		4.2929	4.1129	
Follow-Up Headway (sec)		3.1858		3.1858	3.1858			3.1858		3.1858	3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		0		0	742	351		484	755	618	622	
Entry Volume veh/h		0		0	727	351		475	740	606	610	
Circulating Flow (Vc), pc/h	1982			484			618			742		
Exiting Flow (Vex), pc/h	618			0			484			1364		
Capacity (cPCE), pc/h		156		786	805			733		648	672	
Capacity (c), veh/h		153		771	789			719		635	659	
v/c Ratio (X)		0.00		0.00	0.92			0.66		0.95	0.93	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		23.6		4.7	38.4	0.0		17.5	0.0	50.5	43.8	
Lane LOS		C		A	E	A		C	A	F	E	
95% Queue		0.0		0.0	13.1			5.0		13.4	12.4	
Approach Delay, s/veh				25.9			6.8			47.2		
Approach LOS				D			A			E		
Intersection Delay, s/veh / LOS	26.7						D					

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Civic Center Drive			
Agency or Co.	IBI Group				E/W Street Name	Civic Center Drive			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	37	40	34	0	37	47	79	0	28	732	68	0	44	764	31
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	41	44	38	0	41	52	88	0	31	812	75	0	49	847	34
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		123			181			918			930	
Entry Volume veh/h		121			177			900			912	
Circulating Flow (Vc), pc/h	937			884			134			124		
Exiting Flow (Vex), pc/h	168			117			941			926		
Capacity (cPCE), pc/h		443			467			988			998	
Capacity (c), veh/h		434			458			969			979	
v/c Ratio (X)		0.28			0.39			0.93			0.93	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		12.8			14.7			34.9			35.1	
Lane LOS		B			B			D			E	
95% Queue		1.1			1.8			14.6			14.8	
Approach Delay, s/veh	12.8			14.7			34.9			35.1		
Approach LOS	B			B			D			E		
Intersection Delay, s/veh / LOS	32.0						D					

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Highway - Pier View Way			
Agency or Co.	IBI Group				E/W Street Name	Pier View Way			
Date Performed	7/12/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	48	38	53	0	23	38	64	0	40	717	53	0	29	717	90
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	53	42	59	0	26	42	71	0	44	795	59	0	32	795	100
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		154			139			898			927	
Entry Volume veh/h		151			136			880			909	
Circulating Flow (Vc), pc/h	853			892			127			112		
Exiting Flow (Vex), pc/h	133			186			919			880		
Capacity (cPCE), pc/h		482			463			995			1010	
Capacity (c), veh/h		472			454			976			990	
v/c Ratio (X)		0.32			0.30			0.90			0.92	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		12.8			12.8			30.7			32.6	
Lane LOS		B			B			D			D	
95% Queue		1.4			1.2			13.2			14.1	
Approach Delay, s/veh	12.8			12.8			30.7			32.6		
Approach LOS	B			B			D			D		
Intersection Delay, s/veh / LOS	29.1						D					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

11/17/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	14	8	114	55	8	13	39	393	26	13	354	12
Future Volume (vph)	14	8	114	55	8	13	39	393	26	13	354	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	9	124	60	9	14	42	427	28	14	385	13
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	24	124	83	256	242	207	206					
Volume Left (vph)	15	0	60	42	0	14	0					
Volume Right (vph)	0	124	14	0	28	0	13					
Hadj (s)	0.35	-0.67	0.08	0.12	-0.05	0.07	-0.01					
Departure Headway (s)	7.2	6.2	6.9	5.9	5.7	6.0	5.9					
Degree Utilization, x	0.05	0.21	0.16	0.42	0.39	0.34	0.34					
Capacity (veh/h)	459	533	477	591	607	581	589					
Control Delay (s)	9.3	9.6	11.2	11.9	11.1	10.8	10.6					
Approach Delay (s)	9.6		11.2	11.5		10.7						
Approach LOS	A		B	B		B						
Intersection Summary												
Delay			11.0									
Level of Service			B									
Intersection Capacity Utilization			44.3%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	293	100	180	204	73	211
Future Volume (vph)	293	100	180	204	73	211
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	318	109	196	222	79	229
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	318	109	418	308		
Volume Left (vph)	318	0	0	79		
Volume Right (vph)	0	109	222	0		
Hadj (s)	0.53	-0.67	-0.28	0.09		
Departure Headway (s)	7.0	5.8	5.5	6.0		
Degree Utilization, x	0.62	0.18	0.64	0.52		
Capacity (veh/h)	482	588	626	569		
Control Delay (s)	19.8	8.9	17.8	15.3		
Approach Delay (s)	17.0		17.8	15.3		
Approach LOS	C		C	C		
Intersection Summary						
Delay			16.8			
Level of Service			C			
Intersection Capacity Utilization			63.3%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	0	346	90	311	90	0	0	0	0	135	96
Future Volume (vph)	46	0	346	90	311	90	0	0	0	0	135	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5		4.5	4.5	4.5						4.5	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.97						0.94	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3420						3319	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3420						3319	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	0	376	98	338	98	0	0	0	0	147	104
RTOR Reduction (vph)	0	0	309	71	48	0	0	0	0	0	84	0
Lane Group Flow (vph)	50	0	67	27	388	0	0	0	0	0	167	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	6.8		6.8	10.5	10.5						7.3	
Effective Green, g (s)	6.8		6.8	10.5	10.5						7.3	
Actuated g/C Ratio	0.18		0.18	0.28	0.28						0.19	
Clearance Time (s)	4.5		4.5	4.5	4.5						4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	315		497	487	942						635	
v/s Ratio Prot	c0.03		0.02	0.02	c0.11						c0.05	
v/s Ratio Perm												
v/c Ratio	0.16		0.14	0.06	0.41						0.26	
Uniform Delay, d1	13.2		13.2	10.2	11.3						13.1	
Progression Factor	1.00		1.00	1.00	1.00						1.00	
Incremental Delay, d2	0.2		0.1	0.0	0.3						0.2	
Delay (s)	13.5		13.3	10.2	11.6						13.3	
Level of Service	B		B	B	B						B	
Approach Delay (s)		13.3			11.3			0.0			13.3	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			12.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.30									
Actuated Cycle Length (s)			38.1			Sum of lost time (s)				13.5		
Intersection Capacity Utilization			35.2%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

9/1/2016

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↶	↷	↰	↶			↷	↰
Traffic Volume (vph)	0	0	0	210	436	77	278	745	0	0	625	197
Future Volume (vph)	0	0	0	210	436	77	278	745	0	0	625	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	0.95
Frpb, ped/bikes				1.00	1.00	0.96	1.00	1.00			1.00	0.96
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	3539	1515	1770	1863			1760	1451
Flt Permitted				0.95	1.00	1.00	0.12	1.00			1.00	1.00
Satd. Flow (perm)				1770	3539	1515	231	1863			1760	1451
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	228	474	84	302	810	0	0	679	214
RTOR Reduction (vph)	0	0	0	0	0	66	0	0	0	0	1	48
Lane Group Flow (vph)	0	0	0	228	474	18	302	810	0	0	699	145
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					6
Actuated Green, G (s)				18.1	18.1	18.1	57.4	57.4			37.1	37.1
Effective Green, g (s)				18.1	18.1	18.1	57.4	57.4			37.1	37.1
Actuated g/C Ratio				0.21	0.21	0.21	0.67	0.67			0.43	0.43
Clearance Time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				374	749	320	430	1250			763	629
v/s Ratio Prot				0.13	c0.13		0.13	c0.43			c0.40	
v/s Ratio Perm						0.01	0.35					0.10
v/c Ratio				0.61	0.63	0.06	0.70	0.65			0.92	0.23
Uniform Delay, d1				30.5	30.7	26.9	25.1	8.2			22.7	15.2
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				7.2	4.0	0.3	5.5	1.3			15.8	0.3
Delay (s)				37.7	34.7	27.2	30.6	9.5			38.6	15.5
Level of Service				D	C	C	C	A			D	B
Approach Delay (s)		0.0			34.8			15.2			33.6	
Approach LOS		A			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			26.6									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			85.5								15.0	Sum of lost time (s)
Intersection Capacity Utilization			79.9%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	151	0	134	744	292	16	82	322	406	54	22
Future Volume (vph)	19	151	0	134	744	292	16	82	322	406	54	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		5.0	5.0	4.0		4.6	4.0	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.97	
Satd. Flow (prot)	1770	3539		1770	3539	1583		1848	1583	1681	1688	
Flt Permitted	0.29	1.00		0.65	1.00	1.00		0.93	1.00	0.69	0.73	
Satd. Flow (perm)	533	3539		1207	3539	1583		1739	1583	1219	1272	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	164	0	146	809	317	17	89	350	441	59	24
RTOR Reduction (vph)	0	0	0	0	0	317	0	0	350	0	7	0
Lane Group Flow (vph)	21	164	0	146	809	0	0	106	0	256	261	0
Turn Type	Perm	NA		Perm	NA	NA	Perm	NA	NA	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	17.2	17.2		16.8	16.8	0.0		16.2	0.0	16.2	16.2	
Effective Green, g (s)	17.2	17.2		16.8	16.8	0.0		16.2	0.0	16.2	16.2	
Actuated g/C Ratio	0.40	0.40		0.39	0.39	0.00		0.38	0.00	0.38	0.38	
Clearance Time (s)	4.6	4.6		5.0	5.0			4.6		4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5			4.0		4.0	4.0	
Lane Grp Cap (vph)	215	1428		476	1395	0		661	0	463	483	
v/s Ratio Prot		0.05			c0.23							
v/s Ratio Perm	0.04			0.12				0.06		c0.21	0.21	
v/c Ratio	0.10	0.11		0.31	0.58	0.00		0.16	0.00	0.55	0.54	
Uniform Delay, d1	7.9	7.9		8.9	10.1	21.3		8.7	21.3	10.4	10.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.0		0.4	0.6	0.0		0.2	0.0	1.8	1.6	
Delay (s)	8.2	8.0		9.3	10.8	21.3		8.9	21.3	12.1	11.8	
Level of Service	A	A		A	B	C		A	C	B	B	
Approach Delay (s)		8.0			13.2			18.4			12.0	
Approach LOS		A			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			13.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			42.6			Sum of lost time (s)			9.6			
Intersection Capacity Utilization			55.7%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

9/1/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↙	
Traffic Volume (veh/h)	321	16	24	66	25	30
Future Volume (Veh/h)	321	16	24	66	25	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	349	17	26	72	27	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				238		
pX, platoon unblocked						
vC, conflicting volume			366		482	358
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			366		482	358
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		95	95
cM capacity (veh/h)			1193		532	687
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	366	98	60			
Volume Left	0	26	27			
Volume Right	17	0	33			
cSH	1700	1193	607			
Volume to Capacity	0.22	0.02	0.10			
Queue Length 95th (ft)	0	2	8			
Control Delay (s)	0.0	2.3	11.6			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.3	11.6			
Approach LOS			B			
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			34.5%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	355	221	226	0	0	0	94	507	160	170	435	116
Future Volume (vph)	355	221	226	0	0	0	94	507	160	170	435	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.94				1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1493				1770	1863	1552	1770	1863	1516
Flt Permitted	0.95	1.00	1.00				0.49	1.00	1.00	0.19	1.00	1.00
Satd. Flow (perm)	1770	1863	1493				917	1863	1552	347	1863	1516
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	386	240	246	0	0	0	102	551	174	185	473	126
RTOR Reduction (vph)	0	0	166	0	0	0	0	0	91	0	0	59
Lane Group Flow (vph)	386	240	80	0	0	0	102	551	83	185	473	67
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA	Perm				Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4					2	2		1	6	
Permitted Phases			4				2		2	6		6
Actuated Green, G (s)	19.5	19.5	19.5				22.7	22.7	22.7	31.7	31.7	31.7
Effective Green, g (s)	19.5	19.5	19.5				22.7	22.7	22.7	31.7	31.7	31.7
Actuated g/C Ratio	0.32	0.32	0.32				0.38	0.38	0.38	0.53	0.53	0.53
Clearance Time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0				4.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	575	605	485				346	704	587	301	984	800
v/s Ratio Prot	c0.22	0.13						c0.30		c0.05	0.25	
v/s Ratio Perm			0.05				0.11		0.05	0.27		0.04
v/c Ratio	0.67	0.40	0.16				0.29	0.78	0.14	0.61	0.48	0.08
Uniform Delay, d1	17.5	15.7	14.4				13.0	16.5	12.3	10.1	8.9	7.0
Progression Factor	1.00	1.00	1.00				1.07	1.07	1.64	1.00	1.00	1.00
Incremental Delay, d2	6.1	1.9	0.7				1.9	7.4	0.4	3.7	1.7	0.2
Delay (s)	23.6	17.6	15.2				15.9	25.1	20.5	13.8	10.6	7.2
Level of Service	C	B	B				B	C	C	B	B	A
Approach Delay (s)		19.6			0.0			23.0			10.8	
Approach LOS		B			A			C			B	
Intersection Summary												
HCM 2000 Control Delay			18.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			12.8		
Intersection Capacity Utilization			66.4%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	588	36	0	0	0	0	10	36	29	27	0
Future Volume (Veh/h)	16	588	36	0	0	0	0	10	36	29	27	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	639	39	0	0	0	0	11	39	32	29	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		218										
pX, platoon unblocked												
vC, conflicting volume	0			678			707	692	339	398	712	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			678			707	692	339	398	712	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	97	94	93	92	100
cM capacity (veh/h)	1622			910			300	362	657	489	352	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	336	358	50	61								
Volume Left	17	0	0	32								
Volume Right	0	39	39	0								
cSH	1622	1700	557	413								
Volume to Capacity	0.01	0.21	0.09	0.15								
Queue Length 95th (ft)	1	0	7	13								
Control Delay (s)	0.5	0.0	12.1	15.2								
Lane LOS	A		B	C								
Approach Delay (s)	0.2		12.1	15.2								
Approach LOS			B	C								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			34.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	39	1277	26	0	0	0	0	13	33	59	48	0
Future Volume (vph)	39	1277	26	0	0	0	0	13	33	59	48	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	1388	28	0	0	0	0	14	36	64	52	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	736	722	50	116								
Volume Left (vph)	42	0	0	64								
Volume Right (vph)	0	28	36	0								
Hadj (s)	0.06	0.01	-0.40	0.14								
Departure Headway (s)	5.1	5.0	5.6	6.0								
Degree Utilization, x	1.00	1.00	0.08	0.19								
Capacity (veh/h)	736	722	628	586								
Control Delay (s)	54.7	54.4	9.1	10.4								
Approach Delay (s)	54.5		9.1	10.4								
Approach LOS	F		A	B								
Intersection Summary												
Delay			50.0									
Level of Service			E									
Intersection Capacity Utilization			56.4%	ICU Level of Service					B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

9/1/2016

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	291	524	13	43	0	21	0	19	12	0	0	0								
Future Volume (vph)	291	524	13	43	0	21	0	19	12	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	316	570	14	47	0	23	0	21	13	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	316	584	70	34																
Volume Left (vph)	316	0	47	0																
Volume Right (vph)	0	14	23	13																
Hadj (s)	0.53	0.02	-0.03	-0.20																
Departure Headway (s)	5.2	4.7	4.8	5.4																
Degree Utilization, x	0.46	0.76	0.09	0.05																
Capacity (veh/h)	689	758	732	622																
Control Delay (s)	11.3	19.5	8.3	8.7																
Approach Delay (s)	16.6		8.3	8.7																
Approach LOS	C		A	A																
Intersection Summary																				
Delay			15.8																	
Level of Service			C																	
Intersection Capacity Utilization			45.4%	ICU Level of Service				A												
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	39	0	0	51	17	549	74	37	503	18
Future Volume (Veh/h)	0	0	39	0	0	51	17	549	74	37	503	18
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	42	0	0	55	18	597	80	40	547	20
Pedestrians	7				7							
Lane Width (ft)	12.0				16.0							
Walking Speed (ft/s)	4.0				4.0							
Percent Blockage	1				1							
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			455		
pX, platoon unblocked	0.85	0.85	0.84	0.85	0.85	0.98	0.84				0.98	
vC, conflicting volume	1332	1364	564	1349	1334	644	574				684	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1247	1284	390	1267	1249	625	402				666	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	92	100	100	88	98				96	
cM capacity (veh/h)	106	130	552	107	137	471	970				896	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	42	55	18	677	40	567						
Volume Left	0	0	18	0	40	0						
Volume Right	42	55	0	80	0	20						
cSH	552	471	970	1700	896	1700						
Volume to Capacity	0.08	0.12	0.02	0.40	0.04	0.33						
Queue Length 95th (ft)	6	10	1	0	3	0						
Control Delay (s)	12.1	13.7	8.8	0.0	9.2	0.0						
Lane LOS	B	B	A			A						
Approach Delay (s)	12.1	13.7	0.2			0.6						
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			43.5%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	PM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Washington Avenue
E/W Street Name	Washington Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	14	0	71	0	64	14	12	0	46	540	19	0	24	490	61
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	16	0	79	0	71	16	13	0	51	599	21	0	27	543	68
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		95			100			671			638	
Entry Volume veh/h		93			98			658			625	
Circulating Flow (Vc), pc/h	641			666			43			138		
Exiting Flow (Vex), pc/h	48			135			628			693		
Capacity (cPCE), pc/h		595			581			1082			984	
Capacity (c), veh/h		584			569			1061			965	
v/c Ratio (X)		0.16			0.17			0.62			0.65	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		8.1			8.5			11.9			13.6	
Lane LOS		A			A			B			B	
95% Queue		0.6			0.6			4.5			4.9	
Approach Delay, s/veh	8.1			8.5			11.9			13.6		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh / LOS	12.1						B					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	46	78	26	87	6	135	4	257	70	161	158	2
Future Volume (vph)	46	78	26	87	6	135	4	257	70	161	158	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	85	28	95	7	147	4	279	76	175	172	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	163	249	359	349								
Volume Left (vph)	50	95	4	175								
Volume Right (vph)	28	147	76	2								
Hadj (s)	-0.01	-0.24	-0.09	0.13								
Departure Headway (s)	6.6	6.2	5.9	6.1								
Degree Utilization, x	0.30	0.43	0.59	0.59								
Capacity (veh/h)	458	509	573	549								
Control Delay (s)	12.5	13.7	16.8	17.5								
Approach Delay (s)	12.5	13.7	16.8	17.5								
Approach LOS	B	B	C	C								
Intersection Summary												
Delay			15.7									
Level of Service			C									
Intersection Capacity Utilization			64.7%	ICU Level of Service				C				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	332	43	19	231	35	41	63	65	28	83	14
Future Volume (Veh/h)	12	332	43	19	231	35	41	63	65	28	83	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	361	47	21	251	38	45	68	71	30	90	15
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked												
vC, conflicting volume	303			415			790	762	392	842	767	285
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	303			415			790	762	392	842	767	285
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			80	79	89	85	72	98
cM capacity (veh/h)	1243			1137			226	319	653	202	317	745
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	421	310	184	135								
Volume Left	13	21	45	30								
Volume Right	47	38	71	15								
cSH	1243	1137	353	299								
Volume to Capacity	0.01	0.02	0.52	0.45								
Queue Length 95th (ft)	1	1	72	56								
Control Delay (s)	0.4	0.7	25.7	26.6								
Lane LOS	A	A	D	D								
Approach Delay (s)	0.4	0.7	25.7	26.6								
Approach LOS			D	D								
Intersection Summary												
Average Delay			8.3									
Intersection Capacity Utilization			43.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Wisconsin Avenue			
Agency or Co.	IBI Group				E/W Street Name	Wisconsin Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	99	130	175	0	126	105	22	0	153	529	138	0	24	529	49
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	110	144	194	0	140	116	24	0	170	586	153	0	27	586	54
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		448			280			909			667	
Entry Volume veh/h		439			275			891			654	
Circulating Flow (Vc), pc/h	753			866			281			426		
Exiting Flow (Vex), pc/h	324			340			720			920		
Capacity (cPCE), pc/h		532			475			853			738	
Capacity (c), veh/h		522			466			836			724	
v/c Ratio (X)		0.84			0.59			1.07			0.90	

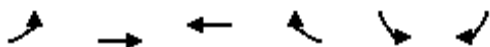
Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		37.8			21.2			71.8			37.8	
Lane LOS		E			C			F			E	
95% Queue		8.7			3.7			22.0			11.9	
Approach Delay, s/veh	37.8			21.2			71.8			37.8		
Approach LOS	E			C			F			E		
Intersection Delay, s/veh / LOS	49.2						E					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

9/1/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	460	342	24	36	38
Future Volume (Veh/h)	9	460	342	24	36	38
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	500	372	26	39	41
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	406				914	394
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	406				914	394
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				87	94
cM capacity (veh/h)	1145				298	650
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	510	398	80			
Volume Left	10	0	39			
Volume Right	0	26	41			
cSH	1145	1700	413			
Volume to Capacity	0.01	0.23	0.19			
Queue Length 95th (ft)	1	0	18			
Control Delay (s)	0.3	0.0	15.8			
Lane LOS	A		C			
Approach Delay (s)	0.3	0.0	15.8			
Approach LOS			C			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			42.8%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	474	4	2	316	29	2	1	3	44	0	35
Future Volume (Veh/h)	26	474	4	2	316	29	2	1	3	44	0	35
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	515	4	2	343	32	2	1	3	48	0	38
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	377			519			976	954	517	942	940	363
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	377			519			976	954	517	942	940	363
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			99	100	99	80	100	94
cM capacity (veh/h)	1180			1047			213	252	558	236	256	680
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	547	377	6	86								
Volume Left	28	2	2	48								
Volume Right	4	32	3	38								
cSH	1180	1047	320	331								
Volume to Capacity	0.02	0.00	0.02	0.26								
Queue Length 95th (ft)	2	0	1	25								
Control Delay (s)	0.7	0.1	16.5	19.6								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.7	0.1	16.5	19.6								
Approach LOS			C	C								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			58.2%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	272	285	82	196	0	170	0	114	0	0	0
Future Volume (vph)	0	272	285	82	196	0	170	0	114	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	296	310	89	213	0	185	0	124	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	606	302	309	0								
Volume Left (vph)	0	89	185	0								
Volume Right (vph)	310	0	124	0								
Hadj (s)	-0.27	0.09	-0.09	0.00								
Departure Headway (s)	5.2	6.0	6.2	7.2								
Degree Utilization, x	0.87	0.50	0.53	0.00								
Capacity (veh/h)	606	569	551	900								
Control Delay (s)	33.1	14.8	15.9	10.2								
Approach Delay (s)	33.1	14.8	15.9	0.0								
Approach LOS	D	B	C	A								
Intersection Summary												
Delay				24.2								
Level of Service				C								
Intersection Capacity Utilization				79.2%	ICU Level of Service	D						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	64	131	185	94	94	180
Future Volume (vph)	64	131	185	94	94	180
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	70	142	201	102	102	196
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	212	303	298			
Volume Left (vph)	70	0	102			
Volume Right (vph)	142	102	0			
Hadj (s)	-0.30	-0.17	0.10			
Departure Headway (s)	5.0	4.7	4.9			
Degree Utilization, x	0.30	0.39	0.41			
Capacity (veh/h)	653	733	694			
Control Delay (s)	10.1	10.7	11.3			
Approach Delay (s)	10.1	10.7	11.3			
Approach LOS	B	B	B			
Intersection Summary						
Delay			10.8			
Level of Service			B			
Intersection Capacity Utilization			51.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	375	22	20	310	69	30	42	40	75	26	21
Future Volume (Veh/h)	14	375	22	20	310	69	30	42	40	75	26	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	408	24	22	337	75	33	46	43	82	28	23
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					213							
pX, platoon unblocked	0.90						0.90	0.90		0.90	0.90	0.90
vC, conflicting volume	415			443			920	920	439	946	894	382
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	289			443			853	853	439	881	824	252
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			84	82	93	55	89	97
cM capacity (veh/h)	1138			1107			212	254	608	184	264	701
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	447	434	122	133								
Volume Left	15	22	33	82								
Volume Right	24	75	43	23								
cSH	1138	1107	299	227								
Volume to Capacity	0.01	0.02	0.41	0.59								
Queue Length 95th (ft)	1	2	47	83								
Control Delay (s)	0.4	0.6	25.0	41.1								
Lane LOS	A	A	D	E								
Approach Delay (s)	0.4	0.6	25.0	41.1								
Approach LOS			D	E								
Intersection Summary												
Average Delay			7.9									
Intersection Capacity Utilization			49.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Oceanside Blvd			
Agency or Co.	IBI Group				E/W Street Name	Oceanside Boulevard			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	1	1	0	0	0	1	1	0	0	1	0
Lane Assignment				LTR	L		TR		LT		R					LTR
Volume (V), veh/h	0	58	230	90	0	252	223	211	0	94	577	162	0	217	490	30
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	64	255	100	0	279	247	234	0	104	640	180	0	241	543	33
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	2				1				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		4.1129		5.1929	5.1929		4.2929	4.1129			4.1129	
Follow-Up Headway (sec)		3.1858		3.1858	3.1858		3.1858	3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		419		279	481		744	180			817	
Entry Volume veh/h		411		274	472		729	176			801	
Circulating Flow (Vc), pc/h	1063			808			560			630		
Exiting Flow (Vex), pc/h	676			384			938			922		
Capacity (cPCE), pc/h		537		504	504		742	764			727	
Capacity (c), veh/h		526		494	494		728	749			713	
v/c Ratio (X)		0.78		0.55	0.95		1.00	0.24			1.12	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		30.9		18.7	58.8		57.6	7.5			95.6	
Lane LOS		D		C	F		F	A			F	
95% Queue		7.1		3.3	12.0		16.6	0.9			23.7	
Approach Delay, s/veh	30.9			44.1			47.9			95.6		
Approach LOS	D			E			E			F		
Intersection Delay, s/veh / LOS	57.8						F					

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	646	6	22	718	196	9	18	58	366	14	90
Future Volume (vph)	45	646	6	22	718	196	9	18	58	366	14	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.97			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1770	3533		1761	3415			3131			1776	1524
Flt Permitted	0.19	1.00		0.28	1.00			0.92			0.66	1.00
Satd. Flow (perm)	350	3533		521	3415			2885			1235	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	702	7	24	780	213	10	20	63	398	15	98
RTOR Reduction (vph)	0	1	0	0	44	0	0	32	0	0	0	40
Lane Group Flow (vph)	49	708	0	24	949	0	0	61	0	0	413	58
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	21.3	21.3		21.3	21.3			29.2			29.2	29.2
Effective Green, g (s)	21.3	21.3		21.3	21.3			29.2			29.2	29.2
Actuated g/C Ratio	0.36	0.36		0.36	0.36			0.49			0.49	0.49
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	124	1254		184	1212			1404			601	741
v/s Ratio Prot		0.20			c0.28							
v/s Ratio Perm	0.14			0.05				0.02			c0.33	0.04
v/c Ratio	0.40	0.56		0.13	0.78			0.04			0.69	0.08
Uniform Delay, d1	14.5	15.6		13.1	17.3			8.1			11.9	8.2
Progression Factor	1.02	1.08		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.7	0.2		0.3	3.4			0.1			6.3	0.2
Delay (s)	15.6	17.1		13.4	20.7			8.1			18.2	8.4
Level of Service	B	B		B	C			A			B	A
Approach Delay (s)		17.0			20.5			8.1			16.3	
Approach LOS		B			C			A			B	
Intersection Summary												
HCM 2000 Control Delay			18.0		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			60.0		Sum of lost time (s)					9.5		
Intersection Capacity Utilization			73.2%		ICU Level of Service					D		
Analysis Period (min)			15									
c Critical Lane Group												

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2035
Time Period	PM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Morse Street
E/W Street Name	Morse Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	40	15	15	0	50	15	167	0	20	737	91	0	213	768	18
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	44	17	17	0	55	17	185	0	22	817	101	0	236	851	20
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		78			257			940			1107	
Entry Volume veh/h		76			252			922			1085	
Circulating Flow (Vc), pc/h	1142			883			297			94		
Exiting Flow (Vex), pc/h	354			59			1046			923		
Capacity (cPCE), pc/h		361			467			840			1029	
Capacity (c), veh/h		354			458			823			1008	
v/c Ratio (X)		0.22			0.55			1.12			1.08	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		14.0			19.8			90.4			70.7	
Lane LOS		B			C			F			F	
95% Queue		0.8			3.3			25.7			25.5	
Approach Delay, s/veh	14.0			19.8			90.4			70.7		
Approach LOS	B			C			F			F		
Intersection Delay, s/veh / LOS	71.1						F					

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	292	31	34	177	0	69	0	59	0	0	0
Future Volume (Veh/h)	0	292	31	34	177	0	69	0	59	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	317	34	37	192	0	75	0	64	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	252											
pX, platoon unblocked												
vC, conflicting volume	192			351			600	600	334	664	617	192
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	192			351			600	600	334	664	617	192
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			81	100	91	100	100	100
cM capacity (veh/h)	1381			1208			403	402	708	332	393	850
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	351	229	139	0								
Volume Left	0	37	75	0								
Volume Right	34	0	64	0								
cSH	1381	1208	503	1700								
Volume to Capacity	0.00	0.03	0.28	0.00								
Queue Length 95th (ft)	0	2	28	0								
Control Delay (s)	0.0	1.5	14.9	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	1.5	14.9	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			45.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	169	38	0	65	0	38	1	12	0	0	0
Future Volume (Veh/h)	0	169	38	0	65	0	38	1	12	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	184	41	0	71	0	41	1	13	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	71			225			276	276	204	289	296	71
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	71			225			276	276	204	289	296	71
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			94	100	98	100	100	100
cM capacity (veh/h)	1529			1344			677	632	836	652	616	991
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	225	71	55	0								
Volume Left	0	0	41	0								
Volume Right	41	0	13	0								
cSH	1529	1344	708	1700								
Volume to Capacity	0.00	0.00	0.08	0.00								
Queue Length 95th (ft)	0	0	6	0								
Control Delay (s)	0.0	0.0	10.5	0.0								
Lane LOS			B	A								
Approach Delay (s)	0.0	0.0	10.5	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			21.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	82	248	26	47	296	26
Future Volume (vph)	82	248	26	47	296	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	89	270	28	51	322	28
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	359	79	350			
Volume Left (vph)	89	0	322			
Volume Right (vph)	270	51	0			
Hadj (s)	-0.37	-0.35	0.22			
Departure Headway (s)	4.6	4.9	5.1			
Degree Utilization, x	0.46	0.11	0.50			
Capacity (veh/h)	731	659	668			
Control Delay (s)	11.6	8.5	13.1			
Approach Delay (s)	11.6	8.5	13.1			
Approach LOS	B	A	B			
Intersection Summary						
Delay			12.0			
Level of Service			B			
Intersection Capacity Utilization			50.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	203	103	14	159	14	140	17	18	4	12	21
Future Volume (Veh/h)	9	203	103	14	159	14	140	17	18	4	12	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	221	112	15	173	15	152	18	20	4	13	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	576											
pX, platoon unblocked												
vC, conflicting volume	188			333			537	515	277	536	564	180
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	188			333			537	515	277	536	564	180
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			64	96	97	99	97	97
cM capacity (veh/h)	1386			1226			426	455	762	423	427	862
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	343	203	190	40								
Volume Left	10	15	152	4								
Volume Right	112	15	20	23								
cSH	1386	1226	449	601								
Volume to Capacity	0.01	0.01	0.42	0.07								
Queue Length 95th (ft)	1	1	52	5								
Control Delay (s)	0.3	0.7	18.7	11.4								
Lane LOS	A	A	C	B								
Approach Delay (s)	0.3	0.7	18.7	11.4								
Approach LOS			C	B								
Intersection Summary												
Average Delay			5.5									
Intersection Capacity Utilization			42.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	227	3	9	189	4	2	2	8	2	1	1
Future Volume (Veh/h)	1	227	3	9	189	4	2	2	8	2	1	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	247	3	10	205	4	2	2	9	2	1	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)	249											
pX, platoon unblocked												
vC, conflicting volume	209			250			479	480	248	488	479	207
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	209			250			479	480	248	488	479	207
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	99	100	100	100
cM capacity (veh/h)	1362			1316			492	481	790	480	482	833
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	251	219	13	4								
Volume Left	1	10	2	2								
Volume Right	3	4	9	1								
cSH	1362	1316	663	538								
Volume to Capacity	0.00	0.01	0.02	0.01								
Queue Length 95th (ft)	0	1	1	1								
Control Delay (s)	0.0	0.4	10.5	11.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.0	0.4	10.5	11.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			26.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2035
Time Period	PM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Cassidy Street
E/W Street Name	Cassidy Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	96	218	192	0	81	126	36	0	212	786	117	0	145	623	74
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	106	242	213	0	90	140	40	0	235	871	130	0	161	691	82
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		561			270			1236			934	
Entry Volume veh/h		550			265			1212			916	
Circulating Flow (Vc), pc/h	942			1212			509			465		
Exiting Flow (Vex), pc/h	533			457			1017			994		
Capacity (cPCE), pc/h		441			336			679			710	
Capacity (c), veh/h		432			330			666			696	
v/c Ratio (X)		1.27			0.80			1.82			1.32	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		167.4			47.5			390.9			171.3	
Lane LOS		F			E			F			F	
95% Queue		23.5			6.7			74.3			36.8	
Approach Delay, s/veh	167.4			47.5			390.9			171.3		
Approach LOS	F			E			F			F		
Intersection Delay, s/veh / LOS	249.9						F					

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	167	58	56	75	12	67	69	26	19	27	22
Future Volume (Veh/h)	22	167	58	56	75	12	67	69	26	19	27	22
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	182	63	61	82	13	73	75	28	21	29	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		280										
pX, platoon unblocked												
vC, conflicting volume	95			245			510	478	214	538	504	88
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	95			245			510	478	214	538	504	88
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			95			83	84	97	94	93	98
cM capacity (veh/h)	1499			1321			418	456	827	366	442	970
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	269	156	176	74								
Volume Left	24	61	73	21								
Volume Right	63	13	28	24								
cSH	1499	1321	472	501								
Volume to Capacity	0.02	0.05	0.37	0.15								
Queue Length 95th (ft)	1	4	43	13								
Control Delay (s)	0.8	3.3	17.1	13.4								
Lane LOS	A	A	C	B								
Approach Delay (s)	0.8	3.3	17.1	13.4								
Approach LOS			C	B								
Intersection Summary												
Average Delay			7.0									
Intersection Capacity Utilization			42.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	7	85	11	13	40	2	14	24	13	3	11	5
Future Volume (vph)	7	85	11	13	40	2	14	24	13	3	11	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	92	12	14	43	2	15	26	14	3	12	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	112	59	55	20								
Volume Left (vph)	8	14	15	3								
Volume Right (vph)	12	2	14	5								
Hadj (s)	-0.02	0.06	-0.06	-0.09								
Departure Headway (s)	4.1	4.2	4.2	4.2								
Degree Utilization, x	0.13	0.07	0.06	0.02								
Capacity (veh/h)	854	827	809	808								
Control Delay (s)	7.7	7.6	7.5	7.3								
Approach Delay (s)	7.7	7.6	7.5	7.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			18.0%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	19	154	12	64	66	44	12	104	144	84	22	5
Future Volume (vph)	19	154	12	64	66	44	12	104	144	84	22	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	167	13	70	72	48	13	113	157	91	24	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	201	190	283	120								
Volume Left (vph)	21	70	13	91								
Volume Right (vph)	13	48	157	5								
Hadj (s)	0.02	-0.04	-0.29	0.16								
Departure Headway (s)	5.3	5.2	4.9	5.6								
Degree Utilization, x	0.29	0.28	0.38	0.19								
Capacity (veh/h)	626	630	682	586								
Control Delay (s)	10.5	10.2	10.9	9.8								
Approach Delay (s)	10.5	10.2	10.9	9.8								
Approach LOS	B	B	B	A								
Intersection Summary												
Delay				10.5								
Level of Service				B								
Intersection Capacity Utilization				54.0%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	98	113	7	64	43
Future Volume (vph)	0	98	113	7	64	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	107	123	8	70	47
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	107	131	117			
Volume Left (vph)	0	0	70			
Volume Right (vph)	107	8	0			
Hadj (s)	-0.57	0.00	0.15			
Departure Headway (s)	3.9	4.2	4.4			
Degree Utilization, x	0.12	0.15	0.14			
Capacity (veh/h)	871	817	781			
Control Delay (s)	7.4	8.0	8.2			
Approach Delay (s)	7.4	8.0	8.2			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.9			
Level of Service			A			
Intersection Capacity Utilization			19.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

11/17/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	147	48	216	117	369	54	691	286	309	581	26
Future Volume (vph)	22	147	48	216	117	369	54	691	286	309	581	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	16	16	16
Total Lost time (s)	5.0	5.0	5.0		4.9	4.9	4.2	5.0	5.0	4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	1.00	0.95	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	2006	1863	1555		1804	1794	1770	2111	1510	2006	3986	
Flt Permitted	0.95	1.00	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	2006	1863	1555		1804	1794	1770	2111	1510	2006	3986	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	160	52	235	127	401	59	751	311	336	632	28
RTOR Reduction (vph)	0	0	47	0	0	179	0	0	108	0	2	0
Lane Group Flow (vph)	24	160	5	0	362	222	59	751	203	336	658	0
Confl. Peds. (#/hr)			2	2					5			
Confl. Bikes (#/hr)									4			
Turn Type	Split	NA	Perm	Split	NA	pt+ov	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	14.7	14.7	14.7		27.1	48.8	7.3	66.0	66.0	21.7	80.4	
Effective Green, g (s)	14.7	14.7	14.7		27.1	48.8	7.3	66.0	66.0	21.7	80.4	
Actuated g/C Ratio	0.10	0.10	0.10		0.18	0.33	0.05	0.44	0.44	0.15	0.54	
Clearance Time (s)	5.0	5.0	5.0		4.9		4.2	5.0	5.0	4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0		2.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	198	184	153		328	589	86	937	670	292	2156	
v/s Ratio Prot	0.01	c0.09			c0.20	0.12	0.03	c0.36		c0.17	0.17	
v/s Ratio Perm			0.00						0.13			
v/c Ratio	0.12	0.87	0.03		1.10	0.38	0.69	0.80	0.30	1.15	0.31	
Uniform Delay, d1	61.1	66.0	60.5		60.8	38.3	69.5	35.6	26.5	63.4	18.7	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	31.7	0.0		80.5	0.4	16.5	7.2	1.2	99.8	0.1	
Delay (s)	61.2	97.7	60.6		141.3	38.7	86.1	42.8	27.7	163.2	18.8	
Level of Service	E	F	E		F	D	F	D	C	F	B	
Approach Delay (s)		85.8			87.3			40.9			67.5	
Approach LOS		F			F			D			E	
Intersection Summary												
HCM 2000 Control Delay			64.2		HCM 2000 Level of Service				E			
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			148.6		Sum of lost time (s)				19.1			
Intersection Capacity Utilization			95.3%		ICU Level of Service				F			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St

12/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	801	31	42	770	52	21	0	42	24	13	53
Future Volume (Veh/h)	9	801	31	42	770	52	21	0	42	24	13	53
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	871	34	46	837	57	23	0	46	26	14	58
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh					2							
Upstream signal (ft)		312										
pX, platoon unblocked				0.92			0.92	0.92	0.92	0.92	0.92	
vC, conflicting volume	894			905			1930	1894	888	1912	1882	866
vC1, stage 1 conf vol							908	908		958	958	
vC2, stage 2 conf vol							1022	986		954	925	
vCu, unblocked vol	894			851			1970	1930	832	1949	1917	866
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			94			86	100	86	85	93	84
cM capacity (veh/h)	759			722			168	223	338	169	214	353
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	915	940	69	98								
Volume Left	10	46	23	26								
Volume Right	34	57	46	58								
cSH	759	722	253	256								
Volume to Capacity	0.01	0.06	0.27	0.38								
Queue Length 95th (ft)	1	5	27	43								
Control Delay (s)	0.4	1.8	24.5	27.6								
Lane LOS	A	A	C	D								
Approach Delay (s)	0.4	1.8	24.5	27.6								
Approach LOS			C	D								
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization			83.2%		ICU Level of Service				E			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

12/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	1116	26	61	1097	61	5	4	97	24	4	15
Future Volume (Veh/h)	9	1116	26	61	1097	61	5	4	97	24	4	15
Sign Control	Free		Free		Stop		Stop					
Grade	0%		0%		0%		0%					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	1213	28	66	1192	66	5	4	105	26	4	16
Pedestrians	1						1					
Lane Width (ft)	12.0						12.0					
Walking Speed (ft/s)	4.0						4.0					
Percent Blockage	0						0					
Right turn flare (veh)												
Median type	TWLTL		TWLTL									
Median storage veh	2		2									
Upstream signal (ft)	687											
pX, platoon unblocked			0.93				0.93	0.93	0.93	0.93	0.93	
vC, conflicting volume	1258			1242			2591	2638	1228	2697	2619	1226
vC1, stage 1 conf vol							1248	1248			1357	1357
vC2, stage 2 conf vol							1343	1390			1340	1262
vCu, unblocked vol	1258			1221			2679	2729	1206	2793	2709	1226
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5			6.1	5.5
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			87			95	97	49	0	97	93
cM capacity (veh/h)	553			528			108	132	207	18	117	218
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	10	1241	66	1258	114	46						
Volume Left	10	0	66	0	5	26						
Volume Right	0	28	0	66	105	16						
cSH	553	1700	528	1700	195	29						
Volume to Capacity	0.02	0.73	0.13	0.74	0.58	1.58						
Queue Length 95th (ft)	1	0	11	0	80	134						
Control Delay (s)	11.6	0.0	12.8	0.0	46.5	585.5						
Lane LOS	B		B		E	F						
Approach Delay (s)	0.1		0.6		46.5	585.5						
Approach LOS					E	F						
Intersection Summary												
Average Delay			12.1									
Intersection Capacity Utilization			77.2%		ICU Level of Service		D					
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

12/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	1215	0	0	1250	329	0	0	0	0	0	22
Future Volume (Veh/h)	13	1215	0	0	1250	329	0	0	0	0	0	22
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	1321	0	0	1359	358	0	0	0	0	0	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		TWLTL			TWLTL							
Median storage veh		2			2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1717			1321			2732	3066	1321	2887	2887	1538
vC1, stage 1 conf vol							1349	1349		1538	1538	
vC2, stage 2 conf vol							1383	1717		1349	1349	
vCu, unblocked vol	1717			1321			2732	3066	1321	2887	2887	1538
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			100	100	100	100	100	83
cM capacity (veh/h)	369			523			102	106	191	107	130	142
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	14	1321	0	1717	0	24						
Volume Left	14	0	0	0	0	0						
Volume Right	0	0	0	358	0	24						
cSH	369	1700	1700	1700	1700	142						
Volume to Capacity	0.04	0.78	0.00	1.01	0.00	0.17						
Queue Length 95th (ft)	3	0	0	0	0	15						
Control Delay (s)	15.2	0.0	0.0	0.0	0.0	35.3						
Lane LOS	C				A	E						
Approach Delay (s)	0.2		0.0		0.0	35.3						
Approach LOS					A	E						
Intersection Summary												
Average Delay			0.3									
Intersection Capacity Utilization			95.8%		ICU Level of Service				F			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

9/1/2016

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	0	0	83	0	0	104	87	878	23	104	704	8	
Future Volume (Veh/h)	0	0	83	0	0	104	87	878	23	104	704	8	
Sign Control		Stop			Stop			Free			Free		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	0	0	90	0	0	113	95	954	25	113	765	9	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	None								None				
Median storage veh													
Upstream signal (ft)												621	
pX, platoon unblocked													
vC, conflicting volume	2252	2164	770	2238	2156	966	774						979
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	2252	2164	770	2238	2156	966	774						979
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1						4.1
tC, 2 stage (s)													
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2						2.2
p0 queue free %	100	100	78	100	100	63	89						84
cM capacity (veh/h)	15	35	401	19	36	309	842						705
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2							
Volume Total	90	113	95	979	113	774							
Volume Left	0	0	95	0	113	0							
Volume Right	90	113	0	25	0	9							
cSH	401	309	842	1700	705	1700							
Volume to Capacity	0.22	0.37	0.11	0.58	0.16	0.46							
Queue Length 95th (ft)	21	41	10	0	14	0							
Control Delay (s)	16.6	23.3	9.8	0.0	11.1	0.0							
Lane LOS	C	C	A		B								
Approach Delay (s)	16.6	23.3	0.9		1.4								
Approach LOS	C	C											
Intersection Summary													
Average Delay			2.9										
Intersection Capacity Utilization			60.7%	ICU Level of Service				B					
Analysis Period (min)			15										

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection		Coast Hwy - Michigan Avenue		
Agency or Co.	IBI Group				E/W Street Name		Michigan Avenue		
Date Performed	05/23/2016				N/S Street Name		Coast Highway		
Analysis Year	2016				Analysis Time Period (hrs)		0.25		
Time Period	PM Peak Hour				Peak Hour Factor		0.92		
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	185	91	77	0	52	12	25	0	25	557	44	0	19	557	47
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	205	101	85	0	58	13	28	0	28	618	49	0	21	618	52
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929		
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (Ve), pc/h		391			99			695			691		
Entry Volume veh/h		383			97			681			677		
Circulating Flow (Vc), pc/h	697			851			327			99			
Exiting Flow (Vex), pc/h	171			93			851			761			
Capacity (cPCE), pc/h		563			483			815			1024		
Capacity (c), veh/h		552			473			799			1003		
v/c Ratio (X)		0.69			0.21			0.85			0.68		

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		23.5			10.6			28.8			14.1	
Lane LOS		C			B			D			B	
95% Queue		5.4			0.8			10.2			5.5	
Approach Delay, s/veh	23.5			10.6			28.8			14.1		
Approach LOS	C			B			D			B		
Intersection Delay, s/veh / LOS	21.3						C					

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - West			
Agency or Co.	IBI Group				E/W Street Name	West Street			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	34	20	29	0	37	20	43	0	29	246	37	0	43	245	34
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	38	22	32	0	41	22	48	0	32	273	41	0	48	272	38
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		92			111			346			358	
Entry Volume veh/h		90			109			339			351	
Circulating Flow (Vc), pc/h	361			343			108			95		
Exiting Flow (Vex), pc/h	111			92			359			345		
Capacity (cPCE), pc/h		788			802			1014			1028	
Capacity (c), veh/h		772			786			994			1007	
v/c Ratio (X)		0.12			0.14			0.34			0.35	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.9			6.0			7.2			7.2	
Lane LOS		A			A			A			A	
95% Queue		0.4			0.5			1.5			1.6	
Approach Delay, s/veh	5.9			6.0			7.2			7.2		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	6.9						A					

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Kelly Street			
Agency or Co.	IBI Group				E/W Street Name	Kelly Street			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	39	16	13	0	8	6	151	0	3	315	8	0	141	305	59
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	43	18	14	0	9	7	167	0	3	349	9	0	156	338	65
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		75			183			361			559	
Entry Volume veh/h		74			179			354			548	
Circulating Flow (Vc), pc/h	503			395			217			19		
Exiting Flow (Vex), pc/h	183			75			559			361		
Capacity (cPCE), pc/h		683			761			910			1109	
Capacity (c), veh/h		670			746			892			1087	
v/c Ratio (X)		0.11			0.24			0.40			0.50	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.6			7.5			8.7			9.2	
Lane LOS		A			A			A			A	
95% Queue		0.4			0.9			1.9			2.9	
Approach Delay, s/veh	6.6			7.5			8.7			9.2		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	8.6						A					

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

06/29/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	103	0	14	13	1059	13	24	2213	16
Future Volume (veh/h)	0	0	0	103	0	14	13	1059	13	24	2213	16
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h				112	0	0	14	1151	0	26	2405	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				738	0	329	92	3173	988	92	2208	988
Arrive On Green				0.20	0.00	0.00	0.05	0.60	0.00	0.05	0.60	0.00
Sat Flow, veh/h				3690	0	1647	1845	5289	1647	1845	3681	1647
Grp Volume(v), veh/h				112	0	0	14	1151	0	26	2405	0
Grp Sat Flow(s),veh/h/ln				1845	0	1647	1845	1763	1647	1845	1840	1647
Q Serve(g_s), s				2.0	0.0	0.0	0.6	8.9	0.0	1.1	48.0	0.0
Cycle Q Clear(g_c), s				2.0	0.0	0.0	0.6	8.9	0.0	1.1	48.0	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				738	0	329	92	3173	988	92	2208	988
V/C Ratio(X)				0.15	0.00	0.00	0.15	0.36	0.00	0.28	1.09	0.00
Avail Cap(c_a), veh/h				738	0	329	92	3173	988	92	2208	988
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				26.4	0.0	0.0	36.4	8.2	0.0	36.6	16.0	0.0
Incr Delay (d2), s/veh				0.4	0.0	0.0	3.5	0.3	0.0	7.5	48.3	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.1	0.0	0.0	0.4	4.4	0.0	0.7	38.7	0.0
LnGrp Delay(d),s/veh				26.8	0.0	0.0	39.8	8.5	0.0	44.1	64.3	0.0
LnGrp LOS				C			D	A		D	F	
Approach Vol, veh/h					112			1165			2431	
Approach Delay, s/veh					26.8			8.9			64.1	
Approach LOS					C			A			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	8.0	52.0			8.0	52.0		20.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	48.0			4.0	48.0		16.0				
Max Q Clear Time (g_c+I1), s	3.1	10.9			2.6	50.0		4.0				
Green Ext Time (p_c), s	0.0	10.6			0.0	0.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				45.6								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↗	↖↖	↑↑					
Traffic Volume (veh/h)	1123	209	317	1287	0	0			
Future Volume (veh/h)	1123	209	317	1287	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937					
Adj Flow Rate, veh/h	1221	227	345	1399					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	2116	947	805	3313					
Arrive On Green	0.57	0.57	0.22	0.90					
Sat Flow, veh/h	3778	1647	3579	3778					
Grp Volume(v), veh/h	1221	227	345	1399					
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840					
Q Serve(g_s), s	8.4	2.7	3.3	2.5					
Cycle Q Clear(g_c), s	8.4	2.7	3.3	2.5					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	2116	947	805	3313					
V/C Ratio(X)	0.58	0.24	0.43	0.42					
Avail Cap(c_a), veh/h	2116	947	805	3313					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	5.4	4.2	13.3	0.3					
Incr Delay (d2), s/veh	1.2	0.6	1.7	0.4					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	4.4	1.4	1.8	1.2					
LnGrp Delay(d),s/veh	6.6	4.8	15.0	0.7					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	1448			1744					
Approach Delay, s/veh	6.3			3.5					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			13.0	27.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			9.0	23.0				36.0	
Max Q Clear Time (g_c+I1), s			5.3	10.4				4.5	
Green Ext Time (p_c), s			0.5	7.5				13.7	
Intersection Summary									
HCM 2010 Ctrl Delay			4.8						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/11/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↰↰	↑↑	↰	↑		
Traffic Volume (veh/h)	1740	97	305	1324	156	0		
Future Volume (veh/h)	1740	97	305	1324	156	0		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	1891	105	332	1439	170	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1840	823	358	2419	422	376		
Arrive On Green	0.50	0.50	0.10	0.66	0.23	0.00		
Sat Flow, veh/h	3778	1647	3579	3778	1845	1647		
Grp Volume(v), veh/h	1891	105	332	1439	170	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840	1845	1647		
Q Serve(g_s), s	35.0	2.4	6.4	15.4	5.5	0.0		
Cycle Q Clear(g_c), s	35.0	2.4	6.4	15.4	5.5	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1840	823	358	2419	422	376		
V/C Ratio(X)	1.03	0.13	0.93	0.59	0.40	0.00		
Avail Cap(c_a), veh/h	1840	823	358	2419	422	376		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	17.5	9.3	31.2	6.8	22.9	0.0		
Incr Delay (d2), s/veh	28.3	0.3	32.3	1.1	2.9	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	24.9	1.2	4.8	8.0	3.1	0.0		
LnGrp Delay(d),s/veh	45.8	9.7	63.6	7.8	25.8	0.0		
LnGrp LOS	F	A	E	A	C			
Approach Vol, veh/h	1996			1771	170			
Approach Delay, s/veh	43.9			18.3	25.8			
Approach LOS	D			B	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	11.0	39.0				50.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	7.0	35.0				46.0
Max Q Clear Time (g_c+I1), s		7.5	8.4	37.0				17.4
Green Ext Time (p_c), s		0.3	0.0	0.0				13.6
Intersection Summary								
HCM 2010 Ctrl Delay			31.6					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary
51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	626	6	82	582	108	5	0	31	77	8	49
Future Volume (veh/h)	0	626	6	82	582	108	5	0	31	77	8	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1937	1976	1937	1937	1937	1937	0	1937	1937	1937	1937
Adj Flow Rate, veh/h	0	680	7	89	633	0	5	0	34	90	0	53
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1244	13	217	1949	872	0	0	0	1158	0	517
Arrive On Green	0.00	0.33	0.33	0.12	0.53	0.00	0.00	0.00	0.00	0.31	0.00	0.31
Sat Flow, veh/h	0	3829	38	1845	3681	1647		0		3690	0	1647
Grp Volume(v), veh/h	0	335	352	89	633	0		0.0		90	0	53
Grp Sat Flow(s),veh/h/ln	0	1840	1930	1845	1840	1647				1845	0	1647
Q Serve(g_s), s	0.0	7.6	7.6	2.3	5.0	0.0				0.9	0.0	1.2
Cycle Q Clear(g_c), s	0.0	7.6	7.6	2.3	5.0	0.0				0.9	0.0	1.2
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	613	643	217	1949	872				1158	0	517
V/C Ratio(X)	0.00	0.55	0.55	0.41	0.32	0.00				0.08	0.00	0.10
Avail Cap(c_a), veh/h	0	613	643	217	1949	872				1158	0	517
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	13.9	13.9	20.9	6.8	0.0				12.3	0.0	12.4
Incr Delay (d2), s/veh	0.0	3.5	3.3	5.6	0.4	0.0				0.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.4	4.6	1.5	2.6	0.0				0.5	0.0	0.6
LnGrp Delay(d),s/veh	0.0	17.3	17.2	26.5	7.3	0.0				12.4	0.0	12.8
LnGrp LOS		B	B	C	A					B		B
Approach Vol, veh/h		687			722						143	
Approach Delay, s/veh		17.3			9.6						12.6	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			10.0	21.0		20.0		31.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			6.0	17.0		16.0		27.0				
Max Q Clear Time (g_c+I1), s			4.3	9.6		3.2		7.0				
Green Ext Time (p_c), s			0.0	2.5		0.3		4.3				
Intersection Summary												
HCM 2010 Ctrl Delay			13.3									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	691	9	28	1014	299	9	2	15	292	7	73
Future Volume (veh/h)	179	691	9	28	1014	299	9	2	15	292	7	73
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1976	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	195	751	10	30	1102	325	10	2	16	202	169	79
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	185	1209	16	115	1058	473	329	66	350	369	250	117
Arrive On Green	0.10	0.32	0.32	0.06	0.29	0.29	0.21	0.21	0.21	0.20	0.20	0.20
Sat Flow, veh/h	1845	3719	50	1845	3681	1647	1550	310	1647	1845	1250	584
Grp Volume(v), veh/h	195	372	389	30	1102	325	12	0	16	202	0	248
Grp Sat Flow(s),veh/h/ln	1845	1840	1929	1845	1840	1647	1860	0	1647	1845	0	1834
Q Serve(g_s), s	8.0	13.7	13.7	1.2	23.0	14.0	0.4	0.0	0.6	7.9	0.0	10.0
Cycle Q Clear(g_c), s	8.0	13.7	13.7	1.2	23.0	14.0	0.4	0.0	0.6	7.9	0.0	10.0
Prop In Lane	1.00		0.03	1.00		1.00	0.83		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	185	598	627	115	1058	473	395	0	350	369	0	367
V/C Ratio(X)	1.06	0.62	0.62	0.26	1.04	0.69	0.03	0.00	0.05	0.55	0.00	0.68
Avail Cap(c_a), veh/h	185	598	627	115	1058	473	395	0	350	369	0	367
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.0	22.8	22.8	35.7	28.5	25.3	25.0	0.0	25.0	28.7	0.0	29.6
Incr Delay (d2), s/veh	82.1	4.8	4.6	5.4	39.0	7.9	0.1	0.0	0.2	5.7	0.0	9.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	7.7	8.0	0.8	17.3	7.4	0.2	0.0	0.3	4.6	0.0	6.0
LnGrp Delay(d),s/veh	118.1	27.6	27.4	41.1	67.5	33.2	25.1	0.0	25.3	34.5	0.0	39.2
LnGrp LOS	F	C	C	D	F	C	C		C	C		D
Approach Vol, veh/h		956			1457			28			450	
Approach Delay, s/veh		46.0			59.3			25.2			37.1	
Approach LOS		D			E			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.0	9.0	30.0		20.0	12.0	27.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	5.0	26.0		16.0	8.0	23.0				
Max Q Clear Time (g_c+I1), s		2.6	3.2	15.7		12.0	10.0	25.0				
Green Ext Time (p_c), s		0.0	0.0	3.5		0.8	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				51.1								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	868	283	88	765	185	360	99	141	437	240	390
Future Volume (veh/h)	61	868	283	88	765	185	360	99	141	437	240	390
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	66	943	308	96	832	201	250	306	153	368	411	424
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	123	838	272	98	1080	483	394	413	351	394	413	351
Arrive On Green	0.07	0.31	0.31	0.05	0.29	0.29	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1845	2732	888	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	66	634	617	96	832	201	250	306	153	368	411	424
Grp Sat Flow(s),veh/h/ln	1845	1840	1780	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	2.6	23.0	23.0	3.9	15.5	7.4	9.2	11.1	6.0	14.7	15.9	16.0
Cycle Q Clear(g_c), s	2.6	23.0	23.0	3.9	15.5	7.4	9.2	11.1	6.0	14.7	15.9	16.0
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	123	564	546	98	1080	483	394	413	351	394	413	351
V/C Ratio(X)	0.54	1.12	1.13	0.98	0.77	0.42	0.64	0.74	0.44	0.93	0.99	1.21
Avail Cap(c_a), veh/h	123	564	546	98	1080	483	394	413	351	394	413	351
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	26.0	26.0	35.5	24.2	21.3	26.8	27.6	25.6	29.0	29.5	29.5
Incr Delay (d2), s/veh	15.8	76.4	79.7	84.3	5.3	2.6	7.6	11.3	3.9	31.6	42.9	116.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	23.6	23.3	4.3	8.7	3.7	5.6	7.2	3.1	10.9	13.4	18.6
LnGrp Delay(d),s/veh	49.6	102.4	105.7	119.7	29.5	24.0	34.5	38.9	29.5	60.6	72.4	146.4
LnGrp LOS	D	F	F	F	C	C	C	D	C	E	E	F
Approach Vol, veh/h	1317				1129				709			
Approach Delay, s/veh	101.3				36.2				35.3			
Approach LOS	F				D				D			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6			7	8			
Phs Duration (G+Y+Rc), s	20.0		8.0	27.0	20.0			9.0	26.0			
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0			4.0	4.0			
Max Green Setting (Gmax), s	16.0		4.0	23.0	16.0			5.0	22.0			
Max Q Clear Time (g_c+I1), s	13.1		5.9	25.0	18.0			4.6	17.5			
Green Ext Time (p_c), s	1.0		0.0	0.0	0.0			0.0	2.5			
Intersection Summary												
HCM 2010 Ctrl Delay	71.9											
HCM 2010 LOS	E											
Notes												

Intersection

Intersection Delay, s/veh 7.6

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	78	7	7	86	9	4	5	8	0	0	0
Future Vol, veh/h	23	78	7	7	86	9	4	5	8	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	85	8	8	93	10	4	5	9	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.7	7.6	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	24%	21%	7%
Vol Thru, %	29%	72%	84%
Vol Right, %	47%	6%	9%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	17	108	102
LT Vol	4	23	7
Through Vol	5	78	86
RT Vol	8	7	9
Lane Flow Rate	18	117	111
Geometry Grp	1	1	1
Degree of Util (X)	0.021	0.132	0.124
Departure Headway (Hd)	4.088	4.052	4.014
Convergence, Y/N	Yes	Yes	Yes
Cap	860	884	891
Service Time	2.187	2.083	2.047
HCM Lane V/C Ratio	0.021	0.132	0.125
HCM Control Delay	7.3	7.7	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.5	0.4

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖						↖	↗
Traffic Vol, veh/h	0	195	55	31	35	0	0	0	0	28	0	46
Future Vol, veh/h	0	195	55	31	35	0	0	0	0	28	0	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	212	60	34	38	0	0	0	0	30	0	50
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	212	0	0				318	318	38
Stage 1	-	-	-	-	-	-				106	106	-
Stage 2	-	-	-	-	-	-				212	212	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1358	-	0				675	598	1034
Stage 1	0	-	-	-	-	0				918	807	-
Stage 2	0	-	-	-	-	0				823	727	-
Platoon blocked, %	-	-	-	-	-	-				-	-	-
Mov Cap-1 Maneuver	-	-	-	1358	-	-				657	0	1034
Mov Cap-2 Maneuver	-	-	-	-	-	-				657	0	-
Stage 1	-	-	-	-	-	-				894	0	-
Stage 2	-	-	-	-	-	-				823	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.6			9.5					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2						
Capacity (veh/h)	-	-	1358	-	657	1034						
HCM Lane V/C Ratio	-	-	0.025	-	0.046	0.048						
HCM Control Delay (s)	-	-	7.7	0	10.7	8.7						
HCM Lane LOS	-	-	A	A	B	A						
HCM 95th %tile Q(veh)	-	-	0.1	-	0.1	0.2						

HCM 2010 Signalized Intersection Summary

56: Vista Way

06/29/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑	↑	↑↑		
Traffic Volume (veh/h)	945	137	935	1632	56	1428		
Future Volume (veh/h)	945	137	935	1632	56	1428		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	1027	0	1016	1774	61	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1302	583	1211	1401	397	624		
Arrive On Green	0.35	0.00	0.34	0.72	0.22	0.00		
Sat Flow, veh/h	3778	1647	3579	1937	1845	2898		
Grp Volume(v), veh/h	1027	0	1016	1774	61	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1937	1845	1449		
Q Serve(g_s), s	32.5	0.0	34.1	94.0	3.5	0.0		
Cycle Q Clear(g_c), s	32.5	0.0	34.1	94.0	3.5	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1302	583	1211	1401	397	624		
V/C Ratio(X)	0.79	0.00	0.84	1.27	0.15	0.00		
Avail Cap(c_a), veh/h	1302	583	1211	1401	397	624		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	37.6	0.0	39.7	18.0	41.4	0.0		
Incr Delay (d2), s/veh	4.9	0.0	7.0	125.7	0.8	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	17.4	0.0	18.0	98.3	1.9	0.0		
LnGrp Delay(d),s/veh	42.5	0.0	46.8	143.7	42.2	0.0		
LnGrp LOS	D		D	F	D			
Approach Vol, veh/h	1027			2790	61			
Approach Delay, s/veh	42.5			108.4	42.2			
Approach LOS	D			F	D			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		32.0	48.0	50.0				98.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		28.0	44.0	46.0				94.0
Max Q Clear Time (g_c+I1), s		5.5	36.1	34.5				96.0
Green Ext Time (p_c), s		0.1	2.8	5.5				0.0
Intersection Summary								
HCM 2010 Ctrl Delay			89.9					
HCM 2010 LOS			F					

Appendix J.2 – Analysis Output Sheets (Future with Project Existing SR-78)

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	81	61	94	302	563	169	18	141	82	23	69
Future Volume (vph)	89	81	61	94	302	563	169	18	141	82	23	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3145	1441		1782	1583		1793	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3145	1441		1782	1583		1793	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	88	66	102	328	612	184	20	153	89	25	75
RTOR Reduction (vph)	0	0	58	0	226	253	0	0	91	0	0	57
Lane Group Flow (vph)	97	88	8	102	408	53	0	204	62	0	114	18
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	5.5	8.4	8.4	8.3	12.8	12.8		21.4	21.4		17.2	17.2
Effective Green, g (s)	5.5	8.4	8.4	8.3	12.8	12.8		21.4	21.4		17.2	17.2
Actuated g/C Ratio	0.07	0.11	0.11	0.11	0.17	0.17		0.29	0.29		0.23	0.23
Clearance Time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	132	212	180	199	546	250		518	460		419	369
v/s Ratio Prot	0.05	0.05		c0.06	c0.13			c0.11			c0.06	
v/s Ratio Perm			0.00			0.04			0.04			0.01
v/c Ratio	0.73	0.42	0.04	0.51	0.75	0.21		0.39	0.13		0.27	0.05
Uniform Delay, d1	33.3	30.3	29.0	30.7	28.9	26.1		20.9	19.3		23.1	21.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	19.0	0.5	0.0	2.2	4.9	0.2		2.2	0.6		1.6	0.2
Delay (s)	52.3	30.8	29.1	33.0	33.8	26.2		23.1	19.9		24.7	22.1
Level of Service	D	C	C	C	C	C		C	B		C	C
Approach Delay (s)		38.7			31.5			21.7			23.7	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			29.8				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			73.6				Sum of lost time (s)		18.3			
Intersection Capacity Utilization			49.4%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				LT				L			
Volume (V), veh/h	0	0	0	0	0	409	0	381	0	0	179	464	0	121	166	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	0	0	0	0	453	0	414	0	0	198	514	0	134	184	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929		4.6453	4.3276			4.3276		4.6453	4.3276	
Follow-Up Headway (s)		3.1858		2.6667	2.5352			2.5352		2.6667	2.5352	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		0		0	453	414		198	514	134	184	
Entry Volume veh/h		0		0	444	414		194	504	131	180	
Circulating Flow (v_c), pc/h	771			198			134			453		
Exiting Flow (v_{ex}), pc/h	134			0			198			637		
Capacity (C_{pce}), pc/h		523		1125	1200			1267		890	966	
Capacity (c), veh/h		512		1103	1177			1242		872	947	
v/c Ratio (x)		0.00		0.00	0.38			0.16		0.15	0.19	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.0		3.3	6.8	0.0		4.2	0.0	5.6	5.6	
Lane LOS		A		A	A	A		A	A	A	A	
95% Queue, veh		0.0		0.0	1.8			0.6		0.5	0.7	
Approach Delay, s/veh				3.5			1.2			5.6		
Approach LOS				A			A			A		
Intersection Delay, s/veh LOS	3.0						A					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	21	4	43	27	84	12	58	62	125	79	6
Future Volume (vph)	2	21	4	43	27	84	12	58	62	125	79	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	23	4	47	29	91	13	63	67	136	86	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	29	167	143	229								
Volume Left (vph)	2	47	13	136								
Volume Right (vph)	4	91	67	7								
Hadj (s)	-0.03	-0.24	-0.23	0.13								
Departure Headway (s)	5.0	4.6	4.4	4.7								
Degree Utilization, x	0.04	0.21	0.18	0.30								
Capacity (veh/h)	650	726	767	732								
Control Delay (s)	8.2	8.8	8.4	9.7								
Approach Delay (s)	8.2	8.8	8.4	9.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.0									
Level of Service			A									
Intersection Capacity Utilization			40.4%	ICU Level of Service		A						
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Surfrider Way
E/W Street Name	Surfrider Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1
Lane Assignment	LTR				LTR				LTR				LT			
Volume (V), veh/h	0	11	8	17	0	2	13	3	0	13	331	2	0	2	360	34
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	12	9	19	0	2	14	3	0	14	367	2	0	2	399	38
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929		4.5436	4.5436	
Follow-Up Headway (s)		3.1858			3.1858			3.1858		2.5352	2.5352	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		40			19			383		401	38	
Entry Volume veh/h		39			19			375		393	37	
Circulating Flow (v_c), pc/h	403			393			23			30		
Exiting Flow (v_{ex}), pc/h	13			66			382			420		
Capacity (C_{pce}), pc/h		755			763			1104		1382	1382	
Capacity (c), veh/h		740			748			1083		1355	1355	
v/c Ratio (x)		0.05			0.02			0.35		0.29	0.03	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.4			5.1			6.8		5.2	2.9	
Lane LOS		A			A			A		A	A	
95% Queue, veh		0.2			0.1			1.6		1.2	0.1	
Approach Delay, s/veh	5.4			5.1			6.8			5.0		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	5.8						A					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Civic Center Drive
E/W Street Name	Civic Center Drive
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	12	9	8	0	22	13	21	0	7	280	27	0	60	333	12
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	13	10	9	0	24	14	23	0	8	310	30	0	67	369	13
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		32			61			348			449	
Entry Volume veh/h		31			60			341			440	
Circulating Flow (v_c), pc/h	460			331			90			46		
Exiting Flow (v_{ex}), pc/h	107			35			346			402		
Capacity (C_{pce}), pc/h		713			812			1033			1079	
Capacity (c), veh/h		699			796			1013			1058	
v/c Ratio (x)		0.04			0.08			0.34			0.42	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.6			5.3			7.0			7.9	
Lane LOS		A			A			A			A	
95% Queue, veh		0.1			0.2			1.5			2.1	
Approach Delay, s/veh	5.6			5.3			7.0			7.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	7.3						A					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	7/11/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Pier View Way
E/W Street Name	Pier View Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	11	8	17	0	2	13	3	0	13	331	2	0	2	360	34
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	12	9	19	0	2	14	3	0	14	367	2	0	2	399	38
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		40			19			383			439	
Entry Volume veh/h		39			19			375			430	
Circulating Flow (v_c), pc/h	403			393			23			30		
Exiting Flow (v_{ex}), pc/h	13			66			382			420		
Capacity (C_{pce}), pc/h		755			763			1104			1097	
Capacity (c), veh/h		740			748			1083			1075	
v/c Ratio (x)		0.05			0.02			0.35			0.40	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.4			5.1			6.8			7.6	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.1			1.6			2.0	
Approach Delay, s/veh	5.4			5.1			6.8			7.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	7.1						A					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	3	19	9	6	4	89	222	3	5	152	7
Future Volume (vph)	2	3	19	9	6	4	89	222	3	5	152	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	3	21	10	7	4	97	241	3	5	165	8
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	5	21	21	218	124	88	91					
Volume Left (vph)	2	0	10	97	0	5	0					
Volume Right (vph)	0	21	4	0	3	0	8					
Hadj (s)	0.23	-0.67	0.01	0.26	0.02	0.06	-0.03					
Departure Headway (s)	5.9	5.0	5.7	5.0	4.8	5.0	4.9					
Degree Utilization, x	0.01	0.03	0.03	0.30	0.16	0.12	0.12					
Capacity (veh/h)	559	655	585	703	735	701	717					
Control Delay (s)	7.8	7.0	8.9	9.0	7.5	7.5	7.4					
Approach Delay (s)	7.1		8.9	8.5		7.4						
Approach LOS	A		A	A		A						
Intersection Summary												
Delay			8.1									
Level of Service			A									
Intersection Capacity Utilization			31.1%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	125	57	130	88	33	114
Future Volume (vph)	125	57	130	88	33	114
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	136	62	141	96	36	124
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	136	62	237	160		
Volume Left (vph)	136	0	0	36		
Volume Right (vph)	0	62	96	0		
Hadj (s)	0.53	-0.67	-0.21	0.08		
Departure Headway (s)	6.0	4.8	4.4	4.8		
Degree Utilization, x	0.23	0.08	0.29	0.21		
Capacity (veh/h)	568	706	777	710		
Control Delay (s)	9.5	7.0	9.3	9.1		
Approach Delay (s)	8.7		9.3	9.1		
Approach LOS	A		A	A		
Intersection Summary						
Delay			9.0			
Level of Service			A			
Intersection Capacity Utilization			37.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	0	123	35	160	32	0	0	0	0	30	40
Future Volume (vph)	18	0	123	35	160	32	0	0	0	0	30	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5		4.5	4.5	4.5						4.5	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.97						0.92	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3450						3239	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3450						3239	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	0	134	38	174	35	0	0	0	0	33	43
RTOR Reduction (vph)	0	0	125	16	15	0	0	0	0	0	40	0
Lane Group Flow (vph)	20	0	9	22	194	0	0	0	0	0	36	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	3.4		3.4	29.2	29.2						3.9	
Effective Green, g (s)	3.4		3.4	29.2	29.2						3.9	
Actuated g/C Ratio	0.07		0.07	0.58	0.58						0.08	
Clearance Time (s)	4.5		4.5	4.5	4.5						4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	120		189	1033	2014						252	
v/s Ratio Prot	c0.01		0.00	0.01	c0.06						c0.01	
v/s Ratio Perm												
v/c Ratio	0.17		0.05	0.02	0.10						0.14	
Uniform Delay, d1	22.0		21.8	4.4	4.6						21.5	
Progression Factor	1.00		1.00	1.00	1.00						1.00	
Incremental Delay, d2	0.7		0.1	0.0	0.1						0.3	
Delay (s)	22.6		21.9	4.4	4.7						21.8	
Level of Service	C		C	A	A						C	
Approach Delay (s)		22.0			4.6			0.0			21.8	
Approach LOS		C			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			13.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.11									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)				13.5		
Intersection Capacity Utilization			22.9%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↱	↱	↰	↱			↰	↰
Traffic Volume (vph)	0	0	0	139	226	72	69	507	0	0	289	32
Future Volume (vph)	0	0	0	139	226	72	69	507	0	0	289	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	0.95
Frpb, ped/bikes				1.00	1.00	0.96	1.00	1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	3539	1526	1770	1863			1766	1461
Flt Permitted				0.95	1.00	1.00	0.43	1.00			1.00	1.00
Satd. Flow (perm)				1770	3539	1526	796	1863			1766	1461
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	151	246	78	75	551	0	0	314	35
RTOR Reduction (vph)	0	0	0	0	0	54	0	0	0	0	1	23
Lane Group Flow (vph)	0	0	0	151	246	24	75	551	0	0	317	8
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					6
Actuated Green, G (s)				18.1	18.1	18.1	30.8	30.8			15.7	15.7
Effective Green, g (s)				18.1	18.1	18.1	30.8	30.8			15.7	15.7
Actuated g/C Ratio				0.31	0.31	0.31	0.52	0.52			0.27	0.27
Clearance Time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				543	1087	468	583	974			470	389
v/s Ratio Prot				c0.09	0.07		0.02	c0.30			c0.18	
v/s Ratio Perm						0.02	0.05					0.01
v/c Ratio				0.28	0.23	0.05	0.13	0.57			0.68	0.02
Uniform Delay, d1				15.5	15.2	14.4	9.9	9.5			19.3	15.9
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				1.3	0.5	0.2	0.1	0.9			4.2	0.0
Delay (s)				16.7	15.7	14.6	10.1	10.4			23.5	16.0
Level of Service				B	B	B	B	B			C	B
Approach Delay (s)		0.0			15.8			10.4			22.8	
Approach LOS		A			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			15.2									HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			58.9								15.0	Sum of lost time (s)
Intersection Capacity Utilization			51.7%									ICU Level of Service A
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	111	1	123	416	202	11	24	185	135	47	6
Future Volume (vph)	23	111	1	123	416	202	11	24	185	135	47	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.98	
Satd. Flow (prot)	1770	3535		1770	3539	1583		1834	1583	1681	1714	
Flt Permitted	0.45	1.00		0.67	1.00	1.00		0.94	1.00	0.73	0.90	
Satd. Flow (perm)	846	3535		1257	3539	1583		1752	1583	1296	1570	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	121	1	134	452	220	12	26	201	147	51	7
RTOR Reduction (vph)	0	1	0	0	0	161	0	0	89	0	3	0
Lane Group Flow (vph)	25	121	0	134	452	59	0	38	112	101	101	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	15.1	15.1		14.7	14.7	14.7		30.7	30.7	30.7	30.7	
Effective Green, g (s)	15.1	15.1		14.7	14.7	14.7		30.7	30.7	30.7	30.7	
Actuated g/C Ratio	0.27	0.27		0.27	0.27	0.27		0.56	0.56	0.56	0.56	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	232	970		335	945	423		977	883	723	876	
v/s Ratio Prot		0.03			c0.13							
v/s Ratio Perm	0.03			0.11		0.04		0.02	0.07	c0.08	0.06	
v/c Ratio	0.11	0.13		0.40	0.48	0.14		0.04	0.13	0.14	0.12	
Uniform Delay, d1	14.9	15.0		16.5	16.9	15.3		5.5	5.8	5.8	5.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.1		0.9	0.5	0.2		0.1	0.3	0.4	0.3	
Delay (s)	15.2	15.1		17.5	17.4	15.5		5.6	6.1	6.2	6.0	
Level of Service	B	B		B	B	B		A	A	A	A	
Approach Delay (s)		15.1			16.9			6.0			6.1	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			13.3				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			55.0				Sum of lost time (s)			9.6		
Intersection Capacity Utilization			38.5%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

07/02/2018

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (veh/h)	78	6	22	28	6	9
Future Volume (Veh/h)	78	6	22	28	6	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	85	7	24	30	7	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				238		
pX, platoon unblocked						
vC, conflicting volume			92		166	88
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			92		166	88
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		99	99
cM capacity (veh/h)			1503		811	970
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	92	54	17			
Volume Left	0	24	7			
Volume Right	7	0	10			
cSH	1700	1503	897			
Volume to Capacity	0.05	0.02	0.02			
Queue Length 95th (ft)	0	1	1			
Control Delay (s)	0.0	3.4	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.4	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			2.1			
Intersection Capacity Utilization			19.4%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	53	99	0	0	0	28	215	58	68	208	55
Future Volume (vph)	93	53	99	0	0	0	28	215	58	68	208	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.95				1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1498				1770	1863	1552	1770	1863	1518
Flt Permitted	0.95	1.00	1.00				0.62	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	1770	1863	1498				1150	1863	1552	831	1863	1518
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	101	58	108	0	0	0	30	234	63	74	226	60
RTOR Reduction (vph)	0	0	60	0	0	0	0	0	45	0	0	36
Lane Group Flow (vph)	101	58	48	0	0	0	30	234	18	74	226	24
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA	Perm				Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4					2	2		1	6	
Permitted Phases			4				2		2	6		6
Actuated Green, G (s)	24.3	24.3	24.3				15.5	15.5	15.5	21.9	21.9	21.9
Effective Green, g (s)	24.3	24.3	24.3				15.5	15.5	15.5	21.9	21.9	21.9
Actuated g/C Ratio	0.44	0.44	0.44				0.28	0.28	0.28	0.40	0.40	0.40
Clearance Time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0				4.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	782	823	661				324	525	437	371	741	604
v/s Ratio Prot	c0.06	0.03						c0.13		0.01	c0.12	
v/s Ratio Perm			0.03				0.03		0.01	0.07		0.02
v/c Ratio	0.13	0.07	0.07				0.09	0.45	0.04	0.20	0.30	0.04
Uniform Delay, d1	9.1	8.8	8.9				14.6	16.2	14.3	10.7	11.3	10.1
Progression Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.2	0.2				0.6	2.7	0.2	0.3	1.1	0.1
Delay (s)	9.4	9.0	9.1				15.1	18.9	14.5	10.9	12.4	10.2
Level of Service	A	A	A				B	B	B	B	B	B
Approach Delay (s)		9.2			0.0			17.7			11.7	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			13.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.27									
Actuated Cycle Length (s)			55.0				Sum of lost time (s)			12.8		
Intersection Capacity Utilization			49.5%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	188	9	0	0	0	0	4	16	21	8	0
Future Volume (Veh/h)	11	188	9	0	0	0	0	4	16	21	8	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	204	10	0	0	0	0	4	17	23	9	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		218										
pX, platoon unblocked												
vC, conflicting volume	0			214			238	233	107	145	238	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			214			238	233	107	145	238	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	99	98	97	99	100
cM capacity (veh/h)	1622			1353			686	661	926	787	657	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	114	112	21	32								
Volume Left	12	0	0	23								
Volume Right	0	10	17	0								
cSH	1622	1700	861	745								
Volume to Capacity	0.01	0.07	0.02	0.04								
Queue Length 95th (ft)	1	0	2	3								
Control Delay (s)	0.8	0.0	9.3	10.0								
Lane LOS	A		A	B								
Approach Delay (s)	0.4		9.3	10.0								
Approach LOS			A	B								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			20.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	425	4	0	0	0	0	4	20	14	13	0
Future Volume (vph)	23	425	4	0	0	0	0	4	20	14	13	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	462	4	0	0	0	0	4	22	15	14	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	256	235	26	29								
Volume Left (vph)	25	0	0	15								
Volume Right (vph)	0	4	22	0								
Hadj (s)	0.08	0.02	-0.47	0.14								
Departure Headway (s)	4.7	4.7	4.5	5.1								
Degree Utilization, x	0.34	0.30	0.03	0.04								
Capacity (veh/h)	754	760	744	656								
Control Delay (s)	8.9	8.5	7.6	8.3								
Approach Delay (s)	8.7		7.6	8.3								
Approach LOS	A		A	A								
Intersection Summary												
Delay			8.6									
Level of Service			A									
Intersection Capacity Utilization			27.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

07/02/2018

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	90	171	9	39	0	91	0	45	29	0	0	0								
Future Volume (vph)	90	171	9	39	0	91	0	45	29	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	98	186	10	42	0	99	0	49	32	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	98	196	141	81																
Volume Left (vph)	98	0	42	0																
Volume Right (vph)	0	10	99	32																
Hadj (s)	0.53	0.00	-0.33	-0.20																
Departure Headway (s)	5.3	4.8	4.2	4.7																
Degree Utilization, x	0.15	0.26	0.16	0.10																
Capacity (veh/h)	662	732	826	716																
Control Delay (s)	8.0	8.3	8.0	8.2																
Approach Delay (s)	8.2		8.0	8.2																
Approach LOS	A		A	A																
Intersection Summary																				
Delay			8.2																	
Level of Service			A																	
Intersection Capacity Utilization			31.4%	ICU Level of Service					A											
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	13	0	0	31	13	235	20	14	243	6
Future Volume (Veh/h)	0	0	13	0	0	31	13	235	20	14	243	6
Sign Control	Stop			Stop				Free			Free	
Grade	0%			0%				0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	14	0	0	34	14	255	22	15	264	7
Pedestrians	7			7								
Lane Width (ft)	12.0			16.0								
Walking Speed (ft/s)	4.0			4.0								
Percent Blockage	1			1								
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			455		
pX, platoon unblocked												
vC, conflicting volume	622	616	274	609	609	273	278				284	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	622	616	274	609	609	273	278				284	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	98	100	100	96	99				99	
cM capacity (veh/h)	369	391	760	386	395	760	1277				1268	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	14	34	14	277	15	271						
Volume Left	0	0	14	0	15	0						
Volume Right	14	34	0	22	0	7						
cSH	760	760	1277	1700	1268	1700						
Volume to Capacity	0.02	0.04	0.01	0.16	0.01	0.16						
Queue Length 95th (ft)	1	4	1	0	1	0						
Control Delay (s)	9.8	10.0	7.8	0.0	7.9	0.0						
Lane LOS	A	A	A		A							
Approach Delay (s)	9.8	10.0	0.4		0.4							
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			23.6%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Washington Avenue
E/W Street Name	Washington Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	14	2	25	0	37	6	4	0	18	241	11	0	3	251	18
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	16	2	28	0	41	7	4	0	20	267	12	0	3	278	20
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		46			52			299			301	
Entry Volume veh/h		45			51			293			295	
Circulating Flow (v_c), pc/h	322			303			21			68		
Exiting Flow (v_{ex}), pc/h	17			47			287			347		
Capacity (C_{pce}), pc/h		819			835			1107			1056	
Capacity (c), veh/h		803			818			1085			1035	
v/c Ratio (x)		0.06			0.06			0.27			0.29	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.0			5.0			5.9			6.3	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.2			1.1			1.2	
Approach Delay, s/veh	5.0			5.0			5.9			6.3		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	5.9						A					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	22	29	18	26	4	80	3	152	41	95	104	1
Future Volume (vph)	22	29	18	26	4	80	3	152	41	95	104	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	32	20	28	4	87	3	165	45	103	113	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	76	119	213	217								
Volume Left (vph)	24	28	3	103								
Volume Right (vph)	20	87	45	1								
Hadj (s)	-0.06	-0.36	-0.09	0.13								
Departure Headway (s)	5.0	4.7	4.6	4.8								
Degree Utilization, x	0.11	0.15	0.27	0.29								
Capacity (veh/h)	642	695	748	715								
Control Delay (s)	8.6	8.5	9.3	9.7								
Approach Delay (s)	8.6	8.5	9.3	9.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.2									
Level of Service			A									
Intersection Capacity Utilization			39.4%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	204	24	5	94	16	12	26	30	22	36	12
Future Volume (Veh/h)	8	204	24	5	94	16	12	26	30	22	36	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	222	26	5	102	17	13	28	33	24	39	13
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	265											
pX, platoon unblocked												
vC, conflicting volume	133			255			414	403	242	434	408	126
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	133			255			414	403	242	434	408	126
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			97	95	96	95	92	99
cM capacity (veh/h)	1435			1302			496	522	792	473	519	913
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	257	124	74	76								
Volume Left	9	5	13	24								
Volume Right	26	17	33	13								
cSH	1435	1302	609	542								
Volume to Capacity	0.01	0.00	0.12	0.14								
Queue Length 95th (ft)	0	0	10	12								
Control Delay (s)	0.3	0.3	11.7	12.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.3	11.7	12.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.7									
Intersection Capacity Utilization			28.7%	ICU Level of Service				A				
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Wisconsin Avenue
E/W Street Name	Wisconsin Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	53	53	134	0	87	28	27	0	65	251	62	0	16	276	18
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	59	59	149	0	96	31	30	0	72	278	69	0	18	306	20
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		267			157			419			344	
Entry Volume veh/h		262			154			411			337	
Circulating Flow (v_c), pc/h	420			409			136			199		
Exiting Flow (v_{ex}), pc/h	146			123			367			551		
Capacity (C_{pce}), pc/h		742			751			986			926	
Capacity (c), veh/h		728			736			967			908	
v/c Ratio (x)		0.36			0.21			0.42			0.37	

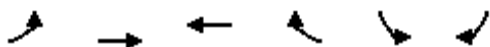
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.5			7.2			8.6			8.1	
Lane LOS		A			A			A			A	
95% Queue, veh		1.6			0.8			2.1			1.7	
Approach Delay, s/veh	9.5			7.2			8.6			8.1		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	8.5						A					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

07/02/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	208	201	5	16	15
Future Volume (Veh/h)	8	208	201	5	16	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	226	218	5	17	16
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	231				474	230
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	231				474	230
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	98
cM capacity (veh/h)	1328				542	804
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	235	223	33			
Volume Left	9	0	17			
Volume Right	0	5	16			
cSH	1328	1700	643			
Volume to Capacity	0.01	0.13	0.05			
Queue Length 95th (ft)	1	0	4			
Control Delay (s)	0.4	0.0	10.9			
Lane LOS	A		B			
Approach Delay (s)	0.4	0.0	10.9			
Approach LOS			B			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			27.8%		ICU Level of Service	
Analysis Period (min)			15			
			A			

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	193	9	20	182	11	5	5	13	33	1	5
Future Volume (Veh/h)	7	193	9	20	182	11	5	5	13	33	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	210	10	22	198	12	5	5	14	36	1	5
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	212			220			486	487	215	498	486	208
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	212			220			486	487	215	498	486	208
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			99	99	98	92	100	99
cM capacity (veh/h)	1356			1349			478	469	825	462	470	830
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	228	232	24	42								
Volume Left	8	22	5	36								
Volume Right	10	12	14	5								
cSH	1356	1349	630	488								
Volume to Capacity	0.01	0.02	0.04	0.09								
Queue Length 95th (ft)	0	1	3	7								
Control Delay (s)	0.3	0.9	10.9	13.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.9	10.9	13.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			32.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	111	175	69	141	0	94	0	35	0	0	0
Future Volume (vph)	0	111	175	69	141	0	94	0	35	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	121	190	75	153	0	102	0	38	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	311	228	140	0								
Volume Left (vph)	0	75	102	0								
Volume Right (vph)	190	0	38	0								
Hadj (s)	-0.33	0.10	0.02	0.00								
Departure Headway (s)	4.2	4.7	5.1	5.3								
Degree Utilization, x	0.36	0.30	0.20	0.00								
Capacity (veh/h)	822	729	643	595								
Control Delay (s)	9.6	9.7	9.4	8.3								
Approach Delay (s)	9.6	9.7	9.4	0.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.6									
Level of Service			A									
Intersection Capacity Utilization			49.5%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	51	69	101	32	81	121
Future Volume (vph)	51	69	101	32	81	121
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	75	110	35	88	132
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	130	145	220			
Volume Left (vph)	55	0	88			
Volume Right (vph)	75	35	0			
Hadj (s)	-0.23	-0.11	0.11			
Departure Headway (s)	4.5	4.4	4.5			
Degree Utilization, x	0.16	0.18	0.27			
Capacity (veh/h)	738	791	770			
Control Delay (s)	8.4	8.3	9.2			
Approach Delay (s)	8.4	8.3	9.2			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.7			
Level of Service			A			
Intersection Capacity Utilization			35.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	235	1	6	189	40	7	10	11	40	16	10
Future Volume (Veh/h)	8	235	1	6	189	40	7	10	11	40	16	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	255	1	7	205	43	8	11	12	43	17	11
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	213											
pX, platoon unblocked	0.94							0.94	0.94			
vC, conflicting volume	251				267				548	550	274	542
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	168				267				485	486	274	479
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1
tC, 2 stage (s)												
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5
p0 queue free %	99				99				98	98	98	90
cM capacity (veh/h)	1319				1285				429	441	752	438
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	265	255	31	71								
Volume Left	9	7	8	43								
Volume Right	1	43	12	11								
cSH	1319	1285	520	477								
Volume to Capacity	0.01	0.01	0.06	0.15								
Queue Length 95th (ft)	1	0	5	13								
Control Delay (s)	0.3	0.3	12.4	13.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.3	12.4	13.9								
Approach LOS				B	B							
Intersection Summary												
Average Delay				2.4								
Intersection Capacity Utilization				31.4%	ICU Level of Service				A			
Analysis Period (min)				15								

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Oceanside Blvd
E/W Street Name	Oceanside Boulevard
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	21	132	76	0	112	134	101	0	39	226	60	0	110	287	15
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	23	146	84	0	124	149	112	0	43	251	67	0	122	318	17
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		253			385			361			457	
Entry Volume veh/h		248			377			354			448	
Circulating Flow (v_c), pc/h	564			317			291			316		
Exiting Flow (v_{ex}), pc/h	335			209			386			526		
Capacity (C_{pce}), pc/h		643			823			845			824	
Capacity (c), veh/h		630			807			828			808	
v/c Ratio (x)		0.39			0.47			0.43			0.55	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		11.3			10.7			9.7			12.6	
Lane LOS		B			B			A			B	
95% Queue, veh		1.9			2.5			2.2			3.5	
Approach Delay, s/veh	11.3			10.7			9.7			12.6		
Approach LOS	B			B			A			B		
Intersection Delay, s/veh LOS	11.2						B					

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	324	0	16	417	79	8	8	34	243	13	44
Future Volume (vph)	11	324	0	16	417	79	8	8	34	243	13	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.96
Flpb, ped/bikes	1.00	1.00		0.99	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1770	3539		1755	3446			3121			1777	1527
Flt Permitted	0.34	1.00		0.53	1.00			0.92			0.69	1.00
Satd. Flow (perm)	635	3539		979	3446			2886			1293	1527
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	352	0	17	453	86	9	9	37	264	14	48
RTOR Reduction (vph)	0	0	0	0	38	0	0	15	0	0	0	20
Lane Group Flow (vph)	12	352	0	17	501	0	0	40	0	0	278	28
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	13.4	13.4		13.4	13.4			32.1			32.1	32.1
Effective Green, g (s)	13.4	13.4		13.4	13.4			32.1			32.1	32.1
Actuated g/C Ratio	0.24	0.24		0.24	0.24			0.58			0.58	0.58
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	154	862		238	839			1684			754	891
v/s Ratio Prot		0.10			c0.15							
v/s Ratio Perm	0.02			0.02				0.01			c0.22	0.02
v/c Ratio	0.08	0.41		0.07	0.60			0.02			0.37	0.03
Uniform Delay, d1	16.0	17.5		16.0	18.4			4.8			6.1	4.9
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.2	0.3		0.1	1.2			0.0			1.4	0.1
Delay (s)	16.3	17.8		16.1	19.6			4.9			7.5	4.9
Level of Service	B	B		B	B			A			A	A
Approach Delay (s)		17.7			19.5			4.9			7.1	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		15.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.44										
Actuated Cycle Length (s)		55.0			Sum of lost time (s)			9.5				
Intersection Capacity Utilization		61.1%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2035
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Morse Street
E/W Street Name	Morse Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	24	13	17	0	31	8	114	0	3	378	61	0	95	511	17
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	27	14	19	0	34	9	126	0	3	419	68	0	105	567	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		60			169			490			691	
Entry Volume veh/h		59			166			480			677	
Circulating Flow (v_c), pc/h	706			449			146			46		
Exiting Flow (v_{ex}), pc/h	187			31			572			620		
Capacity (C_{pce}), pc/h		558			721			977			1079	
Capacity (c), veh/h		547			707			957			1058	
v/c Ratio (x)		0.11			0.23			0.50			0.64	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.9			7.8			10.0			12.4	
Lane LOS		A			A			A			B	
95% Queue, veh		0.4			0.9			2.9			4.8	
Approach Delay, s/veh	7.9			7.8			10.0			12.4		
Approach LOS	A			A			A			B		
Intersection Delay, s/veh LOS	10.8						B					

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	144	24	38	125	0	21	0	31	0	0	0
Future Volume (Veh/h)	0	144	24	38	125	0	21	0	31	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	157	26	41	136	0	23	0	34	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	252											
pX, platoon unblocked												
vC, conflicting volume	136			183			388	388	170	422	401	136
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	136			183			388	388	170	422	401	136
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			96	100	96	100	100	100
cM capacity (veh/h)	1448			1392			558	531	874	509	522	913
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	183	177	57	0								
Volume Left	0	41	23	0								
Volume Right	26	0	34	0								
cSH	1448	1392	711	1700								
Volume to Capacity	0.00	0.03	0.08	0.00								
Queue Length 95th (ft)	0	2	7	0								
Control Delay (s)	0.0	2.0	10.5	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	2.0	10.5	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			31.0%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	63	15	4	45	1	26	0	11	1	0	1
Future Volume (Veh/h)	1	63	15	4	45	1	26	0	11	1	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	68	16	4	49	1	28	0	12	1	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	643											
pX, platoon unblocked												
vC, conflicting volume	50			84			136	136	76	148	144	50
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	50			84			136	136	76	148	144	50
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	99	100	100	100
cM capacity (veh/h)	1557			1513			832	752	985	809	745	1019
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	85	54	40	2								
Volume Left	1	4	28	1								
Volume Right	16	1	12	1								
cSH	1557	1513	872	902								
Volume to Capacity	0.00	0.00	0.05	0.00								
Queue Length 95th (ft)	0	0	4	0								
Control Delay (s)	0.1	0.6	9.3	9.0								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.1	0.6	9.3	9.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			14.9%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	37	106	15	37	132	15
Future Volume (vph)	37	106	15	37	132	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	115	16	40	143	16
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	155	56	159			
Volume Left (vph)	40	0	143			
Volume Right (vph)	115	40	0			
Hadj (s)	-0.36	-0.39	0.21			
Departure Headway (s)	4.0	4.0	4.5			
Degree Utilization, x	0.17	0.06	0.20			
Capacity (veh/h)	850	847	763			
Control Delay (s)	7.9	7.3	8.6			
Approach Delay (s)	7.9	7.3	8.6			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.1			
Level of Service			A			
Intersection Capacity Utilization			30.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	118	91	15	79	3	69	9	15	13	10	5
Future Volume (Veh/h)	3	118	91	15	79	3	69	9	15	13	10	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	128	99	16	86	3	75	10	16	14	11	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	89			227			314	304	178	324	352	88
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			227			314	304	178	324	352	88
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			88	98	98	98	98	99
cM capacity (veh/h)	1506			1341			620	600	866	603	564	971
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	230	105	101	30								
Volume Left	3	16	75	14								
Volume Right	99	3	16	5								
cSH	1506	1341	647	627								
Volume to Capacity	0.00	0.01	0.16	0.05								
Queue Length 95th (ft)	0	1	14	4								
Control Delay (s)	0.1	1.3	11.6	11.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	1.3	11.6	11.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization			28.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	139	9	6	86	2	2	2	17	1	3	1
Future Volume (Veh/h)	0	139	9	6	86	2	2	2	17	1	3	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	151	10	7	93	2	2	2	18	1	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)	249											
pX, platoon unblocked												
vC, conflicting volume	95			161			266	265	156	283	269	94
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	95			161			266	265	156	283	269	94
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	98	100	100	100
cM capacity (veh/h)	1499			1418			680	637	890	652	634	963
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	161	102	22	5								
Volume Left	0	7	2	1								
Volume Right	10	2	18	1								
cSH	1499	1418	836	685								
Volume to Capacity	0.00	0.00	0.03	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.0	0.6	9.4	10.3								
Lane LOS		A	A	B								
Approach Delay (s)	0.0	0.6	9.4	10.3								
Approach LOS			A	B								
Intersection Summary												
Average Delay				1.1								
Intersection Capacity Utilization				19.6%	ICU Level of Service				A			
Analysis Period (min)				15								

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2035
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Cassidy Street
E/W Street Name	Cassidy Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	64	89	55	0	74	41	23	0	69	316	43	0	54	346	13
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (V_{PCE}), pc/h	0	71	99	61	0	82	45	26	0	76	350	48	0	60	384	14
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			4.9763	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		231			153			474			458	
Entry Volume veh/h		226			150			465			449	
Circulating Flow (v_c), pc/h	526			497			230			203		
Exiting Flow (v_{ex}), pc/h	207			135			447			527		
Capacity (C_{PCE}), pc/h		668			687			898			1122	
Capacity (c), veh/h		655			674			880			1100	
v/c Ratio (x)		0.35			0.22			0.53			0.41	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		10.1			8.0			11.2			7.6	
Lane LOS		B			A			B			A	
95% Queue, veh		1.5			0.8			3.2			2.0	
Approach Delay, s/veh	10.1			8.0			11.2			7.6		
Approach LOS	B			A			B			A		
Intersection Delay, s/veh LOS	9.4						A					

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	116	28	33	66	13	11	27	28	10	23	19
Future Volume (Veh/h)	16	116	28	33	66	13	11	27	28	10	23	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	126	30	36	72	14	12	29	30	11	25	21
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		280										
pX, platoon unblocked												
vC, conflicting volume	86			156			360	333	141	370	341	79
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	86			156			360	333	141	370	341	79
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			97			98	95	97	98	96	98
cM capacity (veh/h)	1510			1424			548	566	907	530	560	981
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	173	122	71	57								
Volume Left	17	36	12	11								
Volume Right	30	14	30	21								
cSH	1510	1424	668	657								
Volume to Capacity	0.01	0.03	0.11	0.09								
Queue Length 95th (ft)	1	2	9	7								
Control Delay (s)	0.8	2.4	11.0	11.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.8	2.4	11.0	11.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			24.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	62	14	8	38	2	11	22	19	11	11	7
Future Volume (vph)	5	62	14	8	38	2	11	22	19	11	11	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	67	15	9	41	2	12	24	21	12	12	8
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	87	52	57	32								
Volume Left (vph)	5	9	12	12								
Volume Right (vph)	15	2	21	8								
Hadj (s)	-0.06	0.05	-0.14	-0.04								
Departure Headway (s)	4.1	4.2	4.1	4.2								
Degree Utilization, x	0.10	0.06	0.06	0.04								
Capacity (veh/h)	856	828	842	819								
Control Delay (s)	7.5	7.5	7.4	7.4								
Approach Delay (s)	7.5	7.5	7.4	7.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.5								
Level of Service				A								
Intersection Capacity Utilization				14.9%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	108	4	26	49	15	4	45	108	114	8	5
Future Volume (vph)	5	108	4	26	49	15	4	45	108	114	8	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	117	4	28	53	16	4	49	117	124	9	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	126	97	170	138								
Volume Left (vph)	5	28	4	124								
Volume Right (vph)	4	16	117	5								
Hadj (s)	0.02	-0.01	-0.37	0.19								
Departure Headway (s)	4.8	4.8	4.3	4.8								
Degree Utilization, x	0.17	0.13	0.20	0.19								
Capacity (veh/h)	698	694	796	698								
Control Delay (s)	8.7	8.5	8.3	8.9								
Approach Delay (s)	8.7	8.5	8.3	8.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.6								
Level of Service				A								
Intersection Capacity Utilization				37.9%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	51	33	13	59	67
Future Volume (vph)	0	51	33	13	59	67
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	55	36	14	64	73
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	55	50	137			
Volume Left (vph)	0	0	64			
Volume Right (vph)	55	14	0			
Hadj (s)	-0.57	-0.13	0.13			
Departure Headway (s)	3.7	4.0	4.2			
Degree Utilization, x	0.06	0.06	0.16			
Capacity (veh/h)	914	869	845			
Control Delay (s)	7.0	7.2	8.0			
Approach Delay (s)	7.0	7.2	8.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.6			
Level of Service			A			
Intersection Capacity Utilization			16.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	121	40	256	49	216	29	213	122	183	300	6
Future Volume (vph)	15	121	40	256	49	216	29	213	122	183	300	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	16	16	16
Total Lost time (s)	5.0	5.0	5.0		4.9	4.9	4.2	5.0	5.0	4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	1.00	0.96	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	1.00	
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	2006	1863	1555		1788	1794	1770	2111	1527	2006	3998	
Flt Permitted	0.95	1.00	1.00		0.96	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	2006	1863	1555		1788	1794	1770	2111	1527	2006	3998	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	132	43	278	53	235	32	232	133	199	326	7
RTOR Reduction (vph)	0	0	39	0	0	156	0	0	94	0	2	0
Lane Group Flow (vph)	16	132	4	0	331	79	32	232	39	199	331	0
Confl. Peds. (#/hr)			2	2					5			
Confl. Bikes (#/hr)									4			
Turn Type	Split	NA	Perm	Split	NA	pt+ov	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	6.7	6.7	6.7		16.5	23.3	1.4	20.6	20.6	6.8	26.0	
Effective Green, g (s)	6.7	6.7	6.7		16.5	23.3	1.4	20.6	20.6	6.8	26.0	
Actuated g/C Ratio	0.10	0.10	0.10		0.24	0.33	0.02	0.30	0.30	0.10	0.37	
Clearance Time (s)	5.0	5.0	5.0		4.9		4.2	5.0	5.0	4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0		2.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	192	179	149		423	599	35	623	451	195	1491	
v/s Ratio Prot	0.01	c0.07			c0.19	0.04	0.02	c0.11		c0.10	0.08	
v/s Ratio Perm			0.00						0.03			
v/c Ratio	0.08	0.74	0.03		0.78	0.13	0.91	0.37	0.09	1.02	0.22	
Uniform Delay, d1	28.7	30.6	28.5		24.9	16.2	34.1	19.4	17.8	31.5	14.9	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	12.7	0.0		9.1	0.1	115.3	1.7	0.4	69.9	0.3	
Delay (s)	28.8	43.4	28.6		34.0	16.3	149.4	21.1	18.1	101.3	15.3	
Level of Service	C	D	C		C	B	F	C	B	F	B	
Approach Delay (s)		38.8			26.7			30.5			47.5	
Approach LOS		D			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			35.5									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.64									
Actuated Cycle Length (s)			69.7									Sum of lost time (s) 19.1
Intersection Capacity Utilization			62.5%									ICU Level of Service B
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	434	5	16	646	50	0	0	27	28	0	30
Future Volume (Veh/h)	8	434	5	16	646	50	0	0	27	28	0	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	472	5	17	702	54	0	0	29	30	0	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage (veh)					2							
Upstream signal (ft)		312										
pX, platoon unblocked				0.94			0.94	0.94	0.94	0.94	0.94	
vC, conflicting volume	756			477			1288	1282	474	1284	1258	729
vC1, stage 1 conf vol							492	492		763	763	
vC2, stage 2 conf vol							796	790		522	495	
vCu, unblocked vol	756			412			1275	1269	409	1271	1243	729
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			100	100	95	91	100	92
cM capacity (veh/h)	855			1078			300	336	604	323	345	423
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	486	773	29	63								
Volume Left	9	17	0	30								
Volume Right	5	54	29	33								
cSH	855	1078	604	368								
Volume to Capacity	0.01	0.02	0.05	0.17								
Queue Length 95th (ft)	1	1	4	15								
Control Delay (s)	0.3	0.4	11.3	16.8								
Lane LOS	A	A	B	C								
Approach Delay (s)	0.3	0.4	11.3	16.8								
Approach LOS			B	C								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			62.3%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

07/02/2018

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (veh/h)	11	539	12	36	848	28	12	5	78	33	5	17		
Future Volume (Veh/h)	11	539	12	36	848	28	12	5	78	33	5	17		
Sign Control	Free			Free			Stop			Stop				
Grade	0%			0%			0%			0%				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	12	586	13	39	922	30	13	5	85	36	5	18		
Pedestrians	1						1							
Lane Width (ft)	12.0						12.0							
Walking Speed (ft/s)	4.0						4.0							
Percent Blockage	0						0							
Right turn flare (veh)														
Median type	TWLTL			TWLTL										
Median storage veh	2			2										
Upstream signal (ft)	687													
pX, platoon unblocked				0.98			0.98			0.98	0.98	0.98		
vC, conflicting volume	952			600			1639			1648	594	1712	1639	938
vC1, stage 1 conf vol							618			618	1015		1015	
vC2, stage 2 conf vol							1022			1030	698		624	
vCu, unblocked vol	952			583			1642			1650	577	1716	1642	938
tC, single (s)	4.1			4.1			7.1			6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1			5.5	6.1		5.5	
tF (s)	2.2			2.2			3.5			4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			96			94			98	83	83	98	94
cM capacity (veh/h)	722			972			217			251	507	207	256	320
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1								
Volume Total	12	599	39	952	103	59								
Volume Left	12	0	39	0	13	36								
Volume Right	0	13	0	30	85	18								
cSH	722	1700	972	1700	416	237								
Volume to Capacity	0.02	0.35	0.04	0.56	0.25	0.25								
Queue Length 95th (ft)	1	0	3	0	24	24								
Control Delay (s)	10.1	0.0	8.9	0.0	16.5	25.2								
Lane LOS	B			A	C		D							
Approach Delay (s)	0.2			0.3	16.5		25.2							
Approach LOS					C	D								
Intersection Summary														
Average Delay				2.1										
Intersection Capacity Utilization				62.8%			ICU Level of Service			B				
Analysis Period (min)				15										

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	773	0	0	998	147	0	0	0	0	0	24
Future Volume (Veh/h)	31	773	0	0	998	147	0	0	0	0	0	24
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	840	0	0	1085	160	0	0	0	0	0	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL				TWLTL							
Median storage veh	2				2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1245			840			2019	2153	840	2073	2073	1165
vC1, stage 1 conf vol							908	908		1165	1165	
vC2, stage 2 conf vol							1111	1245		908	908	
vCu, unblocked vol	1245			840			2019	2153	840	2073	2073	1165
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			100	100	100	100	100	89
cM capacity (veh/h)	559			795			161	178	365	185	208	236
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	34	840	0	1245	0	26						
Volume Left	34	0	0	0	0	0						
Volume Right	0	0	0	160	0	26						
cSH	559	1700	1700	1700	1700	236						
Volume to Capacity	0.06	0.49	0.00	0.73	0.00	0.11						
Queue Length 95th (ft)	5	0	0	0	0	9						
Control Delay (s)	11.9	0.0	0.0	0.0	0.0	22.1						
Lane LOS	B				A	C						
Approach Delay (s)	0.5		0.0		0.0	22.1						
Approach LOS					A	C						
Intersection Summary												
Average Delay				0.5								
Intersection Capacity Utilization				71.4%	ICU Level of Service			C				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	82	0	0	70	35	306	28	50	692	12
Future Volume (Veh/h)	0	0	82	0	0	70	35	306	28	50	692	12
Sign Control	Stop			Stop				Free			Free	
Grade	0%			0%				0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	89	0	0	76	38	333	30	54	752	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None						None					
Median storage (veh)												
Upstream signal (ft)	621											
pX, platoon unblocked												
vC, conflicting volume	1352	1306	758	1373	1297	348	765			363		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1352	1306	758	1373	1297	348	765			363		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	78	100	100	89	96			95		
cM capacity (veh/h)	106	146	407	90	148	695	848			1196		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	89	76	38	363	54	765						
Volume Left	0	0	38	0	54	0						
Volume Right	89	76	0	30	0	13						
cSH	407	695	848	1700	1196	1700						
Volume to Capacity	0.22	0.11	0.04	0.21	0.05	0.45						
Queue Length 95th (ft)	21	9	4	0	4	0						
Control Delay (s)	16.3	10.8	9.4	0.0	8.2	0.0						
Lane LOS	C	B	A		A							
Approach Delay (s)	16.3	10.8	0.9		0.5							
Approach LOS	C	B										
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			48.9%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Michigan Avenue
E/W Street Name	Michigan Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	84	13	36	0	45	15	8	0	22	234	6	0	6	230	27
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	93	14	40	0	50	17	9	0	24	259	7	0	7	255	30
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		147			76			290			292	
Entry Volume veh/h		144			75			284			286	
Circulating Flow (v_c), pc/h	312			376			114			91		
Exiting Flow (v_{ex}), pc/h	28			71			361			345		
Capacity (C_{pce}), pc/h		827			776			1008			1032	
Capacity (c), veh/h		811			761			988			1011	
v/c Ratio (x)		0.18			0.10			0.29			0.28	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.3			5.7			6.5			6.4	
Lane LOS		A			A			A			A	
95% Queue, veh		0.6			0.3			1.2			1.2	
Approach Delay, s/veh	6.3			5.7			6.5			6.4		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	6.4						A					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - West
E/W Street Name	West Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	16	9	18	0	20	9	18	0	18	132	20	0	18	132	16
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	18	10	20	0	22	10	20	0	20	146	22	0	20	146	18
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		48			52			188			184	
Entry Volume veh/h		47			51			184			180	
Circulating Flow (v_c), pc/h	188			184			48			52		
Exiting Flow (v_{ex}), pc/h	52			48			184			188		
Capacity (C_{pce}), pc/h		936			940			1077			1073	
Capacity (c), veh/h		918			922			1056			1052	
v/c Ratio (x)		0.05			0.06			0.17			0.17	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.4			4.4			5.0			5.0	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.2			0.6			0.6	
Approach Delay, s/veh	4.4			4.4			5.0			5.0		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	4.9						A					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Kelly
E/W Street Name	Kelly Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	14	21	13	0	15	12	96	0	5	154	14	0	88	146	30
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	16	23	14	0	17	13	106	0	6	171	16	0	98	162	33
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		53			136			193			293	
Entry Volume veh/h		52			133			189			287	
Circulating Flow (v_c), pc/h	277			193			137			36		
Exiting Flow (v_{ex}), pc/h	137			52			293			193		
Capacity (C_{pce}), pc/h		857			932			985			1090	
Capacity (c), veh/h		840			913			966			1069	
v/c Ratio (x)		0.06			0.15			0.20			0.27	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.9			5.3			5.6			5.9	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.5			0.7			1.1	
Approach Delay, s/veh	4.9			5.3			5.6			5.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	5.6						A					

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	150	6	32	7	66	8	22	737	18
Future Volume (veh/h)	0	0	0	150	6	32	7	66	8	22	737	18
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h				168	0	0	8	72	0	24	801	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				1328	0	593	148	1692	527	148	1178	527
Arrive On Green				0.36	0.00	0.00	0.08	0.32	0.00	0.08	0.32	0.00
Sat Flow, veh/h				3690	0	1647	1845	5289	1647	1845	3681	1647
Grp Volume(v), veh/h				168	0	0	8	72	0	24	801	0
Grp Sat Flow(s),veh/h/ln				1845	0	1647	1845	1763	1647	1845	1840	1647
Q Serve(g_s), s				1.5	0.0	0.0	0.2	0.5	0.0	0.6	9.5	0.0
Cycle Q Clear(g_c), s				1.5	0.0	0.0	0.2	0.5	0.0	0.6	9.5	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				1328	0	593	148	1692	527	148	1178	527
V/C Ratio(X)				0.13	0.00	0.00	0.05	0.04	0.00	0.16	0.68	0.00
Avail Cap(c_a), veh/h				1328	0	593	148	1692	527	148	1178	527
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				10.7	0.0	0.0	21.3	11.7	0.0	21.4	14.8	0.0
Incr Delay (d2), s/veh				0.2	0.0	0.0	0.7	0.0	0.0	2.4	3.2	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.8	0.0	0.0	0.1	0.2	0.0	0.4	5.3	0.0
LnGrp Delay(d),s/veh				10.9	0.0	0.0	21.9	11.8	0.0	23.8	18.0	0.0
LnGrp LOS				B			C	B		C	B	
Approach Vol, veh/h					168			80			825	
Approach Delay, s/veh					10.9			12.8			18.1	
Approach LOS					B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	8.0	20.0			8.0	20.0		22.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	16.0			4.0	16.0		18.0				
Max Q Clear Time (g_c+I1), s	2.6	2.5			2.2	11.5		3.5				
Green Ext Time (p_c), s	0.0	0.2			0.0	2.2		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				16.6								
HCM 2010 LOS				B								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↗	↖↖	↑↑					
Traffic Volume (veh/h)	531	188	479	1082	0	0			
Future Volume (veh/h)	531	188	479	1082	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937					
Adj Flow Rate, veh/h	577	204	521	1176					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	1840	823	1074	3313					
Arrive On Green	0.50	0.50	0.30	0.90					
Sat Flow, veh/h	3778	1647	3579	3778					
Grp Volume(v), veh/h	577	204	521	1176					
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840					
Q Serve(g_s), s	3.7	2.8	4.8	1.9					
Cycle Q Clear(g_c), s	3.7	2.8	4.8	1.9					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	1840	823	1074	3313					
V/C Ratio(X)	0.31	0.25	0.49	0.35					
Avail Cap(c_a), veh/h	1840	823	1074	3313					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	5.9	5.7	11.5	0.3					
Incr Delay (d2), s/veh	0.4	0.7	1.6	0.3					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	2.0	1.4	2.5	1.0					
LnGrp Delay(d),s/veh	6.4	6.4	13.0	0.6					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	781			1697					
Approach Delay, s/veh	6.4			4.4					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			16.0	24.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			12.0	20.0				36.0	
Max Q Clear Time (g_c+l1), s			6.8	5.7				3.9	
Green Ext Time (p_c), s			1.0	4.0				10.8	
Intersection Summary									
HCM 2010 Ctrl Delay			5.0						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary 50: I-5 NB On/Off-Ramp & SR-76 ramps

02/11/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↖	↑↑	↖	↗		
Traffic Volume (veh/h)	640	67	807	1970	67	1		
Future Volume (veh/h)	640	67	807	1970	67	1		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	696	73	877	2141	73	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	982	439	954	2208	492	439		
Arrive On Green	0.27	0.27	0.27	0.60	0.27	0.00		
Sat Flow, veh/h	3778	1647	3579	3778	1845	1647		
Grp Volume(v), veh/h	696	73	877	2141	73	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840	1845	1647		
Q Serve(g_s), s	10.3	2.0	14.3	33.4	1.8	0.0		
Cycle Q Clear(g_c), s	10.3	2.0	14.3	33.4	1.8	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	982	439	954	2208	492	439		
V/C Ratio(X)	0.71	0.17	0.92	0.97	0.15	0.00		
Avail Cap(c_a), veh/h	982	439	954	2208	492	439		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	19.9	16.9	21.4	11.5	16.8	0.0		
Incr Delay (d2), s/veh	4.3	0.8	15.1	13.2	0.6	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.8	1.0	8.9	20.4	1.0	0.0		
LnGrp Delay(d),s/veh	24.2	17.7	36.5	24.7	17.4	0.0		
LnGrp LOS	C	B	D	C	B			
Approach Vol, veh/h	769			3018	73			
Approach Delay, s/veh	23.6			28.1	17.4			
Approach LOS	C			C	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	20.0	20.0				40.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	16.0	16.0				36.0
Max Q Clear Time (g_c+I1), s		3.8	16.3	12.3				35.4
Green Ext Time (p_c), s		0.1	0.0	1.7				0.6
Intersection Summary								
HCM 2010 Ctrl Delay			27.0					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary
 51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	287	3	92	499	172	10	0	111	22	31	32
Future Volume (veh/h)	0	287	3	92	499	172	10	0	111	22	31	32
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1937	1976	1937	1937	1937	1937	0	1937	1937	1937	1937
Adj Flow Rate, veh/h	0	312	3	100	542	0	11	0	121	24	34	35
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1149	11	284	1982	887	0	0	0	568	596	507
Arrive On Green	0.00	0.31	0.31	0.15	0.54	0.00	0.00	0.00	0.00	0.31	0.31	0.31
Sat Flow, veh/h	0	3832	36	1845	3681	1647		0		1845	1937	1647
Grp Volume(v), veh/h	0	154	161	100	542	0		0.0		24	34	35
Grp Sat Flow(s),veh/h/ln	0	1840	1931	1845	1840	1647				1845	1937	1647
Q Serve(g_s), s	0.0	3.3	3.3	2.5	4.1	0.0				0.5	0.6	0.8
Cycle Q Clear(g_c), s	0.0	3.3	3.3	2.5	4.1	0.0				0.5	0.6	0.8
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	566	594	284	1982	887				568	596	507
V/C Ratio(X)	0.00	0.27	0.27	0.35	0.27	0.00				0.04	0.06	0.07
Avail Cap(c_a), veh/h	0	566	594	284	1982	887				568	596	507
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	13.6	13.6	19.7	6.5	0.0				12.6	12.7	12.7
Incr Delay (d2), s/veh	0.0	1.2	1.1	3.4	0.3	0.0				0.1	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.8	1.9	1.5	2.1	0.0				0.3	0.4	0.4
LnGrp Delay(d),s/veh	0.0	14.8	14.7	23.1	6.8	0.0				12.8	12.9	13.0
LnGrp LOS		B	B	C	A					B	B	B
Approach Vol, veh/h		315			642						93	
Approach Delay, s/veh		14.7			9.4						12.9	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			12.0	20.0		20.0		32.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			8.0	16.0		16.0		28.0				
Max Q Clear Time (g_c+I1), s			4.5	5.3		2.8		6.1				
Green Ext Time (p_c), s			0.1	1.3		0.2		3.7				
Intersection Summary												
HCM 2010 Ctrl Delay			11.3									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/13/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	465	5	9	612	355	10	10	19	138	2	57
Future Volume (veh/h)	230	465	5	9	612	355	10	10	19	138	2	57
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1976	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	250	505	5	10	665	386	11	11	21	107	62	62
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	158	960	10	105	841	376	216	216	376	422	203	203
Arrive On Green	0.09	0.26	0.26	0.04	0.15	0.15	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	3734	37	1845	3681	1647	945	945	1647	1845	890	890
Grp Volume(v), veh/h	250	249	261	10	665	386	22	0	21	107	0	124
Grp Sat Flow(s),veh/h/ln	1845	1840	1931	1845	1840	1647	1890	0	1647	1845	0	1780
Q Serve(g_s), s	6.0	8.1	8.1	0.4	12.2	16.0	0.6	0.0	0.7	3.3	0.0	4.0
Cycle Q Clear(g_c), s	6.0	8.1	8.1	0.4	12.2	16.0	0.6	0.0	0.7	3.3	0.0	4.0
Prop In Lane	1.00		0.02	1.00		1.00	0.50		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	158	473	496	105	841	376	432	0	376	422	0	407
V/C Ratio(X)	1.58	0.53	0.53	0.09	0.79	1.03	0.05	0.00	0.06	0.25	0.00	0.30
Avail Cap(c_a), veh/h	158	473	496	105	841	376	432	0	376	422	0	407
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.0	22.3	22.3	31.9	28.0	29.6	21.1	0.0	21.1	22.1	0.0	22.4
Incr Delay (d2), s/veh	289.4	4.1	4.0	1.8	7.5	53.1	0.2	0.0	0.3	1.4	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.7	4.6	4.8	0.2	7.1	12.8	0.4	0.0	0.3	1.9	0.0	2.2
LnGrp Delay(d),s/veh	321.4	26.5	26.3	33.7	35.5	82.7	21.3	0.0	21.4	23.6	0.0	24.3
LnGrp LOS	F	C	C	C	D	F	C		C	C		C
Approach Vol, veh/h		760			1061			43			231	
Approach Delay, s/veh		123.4			52.7			21.3			24.0	
Approach LOS		F			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	8.0	22.0		20.0	10.0	20.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	4.0	18.0		16.0	6.0	16.0				
Max Q Clear Time (g_c+I1), s		2.7	2.4	10.1		6.0	8.0	18.0				
Green Ext Time (p_c), s		0.1	0.0	1.9		0.7	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				74.5								
HCM 2010 LOS				E								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Future Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	82	427	316	91	846	199	210	238	87	246	297	211
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	492	362	132	894	400	422	443	376	422	443	376
Arrive On Green	0.07	0.24	0.24	0.07	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	2026	1489	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	82	388	355	91	846	199	210	238	87	246	297	211
Grp Sat Flow(s),veh/h/ln	1845	1840	1674	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	3.0	14.1	14.3	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Cycle Q Clear(g_c), s	3.0	14.1	14.3	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Prop In Lane	1.00		0.89	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	132	447	407	132	894	400	422	443	376	422	443	376
V/C Ratio(X)	0.62	0.87	0.87	0.69	0.95	0.50	0.50	0.54	0.23	0.58	0.67	0.56
Avail Cap(c_a), veh/h	132	447	407	132	894	400	422	443	376	422	443	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.6	25.4	25.5	31.7	26.1	22.8	23.5	23.7	22.0	24.0	24.6	23.9
Incr Delay (d2), s/veh	20.1	19.8	22.1	25.7	19.6	4.4	4.2	4.6	1.4	5.8	7.9	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	9.6	9.1	2.7	10.4	3.8	4.0	4.6	1.5	4.9	6.2	4.2
LnGrp Delay(d),s/veh	51.7	45.2	47.5	57.5	45.7	27.2	27.7	28.4	23.4	29.8	32.5	29.8
LnGrp LOS	D	D	D	E	D	C	C	C	C	C	C	C
Approach Vol, veh/h	825				1136		535				754	
Approach Delay, s/veh	46.9				43.4		27.3				30.9	
Approach LOS	D				D		C				C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	20.0		9.0	21.0	20.0		9.0	21.0				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	16.0		5.0	17.0	16.0		5.0	17.0				
Max Q Clear Time (g_c+I1), s	9.6		5.4	16.3	11.8		5.0	17.8				
Green Ext Time (p_c), s	1.3		0.0	0.4	1.4		0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			38.7									
HCM 2010 LOS			D									
Notes												

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕				
Traffic Vol, veh/h	25	86	7	16	65	39	2	5	6	0	0	0
Future Vol, veh/h	25	86	7	16	65	39	2	5	6	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	93	8	17	71	42	2	5	7	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.8	7.6	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	15%	21%	13%
Vol Thru, %	38%	73%	54%
Vol Right, %	46%	6%	33%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	13	118	120
LT Vol	2	25	16
Through Vol	5	86	65
RT Vol	6	7	39
Lane Flow Rate	14	128	130
Geometry Grp	1	1	1
Degree of Util (X)	0.017	0.145	0.141
Departure Headway (Hd)	4.232	4.064	3.887
Convergence, Y/N	Yes	Yes	Yes
Cap	851	881	920
Service Time	2.232	2.093	1.921
HCM Lane V/C Ratio	0.016	0.145	0.141
HCM Control Delay	7.3	7.8	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.5	0.5

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖						↖	↗
Traffic Vol, veh/h	0	148	69	50	59	0	0	0	0	17	0	55
Future Vol, veh/h	0	148	69	50	59	0	0	0	0	17	0	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	161	75	54	64	0	0	0	0	18	0	60
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	161	0	0				333	333	64
Stage 1	-	-	-	-	-	-				172	172	-
Stage 2	-	-	-	-	-	-				161	161	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1418	-	0				662	587	1000
Stage 1	0	-	-	-	-	0				858	756	-
Stage 2	0	-	-	-	-	0				868	765	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1418	-	-				636	0	1000
Mov Cap-2 Maneuver	-	-	-	-	-	-				636	0	-
Stage 1	-	-	-	-	-	-				825	0	-
Stage 2	-	-	-	-	-	-				868	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.5			9.3					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2						
Capacity (veh/h)	-	-	1418	-	636	1000						
HCM Lane V/C Ratio	-	-	0.038	-	0.029	0.06						
HCM Control Delay (s)	-	-	7.6	0	10.8	8.8						
HCM Lane LOS	-	-	A	A	B	A						
HCM 95th %tile Q(veh)	-	-	0.1	-	0.1	0.2						

HCM 2010 Signalized Intersection Summary

56: Vista Way

07/02/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑	↑	↑↑		
Traffic Volume (veh/h)	518	201	1018	1229	17	967		
Future Volume (veh/h)	518	201	1018	1229	17	967		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	563	0	1107	1336	18	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	883	395	1384	1317	394	618		
Arrive On Green	0.24	0.00	0.39	0.68	0.21	0.00		
Sat Flow, veh/h	3778	1647	3579	1937	1845	2898		
Grp Volume(v), veh/h	563	0	1107	1336	18	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1937	1845	1449		
Q Serve(g_s), s	10.3	0.0	20.6	51.0	0.6	0.0		
Cycle Q Clear(g_c), s	10.3	0.0	20.6	51.0	0.6	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	883	395	1384	1317	394	618		
V/C Ratio(X)	0.64	0.00	0.80	1.01	0.05	0.00		
Avail Cap(c_a), veh/h	883	395	1384	1317	394	618		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	25.6	0.0	20.4	12.0	23.4	0.0		
Incr Delay (d2), s/veh	3.5	0.0	4.9	28.4	0.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.7	0.0	11.1	36.7	0.3	0.0		
LnGrp Delay(d),s/veh	29.1	0.0	25.4	40.4	23.7	0.0		
LnGrp LOS	C		C	F	C			
Approach Vol, veh/h	563			2443	18			
Approach Delay, s/veh	29.1			33.6	23.7			
Approach LOS	C			C	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	33.0	22.0				55.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	29.0	18.0				51.0
Max Q Clear Time (g_c+I1), s		2.6	22.6	12.3				53.0
Green Ext Time (p_c), s		0.0	2.6	1.8				0.0
Intersection Summary								
HCM 2010 Ctrl Delay			32.7					
HCM 2010 LOS			C					

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	107	194	477	307	1656	215	37	179	119	73	77
Future Volume (vph)	270	107	194	477	307	1656	215	37	179	119	73	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3019	1441		1786	1583		1807	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3019	1441		1786	1583		1807	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	293	116	211	518	334	1800	234	40	195	129	79	84
RTOR Reduction (vph)	0	0	190	0	491	503	0	0	117	0	0	70
Lane Group Flow (vph)	293	116	21	518	743	397	0	274	78	0	208	14
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	16.9	9.8	9.8	33.7	28.2	28.2		21.2	21.2		17.0	17.0
Effective Green, g (s)	16.9	9.8	9.8	33.7	28.2	28.2		21.2	21.2		17.0	17.0
Actuated g/C Ratio	0.17	0.10	0.10	0.34	0.28	0.28		0.21	0.21		0.17	0.17
Clearance Time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	299	182	155	596	851	406		378	335		307	269
v/s Ratio Prot	0.17	0.06		c0.29	0.25			c0.15			c0.12	
v/s Ratio Perm			0.01			c0.28			0.05			0.01
v/c Ratio	0.98	0.64	0.13	0.87	0.98dr	0.98		0.72	0.23		0.68	0.05
Uniform Delay, d1	41.4	43.4	41.2	31.1	34.2	35.6		36.7	32.7		38.9	34.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	46.0	5.3	0.1	12.8	9.5	38.5		11.5	1.6		11.4	0.4
Delay (s)	87.3	48.7	41.4	43.9	43.7	74.1		48.2	34.3		50.3	35.1
Level of Service	F	D	D	D	D	E		D	C		D	D
Approach Delay (s)		64.5			54.1			42.4			46.0	
Approach LOS		E			D			D			D	

Intersection Summary

HCM 2000 Control Delay	53.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	108.1%	ICU Level of Service	G
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				LT				L			
Volume (V), veh/h	0	0	0	0	0	661	0	327	0	0	443	674	0	563	568	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	0	0	0	0	733	0	355	0	0	491	747	0	624	630	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			4.6453	4.3276			4.3276		4.6453	4.3276
Follow-Up Headway (s)		3.1858			2.6667	2.5352			2.5352		2.6667	2.5352

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		0		0	733	355		491	747	624	630	
Entry Volume veh/h		0		0	719	355		481	732	612	618	
Circulating Flow (v_c), pc/h	1987			491			624			733		
Exiting Flow (v_{ex}), pc/h	624			0			491			1363		
Capacity (C_{pce}), pc/h		155		859	935			835		688	762	
Capacity (c), veh/h		152		842	917			819		674	747	
v/c Ratio (x)		0.00		0.00	0.78			0.59		0.91	0.83	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		23.7		4.3	20.4	0.0		13.4	0.0	40.1	27.6	
Lane LOS		C		A	C	A		B	A	E	D	
95% Queue, veh		0.0		0.0	8.2			3.9		11.7	9.2	
Approach Delay, s/veh				13.7			5.3			33.8		
Approach LOS				B			A			D		
Intersection Delay, s/veh LOS	17.8						C					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	21	11	92	36	158	18	105	97	182	142	12
Future Volume (vph)	0	21	11	92	36	158	18	105	97	182	142	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	23	12	100	39	172	20	114	105	198	154	13
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	35	311	239	365								
Volume Left (vph)	0	100	20	198								
Volume Right (vph)	12	172	105	13								
Hadj (s)	-0.17	-0.23	-0.21	0.12								
Departure Headway (s)	6.0	5.3	5.3	5.4								
Degree Utilization, x	0.06	0.46	0.35	0.55								
Capacity (veh/h)	491	625	628	637								
Control Delay (s)	9.3	12.8	11.0	14.6								
Approach Delay (s)	9.3	12.8	11.0	14.6								
Approach LOS	A	B	B	B								
Intersection Summary												
Delay				12.9								
Level of Service				B								
Intersection Capacity Utilization				64.1%	ICU Level of Service	C						
Analysis Period (min)				15								

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Surfrider Way
E/W Street Name	Surfrider Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1
Lane Assignment	LTR				LTR				LTR				LT			
Volume (V), veh/h	0	245	81	102	0	17	71	43	0	72	721	27	0	69	729	177
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	272	90	113	0	19	79	48	0	80	799	30	0	76	808	196
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929		4.5436	4.5436	
Follow-Up Headway (s)		3.1858			3.1858			3.1858		2.5352	2.5352	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		475			146			909		884	196	
Entry Volume veh/h		466			143			891		867	192	
Circulating Flow (v_c), pc/h	903			1151			438			178		
Exiting Flow (v_{ex}), pc/h	196			355			1119			940		
Capacity (C_{pce}), pc/h		458			357			729		1208	1208	
Capacity (c), veh/h		449			350			715		1184	1184	
v/c Ratio (x)		1.04			0.41			1.25		0.73	0.16	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		83.1			19.2			142.3		14.5	4.4	
Lane LOS		F			C			F		B	A	
95% Queue, veh		14.3			1.9			32.4		7.0	0.6	
Approach Delay, s/veh	83.1			19.2			142.3			12.7		
Approach LOS	F			C			F			B		
Intersection Delay, s/veh LOS	71.0						F					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Civic Center Drive
E/W Street Name	Civic Center Drive
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	36	38	32	0	36	45	76	0	27	730	65	0	42	762	30
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	40	42	35	0	40	50	84	0	30	809	72	0	47	845	33
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		117			174			911			925	
Entry Volume veh/h		115			171			893			907	
Circulating Flow (v_c), pc/h	932			879			129			120		
Exiting Flow (v_{ex}), pc/h	161			113			933			920		
Capacity (C_{pce}), pc/h		445			469			993			1002	
Capacity (c), veh/h		436			460			974			983	
v/c Ratio (x)		0.26			0.37			0.92			0.92	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		12.5			14.2			32.9			33.6	
Lane LOS		B			B			D			D	
95% Queue, veh		1.0			1.7			13.9			14.3	
Approach Delay, s/veh	12.5			14.2			32.9			33.6		
Approach LOS	B			B			D			D		
Intersection Delay, s/veh LOS	30.6						D					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	7/11/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Pier View Way
E/W Street Name	Pier View Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	72	27	79	0	4	27	10	0	60	810	9	0	5	810	136
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	80	30	88	0	4	30	11	0	67	898	10	0	6	898	151
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		198			45			975			1055	
Entry Volume veh/h		194			44			956			1034	
Circulating Flow (v_c), pc/h	908			1045			116			101		
Exiting Flow (v_{ex}), pc/h	46			248			989			990		
Capacity (C_{pce}), pc/h		456			397			1006			1021	
Capacity (c), veh/h		447			390			987			1001	
v/c Ratio (x)		0.43			0.11			0.97			1.03	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		16.3			11.0			42.0			57.5	
Lane LOS		C			B			E			F	
95% Queue, veh		2.2			0.4			17.1			21.9	
Approach Delay, s/veh	16.3			11.0			42.0			57.5		
Approach LOS	C			B			E			F		
Intersection Delay, s/veh LOS	46.4						E					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	8	117	57	8	14	40	405	27	14	364	12
Future Volume (vph)	15	8	117	57	8	14	40	405	27	14	364	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	9	127	62	9	15	43	440	29	15	396	13
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	25	127	86	263	249	213	211					
Volume Left (vph)	16	0	62	43	0	15	0					
Volume Right (vph)	0	127	15	0	29	0	13					
Hadj (s)	0.35	-0.67	0.07	0.12	-0.05	0.07	-0.01					
Departure Headway (s)	7.3	6.2	7.0	6.0	5.8	6.0	5.9					
Degree Utilization, x	0.05	0.22	0.17	0.44	0.40	0.36	0.35					
Capacity (veh/h)	453	527	472	586	601	575	583					
Control Delay (s)	9.5	9.8	11.3	12.3	11.4	11.1	10.9					
Approach Delay (s)	9.7		11.3	11.9		11.0						
Approach LOS	A		B	B		B						
Intersection Summary												
Delay			11.3									
Level of Service			B									
Intersection Capacity Utilization			45.2%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	284	100	186	197	73	218
Future Volume (vph)	284	100	186	197	73	218
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	309	109	202	214	79	237
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	309	109	416	316		
Volume Left (vph)	309	0	0	79		
Volume Right (vph)	0	109	214	0		
Hadj (s)	0.53	-0.67	-0.27	0.08		
Departure Headway (s)	7.1	5.8	5.5	6.0		
Degree Utilization, x	0.61	0.18	0.64	0.53		
Capacity (veh/h)	489	586	626	574		
Control Delay (s)	19.1	8.9	17.6	15.4		
Approach Delay (s)	16.4		17.6	15.4		
Approach LOS	C		C	C		
Intersection Summary						
Delay			16.6			
Level of Service			C			
Intersection Capacity Utilization			63.1%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	0	322	83	294	89	0	0	0	0	131	94
Future Volume (vph)	45	0	322	83	294	89	0	0	0	0	131	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5		4.5	4.5	4.5						4.5	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.97						0.94	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3416						3317	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3416						3317	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	0	350	90	320	97	0	0	0	0	142	102
RTOR Reduction (vph)	0	0	319	46	43	0	0	0	0	0	86	0
Lane Group Flow (vph)	49	0	32	44	374	0	0	0	0	0	158	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	4.5		4.5	24.4	24.4						7.6	
Effective Green, g (s)	4.5		4.5	24.4	24.4						7.6	
Actuated g/C Ratio	0.09		0.09	0.49	0.49						0.15	
Clearance Time (s)	4.5		4.5	4.5	4.5						4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	159		250	863	1667						504	
v/s Ratio Prot	c0.03		0.01	0.02	c0.11						c0.05	
v/s Ratio Perm												
v/c Ratio	0.31		0.13	0.05	0.22						0.31	
Uniform Delay, d1	21.3		20.9	6.7	7.4						18.9	
Progression Factor	1.00		1.00	1.00	1.00						1.00	
Incremental Delay, d2	1.1		0.2	0.1	0.3						0.4	
Delay (s)	22.4		21.2	6.8	7.7						19.2	
Level of Service	C		C	A	A						B	
Approach Delay (s)		21.3			7.5			0.0			19.2	
Approach LOS		C			A			A			B	
Intersection Summary												
HCM 2000 Control Delay			14.8			HCM 2000 Level of Service					B	
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)			13.5			
Intersection Capacity Utilization			33.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↶	↷	↰	↶			↷	↰
Traffic Volume (vph)	0	0	0	193	443	72	272	743	0	0	602	199
Future Volume (vph)	0	0	0	193	443	72	272	743	0	0	602	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	0.95
Frpb, ped/bikes				1.00	1.00	0.96	1.00	1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	3539	1519	1770	1863			1759	1454
Flt Permitted				0.95	1.00	1.00	0.12	1.00			1.00	1.00
Satd. Flow (perm)				1770	3539	1519	219	1863			1759	1454
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	210	482	78	296	808	0	0	654	216
RTOR Reduction (vph)	0	0	0	0	0	60	0	0	0	0	1	59
Lane Group Flow (vph)	0	0	0	210	482	18	296	808	0	0	675	135
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					6
Actuated Green, G (s)				18.0	18.0	18.0	48.4	48.4			29.0	29.0
Effective Green, g (s)				18.0	18.0	18.0	48.4	48.4			29.0	29.0
Actuated g/C Ratio				0.24	0.24	0.24	0.63	0.63			0.38	0.38
Clearance Time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				417	833	357	431	1180			667	551
v/s Ratio Prot				0.12	c0.14		0.13	c0.43			c0.38	
v/s Ratio Perm						0.01	0.31					0.09
v/c Ratio				0.50	0.58	0.05	0.69	0.68			1.01	0.25
Uniform Delay, d1				25.3	25.8	22.6	23.7	9.1			23.7	16.2
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				4.3	2.9	0.3	4.9	1.8			37.8	0.3
Delay (s)				29.6	28.8	22.9	28.6	10.9			61.5	16.5
Level of Service				C	C	C	C	B			E	B
Approach Delay (s)		0.0			28.4			15.6			51.4	
Approach LOS		A			C			B			D	
Intersection Summary												
HCM 2000 Control Delay			30.6									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			76.4								15.0	Sum of lost time (s)
Intersection Capacity Utilization			78.4%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

07/02/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	145	0	132	715	295	16	83	317	411	55	22
Future Volume (vph)	19	145	0	132	715	295	16	83	317	411	55	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.97	
Satd. Flow (prot)	1770	3539		1770	3539	1583		1848	1583	1681	1688	
Flt Permitted	0.26	1.00		0.65	1.00	1.00		0.94	1.00	0.69	0.73	
Satd. Flow (perm)	488	3539		1214	3539	1583		1754	1583	1217	1275	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	158	0	143	777	321	17	90	345	447	60	24
RTOR Reduction (vph)	0	0	0	0	0	206	0	0	184	0	6	0
Lane Group Flow (vph)	21	158	0	143	777	115	0	107	161	259	266	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	20.1	20.1		19.7	19.7	19.7		25.7	25.7	25.7	25.7	
Effective Green, g (s)	20.1	20.1		19.7	19.7	19.7		25.7	25.7	25.7	25.7	
Actuated g/C Ratio	0.37	0.37		0.36	0.36	0.36		0.47	0.47	0.47	0.47	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	178	1293		434	1267	567		819	739	568	595	
v/s Ratio Prot		0.04			c0.22							
v/s Ratio Perm	0.04			0.12		0.07		0.06	0.10	c0.21	0.21	
v/c Ratio	0.12	0.12		0.33	0.61	0.20		0.13	0.22	0.46	0.45	
Uniform Delay, d1	11.6	11.6		12.8	14.5	12.2		8.3	8.7	9.9	9.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.1		0.5	0.9	0.2		0.3	0.7	2.6	2.4	
Delay (s)	12.0	11.6		13.4	15.4	12.4		8.6	9.4	12.5	12.3	
Level of Service	B	B		B	B	B		A	A	B	B	
Approach Delay (s)		11.7			14.4			9.2			12.4	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			12.8				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			55.0				Sum of lost time (s)			9.6		
Intersection Capacity Utilization			55.1%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

07/02/2018

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↗			↖	↗	
Traffic Volume (veh/h)	281	16	25	58	26	32
Future Volume (Veh/h)	281	16	25	58	26	32
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	305	17	27	63	28	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None		None			
Median storage veh)						
Upstream signal (ft)			238			
pX, platoon unblocked						
vC, conflicting volume			322		430	314
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			322		430	314
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		95	95
cM capacity (veh/h)			1238		569	727
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	322	90	63			
Volume Left	0	27	28			
Volume Right	17	0	35			
cSH	1700	1238	647			
Volume to Capacity	0.19	0.02	0.10			
Queue Length 95th (ft)	0	2	8			
Control Delay (s)	0.0	2.5	11.2			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.5	11.2			
Approach LOS			B			
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			33.6%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	368	210	234	0	0	0	97	492	145	155	422	120
Future Volume (vph)	368	210	234	0	0	0	97	492	145	155	422	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.94				1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1493				1770	1863	1552	1770	1863	1516
Flt Permitted	0.95	1.00	1.00				0.50	1.00	1.00	0.21	1.00	1.00
Satd. Flow (perm)	1770	1863	1493				929	1863	1552	383	1863	1516
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	400	228	254	0	0	0	105	535	158	168	459	130
RTOR Reduction (vph)	0	0	165	0	0	0	0	0	84	0	0	65
Lane Group Flow (vph)	400	228	89	0	0	0	105	535	74	168	459	65
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA	Perm				Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4					2	2		1	6	
Permitted Phases			4				2		2	6		6
Actuated Green, G (s)	21.0	21.0	21.0				23.0	23.0	23.0	30.2	30.2	30.2
Effective Green, g (s)	21.0	21.0	21.0				23.0	23.0	23.0	30.2	30.2	30.2
Actuated g/C Ratio	0.35	0.35	0.35				0.38	0.38	0.38	0.50	0.50	0.50
Clearance Time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0				4.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	619	652	522				356	714	594	266	937	763
v/s Ratio Prot	c0.23	0.12						c0.29		0.03	c0.25	
v/s Ratio Perm			0.06				0.11		0.05	0.28		0.04
v/c Ratio	0.65	0.35	0.17				0.29	0.75	0.12	0.63	0.49	0.09
Uniform Delay, d1	16.4	14.4	13.5				12.9	16.0	12.0	10.5	9.8	7.7
Progression Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.1	1.5	0.7				2.1	7.1	0.4	4.8	1.8	0.2
Delay (s)	21.5	15.9	14.2				15.0	23.1	12.4	15.3	11.7	8.0
Level of Service	C	B	B				B	C	B	B	B	A
Approach Delay (s)		18.0			0.0			19.9			11.8	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.7				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			12.8		
Intersection Capacity Utilization			65.5%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	530	35	0	0	0	0	10	35	30	28	0
Future Volume (Veh/h)	16	530	35	0	0	0	0	10	35	30	28	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	576	38	0	0	0	0	11	38	33	30	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	218											
pX, platoon unblocked												
vC, conflicting volume	0			614			644	629	307	366	648	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			614			644	629	307	366	648	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	97	94	94	92	100
cM capacity (veh/h)	1622			961			334	393	689	519	384	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	305	326	49	63								
Volume Left	17	0	0	33								
Volume Right	0	38	38	0								
cSH	1622	1700	590	444								
Volume to Capacity	0.01	0.19	0.08	0.14								
Queue Length 95th (ft)	1	0	7	12								
Control Delay (s)	0.5	0.0	11.7	14.4								
Lane LOS	A		B	B								
Approach Delay (s)	0.2		11.7	14.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			32.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	37	1148	24	0	0	0	0	13	31	56	49	0
Future Volume (vph)	37	1148	24	0	0	0	0	13	31	56	49	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	1248	26	0	0	0	0	14	34	61	53	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	664	650	48	114								
Volume Left (vph)	40	0	0	61								
Volume Right (vph)	0	26	34	0								
Hadj (s)	0.06	0.01	-0.39	0.14								
Departure Headway (s)	5.1	5.0	5.6	6.0								
Degree Utilization, x	0.93	0.90	0.08	0.19								
Capacity (veh/h)	702	714	628	586								
Control Delay (s)	40.6	35.3	9.1	10.5								
Approach Delay (s)	38.0		9.1	10.5								
Approach LOS	E		A	B								
Intersection Summary												
Delay			34.9									
Level of Service			D									
Intersection Capacity Utilization			52.6%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

07/02/2018

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	271	479	13	42	0	20	0	19	12	0	0	0								
Future Volume (vph)	271	479	13	42	0	20	0	19	12	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	295	521	14	46	0	22	0	21	13	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	295	535	68	34																
Volume Left (vph)	295	0	46	0																
Volume Right (vph)	0	14	22	13																
Hadj (s)	0.53	0.02	-0.02	-0.20																
Departure Headway (s)	5.2	4.7	4.7	5.4																
Degree Utilization, x	0.42	0.69	0.09	0.05																
Capacity (veh/h)	690	767	737	623																
Control Delay (s)	10.8	16.3	8.2	8.7																
Approach Delay (s)	14.3		8.2	8.7																
Approach LOS	B		A	A																
Intersection Summary																				
Delay			13.7																	
Level of Service			B																	
Intersection Capacity Utilization			42.9%	ICU Level of Service						A										
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	38	0	0	31	17	576	45	22	527	18
Future Volume (Veh/h)	0	0	38	0	0	31	17	576	45	22	527	18
Sign Control	Stop			Stop				Free			Free	
Grade	0%			0%				0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	41	0	0	34	18	626	49	24	573	20
Pedestrians	7			7								
Lane Width (ft)	12.0			16.0								
Walking Speed (ft/s)	4.0			4.0								
Percent Blockage	1			1								
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			455		
pX, platoon unblocked	0.87	0.87	0.83	0.87	0.87	0.92	0.83				0.92	
vC, conflicting volume	1334	1356	590	1356	1342	658	600				682	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1106	1132	399	1131	1115	587	411				613	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	92	100	100	93	98				97	
cM capacity (veh/h)	143	166	535	137	169	467	943				884	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	41	34	18	675	24	593						
Volume Left	0	0	18	0	24	0						
Volume Right	41	34	0	49	0	20						
cSH	535	467	943	1700	884	1700						
Volume to Capacity	0.08	0.07	0.02	0.40	0.03	0.35						
Queue Length 95th (ft)	6	6	1	0	2	0						
Control Delay (s)	12.3	13.3	8.9	0.0	9.2	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s)	12.3	13.3	0.2		0.4							
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			43.1%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Washington Avenue
E/W Street Name	Washington Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	14	0	71	0	45	10	13	0	46	577	20	0	25	524	61
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (V_{PCE}), pc/h	0	16	0	79	0	50	11	14	0	51	640	22	0	28	581	68
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		95			75			713			677	
Entry Volume veh/h		93			74			699			664	
Circulating Flow (v_c), pc/h	659			707			44			112		
Exiting Flow (v_{ex}), pc/h	50			130			670			710		
Capacity (C_{pce}), pc/h		585			557			1081			1010	
Capacity (c), veh/h		573			546			1060			990	
v/c Ratio (x)		0.16			0.13			0.66			0.67	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		8.3			8.3			13.0			14.0	
Lane LOS		A			A			B			B	
95% Queue, veh		0.6			0.5			5.2			5.4	
Approach Delay, s/veh	8.3			8.3			13.0			14.0		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh LOS	12.9						B					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	49	76	31	91	6	137	4	287	73	163	177	3
Future Volume (vph)	49	76	31	91	6	137	4	287	73	163	177	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	83	34	99	7	149	4	312	79	177	192	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	170	255	395	372								
Volume Left (vph)	53	99	4	177								
Volume Right (vph)	34	149	79	3								
Hadj (s)	-0.02	-0.24	-0.08	0.12								
Departure Headway (s)	7.0	6.5	6.1	6.3								
Degree Utilization, x	0.33	0.46	0.67	0.65								
Capacity (veh/h)	431	485	559	532								
Control Delay (s)	13.3	14.9	20.4	20.4								
Approach Delay (s)	13.3	14.9	20.4	20.4								
Approach LOS	B	B	C	C								
Intersection Summary												
Delay				18.2								
Level of Service				C								
Intersection Capacity Utilization				68.1%	ICU Level of Service		C					
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	334	48	21	233	38	45	70	71	30	94	15
Future Volume (Veh/h)	13	334	48	21	233	38	45	70	71	30	94	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	363	52	23	253	41	49	76	77	33	102	16
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked	0.98						0.98	0.98		0.98	0.98	0.98
vC, conflicting volume	308			422			812	778	396	866	784	288
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	280			422			795	761	396	850	766	260
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			76	76	88	82	67	98
cM capacity (veh/h)	1239			1131			208	312	650	187	309	751
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	429	317	202	151								
Volume Left	14	23	49	33								
Volume Right	52	41	77	16								
cSH	1239	1131	338	286								
Volume to Capacity	0.01	0.02	0.60	0.53								
Queue Length 95th (ft)	1	2	92	72								
Control Delay (s)	0.4	0.8	30.3	30.8								
Lane LOS	A	A	D	D								
Approach Delay (s)	0.4	0.8	30.3	30.8								
Approach LOS			D	D								
Intersection Summary												
Average Delay			10.2									
Intersection Capacity Utilization			45.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Wisconsin Avenue
E/W Street Name	Wisconsin Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	101	124	179	0	118	99	21	0	157	568	128	0	23	568	50
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	112	137	198	0	131	110	23	0	174	630	142	0	26	630	55
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		447			264			946			711	
Entry Volume veh/h		438			259			927			697	
Circulating Flow (v_c), pc/h	787			916			275			415		
Exiting Flow (v_{ex}), pc/h	305			339			765			959		
Capacity (C_{pce}), pc/h		514			452			858			746	
Capacity (c), veh/h		504			443			841			732	
v/c Ratio (x)		0.87			0.58			1.10			0.95	

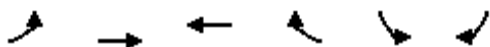
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		42.5			21.8			83.7			46.2	
Lane LOS		E			C			F			E	
95% Queue, veh		9.3			3.6			24.8			14.2	
Approach Delay, s/veh	42.5			21.8			83.7			46.2		
Approach LOS	E			C			F			E		
Intersection Delay, s/veh LOS	57.8						F					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

07/02/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	433	322	23	34	36
Future Volume (Veh/h)	8	433	322	23	34	36
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	471	350	25	37	39
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	383				860	372
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	383				860	372
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				88	94
cM capacity (veh/h)	1168				321	669
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	480	375	76			
Volume Left	9	0	37			
Volume Right	0	25	39			
cSH	1168	1700	438			
Volume to Capacity	0.01	0.22	0.17			
Queue Length 95th (ft)	1	0	16			
Control Delay (s)	0.2	0.0	14.9			
Lane LOS	A		B			
Approach Delay (s)	0.2	0.0	14.9			
Approach LOS			B			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			40.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	443	4	2	296	27	2	1	3	41	0	33
Future Volume (Veh/h)	24	443	4	2	296	27	2	1	3	41	0	33
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	482	4	2	322	29	2	1	3	45	0	36
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	353			486			914	893	484	882	880	340
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	353			486			914	893	484	882	880	340
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			99	100	99	83	100	95
cM capacity (veh/h)	1204			1077			236	274	583	259	278	700
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	512	353	6	81								
Volume Left	26	2	2	45								
Volume Right	4	29	3	36								
cSH	1204	1077	347	360								
Volume to Capacity	0.02	0.00	0.02	0.23								
Queue Length 95th (ft)	2	0	1	21								
Control Delay (s)	0.6	0.1	15.6	17.9								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.6	0.1	15.6	17.9								
Approach LOS			C	C								
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			54.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	265	266	80	192	0	158	0	111	0	0	0
Future Volume (vph)	0	265	266	80	192	0	158	0	111	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	288	289	87	209	0	172	0	121	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	577	296	293	0								
Volume Left (vph)	0	87	172	0								
Volume Right (vph)	289	0	121	0								
Hadj (s)	-0.27	0.09	-0.10	0.00								
Departure Headway (s)	5.1	5.8	6.0	7.0								
Degree Utilization, x	0.82	0.48	0.49	0.00								
Capacity (veh/h)	690	589	560	444								
Control Delay (s)	26.5	14.0	14.7	10.0								
Approach Delay (s)	26.5	14.0	14.7	0.0								
Approach LOS	D	B	B	A								
Intersection Summary												
Delay				20.4								
Level of Service				C								
Intersection Capacity Utilization				76.0%	ICU Level of Service	D						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	69	135	219	101	98	214
Future Volume (vph)	69	135	219	101	98	214
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	75	147	238	110	107	233
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	222	348	340			
Volume Left (vph)	75	0	107			
Volume Right (vph)	147	110	0			
Hadj (s)	-0.30	-0.16	0.10			
Departure Headway (s)	5.2	4.8	5.1			
Degree Utilization, x	0.32	0.47	0.48			
Capacity (veh/h)	622	715	679			
Control Delay (s)	10.7	12.0	12.6			
Approach Delay (s)	10.7	12.0	12.6			
Approach LOS	B	B	B			
Intersection Summary						
Delay			11.9			
Level of Service			B			
Intersection Capacity Utilization			56.5%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	358	21	20	296	77	29	46	38	84	28	23
Future Volume (Veh/h)	15	358	21	20	296	77	29	46	38	84	28	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	389	23	22	322	84	32	50	41	91	30	25
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	213											
pX, platoon unblocked	0.90							0.90	0.90			
vC, conflicting volume	409				423				896	896	420	918
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	294				423				832	833	420	856
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1
tC, 2 stage (s)												
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5
p0 queue free %	99				98				85	81	93	53
cM capacity (veh/h)	1144				1126				220	263	624	192
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	428	428	123	146								
Volume Left	16	22	32	91								
Volume Right	23	84	41	25								
cSH	1144	1126	307	236								
Volume to Capacity	0.01	0.02	0.40	0.62								
Queue Length 95th (ft)	1	1	46	92								
Control Delay (s)	0.5	0.6	24.4	42.1								
Lane LOS	A	A	C	E								
Approach Delay (s)	0.5	0.6	24.4	42.1								
Approach LOS				C	E							
Intersection Summary												
Average Delay				8.5								
Intersection Capacity Utilization				49.3%	ICU Level of Service				A			
Analysis Period (min)				15								

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Oceanside Blvd
E/W Street Name	Oceanside Boulevard
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	56	218	87	0	261	212	218	0	92	646	168	0	225	549	30
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	62	242	96	0	289	235	242	0	102	716	186	0	249	609	33
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		400			766			1004			891	
Entry Volume veh/h		392			751			984			874	
Circulating Flow (v_c), pc/h	1147			880			553			626		
Exiting Flow (v_{ex}), pc/h	677			370			1020			994		
Capacity (C_{pce}), pc/h		359			469			650			604	
Capacity (c), veh/h		352			460			637			592	
v/c Ratio (x)		1.11			1.63			1.54			1.47	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		117.1			317.2			270.8			242.1	
Lane LOS		F			F			F			F	
95% Queue, veh		14.9			43.0			50.7			42.8	
Approach Delay, s/veh	117.1			317.2			270.8			242.1		
Approach LOS	F			F			F			F		
Intersection Delay, s/veh LOS	254.0						F					

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	606	6	22	674	178	9	16	57	333	13	82
Future Volume (vph)	41	606	6	22	674	178	9	16	57	333	13	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.97			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1770	3532		1761	3418			3119			1776	1527
Flt Permitted	0.21	1.00		0.32	1.00			0.92			0.67	1.00
Satd. Flow (perm)	382	3532		584	3418			2876			1241	1527
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	659	7	24	733	193	10	17	62	362	14	89
RTOR Reduction (vph)	0	1	0	0	48	0	0	33	0	0	0	47
Lane Group Flow (vph)	45	665	0	24	878	0	0	56	0	0	376	42
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	19.5	19.5		19.5	19.5			26.0			26.0	26.0
Effective Green, g (s)	19.5	19.5		19.5	19.5			26.0			26.0	26.0
Actuated g/C Ratio	0.35	0.35		0.35	0.35			0.47			0.47	0.47
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	135	1252		207	1211			1359			586	721
v/s Ratio Prot		0.19			c0.26							
v/s Ratio Perm	0.12			0.04				0.02			c0.30	0.03
v/c Ratio	0.33	0.53		0.12	0.73			0.04			0.64	0.06
Uniform Delay, d1	13.0	14.1		11.9	15.4			7.8			11.0	7.9
Progression Factor	1.26	1.22		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.6	0.2		0.3	2.2			0.1			5.3	0.2
Delay (s)	17.0	17.4		12.2	17.6			7.9			16.3	8.0
Level of Service	B	B		B	B			A			B	A
Approach Delay (s)		17.3			17.5			7.9			14.7	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			16.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			55.0		Sum of lost time (s)					9.5		
Intersection Capacity Utilization			71.4%		ICU Level of Service					C		
Analysis Period (min)			15									
c Critical Lane Group												

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2035
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Morse Street
E/W Street Name	Morse Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	42	16	15	0	56	16	190	0	20	846	103	0	243	881	19
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	47	18	17	0	62	18	211	0	22	938	114	0	269	977	21
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		82			291			1074			1267	
Entry Volume veh/h		80			285			1053			1242	
Circulating Flow (v_c), pc/h	1308			1007			334			102		
Exiting Flow (v_{ex}), pc/h	401			61			1196			1056		
Capacity (C_{pce}), pc/h		306			413			809			1020	
Capacity (c), veh/h		300			405			793			1000	
v/c Ratio (x)		0.27			0.70			1.33			1.24	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		17.7			31.1			173.4			133.4	
Lane LOS		C			D			F			F	
95% Queue, veh		1.1			5.3			41.9			41.5	
Approach Delay, s/veh	17.7			31.1			173.4			133.4		
Approach LOS	C			D			F			F		
Intersection Delay, s/veh LOS	134.8						F					

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	325	35	38	197	0	77	0	65	0	0	0
Future Volume (Veh/h)	0	325	35	38	197	0	77	0	65	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	353	38	41	214	0	84	0	71	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	252											
pX, platoon unblocked												
vC, conflicting volume	214			391			668	668	372	739	687	214
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	214			391			668	668	372	739	687	214
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			77	100	89	100	100	100
cM capacity (veh/h)	1356			1168			362	366	674	290	357	826
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	391	255	155	0								
Volume Left	0	41	84	0								
Volume Right	38	0	71	0								
cSH	1356	1168	459	1700								
Volume to Capacity	0.00	0.04	0.34	0.00								
Queue Length 95th (ft)	0	3	37	0								
Control Delay (s)	0.0	1.6	16.8	0.0								
Lane LOS		A	C	A								
Approach Delay (s)	0.0	1.6	16.8	0.0								
Approach LOS			C	A								
Intersection Summary												
Average Delay			3.8									
Intersection Capacity Utilization			49.9%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	170	59	0	66	0	59	1	18	0	0	0
Future Volume (Veh/h)	0	170	59	0	66	0	59	1	18	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	185	64	0	72	0	64	1	20	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	643											
pX, platoon unblocked												
vC, conflicting volume	72			249			289	289	217	310	321	72
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	72			249			289	289	217	310	321	72
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			90	100	98	100	100	100
cM capacity (veh/h)	1528			1317			663	621	823	627	596	990
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	249	72	85	0								
Volume Left	0	0	64	0								
Volume Right	64	0	20	0								
cSH	1528	1317	694	1700								
Volume to Capacity	0.00	0.00	0.12	0.00								
Queue Length 95th (ft)	0	0	10	0								
Control Delay (s)	0.0	0.0	10.9	0.0								
Lane LOS			B	A								
Approach Delay (s)	0.0	0.0	10.9	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay				2.3								
Intersection Capacity Utilization	23.6%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	85	302	27	48	361	27
Future Volume (vph)	85	302	27	48	361	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	328	29	52	392	29
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	420	81	421			
Volume Left (vph)	92	0	392			
Volume Right (vph)	328	52	0			
Hadj (s)	-0.39	-0.35	0.22			
Departure Headway (s)	4.9	5.3	5.4			
Degree Utilization, x	0.57	0.12	0.63			
Capacity (veh/h)	702	608	646			
Control Delay (s)	14.2	9.1	17.0			
Approach Delay (s)	14.2	9.1	17.0			
Approach LOS	B	A	C			
Intersection Summary						
Delay			15.0			
Level of Service			B			
Intersection Capacity Utilization			58.1%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	238	124	17	186	15	169	19	22	4	14	23
Future Volume (Veh/h)	9	238	124	17	186	15	169	19	22	4	14	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	259	135	18	202	16	184	21	24	4	15	25
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	576											
pX, platoon unblocked												
vC, conflicting volume	218			394			625	600	326	627	660	210
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	218			394			625	600	326	627	660	210
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			50	95	97	99	96	97
cM capacity (veh/h)	1352			1165			367	405	715	361	374	830
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	404	236	229	44								
Volume Left	10	18	184	4								
Volume Right	135	16	24	25								
cSH	1352	1165	390	542								
Volume to Capacity	0.01	0.02	0.59	0.08								
Queue Length 95th (ft)	1	1	90	7								
Control Delay (s)	0.3	0.8	26.5	12.2								
Lane LOS	A	A	D	B								
Approach Delay (s)	0.3	0.8	26.5	12.2								
Approach LOS			D	B								
Intersection Summary												
Average Delay	7.5											
Intersection Capacity Utilization	47.4%				ICU Level of Service				A			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	249	6	18	207	5	4	4	17	2	2	1
Future Volume (Veh/h)	1	249	6	18	207	5	4	4	17	2	2	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	271	7	20	225	5	4	4	18	2	2	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	249											
pX, platoon unblocked												
vC, conflicting volume	230			278			546	546	274	564	548	228
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	230			278			546	546	274	564	548	228
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			99	99	98	100	100	100
cM capacity (veh/h)	1338			1285			441	438	764	418	437	812
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	279	250	26	5								
Volume Left	1	20	4	2								
Volume Right	7	5	18	1								
cSH	1338	1285	622	472								
Volume to Capacity	0.00	0.02	0.04	0.01								
Queue Length 95th (ft)	0	1	3	1								
Control Delay (s)	0.0	0.8	11.0	12.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.0	0.8	11.0	12.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			34.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2035
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Cassidy Street
E/W Street Name	Cassidy Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	135	152	129	0	125	88	31	0	142	817	99	0	123	648	50
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	150	169	143	0	139	98	34	0	157	906	110	0	136	718	55
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			4.9763	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		462			271			1173			909	
Entry Volume veh/h		453			266			1150			891	
Circulating Flow (v_c), pc/h	993			1213			455			394		
Exiting Flow (v_{ex}), pc/h	415			310			1090			1000		
Capacity (C_{pce}), pc/h		419			336			717			923	
Capacity (c), veh/h		410			329			703			905	
v/c Ratio (x)		1.10			0.81			1.64			0.98	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		107.1			48.0			309.0			47.5	
Lane LOS		F			E			F			E	
95% Queue, veh		16.0			6.8			62.8			17.4	
Approach Delay, s/veh	107.1			48.0			309.0			47.5		
Approach LOS	F			E			F			E		
Intersection Delay, s/veh LOS	166.3						F					

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	222	74	72	100	13	85	82	33	21	32	24
Future Volume (Veh/h)	24	222	74	72	100	13	85	82	33	21	32	24
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	241	80	78	109	14	92	89	36	23	35	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		280										
pX, platoon unblocked												
vC, conflicting volume	123			321			648	612	281	686	645	116
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	123			321			648	612	281	686	645	116
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			94			72	76	95	91	90	97
cM capacity (veh/h)	1464			1239			324	376	758	265	360	936
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	347	201	217	84								
Volume Left	26	78	92	23								
Volume Right	80	14	36	26								
cSH	1464	1239	382	397								
Volume to Capacity	0.02	0.06	0.57	0.21								
Queue Length 95th (ft)	1	5	85	20								
Control Delay (s)	0.7	3.5	26.1	16.5								
Lane LOS	A	A	D	C								
Approach Delay (s)	0.7	3.5	26.1	16.5								
Approach LOS			D	C								
Intersection Summary												
Average Delay			9.4									
Intersection Capacity Utilization			55.2%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	102	25	30	48	7	33	63	30	9	27	14
Future Volume (vph)	20	102	25	30	48	7	33	63	30	9	27	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	111	27	33	52	8	36	68	33	10	29	15
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	160	93	137	54								
Volume Left (vph)	22	33	36	10								
Volume Right (vph)	27	8	33	15								
Hadj (s)	-0.04	0.05	-0.06	-0.10								
Departure Headway (s)	4.4	4.6	4.5	4.6								
Degree Utilization, x	0.20	0.12	0.17	0.07								
Capacity (veh/h)	777	737	754	730								
Control Delay (s)	8.5	8.2	8.4	7.9								
Approach Delay (s)	8.5	8.2	8.4	7.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.3									
Level of Service			A									
Intersection Capacity Utilization			27.1%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	18	167	16	84	72	40	16	110	189	77	23	4
Future Volume (vph)	18	167	16	84	72	40	16	110	189	77	23	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	182	17	91	78	43	17	120	205	84	25	4
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	219	212	342	113								
Volume Left (vph)	20	91	17	84								
Volume Right (vph)	17	43	205	4								
Hadj (s)	0.01	0.00	-0.32	0.16								
Departure Headway (s)	5.5	5.5	5.0	5.8								
Degree Utilization, x	0.33	0.32	0.47	0.18								
Capacity (veh/h)	599	598	670	546								
Control Delay (s)	11.2	11.1	12.4	10.1								
Approach Delay (s)	11.2	11.1	12.4	10.1								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay				11.5								
Level of Service				B								
Intersection Capacity Utilization				58.9%	ICU Level of Service	B						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	116	138	9	76	52
Future Volume (vph)	0	116	138	9	76	52
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	126	150	10	83	57
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	126	160	140			
Volume Left (vph)	0	0	83			
Volume Right (vph)	126	10	0			
Hadj (s)	-0.57	0.00	0.15			
Departure Headway (s)	4.0	4.3	4.5			
Degree Utilization, x	0.14	0.19	0.17			
Capacity (veh/h)	829	801	765			
Control Delay (s)	7.7	8.4	8.4			
Approach Delay (s)	7.7	8.4	8.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.2			
Level of Service			A			
Intersection Capacity Utilization			21.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	154	50	238	122	409	56	743	316	342	624	28
Future Volume (vph)	23	154	50	238	122	409	56	743	316	342	624	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	16	16	16
Total Lost time (s)	5.0	5.0	5.0		4.9	4.9	4.2	5.0	5.0	4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	1.00	0.95	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	2006	1863	1555		1803	1794	1770	2111	1509	2006	3986	
Flt Permitted	0.95	1.00	1.00		0.97	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	2006	1863	1555		1803	1794	1770	2111	1509	2006	3986	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	167	54	259	133	445	61	808	343	372	678	30
RTOR Reduction (vph)	0	0	49	0	0	141	0	0	112	0	2	0
Lane Group Flow (vph)	25	167	5	0	392	304	61	808	231	372	706	0
Confl. Peds. (#/hr)			2	2					5			
Confl. Bikes (#/hr)									4			
Turn Type	Split	NA	Perm	Split	NA	pt+ov	Prot	NA	Perm	Prot	NA	
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4						2			
Actuated Green, G (s)	15.1	15.1	15.1		32.0	59.7	8.6	55.1	55.1	27.7	74.2	
Effective Green, g (s)	15.1	15.1	15.1		32.0	59.7	8.6	55.1	55.1	27.7	74.2	
Actuated g/C Ratio	0.10	0.10	0.10		0.21	0.40	0.06	0.37	0.37	0.19	0.50	
Clearance Time (s)	5.0	5.0	5.0		4.9		4.2	5.0	5.0	4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0		2.0	3.0	3.0	3.0	3.0	
Lane Grp Cap (vph)	203	188	157		387	718	102	780	558	372	1984	
v/s Ratio Prot	0.01	c0.09			c0.22	0.17	0.03	c0.38		c0.19	0.18	
v/s Ratio Perm			0.00						0.15			
v/c Ratio	0.12	0.89	0.03		1.01	0.42	0.60	1.04	0.41	1.00	0.36	
Uniform Delay, d1	60.9	66.1	60.4		58.5	32.2	68.5	47.0	34.9	60.6	22.8	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.1	35.1	0.0		49.0	0.4	6.1	41.9	2.3	46.7	0.5	
Delay (s)	61.0	101.3	60.4		107.5	32.6	74.7	88.8	37.2	107.3	23.3	
Level of Service	E	F	E		F	C	E	F	D	F	C	
Approach Delay (s)		88.2			67.7			73.5			52.3	
Approach LOS		F			E			E			D	
Intersection Summary												
HCM 2000 Control Delay			66.3									
HCM 2000 Volume to Capacity ratio			1.00									
Actuated Cycle Length (s)			149.0									
Intersection Capacity Utilization			101.7%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	893	32	43	859	77	21	0	43	36	14	81
Future Volume (Veh/h)	13	893	32	43	859	77	21	0	43	36	14	81
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	971	35	47	934	84	23	0	47	39	15	88
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage (veh)					2							
Upstream signal (ft)		312										
pX, platoon unblocked				0.91			0.91	0.91	0.91	0.91	0.91	
vC, conflicting volume	1018			1006			2182	2128	988	2134	2104	976
vC1, stage 1 conf vol							1016	1016		1070	1070	
vC2, stage 2 conf vol							1166	1112		1064	1034	
vCu, unblocked vol	1018			959			2247	2189	940	2194	2162	976
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			93			80	100	84	71	92	71
cM capacity (veh/h)	682			655			116	188	292	135	181	305
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	1020	1065	70	142								
Volume Left	14	47	23	39								
Volume Right	35	84	47	88								
cSH	682	655	195	215								
Volume to Capacity	0.02	0.07	0.36	0.66								
Queue Length 95th (ft)	2	6	38	101								
Control Delay (s)	0.7	2.4	33.5	49.4								
Lane LOS	A	A	D	E								
Approach Delay (s)	0.7	2.4	33.5	49.4								
Approach LOS			D	E								
Intersection Summary												
Average Delay			5.5									
Intersection Capacity Utilization			91.4%		ICU Level of Service				F			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

07/02/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	14	1249	30	72	1228	92	6	5	114	36	5	22	
Future Volume (Veh/h)	14	1249	30	72	1228	92	6	5	114	36	5	22	
Sign Control	Free			Free			Stop			Stop			
Grade	0%			0%			0%			0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	15	1358	33	78	1335	100	7	5	124	39	5	24	
Pedestrians	1						1						
Lane Width (ft)	12.0						12.0						
Walking Speed (ft/s)	4.0						4.0						
Percent Blockage	0						0						
Right turn flare (veh)													
Median type	TWLTL			TWLTL									
Median storage veh)	2			2									
Upstream signal (ft)	687												
pX, platoon unblocked				0.92			0.92			0.92	0.92	0.92	
vC, conflicting volume	1435			1392				2924	2996	1376	3056	2963	1386
vC1, stage 1 conf vol							1406		1406	1541		1541	
vC2, stage 2 conf vol							1518		1591	1514		1422	
vCu, unblocked vol	1435			1383				3045	3124	1365	3188	3087	1386
tC, single (s)	4.1			4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1		5.5	6.1		5.5	
tF (s)	2.2			2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			83				90	95	25	0	94	86
cM capacity (veh/h)	473			456				72	98	166	1	81	175
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1							
Volume Total	15	1391	78	1435	136	68							
Volume Left	15	0	78	0	7	39							
Volume Right	0	33	0	100	124	24							
cSH	473	1700	456	1700	152	2							
Volume to Capacity	0.03	0.82	0.17	0.84	0.89	33.75							
Queue Length 95th (ft)	2	0	15	0	155	Err							
Control Delay (s)	12.9	0.0	14.5	0.0	105.4	Err							
Lane LOS	B		B		F	F							
Approach Delay (s)	0.1		0.7		105.4	Err							
Approach LOS					F	F							
Intersection Summary													
Average Delay	222.7												
Intersection Capacity Utilization	87.1%			ICU Level of Service			E						
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	1446	0	0	1488	455	0	0	0	0	0	31
Future Volume (Veh/h)	18	1446	0	0	1488	455	0	0	0	0	0	31
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	1572	0	0	1617	495	0	0	0	0	0	34
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL				TWLTL							
Median storage veh	2				2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2112			1572			3263	3724	1572	3476	3476	1864
vC1, stage 1 conf vol							1612	1612		1864	1864	
vC2, stage 2 conf vol							1651	2112		1612	1612	
vCu, unblocked vol	2112			1572			3263	3724	1572	3476	3476	1864
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			100			100	100	100	100	100	62
cM capacity (veh/h)	259			419			50	61	136	69	89	91
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	20	1572	0	2112	0	34						
Volume Left	20	0	0	0	0	0						
Volume Right	0	0	0	495	0	34						
cSH	259	1700	1700	1700	1700	91						
Volume to Capacity	0.08	0.92	0.00	1.24	0.00	0.38						
Queue Length 95th (ft)	6	0	0	0	0	37						
Control Delay (s)	20.1	0.0	0.0	0.0	0.0	66.8						
Lane LOS	C				A	F						
Approach Delay (s)	0.3		0.0		0.0	66.8						
Approach LOS					A	F						
Intersection Summary												
Average Delay	0.7											
Intersection Capacity Utilization	116.0%				ICU Level of Service				H			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

07/02/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	0	0	102	0	0	127	107	994	28	127	797	10	
Future Volume (Veh/h)	0	0	102	0	0	127	107	994	28	127	797	10	
Sign Control	Stop				Stop				Free				
Grade	0%				0%				0%				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	0	0	111	0	0	138	116	1080	30	138	866	11	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type							None			None			
Median storage (veh)													
Upstream signal (ft)												621	
pX, platoon unblocked													
vC, conflicting volume	2598	2490	872	2580	2480	1095	877						1110
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	2598	2490	872	2580	2480	1095	877						1110
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1						4.1
tC, 2 stage (s)													
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2						2.2
p0 queue free %	100	100	68	100	100	47	85						78
cM capacity (veh/h)	6	19	350	9	20	260	770						629
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2							
Volume Total	111	138	116	1110	138	877							
Volume Left	0	0	116	0	138	0							
Volume Right	111	138	0	30	0	11							
cSH	350	260	770	1700	629	1700							
Volume to Capacity	0.32	0.53	0.15	0.65	0.22	0.52							
Queue Length 95th (ft)	33	72	13	0	21	0							
Control Delay (s)	20.0	33.5	10.5	0.0	12.3	0.0							
Lane LOS	C	D	B	B									
Approach Delay (s)	20.0	33.5	1.0	1.7									
Approach LOS	C	D											
Intersection Summary													
Average Delay			3.9										
Intersection Capacity Utilization			68.5%	ICU Level of Service					C				
Analysis Period (min)			15										

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Michigan Avenue
E/W Street Name	Michigan Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	187	87	79	0	50	11	24	0	25	537	42	0	18	537	48
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	207	96	88	0	55	12	27	0	28	595	47	0	20	595	53
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		391			94			670			668	
Entry Volume veh/h		383			92			657			655	
Circulating Flow (v_c), pc/h	670			830			323			95		
Exiting Flow (v_{ex}), pc/h	163			93			829			738		
Capacity (C_{pce}), pc/h		578			493			818			1028	
Capacity (c), veh/h		567			483			802			1007	
v/c Ratio (x)		0.68			0.19			0.82			0.65	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		22.0			10.2			25.4			13.2	
Lane LOS		C			B			D			B	
95% Queue, veh		5.1			0.7			9.1			5.0	
Approach Delay, s/veh	22.0			10.2			25.4			13.2		
Approach LOS	C			B			D			B		
Intersection Delay, s/veh LOS	19.4						C					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - West
E/W Street Name	West Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	33	19	36	0	40	19	36	0	36	271	40	0	36	271	33
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	37	21	40	0	44	21	40	0	40	300	44	0	40	300	37
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		98			105			384			377	
Entry Volume veh/h		96			103			376			370	
Circulating Flow (v_c), pc/h	384			377			98			105		
Exiting Flow (v_{ex}), pc/h	105			98			377			384		
Capacity (C_{pce}), pc/h		770			775			1025			1017	
Capacity (c), veh/h		755			760			1004			997	
v/c Ratio (x)		0.13			0.14			0.37			0.37	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.1			6.2			7.6			7.6	
Lane LOS		A			A			A			A	
95% Queue, veh		0.4			0.5			1.8			1.7	
Approach Delay, s/veh	6.1			6.2			7.6			7.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	7.3						A					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Kelly
E/W Street Name	Kelly Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	28	43	27	0	31	26	197	0	10	317	30	0	180	300	62
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	31	48	30	0	34	29	218	0	11	351	33	0	200	333	69
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		109			281			395			602	
Entry Volume veh/h		107			275			387			590	
Circulating Flow (v_c), pc/h	567			393			279			74		
Exiting Flow (v_{ex}), pc/h	281			109			600			397		
Capacity (C_{pce}), pc/h		641			763			855			1049	
Capacity (c), veh/h		628			748			838			1029	
v/c Ratio (x)		0.17			0.37			0.46			0.57	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.7			9.4			10.2			11.0	
Lane LOS		A			A			B			B	
95% Queue, veh		0.6			1.7			2.5			3.8	
Approach Delay, s/veh	7.7			9.4			10.2			11.0		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh LOS	10.2						B					

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	103	0	14	13	1059	13	24	2213	16
Future Volume (veh/h)	0	0	0	103	0	14	13	1059	13	24	2213	16
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h				112	0	0	14	1151	0	26	2405	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				738	0	329	92	3173	988	92	2208	988
Arrive On Green				0.20	0.00	0.00	0.05	0.60	0.00	0.05	0.60	0.00
Sat Flow, veh/h				3690	0	1647	1845	5289	1647	1845	3681	1647
Grp Volume(v), veh/h				112	0	0	14	1151	0	26	2405	0
Grp Sat Flow(s),veh/h/ln				1845	0	1647	1845	1763	1647	1845	1840	1647
Q Serve(g_s), s				2.0	0.0	0.0	0.6	8.9	0.0	1.1	48.0	0.0
Cycle Q Clear(g_c), s				2.0	0.0	0.0	0.6	8.9	0.0	1.1	48.0	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				738	0	329	92	3173	988	92	2208	988
V/C Ratio(X)				0.15	0.00	0.00	0.15	0.36	0.00	0.28	1.09	0.00
Avail Cap(c_a), veh/h				738	0	329	92	3173	988	92	2208	988
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				26.4	0.0	0.0	36.4	8.2	0.0	36.6	16.0	0.0
Incr Delay (d2), s/veh				0.4	0.0	0.0	3.5	0.3	0.0	7.5	48.3	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.1	0.0	0.0	0.4	4.4	0.0	0.7	38.7	0.0
LnGrp Delay(d),s/veh				26.8	0.0	0.0	39.8	8.5	0.0	44.1	64.3	0.0
LnGrp LOS				C			D	A		D	F	
Approach Vol, veh/h					112			1165			2431	
Approach Delay, s/veh					26.8			8.9			64.1	
Approach LOS					C			A			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	8.0	52.0			8.0	52.0		20.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	48.0			4.0	48.0		16.0				
Max Q Clear Time (g_c+I1), s	3.1	10.9			2.6	50.0		4.0				
Green Ext Time (p_c), s	0.0	10.6			0.0	0.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				45.6								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↗	↖↖	↑↑					
Traffic Volume (veh/h)	1123	209	317	1287	0	0			
Future Volume (veh/h)	1123	209	317	1287	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937					
Adj Flow Rate, veh/h	1221	227	345	1399					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	2116	947	805	3313					
Arrive On Green	0.57	0.57	0.22	0.90					
Sat Flow, veh/h	3778	1647	3579	3778					
Grp Volume(v), veh/h	1221	227	345	1399					
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840					
Q Serve(g_s), s	8.4	2.7	3.3	2.5					
Cycle Q Clear(g_c), s	8.4	2.7	3.3	2.5					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	2116	947	805	3313					
V/C Ratio(X)	0.58	0.24	0.43	0.42					
Avail Cap(c_a), veh/h	2116	947	805	3313					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	5.4	4.2	13.3	0.3					
Incr Delay (d2), s/veh	1.2	0.6	1.7	0.4					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	4.4	1.4	1.8	1.2					
LnGrp Delay(d),s/veh	6.6	4.8	15.0	0.7					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	1448			1744					
Approach Delay, s/veh	6.3			3.5					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			13.0	27.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			9.0	23.0				36.0	
Max Q Clear Time (g_c+I1), s			5.3	10.4				4.5	
Green Ext Time (p_c), s			0.5	7.5				13.7	
Intersection Summary									
HCM 2010 Ctrl Delay			4.8						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/11/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑↑	↑	↑		
Traffic Volume (veh/h)	1740	97	305	1324	156	0		
Future Volume (veh/h)	1740	97	305	1324	156	0		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	1891	105	332	1439	170	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1840	823	358	2419	422	376		
Arrive On Green	0.50	0.50	0.10	0.66	0.23	0.00		
Sat Flow, veh/h	3778	1647	3579	3778	1845	1647		
Grp Volume(v), veh/h	1891	105	332	1439	170	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840	1845	1647		
Q Serve(g_s), s	35.0	2.4	6.4	15.4	5.5	0.0		
Cycle Q Clear(g_c), s	35.0	2.4	6.4	15.4	5.5	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1840	823	358	2419	422	376		
V/C Ratio(X)	1.03	0.13	0.93	0.59	0.40	0.00		
Avail Cap(c_a), veh/h	1840	823	358	2419	422	376		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	17.5	9.3	31.2	6.8	22.9	0.0		
Incr Delay (d2), s/veh	28.3	0.3	32.3	1.1	2.9	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	24.9	1.2	4.8	8.0	3.1	0.0		
LnGrp Delay(d),s/veh	45.8	9.7	63.6	7.8	25.8	0.0		
LnGrp LOS	F	A	E	A	C			
Approach Vol, veh/h	1996			1771	170			
Approach Delay, s/veh	43.9			18.3	25.8			
Approach LOS	D			B	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	11.0	39.0				50.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	7.0	35.0				46.0
Max Q Clear Time (g_c+I1), s		7.5	8.4	37.0				17.4
Green Ext Time (p_c), s		0.3	0.0	0.0				13.6
Intersection Summary								
HCM 2010 Ctrl Delay			31.6					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary

51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	626	6	82	582	108	5	0	31	77	8	49
Future Volume (veh/h)	0	626	6	82	582	108	5	0	31	77	8	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1937	1976	1937	1937	1937	1937	0	1937	1937	1937	1937
Adj Flow Rate, veh/h	0	680	7	89	633	0	5	0	34	90	0	53
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1244	13	217	1949	872	0	0	0	1158	0	517
Arrive On Green	0.00	0.33	0.33	0.12	0.53	0.00	0.00	0.00	0.00	0.31	0.00	0.31
Sat Flow, veh/h	0	3829	38	1845	3681	1647		0		3690	0	1647
Grp Volume(v), veh/h	0	335	352	89	633	0		0.0		90	0	53
Grp Sat Flow(s),veh/h/ln	0	1840	1930	1845	1840	1647				1845	0	1647
Q Serve(g_s), s	0.0	7.6	7.6	2.3	5.0	0.0				0.9	0.0	1.2
Cycle Q Clear(g_c), s	0.0	7.6	7.6	2.3	5.0	0.0				0.9	0.0	1.2
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	613	643	217	1949	872				1158	0	517
V/C Ratio(X)	0.00	0.55	0.55	0.41	0.32	0.00				0.08	0.00	0.10
Avail Cap(c_a), veh/h	0	613	643	217	1949	872				1158	0	517
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	13.9	13.9	20.9	6.8	0.0				12.3	0.0	12.4
Incr Delay (d2), s/veh	0.0	3.5	3.3	5.6	0.4	0.0				0.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.4	4.6	1.5	2.6	0.0				0.5	0.0	0.6
LnGrp Delay(d),s/veh	0.0	17.3	17.2	26.5	7.3	0.0				12.4	0.0	12.8
LnGrp LOS		B	B	C	A					B		B
Approach Vol, veh/h		687			722						143	
Approach Delay, s/veh		17.3			9.6						12.6	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			10.0	21.0		20.0		31.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			6.0	17.0		16.0		27.0				
Max Q Clear Time (g_c+I1), s			4.3	9.6		3.2		7.0				
Green Ext Time (p_c), s			0.0	2.5		0.3		4.3				
Intersection Summary												
HCM 2010 Ctrl Delay			13.3									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	691	9	28	1014	299	9	2	15	292	7	73
Future Volume (veh/h)	179	691	9	28	1014	299	9	2	15	292	7	73
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1976	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	195	751	10	30	1102	325	10	2	16	202	169	79
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	185	1209	16	115	1058	473	329	66	350	369	250	117
Arrive On Green	0.10	0.32	0.32	0.06	0.29	0.29	0.21	0.21	0.21	0.20	0.20	0.20
Sat Flow, veh/h	1845	3719	50	1845	3681	1647	1550	310	1647	1845	1250	584
Grp Volume(v), veh/h	195	372	389	30	1102	325	12	0	16	202	0	248
Grp Sat Flow(s),veh/h/ln	1845	1840	1929	1845	1840	1647	1860	0	1647	1845	0	1834
Q Serve(g_s), s	8.0	13.7	13.7	1.2	23.0	14.0	0.4	0.0	0.6	7.9	0.0	10.0
Cycle Q Clear(g_c), s	8.0	13.7	13.7	1.2	23.0	14.0	0.4	0.0	0.6	7.9	0.0	10.0
Prop In Lane	1.00		0.03	1.00		1.00	0.83		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	185	598	627	115	1058	473	395	0	350	369	0	367
V/C Ratio(X)	1.06	0.62	0.62	0.26	1.04	0.69	0.03	0.00	0.05	0.55	0.00	0.68
Avail Cap(c_a), veh/h	185	598	627	115	1058	473	395	0	350	369	0	367
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.0	22.8	22.8	35.7	28.5	25.3	25.0	0.0	25.0	28.7	0.0	29.6
Incr Delay (d2), s/veh	82.1	4.8	4.6	5.4	39.0	7.9	0.1	0.0	0.2	5.7	0.0	9.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	7.7	8.0	0.8	17.3	7.4	0.2	0.0	0.3	4.6	0.0	6.0
LnGrp Delay(d),s/veh	118.1	27.6	27.4	41.1	67.5	33.2	25.1	0.0	25.3	34.5	0.0	39.2
LnGrp LOS	F	C	C	D	F	C	C		C	C		D
Approach Vol, veh/h		956			1457			28			450	
Approach Delay, s/veh		46.0			59.3			25.2			37.1	
Approach LOS		D			E			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.0	9.0	30.0		20.0	12.0	27.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	5.0	26.0		16.0	8.0	23.0				
Max Q Clear Time (g_c+I1), s		2.6	3.2	15.7		12.0	10.0	25.0				
Green Ext Time (p_c), s		0.0	0.0	3.5		0.8	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				51.1								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	868	283	88	765	185	360	99	141	437	240	390
Future Volume (veh/h)	61	868	283	88	765	185	360	99	141	437	240	390
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	66	943	308	96	832	201	250	306	153	368	411	424
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	123	838	272	98	1080	483	394	413	351	394	413	351
Arrive On Green	0.07	0.31	0.31	0.05	0.29	0.29	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1845	2732	888	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	66	634	617	96	832	201	250	306	153	368	411	424
Grp Sat Flow(s),veh/h/ln	1845	1840	1780	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	2.6	23.0	23.0	3.9	15.5	7.4	9.2	11.1	6.0	14.7	15.9	16.0
Cycle Q Clear(g_c), s	2.6	23.0	23.0	3.9	15.5	7.4	9.2	11.1	6.0	14.7	15.9	16.0
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	123	564	546	98	1080	483	394	413	351	394	413	351
V/C Ratio(X)	0.54	1.12	1.13	0.98	0.77	0.42	0.64	0.74	0.44	0.93	0.99	1.21
Avail Cap(c_a), veh/h	123	564	546	98	1080	483	394	413	351	394	413	351
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	26.0	26.0	35.5	24.2	21.3	26.8	27.6	25.6	29.0	29.5	29.5
Incr Delay (d2), s/veh	15.8	76.4	79.7	84.3	5.3	2.6	7.6	11.3	3.9	31.6	42.9	116.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	23.6	23.3	4.3	8.7	3.7	5.6	7.2	3.1	10.9	13.4	18.6
LnGrp Delay(d),s/veh	49.6	102.4	105.7	119.7	29.5	24.0	34.5	38.9	29.5	60.6	72.4	146.4
LnGrp LOS	D	F	F	F	C	C	C	D	C	E	E	F
Approach Vol, veh/h	1317			1129			709			1203		
Approach Delay, s/veh	101.3			36.2			35.3			94.9		
Approach LOS	F			D			D			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	20.0		8.0	27.0	20.0		9.0	26.0				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	16.0		4.0	23.0	16.0		5.0	22.0				
Max Q Clear Time (g_c+I1), s	13.1		5.9	25.0	18.0		4.6	17.5				
Green Ext Time (p_c), s	1.0		0.0	0.0	0.0		0.0	2.5				
Intersection Summary												
HCM 2010 Ctrl Delay	71.9											
HCM 2010 LOS	E											
Notes												

Intersection

Intersection Delay, s/veh 7.6

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	78	7	7	86	9	4	5	8	0	0	0
Future Vol, veh/h	23	78	7	7	86	9	4	5	8	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	85	8	8	93	10	4	5	9	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.7	7.6	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	24%	21%	7%
Vol Thru, %	29%	72%	84%
Vol Right, %	47%	6%	9%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	17	108	102
LT Vol	4	23	7
Through Vol	5	78	86
RT Vol	8	7	9
Lane Flow Rate	18	117	111
Geometry Grp	1	1	1
Degree of Util (X)	0.021	0.132	0.124
Departure Headway (Hd)	4.088	4.052	4.014
Convergence, Y/N	Yes	Yes	Yes
Cap	860	884	891
Service Time	2.187	2.083	2.047
HCM Lane V/C Ratio	0.021	0.132	0.125
HCM Control Delay	7.3	7.7	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.5	0.4

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖						↖	↗
Traffic Vol, veh/h	0	195	55	31	35	0	0	0	0	28	0	46
Future Vol, veh/h	0	195	55	31	35	0	0	0	0	28	0	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	212	60	34	38	0	0	0	0	30	0	50
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	212	0	0				318	318	38
Stage 1	-	-	-	-	-	-				106	106	-
Stage 2	-	-	-	-	-	-				212	212	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1358	-	0				675	598	1034
Stage 1	0	-	-	-	-	0				918	807	-
Stage 2	0	-	-	-	-	0				823	727	-
Platoon blocked, %	-	-	-	-	-	-				-	-	-
Mov Cap-1 Maneuver	-	-	-	1358	-	-				657	0	1034
Mov Cap-2 Maneuver	-	-	-	-	-	-				657	0	-
Stage 1	-	-	-	-	-	-				894	0	-
Stage 2	-	-	-	-	-	-				823	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.6			9.5					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2						
Capacity (veh/h)	-	-	1358	-	657	1034						
HCM Lane V/C Ratio	-	-	0.025	-	0.046	0.048						
HCM Control Delay (s)	-	-	7.7	0	10.7	8.7						
HCM Lane LOS	-	-	A	A	B	A						
HCM 95th %tile Q(veh)	-	-	0.1	-	0.1	0.2						

HCM 2010 Signalized Intersection Summary

56: Vista Way

07/02/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↰↱	↑	↰	↰↱		
Traffic Volume (veh/h)	945	137	935	1632	56	1428		
Future Volume (veh/h)	945	137	935	1632	56	1428		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	1027	0	1016	1774	61	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1302	583	1211	1401	397	624		
Arrive On Green	0.35	0.00	0.34	0.72	0.22	0.00		
Sat Flow, veh/h	3778	1647	3579	1937	1845	2898		
Grp Volume(v), veh/h	1027	0	1016	1774	61	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1937	1845	1449		
Q Serve(g_s), s	32.5	0.0	34.1	94.0	3.5	0.0		
Cycle Q Clear(g_c), s	32.5	0.0	34.1	94.0	3.5	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1302	583	1211	1401	397	624		
V/C Ratio(X)	0.79	0.00	0.84	1.27	0.15	0.00		
Avail Cap(c_a), veh/h	1302	583	1211	1401	397	624		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	37.6	0.0	39.7	18.0	41.4	0.0		
Incr Delay (d2), s/veh	4.9	0.0	7.0	125.7	0.8	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	17.4	0.0	18.0	98.3	1.9	0.0		
LnGrp Delay(d),s/veh	42.5	0.0	46.8	143.7	42.2	0.0		
LnGrp LOS	D		D	F	D			
Approach Vol, veh/h	1027			2790	61			
Approach Delay, s/veh	42.5			108.4	42.2			
Approach LOS	D			F	D			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		32.0	48.0	50.0				98.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		28.0	44.0	46.0				94.0
Max Q Clear Time (g_c+I1), s		5.5	36.1	34.5				96.0
Green Ext Time (p_c), s		0.1	2.8	5.5				0.0
Intersection Summary								
HCM 2010 Ctrl Delay			89.9					
HCM 2010 LOS			F					

Appendix K.1 – Analysis Output Sheets (Future with Project Alternative 1)

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	81	61	93	301	570	169	18	141	83	23	70
Future Volume (vph)	90	81	61	93	301	570	169	18	141	83	23	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3143	1441		1782	1583		1793	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3143	1441		1782	1583		1793	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	88	66	101	327	620	184	20	153	90	25	76
RTOR Reduction (vph)	0	0	58	0	229	256	0	0	91	0	0	58
Lane Group Flow (vph)	98	88	8	101	408	54	0	204	62	0	115	18
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	5.5	8.4	8.4	8.3	12.8	12.8		21.4	21.4		17.2	17.2
Effective Green, g (s)	5.5	8.4	8.4	8.3	12.8	12.8		21.4	21.4		17.2	17.2
Actuated g/C Ratio	0.07	0.11	0.11	0.11	0.17	0.17		0.29	0.29		0.23	0.23
Clearance Time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	132	212	180	199	546	250		518	460		419	369
v/s Ratio Prot	c0.06	0.05		c0.06	c0.13			c0.11			c0.06	
v/s Ratio Perm			0.00			0.04			0.04			0.01
v/c Ratio	0.74	0.42	0.04	0.51	0.75	0.22		0.39	0.13		0.27	0.05
Uniform Delay, d1	33.4	30.3	29.0	30.7	28.9	26.1		20.9	19.3		23.1	21.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	20.0	0.5	0.0	2.0	4.9	0.2		2.2	0.6		1.6	0.2
Delay (s)	53.3	30.8	29.1	32.8	33.7	26.2		23.1	19.9		24.7	22.1
Level of Service	D	C	C	C	C	C		C	B		C	C
Approach Delay (s)		39.1			31.4			21.7			23.7	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			29.8				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			73.6				Sum of lost time (s)		18.3			
Intersection Capacity Utilization			49.7%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				T				L			
Volume (V), veh/h	0	0	0	0	0	413	0	377	0	0	176	469	0	120	164	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	0	0	0	0	458	0	410	0	0	195	520	0	133	182	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929		4.2929	4.1129			4.1129		4.2929	4.1129	
Follow-Up Headway (sec)		3.1858		3.1858	3.1858			3.1858		3.1858	3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		0		0	458	410		195	520	133	182	
Entry Volume veh/h		0		0	449	410		191	510	130	178	
Circulating Flow (Vc), pc/h	773			195			133			458		
Exiting Flow (Vex), pc/h	133			0			195			640		
Capacity (cPCE), pc/h		522		976	986			1030		802	820	
Capacity (c), veh/h		511		957	967			1009		786	804	
v/c Ratio (X)		0.00		0.00	0.46			0.19		0.17	0.22	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.0		3.8	9.2	0.0		5.3	0.0	6.3	6.9	
Lane LOS		A		A	A	A		A	A	A	A	
95% Queue		0.0		0.0	2.5			0.7		0.6	0.8	
Approach Delay, s/veh				4.8			1.5			6.6		
Approach LOS				A			A			A		
Intersection Delay, s/veh / LOS	3.9						A					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	22	4	43	28	84	12	56	62	125	77	6
Future Volume (vph)	2	22	4	43	28	84	12	56	62	125	77	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	24	4	47	30	91	13	61	67	136	84	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	30	168	141	227								
Volume Left (vph)	2	47	13	136								
Volume Right (vph)	4	91	67	7								
Hadj (s)	-0.03	-0.24	-0.23	0.14								
Departure Headway (s)	5.0	4.6	4.4	4.7								
Degree Utilization, x	0.04	0.21	0.17	0.30								
Capacity (veh/h)	652	727	766	731								
Control Delay (s)	8.2	8.8	8.4	9.6								
Approach Delay (s)	8.2	8.8	8.4	9.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.0									
Level of Service			A									
Intersection Capacity Utilization			40.3%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

2/24/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗	↘		↔		↗	↘		↗	↘	↗
Traffic Volume (vph)	173	17	47	9	33	67	44	287	20	26	394	99
Future Volume (vph)	173	17	47	9	33	67	44	287	20	26	394	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.92		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1781	1583		1701		1770	1844		1770	1863	1583
Flt Permitted		0.63	1.00		0.98		0.46	1.00		0.53	1.00	1.00
Satd. Flow (perm)		1174	1583		1668		848	1844		993	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	188	18	51	10	36	73	48	312	22	28	428	108
RTOR Reduction (vph)	0	0	37	0	53	0	0	3	0	0	0	38
Lane Group Flow (vph)	0	206	14	0	66	0	48	331	0	28	428	70
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		22.0	22.0		22.0		50.8	50.8		52.0	52.0	52.0
Effective Green, g (s)		22.0	22.0		22.0		50.8	50.8		52.0	52.0	52.0
Actuated g/C Ratio		0.28	0.28		0.28		0.63	0.63		0.65	0.65	0.65
Clearance Time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		7.0	7.0	7.0
Lane Grp Cap (vph)		322	435		458		538	1170		645	1210	1028
v/s Ratio Prot								0.18			c0.23	
v/s Ratio Perm		c0.18	0.01		0.04		0.06			0.03		0.04
v/c Ratio		0.64	0.03		0.14		0.09	0.28		0.04	0.35	0.07
Uniform Delay, d1		25.5	21.2		21.9		5.6	6.5		5.0	6.4	5.1
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		7.9	0.1		0.5		0.3	0.6		0.1	0.8	0.1
Delay (s)		33.4	21.3		22.4		6.0	7.1		5.2	7.2	5.3
Level of Service		C	C		C		A	A		A	A	A
Approach Delay (s)		31.0			22.4			7.0			6.7	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			12.9									
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			80.0									
Intersection Capacity Utilization			51.4%									
Analysis Period (min)			15									
c Critical Lane Group												

HCS 2010 Roundabout Report

General Information

Analyst		Intersection	Coast Hwy - Civic Center Drive
Agency or Co.	IBI Group	E/W Street Name	Civic Center Drive
Date Performed	05/23/2016	N/S Street Name	Coast Highway
Analysis Year	2016	Analysis Time Period (hrs)	0.25
Time Period	AM Peak Hour	Peak Hour Factor	0.92
Project Description	35130 - Coast Highway	Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	13	10	9	0	23	14	22	0	7	281	28	0	63	334	13
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	14	11	10	0	26	16	24	0	8	312	31	0	70	370	14
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		35			66			351			454	
Entry Volume veh/h		34			65			344			445	
Circulating Flow (Vc), pc/h	466			334			95			50		
Exiting Flow (Vex), pc/h	112			38			350			406		
Capacity (cPCE), pc/h		709			809			1028			1075	
Capacity (c), veh/h		695			793			1007			1054	
v/c Ratio (X)		0.05			0.08			0.34			0.42	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.7			5.3			7.1			8.0	
Lane LOS		A			A			A			A	
95% Queue		0.2			0.3			1.5			2.1	
Approach Delay, s/veh	5.7			5.3			7.1			8.0		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	7.4						A					

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection		Coast Highway - Pier View Way		
Agency or Co.	IBI Group				E/W Street Name		Pier View Way		
Date Performed	7/12/2016				N/S Street Name		Coast Highway		
Analysis Year	2016				Analysis Time Period (hrs)		0.25		
Time Period	AM Peak Hour				Peak Hour Factor		0.92		
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	7	11	11	0	12	17	18	0	8	326	13	0	13	284	22
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	8	12	12	0	13	19	20	0	9	361	14	0	14	315	24
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929		
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (Ve), pc/h		32			52			384			353		
Entry Volume veh/h		31			51			376			346		
Circulating Flow (Vc), pc/h	342			378			34			41			
Exiting Flow (Vex), pc/h	40			52			389			340			
Capacity (cPCE), pc/h		803			774			1092			1085		
Capacity (c), veh/h		787			759			1071			1063		
v/c Ratio (X)		0.04			0.07			0.35			0.33		

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.0			5.4			6.9			6.6	
Lane LOS		A			A			A			A	
95% Queue		0.1			0.2			1.6			1.4	
Approach Delay, s/veh	5.0			5.4			6.9			6.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	6.6						A					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

11/17/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	3	19	9	5	4	86	216	3	5	148	7
Future Volume (vph)	2	3	19	9	5	4	86	216	3	5	148	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	3	21	10	5	4	93	235	3	5	161	8
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	5	21	19	211	121	86	89					
Volume Left (vph)	2	0	10	93	0	5	0					
Volume Right (vph)	0	21	4	0	3	0	8					
Hadj (s)	0.23	-0.67	0.01	0.25	0.02	0.06	-0.03					
Departure Headway (s)	5.9	5.0	5.6	5.0	4.8	5.0	4.9					
Degree Utilization, x	0.01	0.03	0.03	0.29	0.16	0.12	0.12					
Capacity (veh/h)	563	660	588	705	737	704	720					
Control Delay (s)	7.7	6.9	8.8	8.9	7.5	7.4	7.3					
Approach Delay (s)	7.1		8.8	8.4		7.4						
Approach LOS	A		A	A		A						
Intersection Summary												
Delay			8.0									
Level of Service			A									
Intersection Capacity Utilization			30.7%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	129	57	126	91	33	111
Future Volume (vph)	129	57	126	91	33	111
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	140	62	137	99	36	121
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	140	62	236	157		
Volume Left (vph)	140	0	0	36		
Volume Right (vph)	0	62	99	0		
Hadj (s)	0.53	-0.67	-0.22	0.08		
Departure Headway (s)	6.0	4.8	4.4	4.8		
Degree Utilization, x	0.23	0.08	0.29	0.21		
Capacity (veh/h)	569	708	776	708		
Control Delay (s)	9.5	7.0	9.3	9.1		
Approach Delay (s)	8.8		9.3	9.1		
Approach LOS	A		A	A		
Intersection Summary						
Delay			9.0			
Level of Service			A			
Intersection Capacity Utilization			37.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	0	132	38	169	33	0	0	0	0	31	41
Future Volume (vph)	18	0	132	38	169	33	0	0	0	0	31	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5		4.5	4.5	4.5						4.5	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.98						0.91	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3452						3237	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3452						3237	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	0	143	41	184	36	0	0	0	0	34	45
RTOR Reduction (vph)	0	0	130	16	14	0	0	0	0	0	42	0
Lane Group Flow (vph)	20	0	13	25	206	0	0	0	0	0	37	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	5.3		5.3	37.1	37.1						4.1	
Effective Green, g (s)	5.3		5.3	37.1	37.1						4.1	
Actuated g/C Ratio	0.09		0.09	0.62	0.62						0.07	
Clearance Time (s)	4.5		4.5	4.5	4.5						4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	156		246	1094	2134						221	
v/s Ratio Prot	c0.01		0.00	0.01	c0.06						c0.01	
v/s Ratio Perm												
v/c Ratio	0.13		0.05	0.02	0.10						0.17	
Uniform Delay, d1	25.2		25.0	4.4	4.6						26.3	
Progression Factor	1.00		1.00	1.00	1.00						1.00	
Incremental Delay, d2	0.4		0.1	0.0	0.1						0.4	
Delay (s)	25.6		25.1	4.5	4.7						26.7	
Level of Service	C		C	A	A						C	
Approach Delay (s)		25.2			4.7			0.0			26.7	
Approach LOS		C			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			14.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.11									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)			13.5			
Intersection Capacity Utilization			23.2%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↱	↱	↰	↱			↰	↱
Traffic Volume (vph)	0	0	0	144	213	73	67	585	0	0	333	30
Future Volume (vph)	0	0	0	144	213	73	67	585	0	0	333	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	0.95
Frpb, ped/bikes				1.00	1.00	0.96	1.00	1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	3539	1525	1770	1863			1767	1460
Flt Permitted				0.95	1.00	1.00	0.37	1.00			1.00	1.00
Satd. Flow (perm)				1770	3539	1525	686	1863			1767	1460
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	157	232	79	73	636	0	0	362	33
RTOR Reduction (vph)	0	0	0	0	0	55	0	0	0	0	1	22
Lane Group Flow (vph)	0	0	0	157	232	24	73	636	0	0	364	8
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					6
Actuated Green, G (s)				18.1	18.1	18.1	32.7	32.7			17.1	17.1
Effective Green, g (s)				18.1	18.1	18.1	32.7	32.7			17.1	17.1
Actuated g/C Ratio				0.30	0.30	0.30	0.54	0.54			0.28	0.28
Clearance Time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				526	1053	453	557	1001			496	410
v/s Ratio Prot				c0.09	0.07		0.02	c0.34			c0.21	
v/s Ratio Perm						0.02	0.05					0.01
v/c Ratio				0.30	0.22	0.05	0.13	0.64			0.73	0.02
Uniform Delay, d1				16.5	16.0	15.2	10.8	9.9			19.8	15.8
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				1.4	0.5	0.2	0.1	1.5			5.9	0.0
Delay (s)				17.9	16.5	15.4	11.0	11.4			25.7	15.8
Level of Service				B	B	B	B	B			C	B
Approach Delay (s)		0.0			16.8			11.3			25.0	
Approach LOS		A			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			16.4									HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			60.8								15.0	
Intersection Capacity Utilization			54.1%									ICU Level of Service A
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	115	1	124	433	199	11	24	188	134	47	6
Future Volume (vph)	23	115	1	124	433	199	11	24	188	134	47	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.98	
Satd. Flow (prot)	1770	3535		1770	3539	1583		1834	1583	1681	1714	
Flt Permitted	0.42	1.00		0.67	1.00	1.00		0.94	1.00	0.73	0.90	
Satd. Flow (perm)	779	3535		1252	3539	1583		1754	1583	1296	1572	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	125	1	135	471	216	12	26	204	146	51	7
RTOR Reduction (vph)	0	1	0	0	0	160	0	0	85	0	3	0
Lane Group Flow (vph)	25	125	0	135	471	56	0	38	119	101	100	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	15.9	15.9		15.5	15.5	15.5		34.9	34.9	34.9	34.9	
Effective Green, g (s)	15.9	15.9		15.5	15.5	15.5		34.9	34.9	34.9	34.9	
Actuated g/C Ratio	0.27	0.27		0.26	0.26	0.26		0.58	0.58	0.58	0.58	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	206	936		323	914	408		1020	920	753	914	
v/s Ratio Prot		0.04			c0.13							
v/s Ratio Perm	0.03			0.11		0.04		0.02	0.07	c0.08	0.06	
v/c Ratio	0.12	0.13		0.42	0.52	0.14		0.04	0.13	0.13	0.11	
Uniform Delay, d1	16.7	16.8		18.5	19.0	17.1		5.4	5.7	5.7	5.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.1		1.0	0.6	0.2		0.1	0.3	0.4	0.2	
Delay (s)	17.1	16.9		19.5	19.6	17.3		5.4	6.0	6.1	5.8	
Level of Service	B	B		B	B	B		A	A	A	A	
Approach Delay (s)		16.9			19.0			5.9			6.0	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			14.7				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			9.6		
Intersection Capacity Utilization			38.6%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

9/1/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↙	
Traffic Volume (veh/h)	89	6	21	31	6	8
Future Volume (Veh/h)	89	6	21	31	6	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	7	23	34	7	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				238		
pX, platoon unblocked						
vC, conflicting volume			104		180	100
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			104		180	100
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		99	99
cM capacity (veh/h)			1488		796	955
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	104	57	16			
Volume Left	0	23	7			
Volume Right	7	0	9			
cSH	1700	1488	878			
Volume to Capacity	0.06	0.02	0.02			
Queue Length 95th (ft)	0	1	1			
Control Delay (s)	0.0	3.1	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.1	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			19.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	55	96	0	0	0	27	222	64	75	215	53
Future Volume (vph)	89	55	96	0	0	0	27	222	64	75	215	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.94				1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1494				1770	1863	1551	1770	1863	1515
Flt Permitted	0.95	1.00	1.00				0.61	1.00	1.00	0.42	1.00	1.00
Satd. Flow (perm)	1770	1863	1494				1142	1863	1551	783	1863	1515
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	60	104	0	0	0	29	241	70	82	234	58
RTOR Reduction (vph)	0	0	55	0	0	0	0	0	51	0	0	36
Lane Group Flow (vph)	97	60	49	0	0	0	29	241	19	82	234	22
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA	Perm				Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4					2	2		1	6	
Permitted Phases			4				2		2	6		6
Actuated Green, G (s)	28.0	28.0	28.0				16.0	16.0	16.0	23.2	23.2	23.2
Effective Green, g (s)	28.0	28.0	28.0				16.0	16.0	16.0	23.2	23.2	23.2
Actuated g/C Ratio	0.47	0.47	0.47				0.27	0.27	0.27	0.39	0.39	0.39
Clearance Time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0				4.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	826	869	697				304	496	413	355	720	585
v/s Ratio Prot	c0.05	0.03						c0.13		0.01	c0.13	
v/s Ratio Perm			0.03				0.03		0.01	0.08		0.01
v/c Ratio	0.12	0.07	0.07				0.10	0.49	0.05	0.23	0.33	0.04
Uniform Delay, d1	9.0	8.8	8.8				16.6	18.5	16.3	12.2	12.9	11.5
Progression Factor	1.00	1.00	1.00				0.71	0.70	0.27	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.2	0.2				0.6	3.4	0.2	0.3	1.2	0.1
Delay (s)	9.3	9.0	9.0				12.4	16.3	4.6	12.5	14.1	11.6
Level of Service	A	A	A				B	B	A	B	B	B
Approach Delay (s)		9.1			0.0			13.6			13.4	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.3				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.27									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			12.8		
Intersection Capacity Utilization			49.5%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	209	10	0	0	0	0	4	17	20	7	0
Future Volume (Veh/h)	10	209	10	0	0	0	0	4	17	20	7	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	227	11	0	0	0	0	4	18	22	8	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		218										
pX, platoon unblocked												
vC, conflicting volume	0			238			258	254	119	156	260	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			238			258	254	119	156	260	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	99	98	97	99	100
cM capacity (veh/h)	1622			1326			664	644	910	773	639	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	124	124	22	30								
Volume Left	11	0	0	22								
Volume Right	0	11	18	0								
cSH	1622	1700	846	732								
Volume to Capacity	0.01	0.07	0.03	0.04								
Queue Length 95th (ft)	1	0	2	3								
Control Delay (s)	0.7	0.0	9.4	10.1								
Lane LOS	A		A	B								
Approach Delay (s)	0.3		9.4	10.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			21.2%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	24	473	5	0	0	0	0	4	21	14	12	0
Future Volume (vph)	24	473	5	0	0	0	0	4	21	14	12	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	514	5	0	0	0	0	4	23	15	13	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	283	262	27	28								
Volume Left (vph)	26	0	0	15								
Volume Right (vph)	0	5	23	0								
Hadj (s)	0.08	0.02	-0.48	0.14								
Departure Headway (s)	4.7	4.7	4.6	5.2								
Degree Utilization, x	0.37	0.34	0.03	0.04								
Capacity (veh/h)	755	761	730	643								
Control Delay (s)	9.3	8.8	7.7	8.4								
Approach Delay (s)	9.1		7.7	8.4								
Approach LOS	A		A	A								
Intersection Summary												
Delay			9.0									
Level of Service			A									
Intersection Capacity Utilization			28.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

9/1/2016

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	97	187	9	40	0	97	0	47	29	0	0	0								
Future Volume (vph)	97	187	9	40	0	97	0	47	29	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	105	203	10	43	0	105	0	51	32	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	105	213	148	83																
Volume Left (vph)	105	0	43	0																
Volume Right (vph)	0	10	105	32																
Hadj (s)	0.53	0.00	-0.33	-0.20																
Departure Headway (s)	5.4	4.8	4.2	4.7																
Degree Utilization, x	0.16	0.29	0.17	0.11																
Capacity (veh/h)	660	730	821	703																
Control Delay (s)	8.1	8.5	8.1	8.3																
Approach Delay (s)	8.4		8.1	8.3																
Approach LOS	A		A	A																
Intersection Summary																				
Delay			8.3																	
Level of Service			A																	
Intersection Capacity Utilization			32.8%	ICU Level of Service					A											
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	14	0	0	51	14	224	32	23	232	6
Future Volume (Veh/h)	0	0	14	0	0	51	14	224	32	23	232	6
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	15	0	0	55	15	243	35	25	252	7
Pedestrians	7				7							
Lane Width (ft)	12.0				16.0							
Walking Speed (ft/s)	4.0				4.0							
Percent Blockage	1				1							
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			455		
pX, platoon unblocked												
vC, conflicting volume	640	628	262	614	614	268	266				285	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	640	628	262	614	614	268	266				285	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	98	100	100	93	99				98	
cM capacity (veh/h)	346	382	772	380	389	765	1290				1267	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	15	55	15	278	25	259						
Volume Left	0	0	15	0	25	0						
Volume Right	15	55	0	35	0	7						
cSH	772	765	1290	1700	1267	1700						
Volume to Capacity	0.02	0.07	0.01	0.16	0.02	0.15						
Queue Length 95th (ft)	1	6	1	0	2	0						
Control Delay (s)	9.8	10.1	7.8	0.0	7.9	0.0						
Lane LOS	A	B	A	A								
Approach Delay (s)	9.8	10.1	0.4	0.7								
Approach LOS	A	B										
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			23.8%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Washington Avenue			
Agency or Co.	IBI Group				E/W Street Name	Washington Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	AM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	14	2	25	0	59	9	4	0	18	226	11	0	3	235	18
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	16	2	28	0	65	10	4	0	20	251	12	0	3	261	20
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		46			79			283			284	
Entry Volume veh/h		45			77			277			278	
Circulating Flow (Vc), pc/h	329			287			21			95		
Exiting Flow (Vex), pc/h	17			50			271			354		
Capacity (cPCE), pc/h		813			848			1107			1028	
Capacity (c), veh/h		797			831			1085			1007	
v/c Ratio (X)		0.06			0.09			0.26			0.28	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.1			5.2			5.7			6.3	
Lane LOS		A			A			A			A	
95% Queue		0.2			0.3			1.0			1.1	
Approach Delay, s/veh	5.1			5.2			5.7			6.3		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	5.9						A					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	30	16	25	4	79	3	136	39	93	93	1
Future Volume (vph)	20	30	16	25	4	79	3	136	39	93	93	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	33	17	27	4	86	3	148	42	101	101	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	72	117	193	203								
Volume Left (vph)	22	27	3	101								
Volume Right (vph)	17	86	42	1								
Hadj (s)	-0.05	-0.36	-0.09	0.13								
Departure Headway (s)	5.0	4.6	4.5	4.7								
Degree Utilization, x	0.10	0.15	0.24	0.27								
Capacity (veh/h)	657	713	756	722								
Control Delay (s)	8.5	8.4	9.0	9.4								
Approach Delay (s)	8.5	8.4	9.0	9.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.0									
Level of Service			A									
Intersection Capacity Utilization			37.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	202	22	4	93	15	11	23	27	20	32	11
Future Volume (Veh/h)	8	202	22	4	93	15	11	23	27	20	32	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	220	24	4	101	16	12	25	29	22	35	12
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked												
vC, conflicting volume	131			251			404	396	239	422	400	124
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	131			251			404	396	239	422	400	124
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			98	95	96	95	93	99
cM capacity (veh/h)	1437			1307			507	527	795	487	524	915
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	253	121	66	69								
Volume Left	9	4	12	22								
Volume Right	24	16	29	12								
cSH	1437	1307	613	552								
Volume to Capacity	0.01	0.00	0.11	0.13								
Queue Length 95th (ft)	0	0	9	11								
Control Delay (s)	0.3	0.3	11.6	12.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.3	11.6	12.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			28.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Wisconsin Avenue			
Agency or Co.	IBI Group				E/W Street Name	Wisconsin Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	AM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	51	56	131	0	93	30	29	0	64	234	67	0	18	257	17
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	57	62	145	0	103	33	32	0	71	259	74	0	20	285	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		264			168			404			324	
Entry Volume veh/h		259			165			396			318	
Circulating Flow (Vc), pc/h	408			387			139			207		
Exiting Flow (Vex), pc/h	156			123			348			533		
Capacity (cPCE), pc/h		751			767			983			919	
Capacity (c), veh/h		737			752			964			901	
v/c Ratio (X)		0.35			0.22			0.41			0.35	

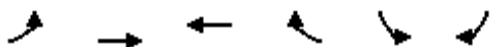
Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.3			7.2			8.4			7.9	
Lane LOS		A			A			A			A	
95% Queue		1.6			0.8			2.0			1.6	
Approach Delay, s/veh	9.3			7.2			8.4			7.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	8.3						A					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

9/1/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	221	214	5	17	15
Future Volume (Veh/h)	9	221	214	5	17	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	240	233	5	18	16
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	246				504	244
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	246				504	244
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	98
cM capacity (veh/h)	1311				519	788
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	250	238	34			
Volume Left	10	0	18			
Volume Right	0	5	16			
cSH	1311	1700	619			
Volume to Capacity	0.01	0.14	0.05			
Queue Length 95th (ft)	1	0	4			
Control Delay (s)	0.4	0.0	11.2			
Lane LOS	A		B			
Approach Delay (s)	0.4	0.0	11.2			
Approach LOS			B			
Intersection Summary						
Average Delay		0.9				
Intersection Capacity Utilization		29.3%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	206	9	20	195	11	6	5	14	36	1	6
Future Volume (Veh/h)	7	206	9	20	195	11	6	5	14	36	1	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	224	10	22	212	12	7	5	15	39	1	7
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	226			234			516	515	229	526	514	222
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	226			234			516	515	229	526	514	222
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			98	99	98	91	100	99
cM capacity (veh/h)	1340			1333			455	452	810	441	453	815
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	242	246	27	47								
Volume Left	8	22	7	39								
Volume Right	10	12	15	7								
cSH	1340	1333	601	473								
Volume to Capacity	0.01	0.02	0.04	0.10								
Queue Length 95th (ft)	0	1	4	8								
Control Delay (s)	0.3	0.8	11.3	13.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.8	11.3	13.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			33.8%		ICU Level of Service				A			
Analysis Period (min)			15									

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	114	188	71	144	0	101	0	36	0	0	0
Future Volume (vph)	0	114	188	71	144	0	101	0	36	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	124	204	77	157	0	110	0	39	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	328	234	149	0								
Volume Left (vph)	0	77	110	0								
Volume Right (vph)	204	0	39	0								
Hadj (s)	-0.34	0.10	0.02	0.00								
Departure Headway (s)	4.3	4.8	5.2	5.4								
Degree Utilization, x	0.39	0.31	0.21	0.00								
Capacity (veh/h)	815	720	634	900								
Control Delay (s)	9.9	9.9	9.6	8.4								
Approach Delay (s)	9.9	9.9	9.6	0.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.8								
Level of Service				A								
Intersection Capacity Utilization				51.4%	ICU Level of Service		A					
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	48	67	85	30	78	102
Future Volume (vph)	48	67	85	30	78	102
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	73	92	33	85	111
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	125	125	196			
Volume Left (vph)	52	0	85			
Volume Right (vph)	73	33	0			
Hadj (s)	-0.23	-0.12	0.12			
Departure Headway (s)	4.4	4.3	4.5			
Degree Utilization, x	0.15	0.15	0.24			
Capacity (veh/h)	760	803	776			
Control Delay (s)	8.2	8.0	8.9			
Approach Delay (s)	8.2	8.0	8.9			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.4			
Level of Service			A			
Intersection Capacity Utilization			29.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	246	1	6	198	36	7	9	12	36	15	9
Future Volume (Veh/h)	7	246	1	6	198	36	7	9	12	36	15	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	267	1	7	215	39	8	10	13	39	16	10
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					213							
pX, platoon unblocked	0.93						0.93	0.93		0.93	0.93	0.93
vC, conflicting volume	257			279			565	566	286	561	546	242
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	164			279			495	496	286	491	476	148
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			98	98	98	91	96	99
cM capacity (veh/h)	1313			1272			420	432	741	427	444	832
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	276	261	31	65								
Volume Left	8	7	8	39								
Volume Right	1	39	13	10								
cSH	1313	1272	519	466								
Volume to Capacity	0.01	0.01	0.06	0.14								
Queue Length 95th (ft)	0	0	5	12								
Control Delay (s)	0.3	0.3	12.4	14.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.3	12.4	14.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			30.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

2/24/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔	↔	↔	↕		↔	↔	
Traffic Volume (vph)	22	139	78	108	141	98	40	202	57	107	256	16
Future Volume (vph)	22	139	78	108	141	98	40	202	57	107	256	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	10	11	11	16	16	16
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.97	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1850	1534	1681	1763	1794	1652	3295		2006	2093	
Flt Permitted		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1850	1534	1681	1763	1794	1652	3295		2006	2093	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	151	85	117	153	107	43	220	62	116	278	17
RTOR Reduction (vph)	0	0	72	0	0	89	0	30	0	0	2	0
Lane Group Flow (vph)	0	175	13	105	165	18	43	252	0	116	293	0
Confl. Peds. (#/hr)			10	10					3			
Confl. Bikes (#/hr)			4						3			
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		11.9	11.9	13.1	13.1	13.1	4.1	25.8		10.4	32.1	
Effective Green, g (s)		11.9	11.9	13.1	13.1	13.1	4.1	25.8		10.4	32.1	
Actuated g/C Ratio		0.15	0.15	0.16	0.16	0.16	0.05	0.32		0.13	0.40	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		275	228	275	288	293	84	1062		260	839	
v/s Ratio Prot		c0.09		0.06	c0.09		0.03	0.08		c0.06	c0.14	
v/s Ratio Perm			0.01			0.01						
v/c Ratio		0.64	0.06	0.38	0.57	0.06	0.51	0.24		0.45	0.35	
Uniform Delay, d1		32.0	29.2	29.8	30.9	28.2	37.0	19.9		32.1	16.7	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.5	0.0	1.0	3.0	0.1	2.2	0.5		1.2	1.1	
Delay (s)		35.5	29.3	30.9	33.8	28.4	39.2	20.4		33.4	17.8	
Level of Service		D	C	C	C	C	D	C		C	B	
Approach Delay (s)		33.5			31.5			22.9			22.2	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			27.0									
HCM 2000 Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			80.0							18.8		
Intersection Capacity Utilization			52.7%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	345	0	16	445	87	8	9	35	267	14	48
Future Volume (vph)	12	345	0	16	445	87	8	9	35	267	14	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.96
Flpb, ped/bikes	1.00	1.00		0.99	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1770	3539		1755	3443			3125			1777	1524
Flt Permitted	0.30	1.00		0.49	1.00			0.92			0.69	1.00
Satd. Flow (perm)	557	3539		909	3443			2887			1290	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	375	0	17	484	95	9	10	38	290	15	52
RTOR Reduction (vph)	0	0	0	0	34	0	0	16	0	0	0	21
Lane Group Flow (vph)	13	375	0	17	545	0	0	41	0	0	305	31
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	15.0	15.0		15.0	15.0			35.5			35.5	35.5
Effective Green, g (s)	15.0	15.0		15.0	15.0			35.5			35.5	35.5
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.59			0.59	0.59
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	139	884		227	860			1708			763	901
v/s Ratio Prot		0.11			c0.16							
v/s Ratio Perm	0.02			0.02				0.01			c0.24	0.02
v/c Ratio	0.09	0.42		0.07	0.63			0.02			0.40	0.03
Uniform Delay, d1	17.3	18.9		17.2	20.1			5.1			6.6	5.1
Progression Factor	0.82	0.84		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.3	0.3		0.1	1.5			0.0			1.6	0.1
Delay (s)	14.5	16.2		17.3	21.6			5.1			8.1	5.2
Level of Service	B	B		B	C			A			A	A
Approach Delay (s)		16.1			21.5			5.1			7.7	
Approach LOS		B			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		15.8			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.47										
Actuated Cycle Length (s)		60.0			Sum of lost time (s)			9.5				
Intersection Capacity Utilization		62.2%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	12	16	27	8	100	2	330	54	84	445	16
Future Volume (vph)	23	12	16	27	8	100	2	330	54	84	445	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	10	11	16
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.96			1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected		0.98			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1737			1792	1794	1770	3912		1652	3404	
Flt Permitted		0.84			0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1484			1822	1794	1770	3912		1652	3404	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	13	17	29	9	109	2	359	59	91	484	17
RTOR Reduction (vph)	0	15	0	0	0	98	0	19	0	0	3	0
Lane Group Flow (vph)	0	40	0	0	38	11	2	399	0	91	498	0
Confl. Peds. (#/hr)			4	4					3			
Confl. Bikes (#/hr)			1						2			
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		3.6			3.6	3.6	0.6	15.9		4.0	19.3	
Effective Green, g (s)		3.6			3.6	3.6	0.6	15.9		4.0	19.3	
Actuated g/C Ratio		0.10			0.10	0.10	0.02	0.43		0.11	0.52	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		143			176	173	28	1672		177	1766	
v/s Ratio Prot							0.00	0.10		c0.06	c0.15	
v/s Ratio Perm		c0.03			0.02	0.01						
v/c Ratio		0.28			0.22	0.06	0.07	0.24		0.51	0.28	
Uniform Delay, d1		15.6			15.5	15.3	18.0	6.8		15.7	5.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			0.2	0.1	1.1	0.1		2.5	0.1	
Delay (s)		16.0			15.7	15.3	19.1	6.9		18.2	5.1	
Level of Service		B			B	B	B	A		B	A	
Approach Delay (s)		16.0			15.4			6.9			7.1	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		8.5										
HCM 2000 Volume to Capacity ratio		0.32										
Actuated Cycle Length (s)		37.2										
Intersection Capacity Utilization		38.3%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	130	22	34	112	0	19	0	28	0	0	0
Future Volume (Veh/h)	0	130	22	34	112	0	19	0	28	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	141	24	37	122	0	21	0	30	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		252										
pX, platoon unblocked												
vC, conflicting volume	122			165			349	349	153	379	361	122
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	122			165			349	349	153	379	361	122
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			96	100	97	100	100	100
cM capacity (veh/h)	1465			1413			594	560	893	548	551	929
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	165	159	51	0								
Volume Left	0	37	21	0								
Volume Right	24	0	30	0								
cSH	1465	1413	739	1700								
Volume to Capacity	0.00	0.03	0.07	0.00								
Queue Length 95th (ft)	0	2	6	0								
Control Delay (s)	0.0	1.9	10.2	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	1.9	10.2	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			29.3%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Dittmar St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	63	10	2	45	1	17	0	7	1	0	1
Future Volume (Veh/h)	1	63	10	2	45	1	17	0	7	1	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	68	11	2	49	1	18	0	8	1	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	50			79			130	130	74	137	134	50
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	50			79			130	130	74	137	134	50
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	99	100	100	100
cM capacity (veh/h)	1557			1519			841	760	988	826	755	1019
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	80	52	26	2								
Volume Left	1	2	18	1								
Volume Right	11	1	8	1								
cSH	1557	1519	881	912								
Volume to Capacity	0.00	0.00	0.03	0.00								
Queue Length 95th (ft)	0	0	2	0								
Control Delay (s)	0.1	0.3	9.2	9.0								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.1	0.3	9.2	9.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			14.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	36	87	14	36	108	14
Future Volume (vph)	36	87	14	36	108	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	95	15	39	117	15
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	134	54	132			
Volume Left (vph)	39	0	117			
Volume Right (vph)	95	39	0			
Hadj (s)	-0.33	-0.40	0.21			
Departure Headway (s)	4.0	3.9	4.4			
Degree Utilization, x	0.15	0.06	0.16			
Capacity (veh/h)	864	870	783			
Control Delay (s)	7.7	7.2	8.3			
Approach Delay (s)	7.7	7.2	8.3			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.9			
Level of Service			A			
Intersection Capacity Utilization			27.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	101	76	12	67	3	57	8	12	12	9	4
Future Volume (Veh/h)	3	101	76	12	67	3	57	8	12	12	9	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	110	83	13	73	3	62	9	13	13	10	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					576							
pX, platoon unblocked												
vC, conflicting volume	76			193			267	260	152	276	300	74
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			193			267	260	152	276	300	74
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			91	99	99	98	98	100
cM capacity (veh/h)	1523			1380			668	638	895	654	606	987
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	196	89	84	27								
Volume Left	3	13	62	13								
Volume Right	83	3	13	4								
cSH	1523	1380	692	668								
Volume to Capacity	0.00	0.01	0.12	0.04								
Queue Length 95th (ft)	0	1	10	3								
Control Delay (s)	0.1	1.2	10.9	10.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	1.2	10.9	10.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			24.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	127	4	3	79	2	1	1	8	1	1	1
Future Volume (Veh/h)	0	127	4	3	79	2	1	1	8	1	1	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	138	4	3	86	2	1	1	9	1	1	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)	249											
pX, platoon unblocked												
vC, conflicting volume	88			142			234	234	140	242	235	87
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	88			142			234	234	140	242	235	87
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	100	100	100
cM capacity (veh/h)	1508			1441			717	665	908	702	664	971
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	142	91	11	3								
Volume Left	0	3	1	1								
Volume Right	4	2	9	1								
cSH	1508	1441	859	758								
Volume to Capacity	0.00	0.00	0.01	0.00								
Queue Length 95th (ft)	0	0	1	0								
Control Delay (s)	0.0	0.3	9.2	9.8								
Lane LOS		A	A	A								
Approach Delay (s)	0.0	0.3	9.2	9.8								
Approach LOS			A	A								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			16.9%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↕		↔	↕	
Traffic Volume (vph)	58	78	52	59	36	18	65	278	34	42	305	13
Future Volume (vph)	58	78	52	59	36	18	65	278	34	42	305	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.6			5.0		4.2	5.0		4.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.96			0.98		1.00	0.98		1.00	0.99	
Flt Protected		0.98			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1766			1776		1770	3481		1770	3518	
Flt Permitted		0.86			0.77		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1550			1401		1770	3481		1770	3518	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	85	57	64	39	20	71	302	37	46	332	14
RTOR Reduction (vph)	0	22	0	0	10	0	0	14	0	0	4	0
Lane Group Flow (vph)	0	183	0	0	113	0	71	325	0	46	342	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		8.6			8.2		4.4	18.3		1.9	15.6	
Effective Green, g (s)		8.6			8.2		4.4	18.3		1.9	15.6	
Actuated g/C Ratio		0.20			0.19		0.10	0.43		0.04	0.37	
Clearance Time (s)		4.6			5.0		4.2	5.0		4.0	5.0	
Vehicle Extension (s)		3.0			3.5		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		314			270		183	1502		79	1294	
v/s Ratio Prot							c0.04	0.09		c0.03	c0.10	
v/s Ratio Perm		c0.12			0.08							
v/c Ratio		0.58			0.42		0.39	0.22		0.58	0.26	
Uniform Delay, d1		15.3			15.0		17.7	7.6		19.9	9.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.8			1.2		0.5	0.1		10.5	0.1	
Delay (s)		18.0			16.2		18.2	7.6		30.3	9.5	
Level of Service		B			B		B	A		C	A	
Approach Delay (s)		18.0			16.2			9.5			11.9	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			12.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			42.4			Sum of lost time (s)			14.2			
Intersection Capacity Utilization			35.3%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	87	22	26	50	12	9	23	22	9	19	17
Future Volume (Veh/h)	15	87	22	26	50	12	9	23	22	9	19	17
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	95	24	28	54	13	10	25	24	10	21	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	280											
pX, platoon unblocked												
vC, conflicting volume	67			119			284	262	107	292	268	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	67			119			284	262	107	292	268	60
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			98	96	97	98	97	98
cM capacity (veh/h)	1535			1469			625	624	947	610	620	1005
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	135	95	59	49								
Volume Left	16	28	10	10								
Volume Right	24	13	24	18								
cSH	1535	1469	725	719								
Volume to Capacity	0.01	0.02	0.08	0.07								
Queue Length 95th (ft)	1	1	7	5								
Control Delay (s)	0.9	2.3	10.4	10.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.9	2.3	10.4	10.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			20.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	51	6	4	31	1	5	8	8	4	4	2
Future Volume (vph)	2	51	6	4	31	1	5	8	8	4	4	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	55	7	4	34	1	5	9	9	4	4	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	64	39	23	10								
Volume Left (vph)	2	4	5	4								
Volume Right (vph)	7	1	9	2								
Hadj (s)	-0.03	0.04	-0.16	-0.01								
Departure Headway (s)	4.0	4.1	4.0	4.1								
Degree Utilization, x	0.07	0.04	0.03	0.01								
Capacity (veh/h)	889	871	873	844								
Control Delay (s)	7.3	7.3	7.1	7.2								
Approach Delay (s)	7.3	7.3	7.1	7.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.2								
Level of Service				A								
Intersection Capacity Utilization				13.5%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	6	100	3	20	46	16	3	43	82	124	8	6
Future Volume (vph)	6	100	3	20	46	16	3	43	82	124	8	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	109	3	22	50	17	3	47	89	135	9	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	119	89	139	151								
Volume Left (vph)	7	22	3	135								
Volume Right (vph)	3	17	89	7								
Hadj (s)	0.03	-0.03	-0.35	0.18								
Departure Headway (s)	4.7	4.7	4.3	4.8								
Degree Utilization, x	0.16	0.12	0.16	0.20								
Capacity (veh/h)	707	707	796	714								
Control Delay (s)	8.6	8.3	8.1	8.9								
Approach Delay (s)	8.6	8.3	8.1	8.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.5									
Level of Service			A									
Intersection Capacity Utilization			36.2%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	45	27	11	50	54
Future Volume (vph)	0	45	27	11	50	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	49	29	12	54	59
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	49	41	113			
Volume Left (vph)	0	0	54			
Volume Right (vph)	49	12	0			
Hadj (s)	-0.57	-0.14	0.13			
Departure Headway (s)	3.7	4.0	4.2			
Degree Utilization, x	0.05	0.05	0.13			
Capacity (veh/h)	938	881	850			
Control Delay (s)	6.9	7.2	7.8			
Approach Delay (s)	6.9	7.2	7.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.4			
Level of Service			A			
Intersection Capacity Utilization			15.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	116	38	231	47	195	28	198	110	166	279	6
Future Volume (vph)	15	116	38	231	47	195	28	198	110	166	279	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	16	16	16
Total Lost time (s)	5.0	5.0	5.0		4.9	4.9	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.95		1.00	1.00	
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2006	1863	1555		1788	1794	1770	3741		2006	3998	
Flt Permitted	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	2006	1863	1555		1788	1794	1770	3741		2006	3998	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	126	41	251	51	212	30	215	120	180	303	7
RTOR Reduction (vph)	0	0	37	0	0	131	0	59	0	0	1	0
Lane Group Flow (vph)	16	126	4	0	302	81	30	276	0	180	309	0
Confl. Peds. (#/hr)			2	2					5			
Confl. Bikes (#/hr)									4			
Turn Type	Split	NA	Perm	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	9.8	9.8	9.8		22.1	38.7	3.2	33.7		16.6	47.1	
Effective Green, g (s)	9.8	9.8	9.8		22.1	38.7	3.2	33.7		16.6	47.1	
Actuated g/C Ratio	0.10	0.10	0.10		0.22	0.38	0.03	0.33		0.16	0.46	
Clearance Time (s)	5.0	5.0	5.0		4.9		4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	194	180	150		390	685	55	1244		328	1858	
v/s Ratio Prot	0.01	c0.07			c0.17	0.05	0.02	c0.07		c0.09	0.08	
v/s Ratio Perm			0.00									
v/c Ratio	0.08	0.70	0.03		0.77	0.12	0.55	0.22		0.55	0.17	
Uniform Delay, d1	41.7	44.3	41.4		37.3	20.3	48.3	24.4		38.9	15.7	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	9.2	0.0		9.3	0.1	5.8	0.4		1.9	0.2	
Delay (s)	41.7	53.5	41.5		46.5	20.3	54.1	24.8		40.8	15.9	
Level of Service	D	D	D		D	C	D	C		D	B	
Approach Delay (s)		49.8			35.7			27.2			25.0	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			32.0									
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			101.3									
Intersection Capacity Utilization			56.2%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St

12/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	389	5	16	579	33	0	0	26	18	0	20
Future Volume (Veh/h)	5	389	5	16	579	33	0	0	26	18	0	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	423	5	17	629	36	0	0	28	20	0	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh					2							
Upstream signal (ft)		312										
pX, platoon unblocked				0.94			0.94	0.94	0.94	0.94	0.94	
vC, conflicting volume	665			428			1138	1134	426	1144	1119	647
vC1, stage 1 conf vol							436	436		681	681	
vC2, stage 2 conf vol							703	699		464	438	
vCu, unblocked vol	665			358			1115	1111	355	1121	1094	647
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			100	100	96	94	100	95
cM capacity (veh/h)	924			1127			353	376	646	363	381	471
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	433	682	28	42								
Volume Left	5	17	0	20								
Volume Right	5	36	28	22								
cSH	924	1127	646	413								
Volume to Capacity	0.01	0.02	0.04	0.10								
Queue Length 95th (ft)	0	1	3	8								
Control Delay (s)	0.2	0.4	10.8	14.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.4	10.8	14.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			57.5%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

12/21/2016

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (veh/h)	7	481	10	31	758	18	10	4	66	22	4	11		
Future Volume (Veh/h)	7	481	10	31	758	18	10	4	66	22	4	11		
Sign Control	Free			Free			Stop			Stop				
Grade	0%			0%			0%			0%				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	8	523	11	34	824	20	11	4	72	24	4	12		
Pedestrians	1						1							
Lane Width (ft)	12.0						12.0							
Walking Speed (ft/s)	4.0						4.0							
Percent Blockage	0						0							
Right turn flare (veh)														
Median type	TWLTL			TWLTL										
Median storage veh	2			2										
Upstream signal (ft)	687													
pX, platoon unblocked				0.96			0.96			0.96	0.96	0.96		
vC, conflicting volume	844			535			1452			1458	530	1515	1453	835
vC1, stage 1 conf vol							546			546	902		902	
vC2, stage 2 conf vol							907			912	613		551	
vCu, unblocked vol	844			494			1450			1456	488	1516	1451	835
tC, single (s)	4.1			4.1			7.1			6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1			5.5	6.1		5.5	
tF (s)	2.2			2.2			3.5			4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			97			96			99	87	90	99	97
cM capacity (veh/h)	792			1025			264			292	556	251	293	367
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1								
Volume Total	8	534	34	844	87	40								
Volume Left	8	0	34	0	11	24								
Volume Right	0	11	0	20	72	12								
cSH	792	1700	1025	1700	470	281								
Volume to Capacity	0.01	0.31	0.03	0.50	0.18	0.14								
Queue Length 95th (ft)	1	0	3	0	17	12								
Control Delay (s)	9.6	0.0	8.6	0.0	14.4	19.9								
Lane LOS	A		A		B	C								
Approach Delay (s)	0.1		0.3		14.4	19.9								
Approach LOS					B	C								
Intersection Summary														
Average Delay				1.6										
Intersection Capacity Utilization				54.6%			ICU Level of Service			A				
Analysis Period (min)				15										

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

12/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	650	0	0	838	106	0	0	0	0	0	18
Future Volume (Veh/h)	22	650	0	0	838	106	0	0	0	0	0	18
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	707	0	0	911	115	0	0	0	0	0	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL				TWLTL							
Median storage veh	2				2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1026			707			1686	1781	707	1724	1724	968
vC1, stage 1 conf vol							755	755		968	968	
vC2, stage 2 conf vol							931	1026		755	755	
vCu, unblocked vol	1026			707			1686	1781	707	1724	1724	968
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			100	100	100	100	100	94
cM capacity (veh/h)	677			891			227	240	435	242	263	308
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	24	707	0	1026	0	20						
Volume Left	24	0	0	0	0	0						
Volume Right	0	0	0	115	0	20						
cSH	677	1700	1700	1700	1700	308						
Volume to Capacity	0.04	0.42	0.00	0.60	0.00	0.06						
Queue Length 95th (ft)	3	0	0	0	0	5						
Control Delay (s)	10.5	0.0	0.0	0.0	0.0	17.5						
Lane LOS	B				A	C						
Approach Delay (s)	0.3		0.0		0.0	17.5						
Approach LOS					A	C						
Intersection Summary												
Average Delay				0.3								
Intersection Capacity Utilization				60.5%	ICU Level of Service			B				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

9/1/2016

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	0	0	67	0	0	58	28	270	23	41	612	10	
Future Volume (Veh/h)	0	0	67	0	0	58	28	270	23	41	612	10	
Sign Control		Stop			Stop			Free			Free		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	0	0	73	0	0	63	30	293	25	45	665	11	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type								TWLT					TWLT
Median storage veh								2					2
Upstream signal (ft)													621
pX, platoon unblocked													
vC, conflicting volume	1030	1138	670	1194	1132	159	676						318
vC1, stage 1 conf vol	760	760		366	366								
vC2, stage 2 conf vol	270	378		828	766								
vCu, unblocked vol	1030	1138	670	1194	1132	159	676						318
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1						4.1
tC, 2 stage (s)	6.5	5.5		6.5	5.5								
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2						2.2
p0 queue free %	100	100	82	100	100	93	97						96
cM capacity (veh/h)	322	352	399	220	337	858	911						1239
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2						
Volume Total	73	63	30	195	123	45	676						
Volume Left	0	0	30	0	0	45	0						
Volume Right	73	63	0	0	25	0	11						
cSH	399	858	911	1700	1700	1239	1700						
Volume to Capacity	0.18	0.07	0.03	0.11	0.07	0.04	0.40						
Queue Length 95th (ft)	17	6	3	0	0	3	0						
Control Delay (s)	16.0	9.5	9.1	0.0	0.0	8.0	0.0						
Lane LOS	C	A	A					A					
Approach Delay (s)	16.0	9.5	0.8					0.5					
Approach LOS	C	A											
Intersection Summary													
Average Delay			2.0										
Intersection Capacity Utilization			43.6%	ICU Level of Service				A					
Analysis Period (min)			15										

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Michigan Avenue
E/W Street Name	Michigan Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	84	15	36	0	48	15	8	0	22	243	6	0	6	238	26
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	93	17	40	0	53	17	9	0	24	269	7	0	7	264	29
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		150			79			300			300	
Entry Volume veh/h		147			77			294			294	
Circulating Flow (Vc), pc/h	324			386			117			94		
Exiting Flow (Vex), pc/h	31			70			371			357		
Capacity (cPCE), pc/h		817			768			1005			1029	
Capacity (c), veh/h		801			753			986			1008	
v/c Ratio (X)		0.18			0.10			0.30			0.29	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.4			5.8			6.7			6.5	
Lane LOS		A			A			A			A	
95% Queue		0.7			0.3			1.3			1.2	
Approach Delay, s/veh	6.4			5.8			6.7			6.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	6.5						A					

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - West
E/W Street Name	West Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	17	10	14	0	18	10	21	0	14	120	18	0	21	120	16
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	19	11	16	0	20	11	23	0	16	133	20	0	23	133	18
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		46			54			169			174	
Entry Volume veh/h		45			53			166			171	
Circulating Flow (Vc), pc/h	176			168			53			47		
Exiting Flow (Vex), pc/h	54			45			175			169		
Capacity (cPCE), pc/h		948			955			1072			1078	
Capacity (c), veh/h		929			937			1051			1057	
v/c Ratio (X)		0.05			0.06			0.16			0.16	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.3			4.4			4.9			4.9	
Lane LOS		A			A			A			A	
95% Queue		0.2			0.2			0.6			0.6	
Approach Delay, s/veh	4.3			4.4			4.9			4.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	4.7						A					

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Kelly
E/W Street Name	Kelly Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	13	17	11	0	12	10	89	0	4	141	12	0	81	134	27
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	14	19	12	0	13	11	99	0	4	156	13	0	90	149	30
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		45			123			173			269	
Entry Volume veh/h		44			121			170			264	
Circulating Flow (Vc), pc/h	252			174			123			28		
Exiting Flow (Vex), pc/h	122			45			269			174		
Capacity (cPCE), pc/h		878			950			999			1099	
Capacity (c), veh/h		861			931			980			1077	
v/c Ratio (X)		0.05			0.13			0.17			0.24	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.7			5.1			5.3			5.6	
Lane LOS		A			A			A			A	
95% Queue		0.2			0.4			0.6			1.0	
Approach Delay, s/veh	4.7			5.1			5.3			5.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	5.4						A					

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

06/29/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	150	6	32	7	66	8	22	737	18
Future Volume (veh/h)	0	0	0	150	6	32	7	66	8	22	737	18
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h				168	0	0	8	72	0	24	801	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				1328	0	593	148	1692	527	148	1178	527
Arrive On Green				0.36	0.00	0.00	0.08	0.32	0.00	0.08	0.32	0.00
Sat Flow, veh/h				3690	0	1647	1845	5289	1647	1845	3681	1647
Grp Volume(v), veh/h				168	0	0	8	72	0	24	801	0
Grp Sat Flow(s),veh/h/ln				1845	0	1647	1845	1763	1647	1845	1840	1647
Q Serve(g_s), s				1.5	0.0	0.0	0.2	0.5	0.0	0.6	9.5	0.0
Cycle Q Clear(g_c), s				1.5	0.0	0.0	0.2	0.5	0.0	0.6	9.5	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				1328	0	593	148	1692	527	148	1178	527
V/C Ratio(X)				0.13	0.00	0.00	0.05	0.04	0.00	0.16	0.68	0.00
Avail Cap(c_a), veh/h				1328	0	593	148	1692	527	148	1178	527
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				10.7	0.0	0.0	21.3	11.7	0.0	21.4	14.8	0.0
Incr Delay (d2), s/veh				0.2	0.0	0.0	0.7	0.0	0.0	2.4	3.2	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.8	0.0	0.0	0.1	0.2	0.0	0.4	5.3	0.0
LnGrp Delay(d),s/veh				10.9	0.0	0.0	21.9	11.8	0.0	23.8	18.0	0.0
LnGrp LOS				B			C	B		C	B	
Approach Vol, veh/h					168			80			825	
Approach Delay, s/veh					10.9			12.8			18.1	
Approach LOS					B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	8.0	20.0			8.0	20.0		22.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	16.0			4.0	16.0		18.0				
Max Q Clear Time (g_c+I1), s	2.6	2.5			2.2	11.5		3.5				
Green Ext Time (p_c), s	0.0	0.2			0.0	2.2		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				16.6								
HCM 2010 LOS				B								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↗	↖↖	↑↑					
Traffic Volume (veh/h)	531	188	479	1082	0	0			
Future Volume (veh/h)	531	188	479	1082	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937					
Adj Flow Rate, veh/h	577	204	521	1176					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	1840	823	1074	3313					
Arrive On Green	0.50	0.50	0.30	0.90					
Sat Flow, veh/h	3778	1647	3579	3778					
Grp Volume(v), veh/h	577	204	521	1176					
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840					
Q Serve(g_s), s	3.7	2.8	4.8	1.9					
Cycle Q Clear(g_c), s	3.7	2.8	4.8	1.9					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	1840	823	1074	3313					
V/C Ratio(X)	0.31	0.25	0.49	0.35					
Avail Cap(c_a), veh/h	1840	823	1074	3313					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	5.9	5.7	11.5	0.3					
Incr Delay (d2), s/veh	0.4	0.7	1.6	0.3					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	2.0	1.4	2.5	1.0					
LnGrp Delay(d),s/veh	6.4	6.4	13.0	0.6					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	781			1697					
Approach Delay, s/veh	6.4			4.4					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			16.0	24.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			12.0	20.0				36.0	
Max Q Clear Time (g_c+l1), s			6.8	5.7				3.9	
Green Ext Time (p_c), s			1.0	4.0				10.8	
Intersection Summary									
HCM 2010 Ctrl Delay			5.0						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/11/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↖	↑↑	↖	↗		
Traffic Volume (veh/h)	640	67	807	1970	67	1		
Future Volume (veh/h)	640	67	807	1970	67	1		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	696	73	877	2141	73	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	982	439	954	2208	492	439		
Arrive On Green	0.27	0.27	0.27	0.60	0.27	0.00		
Sat Flow, veh/h	3778	1647	3579	3778	1845	1647		
Grp Volume(v), veh/h	696	73	877	2141	73	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840	1845	1647		
Q Serve(g_s), s	10.3	2.0	14.3	33.4	1.8	0.0		
Cycle Q Clear(g_c), s	10.3	2.0	14.3	33.4	1.8	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	982	439	954	2208	492	439		
V/C Ratio(X)	0.71	0.17	0.92	0.97	0.15	0.00		
Avail Cap(c_a), veh/h	982	439	954	2208	492	439		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	19.9	16.9	21.4	11.5	16.8	0.0		
Incr Delay (d2), s/veh	4.3	0.8	15.1	13.2	0.6	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.8	1.0	8.9	20.4	1.0	0.0		
LnGrp Delay(d),s/veh	24.2	17.7	36.5	24.7	17.4	0.0		
LnGrp LOS	C	B	D	C	B			
Approach Vol, veh/h	769			3018	73			
Approach Delay, s/veh	23.6			28.1	17.4			
Approach LOS	C			C	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	20.0	20.0				40.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	16.0	16.0				36.0
Max Q Clear Time (g_c+I1), s		3.8	16.3	12.3				35.4
Green Ext Time (p_c), s		0.1	0.0	1.7				0.6
Intersection Summary								
HCM 2010 Ctrl Delay			27.0					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary
51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	287	3	92	499	172	10	0	111	22	31	32
Future Volume (veh/h)	0	287	3	92	499	172	10	0	111	22	31	32
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1937	1976	1937	1937	1937	1937	0	1937	1937	1937	1937
Adj Flow Rate, veh/h	0	312	3	100	542	0	11	0	121	24	34	35
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1149	11	284	1982	887	0	0	0	568	596	507
Arrive On Green	0.00	0.31	0.31	0.15	0.54	0.00	0.00	0.00	0.00	0.31	0.31	0.31
Sat Flow, veh/h	0	3832	36	1845	3681	1647		0		1845	1937	1647
Grp Volume(v), veh/h	0	154	161	100	542	0		0.0		24	34	35
Grp Sat Flow(s),veh/h/ln	0	1840	1931	1845	1840	1647				1845	1937	1647
Q Serve(g_s), s	0.0	3.3	3.3	2.5	4.1	0.0				0.5	0.6	0.8
Cycle Q Clear(g_c), s	0.0	3.3	3.3	2.5	4.1	0.0				0.5	0.6	0.8
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	566	594	284	1982	887				568	596	507
V/C Ratio(X)	0.00	0.27	0.27	0.35	0.27	0.00				0.04	0.06	0.07
Avail Cap(c_a), veh/h	0	566	594	284	1982	887				568	596	507
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	13.6	13.6	19.7	6.5	0.0				12.6	12.7	12.7
Incr Delay (d2), s/veh	0.0	1.2	1.1	3.4	0.3	0.0				0.1	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.8	1.9	1.5	2.1	0.0				0.3	0.4	0.4
LnGrp Delay(d),s/veh	0.0	14.8	14.7	23.1	6.8	0.0				12.8	12.9	13.0
LnGrp LOS		B	B	C	A					B	B	B
Approach Vol, veh/h		315			642						93	
Approach Delay, s/veh		14.7			9.4						12.9	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			12.0	20.0		20.0		32.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			8.0	16.0		16.0		28.0				
Max Q Clear Time (g_c+I1), s			4.5	5.3		2.8		6.1				
Green Ext Time (p_c), s			0.1	1.3		0.2		3.7				
Intersection Summary												
HCM 2010 Ctrl Delay			11.3									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/13/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	465	5	9	612	355	10	10	19	138	2	57
Future Volume (veh/h)	230	465	5	9	612	355	10	10	19	138	2	57
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1976	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	250	505	5	10	665	386	11	11	21	107	62	62
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	158	960	10	105	841	376	216	216	376	422	203	203
Arrive On Green	0.09	0.26	0.26	0.02	0.08	0.08	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	3734	37	1845	3681	1647	945	945	1647	1845	890	890
Grp Volume(v), veh/h	250	249	261	10	665	386	22	0	21	107	0	124
Grp Sat Flow(s),veh/h/ln	1845	1840	1931	1845	1840	1647	1890	0	1647	1845	0	1780
Q Serve(g_s), s	6.0	8.1	8.1	0.4	12.4	16.0	0.6	0.0	0.7	3.3	0.0	4.0
Cycle Q Clear(g_c), s	6.0	8.1	8.1	0.4	12.4	16.0	0.6	0.0	0.7	3.3	0.0	4.0
Prop In Lane	1.00		0.02	1.00		1.00	0.50		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	158	473	496	105	841	376	432	0	376	422	0	407
V/C Ratio(X)	1.58	0.53	0.53	0.09	0.79	1.03	0.05	0.00	0.06	0.25	0.00	0.30
Avail Cap(c_a), veh/h	158	473	496	105	841	376	432	0	376	422	0	407
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.0	22.3	22.3	32.6	30.7	32.4	21.1	0.0	21.1	22.1	0.0	22.4
Incr Delay (d2), s/veh	289.4	4.1	4.0	1.8	7.5	53.1	0.2	0.0	0.3	1.4	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.7	4.6	4.8	0.2	7.2	12.8	0.4	0.0	0.3	1.9	0.0	2.2
LnGrp Delay(d),s/veh	321.4	26.5	26.3	34.3	38.2	85.4	21.3	0.0	21.4	23.6	0.0	24.3
LnGrp LOS	F	C	C	C	D	F	C		C	C		C
Approach Vol, veh/h		760			1061			43			231	
Approach Delay, s/veh		123.4			55.3			21.3			24.0	
Approach LOS		F			E			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	8.0	22.0		20.0	10.0	20.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	4.0	18.0		16.0	6.0	16.0				
Max Q Clear Time (g_c+I1), s		2.7	2.4	10.1		6.0	8.0	18.0				
Green Ext Time (p_c), s		0.1	0.0	1.9		0.7	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				75.9								
HCM 2010 LOS				E								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Future Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	82	427	316	91	846	199	210	238	87	246	297	211
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	492	362	132	894	400	422	443	376	422	443	376
Arrive On Green	0.02	0.08	0.08	0.07	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	2026	1489	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	82	388	355	91	846	199	210	238	87	246	297	211
Grp Sat Flow(s),veh/h/ln	1845	1840	1674	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	3.1	14.6	14.7	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Cycle Q Clear(g_c), s	3.1	14.6	14.7	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Prop In Lane	1.00		0.89	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	132	447	407	132	894	400	422	443	376	422	443	376
V/C Ratio(X)	0.62	0.87	0.87	0.69	0.95	0.50	0.50	0.54	0.23	0.58	0.67	0.56
Avail Cap(c_a), veh/h	132	447	407	132	894	400	422	443	376	422	443	376
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	31.1	31.1	31.7	26.1	22.8	23.5	23.7	22.0	24.0	24.6	23.9
Incr Delay (d2), s/veh	20.1	19.8	22.1	25.7	19.6	4.4	4.2	4.6	1.4	5.8	7.9	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	9.9	9.3	2.7	10.4	3.8	4.0	4.6	1.5	4.9	6.2	4.2
LnGrp Delay(d),s/veh	53.4	50.8	53.2	57.5	45.7	27.2	27.7	28.4	23.4	29.8	32.5	29.8
LnGrp LOS	D	D	D	E	D	C	C	C	C	C	C	C
Approach Vol, veh/h		825			1136			535			754	
Approach Delay, s/veh		52.1			43.4			27.3			30.9	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	9.0	21.0		20.0	9.0	21.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	5.0	17.0		16.0	5.0	17.0				
Max Q Clear Time (g_c+I1), s		9.6	5.4	16.7		11.8	5.1	17.8				
Green Ext Time (p_c), s		1.3	0.0	0.2		1.4	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			40.0									
HCM 2010 LOS			D									
Notes												

Intersection

Intersection Delay, s/veh 7.7

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	86	7	16	65	39	2	5	6	0	0	0
Future Vol, veh/h	25	86	7	16	65	39	2	5	6	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	93	8	17	71	42	2	5	7	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.8	7.6	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	15%	21%	13%
Vol Thru, %	38%	73%	54%
Vol Right, %	46%	6%	33%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	13	118	120
LT Vol	2	25	16
Through Vol	5	86	65
RT Vol	6	7	39
Lane Flow Rate	14	128	130
Geometry Grp	1	1	1
Degree of Util (X)	0.017	0.145	0.141
Departure Headway (Hd)	4.232	4.064	3.887
Convergence, Y/N	Yes	Yes	Yes
Cap	851	881	920
Service Time	2.232	2.093	1.921
HCM Lane V/C Ratio	0.016	0.145	0.141
HCM Control Delay	7.3	7.8	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.5	0.5

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖						↖	↗
Traffic Vol, veh/h	0	148	69	50	59	0	0	0	0	17	0	55
Future Vol, veh/h	0	148	69	50	59	0	0	0	0	17	0	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	161	75	54	64	0	0	0	0	18	0	60
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	161	0	0				333	333	64
Stage 1	-	-	-	-	-	-				172	172	-
Stage 2	-	-	-	-	-	-				161	161	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1418	-	0				662	587	1000
Stage 1	0	-	-	-	-	0				858	756	-
Stage 2	0	-	-	-	-	0				868	765	-
Platoon blocked, %	-	-	-	-	-	-				-	-	-
Mov Cap-1 Maneuver	-	-	-	1418	-	-				636	0	1000
Mov Cap-2 Maneuver	-	-	-	-	-	-				636	0	-
Stage 1	-	-	-	-	-	-				825	0	-
Stage 2	-	-	-	-	-	-				868	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.5			9.3					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2						
Capacity (veh/h)	-	-	1418	-	636	1000						
HCM Lane V/C Ratio	-	-	0.038	-	0.029	0.06						
HCM Control Delay (s)	-	-	7.6	0	10.8	8.8						
HCM Lane LOS	-	-	A	A	B	A						
HCM 95th %tile Q(veh)	-	-	0.1	-	0.1	0.2						

HCM 2010 Signalized Intersection Summary

56: I-5 SB On/Off-Ramp & Vista Way

06/29/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑	↑	↑↑		
Traffic Volume (veh/h)	518	201	1018	1229	17	967		
Future Volume (veh/h)	518	201	1018	1229	17	967		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	563	0	1107	1336	18	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	883	395	1384	1317	394	618		
Arrive On Green	0.24	0.00	0.39	0.68	0.21	0.00		
Sat Flow, veh/h	3778	1647	3579	1937	1845	2898		
Grp Volume(v), veh/h	563	0	1107	1336	18	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1937	1845	1449		
Q Serve(g_s), s	10.3	0.0	20.6	51.0	0.6	0.0		
Cycle Q Clear(g_c), s	10.3	0.0	20.6	51.0	0.6	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	883	395	1384	1317	394	618		
V/C Ratio(X)	0.64	0.00	0.80	1.01	0.05	0.00		
Avail Cap(c_a), veh/h	883	395	1384	1317	394	618		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	25.6	0.0	20.4	12.0	23.4	0.0		
Incr Delay (d2), s/veh	3.5	0.0	4.9	28.4	0.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.7	0.0	11.1	36.7	0.3	0.0		
LnGrp Delay(d),s/veh	29.1	0.0	25.4	40.4	23.7	0.0		
LnGrp LOS	C		C	F	C			
Approach Vol, veh/h	563			2443	18			
Approach Delay, s/veh	29.1			33.6	23.7			
Approach LOS	C			C	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	33.0	22.0				55.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	29.0	18.0				51.0
Max Q Clear Time (g_c+I1), s		2.6	22.6	12.3				53.0
Green Ext Time (p_c), s		0.0	2.6	1.8				0.0
Intersection Summary								
HCM 2010 Ctrl Delay			32.7					
HCM 2010 LOS			C					

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	273	107	194	477	306	1676	214	38	179	121	74	78
Future Volume (vph)	273	107	194	477	306	1676	214	38	179	121	74	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3018	1441		1787	1583		1807	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3018	1441		1787	1583		1807	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	297	116	211	518	333	1822	233	41	195	132	80	85
RTOR Reduction (vph)	0	0	189	0	477	481	0	0	122	0	0	73
Lane Group Flow (vph)	297	116	22	518	767	430	0	274	73	0	212	12
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	17.0	9.6	9.6	34.2	28.4	28.4		16.3	16.3		13.1	13.1
Effective Green, g (s)	17.0	9.6	9.6	34.2	28.4	28.4		16.3	16.3		13.1	13.1
Actuated g/C Ratio	0.19	0.10	0.10	0.37	0.31	0.31		0.18	0.18		0.14	0.14
Clearance Time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	328	195	166	661	936	447		318	281		258	226
v/s Ratio Prot	c0.17	0.06		0.29	0.25			c0.15			c0.12	
v/s Ratio Perm			0.01			c0.30			0.05			0.01
v/c Ratio	0.91	0.59	0.13	0.78	0.97dr	0.96		0.86	0.26		0.82	0.05
Uniform Delay, d1	36.5	39.1	37.2	25.4	29.2	31.0		36.5	32.4		38.1	33.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	27.0	3.2	0.1	6.1	7.9	34.2		20.0	0.2		17.8	0.0
Delay (s)	63.5	42.3	37.3	31.4	37.1	65.2		56.5	32.6		55.9	33.9
Level of Service	E	D	D	C	D	E		E	C		E	C
Approach Delay (s)		50.7			45.6			46.5			49.6	
Approach LOS		D			D			D			D	

Intersection Summary

HCM 2000 Control Delay	46.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	91.5	Sum of lost time (s)	18.3
Intersection Capacity Utilization	109.1%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	PM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				T				L			
Volume (V), veh/h	0	0	0	0	0	669	0	323	0	0	437	681	0	557	561	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	0	0	0	0	742	0	351	0	0	484	755	0	618	622	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929		4.2929	4.1129			4.1129		4.2929	4.1129	
Follow-Up Headway (sec)		3.1858		3.1858	3.1858			3.1858		3.1858	3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		0		0	742	351		484	755	618	622	
Entry Volume veh/h		0		0	727	351		475	740	606	610	
Circulating Flow (Vc), pc/h	1982			484			618			742		
Exiting Flow (Vex), pc/h	618			0			484			1364		
Capacity (cPCE), pc/h		156		786	805			733		648	672	
Capacity (c), veh/h		153		771	789			719		635	659	
v/c Ratio (X)		0.00		0.00	0.92			0.66		0.95	0.93	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		23.6		4.7	38.4	0.0		17.5	0.0	50.5	43.8	
Lane LOS		C		A	E	A		C	A	F	E	
95% Queue		0.0		0.0	13.1			5.0		13.4	12.4	
Approach Delay, s/veh				25.9			6.8			47.2		
Approach LOS				D			A			E		
Intersection Delay, s/veh / LOS	26.7						D					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	21	11	91	36	158	17	102	95	182	139	12
Future Volume (vph)	0	21	11	91	36	158	17	102	95	182	139	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	23	12	99	39	172	18	111	103	198	151	13
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	35	310	232	362								
Volume Left (vph)	0	99	18	198								
Volume Right (vph)	12	172	103	13								
Hadj (s)	-0.17	-0.24	-0.22	0.12								
Departure Headway (s)	5.9	5.3	5.2	5.4								
Degree Utilization, x	0.06	0.46	0.34	0.54								
Capacity (veh/h)	496	629	630	640								
Control Delay (s)	9.3	12.7	10.9	14.4								
Approach Delay (s)	9.3	12.7	10.9	14.4								
Approach LOS	A	B	B	B								
Intersection Summary												
Delay				12.8								
Level of Service				B								
Intersection Capacity Utilization				63.5%	ICU Level of Service	B						
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

2/24/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	251	80	104	17	70	42	73	731	26	67	739	181
Future Volume (vph)	251	80	104	17	70	42	73	731	26	67	739	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1795	1583		1769		1770	1853		1770	1863	1583
Flt Permitted		0.70	1.00		0.95		0.14	1.00		0.13	1.00	1.00
Satd. Flow (perm)		1304	1583		1685		256	1853		249	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	273	87	113	18	76	46	79	795	28	73	803	197
RTOR Reduction (vph)	0	0	72	0	29	0	0	2	0	0	0	91
Lane Group Flow (vph)	0	360	41	0	111	0	79	821	0	73	803	106
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		21.7	21.7		21.7		31.1	31.1		32.3	32.3	32.3
Effective Green, g (s)		21.7	21.7		21.7		31.1	31.1		32.3	32.3	32.3
Actuated g/C Ratio		0.36	0.36		0.36		0.52	0.52		0.54	0.54	0.54
Clearance Time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		7.0	7.0	7.0
Lane Grp Cap (vph)		471	572		609		132	960		134	1002	852
v/s Ratio Prot							c0.44				0.43	
v/s Ratio Perm		c0.28	0.03		0.07		0.31			0.29		0.07
v/c Ratio		0.76	0.07		0.18		0.60	0.86		0.54	0.80	0.12
Uniform Delay, d1		16.9	12.5		13.1		10.1	12.5		9.0	11.2	6.9
Progression Factor		1.00	1.00		1.00		1.03	0.95		1.00	1.00	1.00
Incremental Delay, d2		10.0	0.2		0.5		16.4	8.6		15.0	6.7	0.3
Delay (s)		26.9	12.7		13.6		26.7	20.4		24.0	18.0	7.2
Level of Service		C	B		B		C	C		C	B	A
Approach Delay (s)		23.5			13.6			21.0			16.4	
Approach LOS		C			B			C			B	
Intersection Summary												
HCM 2000 Control Delay			19.2			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)				7.2		
Intersection Capacity Utilization			78.7%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Civic Center Drive			
Agency or Co.	IBI Group				E/W Street Name	Civic Center Drive			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	37	40	34	0	37	47	79	0	28	732	68	0	44	764	31
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	41	44	38	0	41	52	88	0	31	812	75	0	49	847	34
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		123			181			918			930	
Entry Volume veh/h		121			177			900			912	
Circulating Flow (Vc), pc/h	937			884			134			124		
Exiting Flow (Vex), pc/h	168			117			941			926		
Capacity (cPCE), pc/h		443			467			988			998	
Capacity (c), veh/h		434			458			969			979	
v/c Ratio (X)		0.28			0.39			0.93			0.93	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		12.8			14.7			34.9			35.1	
Lane LOS		B			B			D			E	
95% Queue		1.1			1.8			14.6			14.8	
Approach Delay, s/veh	12.8			14.7			34.9			35.1		
Approach LOS	B			B			D			E		
Intersection Delay, s/veh / LOS	32.0						D					

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Highway - Pier View Way			
Agency or Co.	IBI Group				E/W Street Name	Pier View Way			
Date Performed	7/12/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	48	38	53	0	23	38	64	0	40	717	53	0	29	717	90
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	53	42	59	0	26	42	71	0	44	795	59	0	32	795	100
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		154			139			898			927	
Entry Volume veh/h		151			136			880			909	
Circulating Flow (Vc), pc/h	853			892			127			112		
Exiting Flow (Vex), pc/h	133			186			919			880		
Capacity (cPCE), pc/h		482			463			995			1010	
Capacity (c), veh/h		472			454			976			990	
v/c Ratio (X)		0.32			0.30			0.90			0.92	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		12.8			12.8			30.7			32.6	
Lane LOS		B			B			D			D	
95% Queue		1.4			1.2			13.2			14.1	
Approach Delay, s/veh	12.8			12.8			30.7			32.6		
Approach LOS	B			B			D			D		
Intersection Delay, s/veh / LOS	29.1						D					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

11/17/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	14	8	114	55	8	13	39	393	26	13	354	12
Future Volume (vph)	14	8	114	55	8	13	39	393	26	13	354	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	9	124	60	9	14	42	427	28	14	385	13
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	24	124	83	256	242	207	206					
Volume Left (vph)	15	0	60	42	0	14	0					
Volume Right (vph)	0	124	14	0	28	0	13					
Hadj (s)	0.35	-0.67	0.08	0.12	-0.05	0.07	-0.01					
Departure Headway (s)	7.2	6.2	6.9	5.9	5.7	6.0	5.9					
Degree Utilization, x	0.05	0.21	0.16	0.42	0.39	0.34	0.34					
Capacity (veh/h)	459	533	477	591	607	581	589					
Control Delay (s)	9.3	9.6	11.2	11.9	11.1	10.8	10.6					
Approach Delay (s)	9.6		11.2	11.5		10.7						
Approach LOS	A		B	B		B						
Intersection Summary												
Delay			11.0									
Level of Service			B									
Intersection Capacity Utilization			44.3%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	293	100	180	204	73	211
Future Volume (vph)	293	100	180	204	73	211
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	318	109	196	222	79	229
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	318	109	418	308		
Volume Left (vph)	318	0	0	79		
Volume Right (vph)	0	109	222	0		
Hadj (s)	0.53	-0.67	-0.28	0.09		
Departure Headway (s)	7.0	5.8	5.5	6.0		
Degree Utilization, x	0.62	0.18	0.64	0.52		
Capacity (veh/h)	482	588	626	569		
Control Delay (s)	19.8	8.9	17.8	15.3		
Approach Delay (s)	17.0		17.8	15.3		
Approach LOS	C		C	C		
Intersection Summary						
Delay			16.8			
Level of Service			C			
Intersection Capacity Utilization			63.3%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	46	0	346	90	311	90	0	0	0	0	135	96
Future Volume (vph)	46	0	346	90	311	90	0	0	0	0	135	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5		4.5	4.5	4.5						4.5	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.97						0.94	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3420						3319	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3420						3319	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	0	376	98	338	98	0	0	0	0	147	104
RTOR Reduction (vph)	0	0	309	71	48	0	0	0	0	0	84	0
Lane Group Flow (vph)	50	0	67	27	388	0	0	0	0	0	167	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	6.8		6.8	10.5	10.5						7.3	
Effective Green, g (s)	6.8		6.8	10.5	10.5						7.3	
Actuated g/C Ratio	0.18		0.18	0.28	0.28						0.19	
Clearance Time (s)	4.5		4.5	4.5	4.5						4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	315		497	487	942						635	
v/s Ratio Prot	c0.03		0.02	0.02	c0.11						c0.05	
v/s Ratio Perm												
v/c Ratio	0.16		0.14	0.06	0.41						0.26	
Uniform Delay, d1	13.2		13.2	10.2	11.3						13.1	
Progression Factor	1.00		1.00	1.00	1.00						1.00	
Incremental Delay, d2	0.2		0.1	0.0	0.3						0.2	
Delay (s)	13.5		13.3	10.2	11.6						13.3	
Level of Service	B		B	B	B						B	
Approach Delay (s)		13.3			11.3			0.0			13.3	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			12.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.30									
Actuated Cycle Length (s)			38.1			Sum of lost time (s)			13.5			
Intersection Capacity Utilization			35.2%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	210	436	77	278	745	0	0	625	197
Future Volume (vph)	0	0	0	210	436	77	278	745	0	0	625	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	0.95
Frpb, ped/bikes				1.00	1.00	0.96	1.00	1.00			1.00	0.96
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	3539	1515	1770	1863			1760	1451
Flt Permitted				0.95	1.00	1.00	0.12	1.00			1.00	1.00
Satd. Flow (perm)				1770	3539	1515	231	1863			1760	1451
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	228	474	84	302	810	0	0	679	214
RTOR Reduction (vph)	0	0	0	0	0	66	0	0	0	0	1	48
Lane Group Flow (vph)	0	0	0	228	474	18	302	810	0	0	699	145
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					6
Actuated Green, G (s)				18.1	18.1	18.1	57.4	57.4			37.1	37.1
Effective Green, g (s)				18.1	18.1	18.1	57.4	57.4			37.1	37.1
Actuated g/C Ratio				0.21	0.21	0.21	0.67	0.67			0.43	0.43
Clearance Time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				374	749	320	430	1250			763	629
v/s Ratio Prot				0.13	c0.13		0.13	c0.43			c0.40	
v/s Ratio Perm						0.01	0.35					0.10
v/c Ratio				0.61	0.63	0.06	0.70	0.65			0.92	0.23
Uniform Delay, d1				30.5	30.7	26.9	25.1	8.2			22.7	15.2
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				7.2	4.0	0.3	5.5	1.3			15.8	0.3
Delay (s)				37.7	34.7	27.2	30.6	9.5			38.6	15.5
Level of Service				D	C	C	C	A			D	B
Approach Delay (s)		0.0			34.8			15.2			33.6	
Approach LOS		A			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			26.6									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			85.5								15.0	Sum of lost time (s)
Intersection Capacity Utilization			79.9%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	151	0	134	744	292	16	82	322	406	54	22
Future Volume (vph)	19	151	0	134	744	292	16	82	322	406	54	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		5.0	5.0	4.0		4.6	4.0	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.97	
Satd. Flow (prot)	1770	3539		1770	3539	1583		1848	1583	1681	1688	
Flt Permitted	0.29	1.00		0.65	1.00	1.00		0.93	1.00	0.69	0.73	
Satd. Flow (perm)	533	3539		1207	3539	1583		1739	1583	1219	1272	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	164	0	146	809	317	17	89	350	441	59	24
RTOR Reduction (vph)	0	0	0	0	0	317	0	0	350	0	7	0
Lane Group Flow (vph)	21	164	0	146	809	0	0	106	0	256	261	0
Turn Type	Perm	NA		Perm	NA	NA	Perm	NA	NA	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	17.2	17.2		16.8	16.8	0.0		16.2	0.0	16.2	16.2	
Effective Green, g (s)	17.2	17.2		16.8	16.8	0.0		16.2	0.0	16.2	16.2	
Actuated g/C Ratio	0.40	0.40		0.39	0.39	0.00		0.38	0.00	0.38	0.38	
Clearance Time (s)	4.6	4.6		5.0	5.0			4.6		4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5			4.0		4.0	4.0	
Lane Grp Cap (vph)	215	1428		476	1395	0		661	0	463	483	
v/s Ratio Prot		0.05			c0.23							
v/s Ratio Perm	0.04			0.12				0.06		c0.21	0.21	
v/c Ratio	0.10	0.11		0.31	0.58	0.00		0.16	0.00	0.55	0.54	
Uniform Delay, d1	7.9	7.9		8.9	10.1	21.3		8.7	21.3	10.4	10.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.0		0.4	0.6	0.0		0.2	0.0	1.8	1.6	
Delay (s)	8.2	8.0		9.3	10.8	21.3		8.9	21.3	12.1	11.8	
Level of Service	A	A		A	B	C		A	C	B	B	
Approach Delay (s)		8.0			13.2			18.4			12.0	
Approach LOS		A			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			13.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			42.6			Sum of lost time (s)			9.6			
Intersection Capacity Utilization			55.7%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

9/1/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↙	
Traffic Volume (veh/h)	321	16	24	66	25	30
Future Volume (Veh/h)	321	16	24	66	25	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	349	17	26	72	27	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				238		
pX, platoon unblocked						
vC, conflicting volume			366		482	358
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			366		482	358
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		95	95
cM capacity (veh/h)			1193		532	687
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	366	98	60			
Volume Left	0	26	27			
Volume Right	17	0	33			
cSH	1700	1193	607			
Volume to Capacity	0.22	0.02	0.10			
Queue Length 95th (ft)	0	2	8			
Control Delay (s)	0.0	2.3	11.6			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.3	11.6			
Approach LOS			B			
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			34.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	355	221	226	0	0	0	94	507	160	170	435	116
Future Volume (vph)	355	221	226	0	0	0	94	507	160	170	435	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.94				1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1493				1770	1863	1552	1770	1863	1516
Flt Permitted	0.95	1.00	1.00				0.49	1.00	1.00	0.19	1.00	1.00
Satd. Flow (perm)	1770	1863	1493				917	1863	1552	347	1863	1516
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	386	240	246	0	0	0	102	551	174	185	473	126
RTOR Reduction (vph)	0	0	166	0	0	0	0	0	91	0	0	59
Lane Group Flow (vph)	386	240	80	0	0	0	102	551	83	185	473	67
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA	Perm				Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4					2	2		1	6	
Permitted Phases			4				2		2	6		6
Actuated Green, G (s)	19.5	19.5	19.5				22.7	22.7	22.7	31.7	31.7	31.7
Effective Green, g (s)	19.5	19.5	19.5				22.7	22.7	22.7	31.7	31.7	31.7
Actuated g/C Ratio	0.32	0.32	0.32				0.38	0.38	0.38	0.53	0.53	0.53
Clearance Time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0				4.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	575	605	485				346	704	587	301	984	800
v/s Ratio Prot	c0.22	0.13						c0.30		c0.05	0.25	
v/s Ratio Perm			0.05				0.11		0.05	0.27		0.04
v/c Ratio	0.67	0.40	0.16				0.29	0.78	0.14	0.61	0.48	0.08
Uniform Delay, d1	17.5	15.7	14.4				13.0	16.5	12.3	10.1	8.9	7.0
Progression Factor	1.00	1.00	1.00				1.07	1.07	1.64	1.00	1.00	1.00
Incremental Delay, d2	6.1	1.9	0.7				1.9	7.4	0.4	3.7	1.7	0.2
Delay (s)	23.6	17.6	15.2				15.9	25.1	20.5	13.8	10.6	7.2
Level of Service	C	B	B				B	C	C	B	B	A
Approach Delay (s)		19.6			0.0			23.0			10.8	
Approach LOS		B			A			C			B	
Intersection Summary												
HCM 2000 Control Delay			18.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			12.8		
Intersection Capacity Utilization			66.4%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	588	36	0	0	0	0	10	36	29	27	0
Future Volume (Veh/h)	16	588	36	0	0	0	0	10	36	29	27	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	639	39	0	0	0	0	11	39	32	29	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		218										
pX, platoon unblocked												
vC, conflicting volume	0			678			707	692	339	398	712	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			678			707	692	339	398	712	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	97	94	93	92	100
cM capacity (veh/h)	1622			910			300	362	657	489	352	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	336	358	50	61								
Volume Left	17	0	0	32								
Volume Right	0	39	39	0								
cSH	1622	1700	557	413								
Volume to Capacity	0.01	0.21	0.09	0.15								
Queue Length 95th (ft)	1	0	7	13								
Control Delay (s)	0.5	0.0	12.1	15.2								
Lane LOS	A		B	C								
Approach Delay (s)	0.2		12.1	15.2								
Approach LOS			B	C								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			34.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	39	1277	26	0	0	0	0	13	33	59	48	0
Future Volume (vph)	39	1277	26	0	0	0	0	13	33	59	48	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	1388	28	0	0	0	0	14	36	64	52	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	736	722	50	116								
Volume Left (vph)	42	0	0	64								
Volume Right (vph)	0	28	36	0								
Hadj (s)	0.06	0.01	-0.40	0.14								
Departure Headway (s)	5.1	5.0	5.6	6.0								
Degree Utilization, x	1.00	1.00	0.08	0.19								
Capacity (veh/h)	736	722	628	586								
Control Delay (s)	54.7	54.4	9.1	10.4								
Approach Delay (s)	54.5		9.1	10.4								
Approach LOS	F		A	B								
Intersection Summary												
Delay			50.0									
Level of Service			E									
Intersection Capacity Utilization			56.4%	ICU Level of Service					B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Yield				Stop			Stop			Stop	
Traffic Volume (vph)	291	524	13	43	0	21	0	19	12	0	0	0
Future Volume (vph)	291	524	13	43	0	21	0	19	12	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	316	570	14	47	0	23	0	21	13	0	0	0
Direction, Lane #	EB 1	EB 2	WB 1	NB 1								
Volume Total (vph)	316	584	70	34								
Volume Left (vph)	316	0	47	0								
Volume Right (vph)	0	14	23	13								
Hadj (s)	0.53	0.02	-0.03	-0.20								
Departure Headway (s)	5.2	4.7	4.8	5.4								
Degree Utilization, x	0.46	0.76	0.09	0.05								
Capacity (veh/h)	689	758	732	622								
Control Delay (s)	11.3	19.5	8.3	8.7								
Approach Delay (s)	16.6		8.3	8.7								
Approach LOS	C		A	A								
Intersection Summary												
Delay			15.8									
Level of Service			C									
Intersection Capacity Utilization			45.4%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	39	0	0	51	17	549	74	37	503	18
Future Volume (Veh/h)	0	0	39	0	0	51	17	549	74	37	503	18
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	42	0	0	55	18	597	80	40	547	20
Pedestrians	7				7							
Lane Width (ft)	12.0				16.0							
Walking Speed (ft/s)	4.0				4.0							
Percent Blockage	1				1							
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			455		
pX, platoon unblocked	0.85	0.85	0.84	0.85	0.85	0.98	0.84				0.98	
vC, conflicting volume	1332	1364	564	1349	1334	644	574				684	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1247	1284	390	1267	1249	625	402				666	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	92	100	100	88	98				96	
cM capacity (veh/h)	106	130	552	107	137	471	970				896	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	42	55	18	677	40	567						
Volume Left	0	0	18	0	40	0						
Volume Right	42	55	0	80	0	20						
cSH	552	471	970	1700	896	1700						
Volume to Capacity	0.08	0.12	0.02	0.40	0.04	0.33						
Queue Length 95th (ft)	6	10	1	0	3	0						
Control Delay (s)	12.1	13.7	8.8	0.0	9.2	0.0						
Lane LOS	B	B	A			A						
Approach Delay (s)	12.1	13.7	0.2			0.6						
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			43.5%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Washington Avenue			
Agency or Co.	IBI Group				E/W Street Name	Washington Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	14	0	71	0	64	14	12	0	46	540	19	0	24	490	61
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	16	0	79	0	71	16	13	0	51	599	21	0	27	543	68
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929		
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (Ve), pc/h		95			100			671			638		
Entry Volume veh/h		93			98			658			625		
Circulating Flow (Vc), pc/h	641			666			43			138			
Exiting Flow (Vex), pc/h	48			135			628			693			
Capacity (cPCE), pc/h		595			581			1082			984		
Capacity (c), veh/h		584			569			1061			965		
v/c Ratio (X)		0.16			0.17			0.62			0.65		

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		8.1			8.5			11.9			13.6	
Lane LOS		A			A			B			B	
95% Queue		0.6			0.6			4.5			4.9	
Approach Delay, s/veh	8.1			8.5			11.9			13.6		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh / LOS	12.1						B					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	46	78	26	87	6	135	4	257	70	161	158	2
Future Volume (vph)	46	78	26	87	6	135	4	257	70	161	158	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	85	28	95	7	147	4	279	76	175	172	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	163	249	359	349								
Volume Left (vph)	50	95	4	175								
Volume Right (vph)	28	147	76	2								
Hadj (s)	-0.01	-0.24	-0.09	0.13								
Departure Headway (s)	6.6	6.2	5.9	6.1								
Degree Utilization, x	0.30	0.43	0.59	0.59								
Capacity (veh/h)	458	509	573	549								
Control Delay (s)	12.5	13.7	16.8	17.5								
Approach Delay (s)	12.5	13.7	16.8	17.5								
Approach LOS	B	B	C	C								
Intersection Summary												
Delay			15.7									
Level of Service			C									
Intersection Capacity Utilization			64.7%	ICU Level of Service					C			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	332	43	19	231	35	41	63	65	28	83	14
Future Volume (Veh/h)	12	332	43	19	231	35	41	63	65	28	83	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	361	47	21	251	38	45	68	71	30	90	15
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked												
vC, conflicting volume	303			415			790	762	392	842	767	285
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	303			415			790	762	392	842	767	285
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			80	79	89	85	72	98
cM capacity (veh/h)	1243			1137			226	319	653	202	317	745
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	421	310	184	135								
Volume Left	13	21	45	30								
Volume Right	47	38	71	15								
cSH	1243	1137	353	299								
Volume to Capacity	0.01	0.02	0.52	0.45								
Queue Length 95th (ft)	1	1	72	56								
Control Delay (s)	0.4	0.7	25.7	26.6								
Lane LOS	A	A	D	D								
Approach Delay (s)	0.4	0.7	25.7	26.6								
Approach LOS			D	D								
Intersection Summary												
Average Delay			8.3									
Intersection Capacity Utilization			43.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Wisconsin Avenue			
Agency or Co.	IBI Group				E/W Street Name	Wisconsin Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	99	130	175	0	126	105	22	0	153	529	138	0	24	529	49
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	110	144	194	0	140	116	24	0	170	586	153	0	27	586	54
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929		
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858		

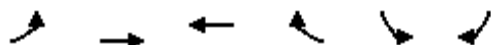
Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (Ve), pc/h		448			280			909			667		
Entry Volume veh/h		439			275			891			654		
Circulating Flow (Vc), pc/h	753			866			281			426			
Exiting Flow (Vex), pc/h	324			340			720			920			
Capacity (cPCE), pc/h		532			475			853			738		
Capacity (c), veh/h		522			466			836			724		
v/c Ratio (X)		0.84			0.59			1.07			0.90		

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		37.8			21.2			71.8			37.8	
Lane LOS		E			C			F			E	
95% Queue		8.7			3.7			22.0			11.9	
Approach Delay, s/veh	37.8			21.2			71.8			37.8		
Approach LOS	E			C			F			E		
Intersection Delay, s/veh / LOS	49.2						E					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

9/1/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	460	342	24	36	38
Future Volume (Veh/h)	9	460	342	24	36	38
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	500	372	26	39	41
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	406				914	394
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	406				914	394
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				87	94
cM capacity (veh/h)	1145				298	650
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	510	398	80			
Volume Left	10	0	39			
Volume Right	0	26	41			
cSH	1145	1700	413			
Volume to Capacity	0.01	0.23	0.19			
Queue Length 95th (ft)	1	0	18			
Control Delay (s)	0.3	0.0	15.8			
Lane LOS	A		C			
Approach Delay (s)	0.3	0.0	15.8			
Approach LOS			C			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			42.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	474	4	2	316	29	2	1	3	44	0	35
Future Volume (Veh/h)	26	474	4	2	316	29	2	1	3	44	0	35
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	515	4	2	343	32	2	1	3	48	0	38
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	377			519			976	954	517	942	940	363
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	377			519			976	954	517	942	940	363
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			99	100	99	80	100	94
cM capacity (veh/h)	1180			1047			213	252	558	236	256	680
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	547	377	6	86								
Volume Left	28	2	2	48								
Volume Right	4	32	3	38								
cSH	1180	1047	320	331								
Volume to Capacity	0.02	0.00	0.02	0.26								
Queue Length 95th (ft)	2	0	1	25								
Control Delay (s)	0.7	0.1	16.5	19.6								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.7	0.1	16.5	19.6								
Approach LOS			C	C								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			58.2%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	272	285	82	196	0	170	0	114	0	0	0
Future Volume (vph)	0	272	285	82	196	0	170	0	114	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	296	310	89	213	0	185	0	124	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	606	302	309	0								
Volume Left (vph)	0	89	185	0								
Volume Right (vph)	310	0	124	0								
Hadj (s)	-0.27	0.09	-0.09	0.00								
Departure Headway (s)	5.2	6.0	6.2	7.2								
Degree Utilization, x	0.87	0.50	0.53	0.00								
Capacity (veh/h)	606	569	551	900								
Control Delay (s)	33.1	14.8	15.9	10.2								
Approach Delay (s)	33.1	14.8	15.9	0.0								
Approach LOS	D	B	C	A								
Intersection Summary												
Delay				24.2								
Level of Service				C								
Intersection Capacity Utilization				79.2%	ICU Level of Service	D						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	64	131	185	94	94	180
Future Volume (vph)	64	131	185	94	94	180
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	70	142	201	102	102	196
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	212	303	298			
Volume Left (vph)	70	0	102			
Volume Right (vph)	142	102	0			
Hadj (s)	-0.30	-0.17	0.10			
Departure Headway (s)	5.0	4.7	4.9			
Degree Utilization, x	0.30	0.39	0.41			
Capacity (veh/h)	653	733	694			
Control Delay (s)	10.1	10.7	11.3			
Approach Delay (s)	10.1	10.7	11.3			
Approach LOS	B	B	B			
Intersection Summary						
Delay			10.8			
Level of Service			B			
Intersection Capacity Utilization			51.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	375	22	20	310	69	30	42	40	75	26	21
Future Volume (Veh/h)	14	375	22	20	310	69	30	42	40	75	26	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	408	24	22	337	75	33	46	43	82	28	23
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					213							
pX, platoon unblocked	0.88						0.88	0.88		0.88	0.88	0.88
vC, conflicting volume	415			443			920	920	439	946	894	382
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	266			443			841	840	439	869	811	228
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			84	82	93	55	89	97
cM capacity (veh/h)	1138			1107			212	253	608	183	263	709
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	447	434	122	133								
Volume Left	15	22	33	82								
Volume Right	24	75	43	23								
cSH	1138	1107	299	227								
Volume to Capacity	0.01	0.02	0.41	0.59								
Queue Length 95th (ft)	1	2	48	83								
Control Delay (s)	0.4	0.6	25.1	41.1								
Lane LOS	A	A	D	E								
Approach Delay (s)	0.4	0.6	25.1	41.1								
Approach LOS			D	E								
Intersection Summary												
Average Delay			7.9									
Intersection Capacity Utilization			49.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

2/24/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗	↗	↖	↖↗		↖	↗	
Traffic Volume (vph)	58	230	90	252	223	211	94	577	162	217	490	30
Future Volume (vph)	58	230	90	252	223	211	94	577	162	217	490	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	10	11	11	16	16	16
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.97	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1844	1534	1681	1761	1794	1652	3295		2006	2093	
Flt Permitted		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1844	1534	1681	1761	1794	1652	3295		2006	2093	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	250	98	274	242	229	102	627	176	236	533	33
RTOR Reduction (vph)	0	0	79	0	0	187	0	28	0	0	3	0
Lane Group Flow (vph)	0	313	19	247	269	42	102	775	0	236	563	0
Confl. Peds. (#/hr)			10	10					3			
Confl. Bikes (#/hr)			4						3			
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		17.4	17.4	16.4	16.4	16.4	6.8	25.6		11.8	30.6	
Effective Green, g (s)		17.4	17.4	16.4	16.4	16.4	6.8	25.6		11.8	30.6	
Actuated g/C Ratio		0.19	0.19	0.18	0.18	0.18	0.08	0.28		0.13	0.34	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		356	296	306	320	326	124	937		263	711	
v/s Ratio Prot		c0.17		0.15	c0.15		0.06	c0.24		0.12	c0.27	
v/s Ratio Perm			0.01			0.02						
v/c Ratio		0.88	0.06	0.81	0.84	0.13	0.82	0.83		0.90	0.79	
Uniform Delay, d1		35.3	29.6	35.3	35.5	30.8	41.0	30.1		38.5	26.8	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		20.5	0.0	14.7	18.1	0.2	32.4	8.3		29.9	8.8	
Delay (s)		55.8	29.7	50.0	53.6	31.0	73.4	38.4		68.4	35.7	
Level of Service		E	C	D	D	C	E	D		E	D	
Approach Delay (s)		49.5			45.5			42.4			45.3	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			45.0									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			90.0							18.8		
Intersection Capacity Utilization			77.0%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	646	6	22	718	196	9	18	58	366	14	90
Future Volume (vph)	45	646	6	22	718	196	9	18	58	366	14	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.97			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1770	3533		1761	3415			3131			1776	1524
Flt Permitted	0.19	1.00		0.28	1.00			0.92			0.66	1.00
Satd. Flow (perm)	350	3533		521	3415			2885			1235	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	702	7	24	780	213	10	20	63	398	15	98
RTOR Reduction (vph)	0	1	0	0	44	0	0	32	0	0	0	40
Lane Group Flow (vph)	49	708	0	24	949	0	0	61	0	0	413	58
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	21.3	21.3		21.3	21.3			29.2			29.2	29.2
Effective Green, g (s)	21.3	21.3		21.3	21.3			29.2			29.2	29.2
Actuated g/C Ratio	0.36	0.36		0.36	0.36			0.49			0.49	0.49
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	124	1254		184	1212			1404			601	741
v/s Ratio Prot		0.20			c0.28							
v/s Ratio Perm	0.14			0.05				0.02			c0.33	0.04
v/c Ratio	0.40	0.56		0.13	0.78			0.04			0.69	0.08
Uniform Delay, d1	14.5	15.6		13.1	17.3			8.1			11.9	8.2
Progression Factor	1.02	1.08		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.7	0.2		0.3	3.4			0.1			6.3	0.2
Delay (s)	15.4	17.0		13.4	20.7			8.1			18.2	8.4
Level of Service	B	B		B	C			A			B	A
Approach Delay (s)		16.9			20.5			8.1			16.3	
Approach LOS		B			C			A			B	
Intersection Summary												
HCM 2000 Control Delay			18.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)			9.5			
Intersection Capacity Utilization			73.2%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	15	15	50	15	167	20	737	91	213	768	18
Future Volume (vph)	40	15	15	50	15	167	20	737	91	213	768	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	10	11	16
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1752			1789	1794	1770	3933		1652	3409	
Flt Permitted		0.78			0.81	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1412			1504	1794	1770	3933		1652	3409	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	16	16	54	16	182	22	801	99	232	835	20
RTOR Reduction (vph)	0	12	0	0	0	158	0	11	0	0	1	0
Lane Group Flow (vph)	0	63	0	0	70	24	22	889	0	232	854	0
Confl. Peds. (#/hr)			4	4					3			
Confl. Bikes (#/hr)			1						2			
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		8.4			8.4	8.4	1.3	28.0		13.1	39.8	
Effective Green, g (s)		8.4			8.4	8.4	1.3	28.0		13.1	39.8	
Actuated g/C Ratio		0.13			0.13	0.13	0.02	0.44		0.21	0.63	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		187			199	238	36	1742		342	2146	
v/s Ratio Prot							0.01	c0.23		c0.14	0.25	
v/s Ratio Perm		0.04			c0.05	0.01						
v/c Ratio		0.34			0.35	0.10	0.61	0.51		0.68	0.40	
Uniform Delay, d1		24.9			24.9	24.1	30.7	12.7		23.1	5.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			0.4	0.1	27.0	0.3		5.3	0.1	
Delay (s)		25.3			25.3	24.2	57.7	12.9		28.4	5.9	
Level of Service		C			C	C	E	B		C	A	
Approach Delay (s)		25.3			24.5			14.0			10.7	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay		14.0										
HCM 2000 Volume to Capacity ratio		0.53										
Actuated Cycle Length (s)		63.2								13.7		
Intersection Capacity Utilization		58.2%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	292	31	34	177	0	69	0	59	0	0	0
Future Volume (Veh/h)	0	292	31	34	177	0	69	0	59	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	317	34	37	192	0	75	0	64	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)	252											
pX, platoon unblocked												
vC, conflicting volume	192			351			600	600	334	664	617	192
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	192			351			600	600	334	664	617	192
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			81	100	91	100	100	100
cM capacity (veh/h)	1381			1208			403	402	708	332	393	850
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	351	229	139	0								
Volume Left	0	37	75	0								
Volume Right	34	0	64	0								
cSH	1381	1208	503	1700								
Volume to Capacity	0.00	0.03	0.28	0.00								
Queue Length 95th (ft)	0	2	28	0								
Control Delay (s)	0.0	1.5	14.9	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	1.5	14.9	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			45.9%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	169	38	0	65	0	38	1	12	0	0	0
Future Volume (Veh/h)	0	169	38	0	65	0	38	1	12	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	184	41	0	71	0	41	1	13	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	643											
pX, platoon unblocked												
vC, conflicting volume	71			225			276	276	204	289	296	71
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	71			225			276	276	204	289	296	71
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			94	100	98	100	100	100
cM capacity (veh/h)	1529			1344			677	632	836	652	616	991
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	225	71	55	0								
Volume Left	0	0	41	0								
Volume Right	41	0	13	0								
cSH	1529	1344	708	1700								
Volume to Capacity	0.00	0.00	0.08	0.00								
Queue Length 95th (ft)	0	0	6	0								
Control Delay (s)	0.0	0.0	10.5	0.0								
Lane LOS			B	A								
Approach Delay (s)	0.0	0.0	10.5	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			21.2%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	82	248	26	47	296	26
Future Volume (vph)	82	248	26	47	296	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	89	270	28	51	322	28
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	359	79	350			
Volume Left (vph)	89	0	322			
Volume Right (vph)	270	51	0			
Hadj (s)	-0.37	-0.35	0.22			
Departure Headway (s)	4.6	4.9	5.1			
Degree Utilization, x	0.46	0.11	0.50			
Capacity (veh/h)	731	659	668			
Control Delay (s)	11.6	8.5	13.1			
Approach Delay (s)	11.6	8.5	13.1			
Approach LOS	B	A	B			
Intersection Summary						
Delay			12.0			
Level of Service			B			
Intersection Capacity Utilization			50.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	203	103	14	159	14	140	17	18	4	12	21
Future Volume (Veh/h)	9	203	103	14	159	14	140	17	18	4	12	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	221	112	15	173	15	152	18	20	4	13	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					576							
pX, platoon unblocked												
vC, conflicting volume	188			333			537	515	277	536	564	180
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	188			333			537	515	277	536	564	180
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			64	96	97	99	97	97
cM capacity (veh/h)	1386			1226			426	455	762	423	427	862
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	343	203	190	40								
Volume Left	10	15	152	4								
Volume Right	112	15	20	23								
cSH	1386	1226	449	601								
Volume to Capacity	0.01	0.01	0.42	0.07								
Queue Length 95th (ft)	1	1	52	5								
Control Delay (s)	0.3	0.7	18.7	11.4								
Lane LOS	A	A	C	B								
Approach Delay (s)	0.3	0.7	18.7	11.4								
Approach LOS			C	B								
Intersection Summary												
Average Delay			5.5									
Intersection Capacity Utilization			42.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	227	3	9	189	4	2	2	8	2	1	1
Future Volume (Veh/h)	1	227	3	9	189	4	2	2	8	2	1	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	247	3	10	205	4	2	2	9	2	1	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)	249											
pX, platoon unblocked												
vC, conflicting volume	209			250			479	480	248	488	479	207
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	209			250			479	480	248	488	479	207
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	99	100	100	100
cM capacity (veh/h)	1362			1316			492	481	790	480	482	833
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	251	219	13	4								
Volume Left	1	10	2	2								
Volume Right	3	4	9	1								
cSH	1362	1316	663	538								
Volume to Capacity	0.00	0.01	0.02	0.01								
Queue Length 95th (ft)	0	1	1	1								
Control Delay (s)	0.0	0.4	10.5	11.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.0	0.4	10.5	11.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			26.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↕	↕		↕	↕	
Traffic Volume (vph)	116	133	122	68	76	24	134	719	78	97	571	47
Future Volume (vph)	116	133	122	68	76	24	134	719	78	97	571	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.6			5.0		4.2	5.0		4.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.96			0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1753			1791		1770	3487		1770	3499	
Flt Permitted		0.83			0.65		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1476			1194		1770	3487		1770	3499	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	126	145	133	74	83	26	146	782	85	105	621	51
RTOR Reduction (vph)	0	25	0	0	9	0	0	12	0	0	9	0
Lane Group Flow (vph)	0	379	0	0	174	0	146	855	0	105	663	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		19.0			18.6		17.9	28.0		8.1	18.0	
Effective Green, g (s)		19.0			18.6		17.9	28.0		8.1	18.0	
Actuated g/C Ratio		0.28			0.27		0.26	0.41		0.12	0.26	
Clearance Time (s)		4.6			5.0		4.2	5.0		4.0	5.0	
Vehicle Extension (s)		3.0			3.5		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		408			323		461	1421		208	916	
v/s Ratio Prot							0.08	c0.25		0.06	c0.19	
v/s Ratio Perm		c0.26			0.15							
v/c Ratio		0.93			0.54		0.32	0.60		0.50	0.72	
Uniform Delay, d1		24.2			21.4		20.5	16.0		28.4	23.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		27.1			2.0		0.1	1.9		1.9	5.0	
Delay (s)		51.2			23.3		20.6	17.9		30.3	28.0	
Level of Service		D			C		C	B		C	C	
Approach Delay (s)		51.2			23.3			18.3			28.4	
Approach LOS		D			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			27.6				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			68.7				Sum of lost time (s)		14.2			
Intersection Capacity Utilization			63.9%				ICU Level of Service		B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	167	58	56	75	12	67	69	26	19	27	22
Future Volume (Veh/h)	22	167	58	56	75	12	67	69	26	19	27	22
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	182	63	61	82	13	73	75	28	21	29	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	280											
pX, platoon unblocked												
vC, conflicting volume	95			245			510	478	214	538	504	88
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	95			245			510	478	214	538	504	88
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			95			83	84	97	94	93	98
cM capacity (veh/h)	1499			1321			418	456	827	366	442	970
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	269	156	176	74								
Volume Left	24	61	73	21								
Volume Right	63	13	28	24								
cSH	1499	1321	472	501								
Volume to Capacity	0.02	0.05	0.37	0.15								
Queue Length 95th (ft)	1	4	43	13								
Control Delay (s)	0.8	3.3	17.1	13.4								
Lane LOS	A	A	C	B								
Approach Delay (s)	0.8	3.3	17.1	13.4								
Approach LOS			C	B								
Intersection Summary												
Average Delay			7.0									
Intersection Capacity Utilization			42.7%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	7	85	11	13	40	2	14	24	13	3	11	5
Future Volume (vph)	7	85	11	13	40	2	14	24	13	3	11	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	92	12	14	43	2	15	26	14	3	12	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	112	59	55	20								
Volume Left (vph)	8	14	15	3								
Volume Right (vph)	12	2	14	5								
Hadj (s)	-0.02	0.06	-0.06	-0.09								
Departure Headway (s)	4.1	4.2	4.2	4.2								
Degree Utilization, x	0.13	0.07	0.06	0.02								
Capacity (veh/h)	854	827	809	808								
Control Delay (s)	7.7	7.6	7.5	7.3								
Approach Delay (s)	7.7	7.6	7.5	7.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.6								
Level of Service				A								
Intersection Capacity Utilization				18.0%	ICU Level of Service		A					
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	19	154	12	64	66	44	12	104	144	84	22	5
Future Volume (vph)	19	154	12	64	66	44	12	104	144	84	22	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	167	13	70	72	48	13	113	157	91	24	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	201	190	283	120								
Volume Left (vph)	21	70	13	91								
Volume Right (vph)	13	48	157	5								
Hadj (s)	0.02	-0.04	-0.29	0.16								
Departure Headway (s)	5.3	5.2	4.9	5.6								
Degree Utilization, x	0.29	0.28	0.38	0.19								
Capacity (veh/h)	626	630	682	586								
Control Delay (s)	10.5	10.2	10.9	9.8								
Approach Delay (s)	10.5	10.2	10.9	9.8								
Approach LOS	B	B	B	A								
Intersection Summary												
Delay	10.5											
Level of Service	B											
Intersection Capacity Utilization	54.0%			ICU Level of Service			A					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	98	113	7	64	43
Future Volume (vph)	0	98	113	7	64	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	107	123	8	70	47
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	107	131	117			
Volume Left (vph)	0	0	70			
Volume Right (vph)	107	8	0			
Hadj (s)	-0.57	0.00	0.15			
Departure Headway (s)	3.9	4.2	4.4			
Degree Utilization, x	0.12	0.15	0.14			
Capacity (veh/h)	871	817	781			
Control Delay (s)	7.4	8.0	8.2			
Approach Delay (s)	7.4	8.0	8.2			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.9			
Level of Service			A			
Intersection Capacity Utilization			19.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	147	48	216	117	369	54	691	286	309	581	26
Future Volume (vph)	22	147	48	216	117	369	54	691	286	309	581	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	16	16	16
Total Lost time (s)	5.0	5.0	5.0		4.9	4.9	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2006	1863	1557		1804	1794	1770	3792		2006	3986	
Flt Permitted	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	2006	1863	1557		1804	1794	1770	3792		2006	3986	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	160	52	235	127	401	59	751	311	336	632	28
RTOR Reduction (vph)	0	0	46	0	0	242	0	49	0	0	3	0
Lane Group Flow (vph)	24	160	6	0	362	159	59	1013	0	336	657	0
Confl. Peds. (#/hr)			2	2					5			
Confl. Bikes (#/hr)									4			
Turn Type	Split	NA	Perm	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	10.0	10.0	10.0		19.2	32.9	5.1	21.2		13.7	29.8	
Effective Green, g (s)	10.0	10.0	10.0		19.2	32.9	5.1	21.2		13.7	29.8	
Actuated g/C Ratio	0.12	0.12	0.12		0.23	0.40	0.06	0.25		0.16	0.36	
Clearance Time (s)	5.0	5.0	5.0		4.9		4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	241	223	187		416	709	108	966		330	1427	
v/s Ratio Prot	0.01	c0.09			c0.20	0.09	0.03	c0.27		c0.17	0.16	
v/s Ratio Perm			0.00									
v/c Ratio	0.10	0.72	0.03		0.87	0.22	0.55	1.05		1.02	0.46	
Uniform Delay, d1	32.6	35.2	32.3		30.8	16.7	37.9	31.0		34.8	20.5	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	8.8	0.0		17.6	0.2	3.0	42.5		54.2	0.2	
Delay (s)	32.7	44.1	32.4		48.4	16.8	40.9	73.5		89.0	20.8	
Level of Service	C	D	C		D	B	D	E		F	C	
Approach Delay (s)		40.3			31.8			71.8			43.8	
Approach LOS		D			C			E			D	
Intersection Summary												
HCM 2000 Control Delay			50.7									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			83.2									Sum of lost time (s) 19.1
Intersection Capacity Utilization			87.3%									ICU Level of Service E
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St

12/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	801	31	42	770	52	21	0	42	24	13	53
Future Volume (Veh/h)	9	801	31	42	770	52	21	0	42	24	13	53
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	871	34	46	837	57	23	0	46	26	14	58
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage (veh)					2							
Upstream signal (ft)		312										
pX, platoon unblocked				0.92			0.92	0.92	0.92	0.92	0.92	
vC, conflicting volume	894			905			1930	1894	888	1912	1882	866
vC1, stage 1 conf vol							908	908		958	958	
vC2, stage 2 conf vol							1022	986		954	925	
vCu, unblocked vol	894			854			1967	1928	836	1947	1915	866
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			94			86	100	86	85	93	84
cM capacity (veh/h)	759			724			168	223	338	170	214	353
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	915	940	69	98								
Volume Left	10	46	23	26								
Volume Right	34	57	46	58								
cSH	759	724	253	256								
Volume to Capacity	0.01	0.06	0.27	0.38								
Queue Length 95th (ft)	1	5	27	43								
Control Delay (s)	0.4	1.8	24.5	27.5								
Lane LOS	A	A	C	D								
Approach Delay (s)	0.4	1.8	24.5	27.5								
Approach LOS			C	D								
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization			83.2%		ICU Level of Service				E			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

12/21/2016

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	9	1116	26	61	1097	61	5	4	97	24	4	15	
Future Volume (Veh/h)	9	1116	26	61	1097	61	5	4	97	24	4	15	
Sign Control	Free			Free			Stop			Stop			
Grade	0%			0%			0%			0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	10	1213	28	66	1192	66	5	4	105	26	4	16	
Pedestrians	1						1						
Lane Width (ft)	12.0						12.0						
Walking Speed (ft/s)	4.0						4.0						
Percent Blockage	0						0						
Right turn flare (veh)													
Median type	TWLTL			TWLTL									
Median storage veh)	2			2									
Upstream signal (ft)	687												
pX, platoon unblocked				0.95			0.95			0.95	0.95	0.95	
vC, conflicting volume	1258			1242				2591	2638	1228	2697	2619	1226
vC1, stage 1 conf vol							1248		1248	1357		1357	
vC2, stage 2 conf vol							1343		1390	1340		1262	
vCu, unblocked vol	1258			1228				2651	2700	1213	2762	2680	1226
tC, single (s)	4.1			4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1		5.5	6.1		5.5	
tF (s)	2.2			2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			88				95	97	50	0	97	93
cM capacity (veh/h)	553			538				109	134	210	20	119	218
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1							
Volume Total	10	1241	66	1258	114	46							
Volume Left	10	0	66	0	5	26							
Volume Right	0	28	0	66	105	16							
cSH	553	1700	538	1700	198	33							
Volume to Capacity	0.02	0.73	0.12	0.74	0.58	1.38							
Queue Length 95th (ft)	1	0	10	0	78	126							
Control Delay (s)	11.6	0.0	12.6	0.0	45.3	472.7							
Lane LOS	B		B		E	F							
Approach Delay (s)	0.1		0.6		45.3	472.7							
Approach LOS					E	F							
Intersection Summary													
Average Delay				10.2									
Intersection Capacity Utilization				77.2%			ICU Level of Service			D			
Analysis Period (min)				15									

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

12/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	1215	0	0	1250	329	0	0	0	0	0	22
Future Volume (Veh/h)	13	1215	0	0	1250	329	0	0	0	0	0	22
Sign Control	Free				Free				Stop		Stop	
Grade	0%				0%				0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	1321	0	0	1359	358	0	0	0	0	0	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage veh	2			2								
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1717			1321			2732	3066	1321	2887	2887	1538
vC1, stage 1 conf vol							1349	1349		1538	1538	
vC2, stage 2 conf vol							1383	1717		1349	1349	
vCu, unblocked vol	1717			1321			2732	3066	1321	2887	2887	1538
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			100	100	100	100	100	83
cM capacity (veh/h)	369			523			102	106	191	107	130	142
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	14	1321	0	1717	0	24						
Volume Left	14	0	0	0	0	0						
Volume Right	0	0	0	358	0	24						
cSH	369	1700	1700	1700	1700	142						
Volume to Capacity	0.04	0.78	0.00	1.01	0.00	0.17						
Queue Length 95th (ft)	3	0	0	0	0	15						
Control Delay (s)	15.2	0.0	0.0	0.0	0.0	35.3						
Lane LOS	C				A	E						
Approach Delay (s)	0.2		0.0		0.0	35.3						
Approach LOS					A	E						
Intersection Summary												
Average Delay	0.3											
Intersection Capacity Utilization	95.8%			ICU Level of Service					F			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	83	0	0	104	87	878	23	104	704	8
Future Volume (Veh/h)	0	0	83	0	0	104	87	878	23	104	704	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	90	0	0	113	95	954	25	113	765	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLT			TWLT	
Median storage veh								2			2	
Upstream signal (ft)											621	
pX, platoon unblocked												
vC, conflicting volume	1776	2164	770	2238	2156	490	774			979		
vC1, stage 1 conf vol	996	996		1156	1156							
vC2, stage 2 conf vol	780	1169		1081	1000							
vCu, unblocked vol	1776	2164	770	2238	2156	490	774			979		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	74	100	100	78	89			84		
cM capacity (veh/h)	115	111	344	47	140	524	837			701		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	90	113	95	636	343	113	774					
Volume Left	0	0	95	0	0	113	0					
Volume Right	90	113	0	0	25	0	9					
cSH	344	524	837	1700	1700	701	1700					
Volume to Capacity	0.26	0.22	0.11	0.37	0.20	0.16	0.46					
Queue Length 95th (ft)	26	20	10	0	0	14	0					
Control Delay (s)	19.2	13.7	9.8	0.0	0.0	11.1	0.0					
Lane LOS	C	B	A			B						
Approach Delay (s)	19.2	13.7	0.9			1.4						
Approach LOS	C	B										
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization			49.3%		ICU Level of Service					A		
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection		Coast Hwy - Michigan Avenue		
Agency or Co.	IBI Group				E/W Street Name		Michigan Avenue		
Date Performed	05/23/2016				N/S Street Name		Coast Highway		
Analysis Year	2016				Analysis Time Period (hrs)		0.25		
Time Period	PM Peak Hour				Peak Hour Factor		0.92		
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	185	91	77	0	52	12	25	0	25	557	44	0	19	557	47
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	205	101	85	0	58	13	28	0	28	618	49	0	21	618	52
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929		
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (Ve), pc/h		391			99			695			691		
Entry Volume veh/h		383			97			681			677		
Circulating Flow (Vc), pc/h	697			851			327			99			
Exiting Flow (Vex), pc/h	171			93			851			761			
Capacity (cPCE), pc/h		563			483			815			1024		
Capacity (c), veh/h		552			473			799			1003		
v/c Ratio (X)		0.69			0.21			0.85			0.68		

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		23.5			10.6			28.8			14.1	
Lane LOS		C			B			D			B	
95% Queue		5.4			0.8			10.2			5.5	
Approach Delay, s/veh	23.5			10.6			28.8			14.1		
Approach LOS	C			B			D			B		
Intersection Delay, s/veh / LOS	21.3						C					

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	PM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - West
E/W Street Name	West Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	34	20	29	0	37	20	43	0	29	246	37	0	43	245	34
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	38	22	32	0	41	22	48	0	32	273	41	0	48	272	38
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		92			111			346			358	
Entry Volume veh/h		90			109			339			351	
Circulating Flow (Vc), pc/h	361			343			108			95		
Exiting Flow (Vex), pc/h	111			92			359			345		
Capacity (cPCE), pc/h		788			802			1014			1028	
Capacity (c), veh/h		772			786			994			1007	
v/c Ratio (X)		0.12			0.14			0.34			0.35	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.9			6.0			7.2			7.2	
Lane LOS		A			A			A			A	
95% Queue		0.4			0.5			1.5			1.6	
Approach Delay, s/veh	5.9			6.0			7.2			7.2		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	6.9						A					

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Kelly Street			
Agency or Co.	IBI Group				E/W Street Name	Kelly Street			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	39	16	13	0	8	6	151	0	3	315	8	0	141	305	59
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	43	18	14	0	9	7	167	0	3	349	9	0	156	338	65
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		75			183			361			559	
Entry Volume veh/h		74			179			354			548	
Circulating Flow (Vc), pc/h	503			395			217			19		
Exiting Flow (Vex), pc/h	183			75			559			361		
Capacity (cPCE), pc/h		683			761			910			1109	
Capacity (c), veh/h		670			746			892			1087	
v/c Ratio (X)		0.11			0.24			0.40			0.50	

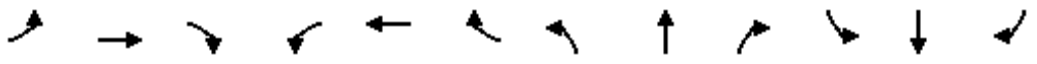
Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.6			7.5			8.7			9.2	
Lane LOS		A			A			A			A	
95% Queue		0.4			0.9			1.9			2.9	
Approach Delay, s/veh	6.6			7.5			8.7			9.2		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	8.6						A					

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

06/29/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	103	0	14	13	1059	13	24	2213	16
Future Volume (veh/h)	0	0	0	103	0	14	13	1059	13	24	2213	16
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h				112	0	0	14	1151	0	26	2405	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				738	0	329	92	3173	988	92	2208	988
Arrive On Green				0.20	0.00	0.00	0.05	0.60	0.00	0.05	0.60	0.00
Sat Flow, veh/h				3690	0	1647	1845	5289	1647	1845	3681	1647
Grp Volume(v), veh/h				112	0	0	14	1151	0	26	2405	0
Grp Sat Flow(s),veh/h/ln				1845	0	1647	1845	1763	1647	1845	1840	1647
Q Serve(g_s), s				2.0	0.0	0.0	0.6	8.9	0.0	1.1	48.0	0.0
Cycle Q Clear(g_c), s				2.0	0.0	0.0	0.6	8.9	0.0	1.1	48.0	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				738	0	329	92	3173	988	92	2208	988
V/C Ratio(X)				0.15	0.00	0.00	0.15	0.36	0.00	0.28	1.09	0.00
Avail Cap(c_a), veh/h				738	0	329	92	3173	988	92	2208	988
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				26.4	0.0	0.0	36.4	8.2	0.0	36.6	16.0	0.0
Incr Delay (d2), s/veh				0.4	0.0	0.0	3.5	0.3	0.0	7.5	48.3	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.1	0.0	0.0	0.4	4.4	0.0	0.7	38.7	0.0
LnGrp Delay(d),s/veh				26.8	0.0	0.0	39.8	8.5	0.0	44.1	64.3	0.0
LnGrp LOS				C			D	A		D	F	
Approach Vol, veh/h					112			1165			2431	
Approach Delay, s/veh					26.8			8.9			64.1	
Approach LOS					C			A			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	8.0	52.0			8.0	52.0		20.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	48.0			4.0	48.0		16.0				
Max Q Clear Time (g_c+I1), s	3.1	10.9			2.6	50.0		4.0				
Green Ext Time (p_c), s	0.0	10.6			0.0	0.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				45.6								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↑	↑↑	↑↑					
Traffic Volume (veh/h)	1123	209	317	1287	0	0			
Future Volume (veh/h)	1123	209	317	1287	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937					
Adj Flow Rate, veh/h	1221	227	345	1399					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	2116	947	805	3313					
Arrive On Green	0.57	0.57	0.22	0.90					
Sat Flow, veh/h	3778	1647	3579	3778					
Grp Volume(v), veh/h	1221	227	345	1399					
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840					
Q Serve(g_s), s	8.4	2.7	3.3	2.5					
Cycle Q Clear(g_c), s	8.4	2.7	3.3	2.5					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	2116	947	805	3313					
V/C Ratio(X)	0.58	0.24	0.43	0.42					
Avail Cap(c_a), veh/h	2116	947	805	3313					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	5.4	4.2	13.3	0.3					
Incr Delay (d2), s/veh	1.2	0.6	1.7	0.4					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	4.4	1.4	1.8	1.2					
LnGrp Delay(d),s/veh	6.6	4.8	15.0	0.7					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	1448			1744					
Approach Delay, s/veh	6.3			3.5					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			13.0	27.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			9.0	23.0				36.0	
Max Q Clear Time (g_c+I1), s			5.3	10.4				4.5	
Green Ext Time (p_c), s			0.5	7.5				13.7	
Intersection Summary									
HCM 2010 Ctrl Delay			4.8						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/11/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑↑	↑	↑		
Traffic Volume (veh/h)	1740	97	305	1324	156	0		
Future Volume (veh/h)	1740	97	305	1324	156	0		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	1891	105	332	1439	170	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1840	823	358	2419	422	376		
Arrive On Green	0.50	0.50	0.10	0.66	0.23	0.00		
Sat Flow, veh/h	3778	1647	3579	3778	1845	1647		
Grp Volume(v), veh/h	1891	105	332	1439	170	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840	1845	1647		
Q Serve(g_s), s	35.0	2.4	6.4	15.4	5.5	0.0		
Cycle Q Clear(g_c), s	35.0	2.4	6.4	15.4	5.5	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1840	823	358	2419	422	376		
V/C Ratio(X)	1.03	0.13	0.93	0.59	0.40	0.00		
Avail Cap(c_a), veh/h	1840	823	358	2419	422	376		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	17.5	9.3	31.2	6.8	22.9	0.0		
Incr Delay (d2), s/veh	28.3	0.3	32.3	1.1	2.9	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	24.9	1.2	4.8	8.0	3.1	0.0		
LnGrp Delay(d),s/veh	45.8	9.7	63.6	7.8	25.8	0.0		
LnGrp LOS	F	A	E	A	C			
Approach Vol, veh/h	1996			1771	170			
Approach Delay, s/veh	43.9			18.3	25.8			
Approach LOS	D			B	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	11.0	39.0				50.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	7.0	35.0				46.0
Max Q Clear Time (g_c+I1), s		7.5	8.4	37.0				17.4
Green Ext Time (p_c), s		0.3	0.0	0.0				13.6
Intersection Summary								
HCM 2010 Ctrl Delay			31.6					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary
 51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	626	6	82	582	108	5	0	31	77	8	49
Future Volume (veh/h)	0	626	6	82	582	108	5	0	31	77	8	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1937	1976	1937	1937	1937	1937	0	1937	1937	1937	1937
Adj Flow Rate, veh/h	0	680	7	89	633	0	5	0	34	90	0	53
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1244	13	217	1949	872	0	0	0	1158	0	517
Arrive On Green	0.00	0.33	0.33	0.12	0.53	0.00	0.00	0.00	0.00	0.31	0.00	0.31
Sat Flow, veh/h	0	3829	38	1845	3681	1647		0		3690	0	1647
Grp Volume(v), veh/h	0	335	352	89	633	0		0.0		90	0	53
Grp Sat Flow(s),veh/h/ln	0	1840	1930	1845	1840	1647				1845	0	1647
Q Serve(g_s), s	0.0	7.6	7.6	2.3	5.0	0.0				0.9	0.0	1.2
Cycle Q Clear(g_c), s	0.0	7.6	7.6	2.3	5.0	0.0				0.9	0.0	1.2
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	613	643	217	1949	872				1158	0	517
V/C Ratio(X)	0.00	0.55	0.55	0.41	0.32	0.00				0.08	0.00	0.10
Avail Cap(c_a), veh/h	0	613	643	217	1949	872				1158	0	517
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	13.9	13.9	20.9	6.8	0.0				12.3	0.0	12.4
Incr Delay (d2), s/veh	0.0	3.5	3.3	5.6	0.4	0.0				0.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.4	4.6	1.5	2.6	0.0				0.5	0.0	0.6
LnGrp Delay(d),s/veh	0.0	17.3	17.2	26.5	7.3	0.0				12.4	0.0	12.8
LnGrp LOS		B	B	C	A					B		B
Approach Vol, veh/h		687			722						143	
Approach Delay, s/veh		17.3			9.6						12.6	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			10.0	21.0		20.0		31.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			6.0	17.0		16.0		27.0				
Max Q Clear Time (g_c+I1), s			4.3	9.6		3.2		7.0				
Green Ext Time (p_c), s			0.0	2.5		0.3		4.3				
Intersection Summary												
HCM 2010 Ctrl Delay			13.3									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	691	9	28	1014	299	9	2	15	292	7	73
Future Volume (veh/h)	179	691	9	28	1014	299	9	2	15	292	7	73
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1976	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	195	751	10	30	1102	325	10	2	16	202	169	79
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	185	1209	16	115	1058	473	329	66	350	369	250	117
Arrive On Green	0.10	0.32	0.32	0.06	0.29	0.29	0.21	0.21	0.21	0.20	0.20	0.20
Sat Flow, veh/h	1845	3719	50	1845	3681	1647	1550	310	1647	1845	1250	584
Grp Volume(v), veh/h	195	372	389	30	1102	325	12	0	16	202	0	248
Grp Sat Flow(s),veh/h/ln	1845	1840	1929	1845	1840	1647	1860	0	1647	1845	0	1834
Q Serve(g_s), s	8.0	13.7	13.7	1.2	23.0	14.0	0.4	0.0	0.6	7.9	0.0	10.0
Cycle Q Clear(g_c), s	8.0	13.7	13.7	1.2	23.0	14.0	0.4	0.0	0.6	7.9	0.0	10.0
Prop In Lane	1.00		0.03	1.00		1.00	0.83		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	185	598	627	115	1058	473	395	0	350	369	0	367
V/C Ratio(X)	1.06	0.62	0.62	0.26	1.04	0.69	0.03	0.00	0.05	0.55	0.00	0.68
Avail Cap(c_a), veh/h	185	598	627	115	1058	473	395	0	350	369	0	367
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.0	22.8	22.8	35.7	28.5	25.3	25.0	0.0	25.0	28.7	0.0	29.6
Incr Delay (d2), s/veh	82.1	4.8	4.6	5.4	39.0	7.9	0.1	0.0	0.2	5.7	0.0	9.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	7.7	8.0	0.8	17.3	7.4	0.2	0.0	0.3	4.6	0.0	6.0
LnGrp Delay(d),s/veh	118.1	27.6	27.4	41.1	67.5	33.2	25.1	0.0	25.3	34.5	0.0	39.2
LnGrp LOS	F	C	C	D	F	C	C		C	C		D
Approach Vol, veh/h		956			1457			28			450	
Approach Delay, s/veh		46.0			59.3			25.2			37.1	
Approach LOS		D			E			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.0	9.0	30.0		20.0	12.0	27.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	5.0	26.0		16.0	8.0	23.0				
Max Q Clear Time (g_c+I1), s		2.6	3.2	15.7		12.0	10.0	25.0				
Green Ext Time (p_c), s		0.0	0.0	3.5		0.8	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				51.1								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	868	283	88	765	185	360	99	141	437	240	390
Future Volume (veh/h)	61	868	283	88	765	185	360	99	141	437	240	390
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	66	943	308	96	832	201	250	306	153	368	411	424
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	123	838	272	98	1080	483	394	413	351	394	413	351
Arrive On Green	0.07	0.31	0.31	0.05	0.29	0.29	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1845	2732	888	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	66	634	617	96	832	201	250	306	153	368	411	424
Grp Sat Flow(s),veh/h/ln	1845	1840	1780	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	2.6	23.0	23.0	3.9	15.5	7.4	9.2	11.1	6.0	14.7	15.9	16.0
Cycle Q Clear(g_c), s	2.6	23.0	23.0	3.9	15.5	7.4	9.2	11.1	6.0	14.7	15.9	16.0
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	123	564	546	98	1080	483	394	413	351	394	413	351
V/C Ratio(X)	0.54	1.12	1.13	0.98	0.77	0.42	0.64	0.74	0.44	0.93	0.99	1.21
Avail Cap(c_a), veh/h	123	564	546	98	1080	483	394	413	351	394	413	351
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	26.0	26.0	35.5	24.2	21.3	26.8	27.6	25.6	29.0	29.5	29.5
Incr Delay (d2), s/veh	15.8	76.4	79.7	84.3	5.3	2.6	7.6	11.3	3.9	31.6	42.9	116.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	23.6	23.3	4.3	8.7	3.7	5.6	7.2	3.1	10.9	13.4	18.6
LnGrp Delay(d),s/veh	49.6	102.4	105.7	119.7	29.5	24.0	34.5	38.9	29.5	60.6	72.4	146.4
LnGrp LOS	D	F	F	F	C	C	C	D	C	E	E	F
Approach Vol, veh/h	1317				1129				709			
Approach Delay, s/veh	101.3				36.2				35.3			
Approach LOS	F				D				D			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	20.0		8.0	27.0	20.0		9.0	26.0				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	16.0		4.0	23.0	16.0		5.0	22.0				
Max Q Clear Time (g_c+I1), s	13.1		5.9	25.0	18.0		4.6	17.5				
Green Ext Time (p_c), s	1.0		0.0	0.0	0.0		0.0	2.5				
Intersection Summary												
HCM 2010 Ctrl Delay	71.9											
HCM 2010 LOS	E											
Notes												

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	78	7	7	86	9	4	5	8	0	0	0
Future Vol, veh/h	23	78	7	7	86	9	4	5	8	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	85	8	8	93	10	4	5	9	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.7	7.6	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	24%	21%	7%
Vol Thru, %	29%	72%	84%
Vol Right, %	47%	6%	9%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	17	108	102
LT Vol	4	23	7
Through Vol	5	78	86
RT Vol	8	7	9
Lane Flow Rate	18	117	111
Geometry Grp	1	1	1
Degree of Util (X)	0.021	0.132	0.124
Departure Headway (Hd)	4.088	4.052	4.014
Convergence, Y/N	Yes	Yes	Yes
Cap	860	884	891
Service Time	2.187	2.083	2.047
HCM Lane V/C Ratio	0.021	0.132	0.125
HCM Control Delay	7.3	7.7	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.5	0.4

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖						↖	↗
Traffic Vol, veh/h	0	195	55	31	35	0	0	0	0	28	0	46
Future Vol, veh/h	0	195	55	31	35	0	0	0	0	28	0	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	212	60	34	38	0	0	0	0	30	0	50
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	212	0	0				318	318	38
Stage 1	-	-	-	-	-	-				106	106	-
Stage 2	-	-	-	-	-	-				212	212	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1358	-	0				675	598	1034
Stage 1	0	-	-	-	-	0				918	807	-
Stage 2	0	-	-	-	-	0				823	727	-
Platoon blocked, %	-	-	-	-	-	-				-	-	-
Mov Cap-1 Maneuver	-	-	-	1358	-	-				657	0	1034
Mov Cap-2 Maneuver	-	-	-	-	-	-				657	0	-
Stage 1	-	-	-	-	-	-				894	0	-
Stage 2	-	-	-	-	-	-				823	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.6			9.5					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT		EBR	WBL	WBT	SBLn1	SBLn2					
Capacity (veh/h)	-		-	1358	-	657	1034					
HCM Lane V/C Ratio	-		-	0.025	-	0.046	0.048					
HCM Control Delay (s)	-		-	7.7	0	10.7	8.7					
HCM Lane LOS	-		-	A	A	B	A					
HCM 95th %tile Q(veh)	-		-	0.1	-	0.1	0.2					

HCM 2010 Signalized Intersection Summary

56: I-5 SB On/Off-Ramp & Vista Way

06/29/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑	↑	↑↑		
Traffic Volume (veh/h)	945	137	935	1632	56	1428		
Future Volume (veh/h)	945	137	935	1632	56	1428		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	1027	0	1016	1774	61	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1302	583	1211	1401	397	624		
Arrive On Green	0.35	0.00	0.34	0.72	0.22	0.00		
Sat Flow, veh/h	3778	1647	3579	1937	1845	2898		
Grp Volume(v), veh/h	1027	0	1016	1774	61	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1937	1845	1449		
Q Serve(g_s), s	32.5	0.0	34.1	94.0	3.5	0.0		
Cycle Q Clear(g_c), s	32.5	0.0	34.1	94.0	3.5	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1302	583	1211	1401	397	624		
V/C Ratio(X)	0.79	0.00	0.84	1.27	0.15	0.00		
Avail Cap(c_a), veh/h	1302	583	1211	1401	397	624		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	37.6	0.0	39.7	18.0	41.4	0.0		
Incr Delay (d2), s/veh	4.9	0.0	7.0	125.7	0.8	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	17.4	0.0	18.0	98.3	1.9	0.0		
LnGrp Delay(d),s/veh	42.5	0.0	46.8	143.7	42.2	0.0		
LnGrp LOS	D		D	F	D			
Approach Vol, veh/h	1027			2790	61			
Approach Delay, s/veh	42.5			108.4	42.2			
Approach LOS	D			F	D			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		32.0	48.0	50.0				98.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		28.0	44.0	46.0				94.0
Max Q Clear Time (g_c+I1), s		5.5	36.1	34.5				96.0
Green Ext Time (p_c), s		0.1	2.8	5.5				0.0
Intersection Summary								
HCM 2010 Ctrl Delay			89.9					
HCM 2010 LOS			F					

Appendix K.2 – Analysis Output Sheets (Future with Project Alternative 1 Existing SR-78)

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	81	61	94	302	563	169	18	141	82	23	69
Future Volume (vph)	89	81	61	94	302	563	169	18	141	82	23	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3145	1441		1782	1583		1793	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3145	1441		1782	1583		1793	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	88	66	102	328	612	184	20	153	89	25	75
RTOR Reduction (vph)	0	0	58	0	226	253	0	0	91	0	0	57
Lane Group Flow (vph)	97	88	8	102	408	53	0	204	62	0	114	18
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	5.5	8.4	8.4	8.3	12.8	12.8		21.4	21.4		17.2	17.2
Effective Green, g (s)	5.5	8.4	8.4	8.3	12.8	12.8		21.4	21.4		17.2	17.2
Actuated g/C Ratio	0.07	0.11	0.11	0.11	0.17	0.17		0.29	0.29		0.23	0.23
Clearance Time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	132	212	180	199	546	250		518	460		419	369
v/s Ratio Prot	0.05	0.05		c0.06	c0.13			c0.11			c0.06	
v/s Ratio Perm			0.00			0.04			0.04			0.01
v/c Ratio	0.73	0.42	0.04	0.51	0.75	0.21		0.39	0.13		0.27	0.05
Uniform Delay, d1	33.3	30.3	29.0	30.7	28.9	26.1		20.9	19.3		23.1	21.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	19.0	0.5	0.0	2.2	4.9	0.2		2.2	0.6		1.6	0.2
Delay (s)	52.3	30.8	29.1	33.0	33.8	26.2		23.1	19.9		24.7	22.1
Level of Service	D	C	C	C	C	C		C	B		C	C
Approach Delay (s)		38.7			31.5			21.7			23.7	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			29.8				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			73.6				Sum of lost time (s)		18.3			
Intersection Capacity Utilization			49.4%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				LT				L			
Volume (V), veh/h	0	0	0	0	0	409	0	381	0	0	179	464	0	121	166	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	0	0	0	0	453	0	414	0	0	198	514	0	134	184	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			4.6453	4.3276			4.3276		4.6453	4.3276
Follow-Up Headway (s)		3.1858			2.6667	2.5352			2.5352		2.6667	2.5352

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		0		0	453	414		198	514	134	184	
Entry Volume veh/h		0		0	444	414		194	504	131	180	
Circulating Flow (v_c), pc/h	771			198			134			453		
Exiting Flow (v_{ex}), pc/h	134			0			198			637		
Capacity (C_{pce}), pc/h		523		1125	1200			1267		890	966	
Capacity (c), veh/h		512		1103	1177			1242		872	947	
v/c Ratio (x)		0.00		0.00	0.38			0.16		0.15	0.19	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.0		3.3	6.8	0.0		4.2	0.0	5.6	5.6	
Lane LOS		A		A	A	A		A	A	A	A	
95% Queue, veh		0.0		0.0	1.8			0.6		0.5	0.7	
Approach Delay, s/veh				3.5			1.2			5.6		
Approach LOS				A			A			A		
Intersection Delay, s/veh LOS	3.0						A					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	21	4	43	27	84	12	58	62	125	79	6
Future Volume (vph)	2	21	4	43	27	84	12	58	62	125	79	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	23	4	47	29	91	13	63	67	136	86	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	29	167	143	229								
Volume Left (vph)	2	47	13	136								
Volume Right (vph)	4	91	67	7								
Hadj (s)	-0.03	-0.24	-0.23	0.13								
Departure Headway (s)	5.0	4.6	4.4	4.7								
Degree Utilization, x	0.04	0.21	0.18	0.30								
Capacity (veh/h)	650	726	767	732								
Control Delay (s)	8.2	8.8	8.4	9.7								
Approach Delay (s)	8.2	8.8	8.4	9.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.0									
Level of Service			A									
Intersection Capacity Utilization			40.4%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Surfrider Way
E/W Street Name	Surfrider Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1
Lane Assignment	LTR				LTR				LTR				LT			
Volume (V), veh/h	0	11	8	17	0	2	13	3	0	13	331	2	0	2	360	34
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	12	9	19	0	2	14	3	0	14	367	2	0	2	399	38
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929		4.5436	4.5436	
Follow-Up Headway (s)		3.1858			3.1858			3.1858		2.5352	2.5352	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		40			19			383		401	38	
Entry Volume veh/h		39			19			375		393	37	
Circulating Flow (v_c), pc/h	403			393			23			30		
Exiting Flow (v_{ex}), pc/h	13			66			382			420		
Capacity (C_{pce}), pc/h		755			763			1104		1382	1382	
Capacity (c), veh/h		740			748			1083		1355	1355	
v/c Ratio (x)		0.05			0.02			0.35		0.29	0.03	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.4			5.1			6.8		5.2	2.9	
Lane LOS		A			A			A		A	A	
95% Queue, veh		0.2			0.1			1.6		1.2	0.1	
Approach Delay, s/veh	5.4			5.1			6.8			5.0		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	5.8						A					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Civic Center Drive
E/W Street Name	Civic Center Drive
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	12	9	8	0	22	13	21	0	7	280	27	0	60	333	12
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	13	10	9	0	24	14	23	0	8	310	30	0	67	369	13
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		32			61			348			449	
Entry Volume veh/h		31			60			341			440	
Circulating Flow (v_c), pc/h	460			331			90			46		
Exiting Flow (v_{ex}), pc/h	107			35			346			402		
Capacity (C_{pce}), pc/h		713			812			1033			1079	
Capacity (c), veh/h		699			796			1013			1058	
v/c Ratio (x)		0.04			0.08			0.34			0.42	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.6			5.3			7.0			7.9	
Lane LOS		A			A			A			A	
95% Queue, veh		0.1			0.2			1.5			2.1	
Approach Delay, s/veh	5.6			5.3			7.0			7.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	7.3						A					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	7/11/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Pier View Way
E/W Street Name	Pier View Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	11	8	17	0	2	13	3	0	13	331	2	0	2	360	34
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	12	9	19	0	2	14	3	0	14	367	2	0	2	399	38
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		40			19			383			439	
Entry Volume veh/h		39			19			375			430	
Circulating Flow (v_c), pc/h	403			393			23			30		
Exiting Flow (v_{ex}), pc/h	13			66			382			420		
Capacity (C_{pce}), pc/h		755			763			1104			1097	
Capacity (c), veh/h		740			748			1083			1075	
v/c Ratio (x)		0.05			0.02			0.35			0.40	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.4			5.1			6.8			7.6	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.1			1.6			2.0	
Approach Delay, s/veh	5.4			5.1			6.8			7.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	7.1						A					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

07/02/2018

																	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR					
Lane Configurations																	
Sign Control		Stop			Stop			Stop			Stop						
Traffic Volume (vph)	2	3	19	9	6	4	89	222	3	5	152	7					
Future Volume (vph)	2	3	19	9	6	4	89	222	3	5	152	7					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92					
Hourly flow rate (vph)	2	3	21	10	7	4	97	241	3	5	165	8					
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2										
Volume Total (vph)	5	21	21	218	124	88	91										
Volume Left (vph)	2	0	10	97	0	5	0										
Volume Right (vph)	0	21	4	0	3	0	8										
Hadj (s)	0.23	-0.67	0.01	0.26	0.02	0.06	-0.03										
Departure Headway (s)	5.9	5.0	5.7	5.0	4.8	5.0	4.9										
Degree Utilization, x	0.01	0.03	0.03	0.30	0.16	0.12	0.12										
Capacity (veh/h)	559	655	585	703	735	701	717										
Control Delay (s)	7.8	7.0	8.9	9.0	7.5	7.5	7.4										
Approach Delay (s)	7.1		8.9	8.5		7.4											
Approach LOS	A		A	A		A											
Intersection Summary																	
Delay			8.1														
Level of Service			A														
Intersection Capacity Utilization			31.1%	ICU Level of Service						A							
Analysis Period (min)			15														

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	125	57	130	88	33	114
Future Volume (vph)	125	57	130	88	33	114
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	136	62	141	96	36	124
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	136	62	237	160		
Volume Left (vph)	136	0	0	36		
Volume Right (vph)	0	62	96	0		
Hadj (s)	0.53	-0.67	-0.21	0.08		
Departure Headway (s)	6.0	4.8	4.4	4.8		
Degree Utilization, x	0.23	0.08	0.29	0.21		
Capacity (veh/h)	568	706	777	710		
Control Delay (s)	9.5	7.0	9.3	9.1		
Approach Delay (s)	8.7		9.3	9.1		
Approach LOS	A		A	A		
Intersection Summary						
Delay			9.0			
Level of Service			A			
Intersection Capacity Utilization			37.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	0	123	35	160	32	0	0	0	0	30	40
Future Volume (vph)	18	0	123	35	160	32	0	0	0	0	30	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5		4.5	4.5	4.5						4.5	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.97						0.92	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3450						3239	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3450						3239	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	0	134	38	174	35	0	0	0	0	33	43
RTOR Reduction (vph)	0	0	122	14	13	0	0	0	0	0	40	0
Lane Group Flow (vph)	20	0	12	24	196	0	0	0	0	0	36	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	5.2		5.2	37.2	37.2						4.1	
Effective Green, g (s)	5.2		5.2	37.2	37.2						4.1	
Actuated g/C Ratio	0.09		0.09	0.62	0.62						0.07	
Clearance Time (s)	4.5		4.5	4.5	4.5						4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	153		241	1097	2139						221	
v/s Ratio Prot	c0.01		0.00	0.01	c0.06						c0.01	
v/s Ratio Perm												
v/c Ratio	0.13		0.05	0.02	0.09						0.16	
Uniform Delay, d1	25.3		25.1	4.4	4.6						26.3	
Progression Factor	1.00		1.00	1.00	1.00						1.00	
Incremental Delay, d2	0.4		0.1	0.0	0.1						0.3	
Delay (s)	25.7		25.2	4.4	4.7						26.7	
Level of Service	C		C	A	A						C	
Approach Delay (s)		25.3			4.6			0.0			26.7	
Approach LOS		C			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			14.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.10									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)			13.5			
Intersection Capacity Utilization			22.9%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	139	226	72	69	507	0	0	289	32
Future Volume (vph)	0	0	0	139	226	72	69	507	0	0	289	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	0.95
Frpb, ped/bikes				1.00	1.00	0.96	1.00	1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	3539	1526	1770	1863			1766	1461
Flt Permitted				0.95	1.00	1.00	0.43	1.00			1.00	1.00
Satd. Flow (perm)				1770	3539	1526	796	1863			1766	1461
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	151	246	78	75	551	0	0	314	35
RTOR Reduction (vph)	0	0	0	0	0	54	0	0	0	0	1	23
Lane Group Flow (vph)	0	0	0	151	246	24	75	551	0	0	317	8
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					6
Actuated Green, G (s)				18.1	18.1	18.1	30.8	30.8			15.7	15.7
Effective Green, g (s)				18.1	18.1	18.1	30.8	30.8			15.7	15.7
Actuated g/C Ratio				0.31	0.31	0.31	0.52	0.52			0.27	0.27
Clearance Time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				543	1087	468	583	974			470	389
v/s Ratio Prot				c0.09	0.07		0.02	c0.30			c0.18	
v/s Ratio Perm						0.02	0.05					0.01
v/c Ratio				0.28	0.23	0.05	0.13	0.57			0.68	0.02
Uniform Delay, d1				15.5	15.2	14.4	9.9	9.5			19.3	15.9
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				1.3	0.5	0.2	0.1	0.9			4.2	0.0
Delay (s)				16.7	15.7	14.6	10.1	10.4			23.5	16.0
Level of Service				B	B	B	B	B			C	B
Approach Delay (s)		0.0			15.8			10.4			22.8	
Approach LOS		A			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			15.2		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			58.9		Sum of lost time (s)					15.0		
Intersection Capacity Utilization			51.7%		ICU Level of Service					A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	111	1	123	416	202	11	24	185	135	47	6
Future Volume (vph)	23	111	1	123	416	202	11	24	185	135	47	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Flt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.98	
Satd. Flow (prot)	1770	3535		1770	3539	1583		1834	1583	1681	1714	
Flt Permitted	0.45	1.00		0.67	1.00	1.00		0.94	1.00	0.73	0.90	
Satd. Flow (perm)	846	3535		1257	3539	1583		1752	1583	1296	1570	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	121	1	134	452	220	12	26	201	147	51	7
RTOR Reduction (vph)	0	1	0	0	0	161	0	0	89	0	3	0
Lane Group Flow (vph)	25	121	0	134	452	59	0	38	112	101	101	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	15.1	15.1		14.7	14.7	14.7		30.7	30.7	30.7	30.7	
Effective Green, g (s)	15.1	15.1		14.7	14.7	14.7		30.7	30.7	30.7	30.7	
Actuated g/C Ratio	0.27	0.27		0.27	0.27	0.27		0.56	0.56	0.56	0.56	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	232	970		335	945	423		977	883	723	876	
v/s Ratio Prot		0.03			c0.13							
v/s Ratio Perm	0.03			0.11		0.04		0.02	0.07	c0.08	0.06	
v/c Ratio	0.11	0.13		0.40	0.48	0.14		0.04	0.13	0.14	0.12	
Uniform Delay, d1	14.9	15.0		16.5	16.9	15.3		5.5	5.8	5.8	5.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.1		0.9	0.5	0.2		0.1	0.3	0.4	0.3	
Delay (s)	15.2	15.1		17.5	17.4	15.5		5.6	6.1	6.2	6.0	
Level of Service	B	B		B	B	B		A	A	A	A	
Approach Delay (s)		15.1			16.9			6.0			6.1	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			13.3				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			55.0				Sum of lost time (s)			9.6		
Intersection Capacity Utilization			38.5%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

07/02/2018

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	78	6	22	28	6	9
Future Volume (Veh/h)	78	6	22	28	6	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	85	7	24	30	7	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh)						
Upstream signal (ft)				238		
pX, platoon unblocked						
vC, conflicting volume			92		166	88
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			92		166	88
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		99	99
cM capacity (veh/h)			1503		811	970
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	92	54	17			
Volume Left	0	24	7			
Volume Right	7	0	10			
cSH	1700	1503	897			
Volume to Capacity	0.05	0.02	0.02			
Queue Length 95th (ft)	0	1	1			
Control Delay (s)	0.0	3.4	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.4	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			2.1			
Intersection Capacity Utilization			19.4%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	53	99	0	0	0	28	215	58	68	208	55
Future Volume (vph)	93	53	99	0	0	0	28	215	58	68	208	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.95				1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1498				1770	1863	1552	1770	1863	1518
Flt Permitted	0.95	1.00	1.00				0.62	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	1770	1863	1498				1150	1863	1552	831	1863	1518
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	101	58	108	0	0	0	30	234	63	74	226	60
RTOR Reduction (vph)	0	0	60	0	0	0	0	0	45	0	0	36
Lane Group Flow (vph)	101	58	48	0	0	0	30	234	18	74	226	24
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA	Perm				Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4					2	2		1	6	
Permitted Phases			4				2		2	6		6
Actuated Green, G (s)	24.3	24.3	24.3				15.5	15.5	15.5	21.9	21.9	21.9
Effective Green, g (s)	24.3	24.3	24.3				15.5	15.5	15.5	21.9	21.9	21.9
Actuated g/C Ratio	0.44	0.44	0.44				0.28	0.28	0.28	0.40	0.40	0.40
Clearance Time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0				4.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	782	823	661				324	525	437	371	741	604
v/s Ratio Prot	c0.06	0.03						c0.13		0.01	c0.12	
v/s Ratio Perm			0.03				0.03		0.01	0.07		0.02
v/c Ratio	0.13	0.07	0.07				0.09	0.45	0.04	0.20	0.30	0.04
Uniform Delay, d1	9.1	8.8	8.9				14.6	16.2	14.3	10.7	11.3	10.1
Progression Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.2	0.2				0.6	2.7	0.2	0.3	1.1	0.1
Delay (s)	9.4	9.0	9.1				15.1	18.9	14.5	10.9	12.4	10.2
Level of Service	A	A	A				B	B	B	B	B	B
Approach Delay (s)		9.2			0.0			17.7			11.7	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			13.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.27									
Actuated Cycle Length (s)			55.0				Sum of lost time (s)			12.8		
Intersection Capacity Utilization			49.5%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	188	9	0	0	0	0	4	16	21	8	0
Future Volume (Veh/h)	11	188	9	0	0	0	0	4	16	21	8	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	204	10	0	0	0	0	4	17	23	9	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		218										
pX, platoon unblocked												
vC, conflicting volume	0			214			238	233	107	145	238	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			214			238	233	107	145	238	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	99	98	97	99	100
cM capacity (veh/h)	1622			1353			686	661	926	787	657	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	114	112	21	32								
Volume Left	12	0	0	23								
Volume Right	0	10	17	0								
cSH	1622	1700	861	745								
Volume to Capacity	0.01	0.07	0.02	0.04								
Queue Length 95th (ft)	1	0	2	3								
Control Delay (s)	0.8	0.0	9.3	10.0								
Lane LOS	A		A	B								
Approach Delay (s)	0.4		9.3	10.0								
Approach LOS			A	B								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			20.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	425	4	0	0	0	0	4	20	14	13	0
Future Volume (vph)	23	425	4	0	0	0	0	4	20	14	13	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	462	4	0	0	0	0	4	22	15	14	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	256	235	26	29								
Volume Left (vph)	25	0	0	15								
Volume Right (vph)	0	4	22	0								
Hadj (s)	0.08	0.02	-0.47	0.14								
Departure Headway (s)	4.7	4.7	4.5	5.1								
Degree Utilization, x	0.34	0.30	0.03	0.04								
Capacity (veh/h)	754	760	744	656								
Control Delay (s)	8.9	8.5	7.6	8.3								
Approach Delay (s)	8.7		7.6	8.3								
Approach LOS	A		A	A								
Intersection Summary												
Delay			8.6									
Level of Service			A									
Intersection Capacity Utilization			27.3%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

07/02/2018

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	90	171	9	39	0	91	0	45	29	0	0	0								
Future Volume (vph)	90	171	9	39	0	91	0	45	29	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	98	186	10	42	0	99	0	49	32	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	98	196	141	81																
Volume Left (vph)	98	0	42	0																
Volume Right (vph)	0	10	99	32																
Hadj (s)	0.53	0.00	-0.33	-0.20																
Departure Headway (s)	5.3	4.8	4.2	4.7																
Degree Utilization, x	0.15	0.26	0.16	0.10																
Capacity (veh/h)	662	732	826	716																
Control Delay (s)	8.0	8.3	8.0	8.2																
Approach Delay (s)	8.2		8.0	8.2																
Approach LOS	A		A	A																
Intersection Summary																				
Delay			8.2																	
Level of Service			A																	
Intersection Capacity Utilization			31.4%	ICU Level of Service						A										
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	13	0	0	31	13	235	20	14	243	6
Future Volume (Veh/h)	0	0	13	0	0	31	13	235	20	14	243	6
Sign Control	Stop			Stop				Free			Free	
Grade	0%			0%				0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	14	0	0	34	14	255	22	15	264	7
Pedestrians	7			7								
Lane Width (ft)	12.0			16.0								
Walking Speed (ft/s)	4.0			4.0								
Percent Blockage	1			1								
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			455		
pX, platoon unblocked												
vC, conflicting volume	622	616	274	609	609	273	278				284	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	622	616	274	609	609	273	278				284	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	98	100	100	96	99				99	
cM capacity (veh/h)	369	391	760	386	395	760	1277				1268	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	14	34	14	277	15	271						
Volume Left	0	0	14	0	15	0						
Volume Right	14	34	0	22	0	7						
cSH	760	760	1277	1700	1268	1700						
Volume to Capacity	0.02	0.04	0.01	0.16	0.01	0.16						
Queue Length 95th (ft)	1	4	1	0	1	0						
Control Delay (s)	9.8	10.0	7.8	0.0	7.9	0.0						
Lane LOS	A	A	A		A							
Approach Delay (s)	9.8	10.0	0.4		0.4							
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			23.6%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Washington Avenue
E/W Street Name	Washington Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	14	2	25	0	37	6	4	0	18	241	11	0	3	251	18
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	16	2	28	0	41	7	4	0	20	267	12	0	3	278	20
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		46			52			299			301	
Entry Volume veh/h		45			51			293			295	
Circulating Flow (v_c), pc/h	322			303			21			68		
Exiting Flow (v_{ex}), pc/h	17			47			287			347		
Capacity (C_{pce}), pc/h		819			835			1107			1056	
Capacity (c), veh/h		803			818			1085			1035	
v/c Ratio (x)		0.06			0.06			0.27			0.29	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.0			5.0			5.9			6.3	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.2			1.1			1.2	
Approach Delay, s/veh	5.0			5.0			5.9			6.3		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	5.9						A					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	22	29	18	26	4	80	3	152	41	95	104	1
Future Volume (vph)	22	29	18	26	4	80	3	152	41	95	104	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	32	20	28	4	87	3	165	45	103	113	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	76	119	213	217								
Volume Left (vph)	24	28	3	103								
Volume Right (vph)	20	87	45	1								
Hadj (s)	-0.06	-0.36	-0.09	0.13								
Departure Headway (s)	5.0	4.7	4.6	4.8								
Degree Utilization, x	0.11	0.15	0.27	0.29								
Capacity (veh/h)	642	695	748	715								
Control Delay (s)	8.6	8.5	9.3	9.7								
Approach Delay (s)	8.6	8.5	9.3	9.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.2									
Level of Service			A									
Intersection Capacity Utilization			39.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	204	24	5	94	16	12	26	30	22	36	12
Future Volume (Veh/h)	8	204	24	5	94	16	12	26	30	22	36	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	222	26	5	102	17	13	28	33	24	39	13
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked												
vC, conflicting volume	133			255			414	403	242	434	408	126
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	133			255			414	403	242	434	408	126
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			97	95	96	95	92	99
cM capacity (veh/h)	1435			1302			496	522	792	473	519	913
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	257	124	74	76								
Volume Left	9	5	13	24								
Volume Right	26	17	33	13								
cSH	1435	1302	609	542								
Volume to Capacity	0.01	0.00	0.12	0.14								
Queue Length 95th (ft)	0	0	10	12								
Control Delay (s)	0.3	0.3	11.7	12.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.3	11.7	12.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.7									
Intersection Capacity Utilization			28.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Wisconsin Avenue
E/W Street Name	Wisconsin Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	53	53	134	0	87	28	27	0	65	251	62	0	16	276	18
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	59	59	149	0	96	31	30	0	72	278	69	0	18	306	20
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		267			157			419			344	
Entry Volume veh/h		262			154			411			337	
Circulating Flow (v_c), pc/h	420			409			136			199		
Exiting Flow (v_{ex}), pc/h	146			123			367			551		
Capacity (C_{pce}), pc/h		742			751			986			926	
Capacity (c), veh/h		728			736			967			908	
v/c Ratio (x)		0.36			0.21			0.42			0.37	

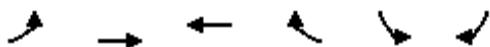
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.5			7.2			8.6			8.1	
Lane LOS		A			A			A			A	
95% Queue, veh		1.6			0.8			2.1			1.7	
Approach Delay, s/veh	9.5			7.2			8.6			8.1		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	8.5						A					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

07/02/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	208	201	5	16	15
Future Volume (Veh/h)	8	208	201	5	16	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	226	218	5	17	16
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	231				474	230
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	231				474	230
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	98
cM capacity (veh/h)	1328				542	804
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	235	223	33			
Volume Left	9	0	17			
Volume Right	0	5	16			
cSH	1328	1700	643			
Volume to Capacity	0.01	0.13	0.05			
Queue Length 95th (ft)	1	0	4			
Control Delay (s)	0.4	0.0	10.9			
Lane LOS	A		B			
Approach Delay (s)	0.4	0.0	10.9			
Approach LOS			B			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			27.8%		ICU Level of Service	
Analysis Period (min)			15		A	

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	193	9	20	182	11	5	5	13	33	1	5
Future Volume (Veh/h)	7	193	9	20	182	11	5	5	13	33	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	210	10	22	198	12	5	5	14	36	1	5
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	212			220			486	487	215	498	486	208
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	212			220			486	487	215	498	486	208
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			99	99	98	92	100	99
cM capacity (veh/h)	1356			1349			478	469	825	462	470	830
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	228	232	24	42								
Volume Left	8	22	5	36								
Volume Right	10	12	14	5								
cSH	1356	1349	630	488								
Volume to Capacity	0.01	0.02	0.04	0.09								
Queue Length 95th (ft)	0	1	3	7								
Control Delay (s)	0.3	0.9	10.9	13.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.9	10.9	13.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			32.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	111	175	69	141	0	94	0	35	0	0	0
Future Volume (vph)	0	111	175	69	141	0	94	0	35	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	121	190	75	153	0	102	0	38	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	311	228	140	0								
Volume Left (vph)	0	75	102	0								
Volume Right (vph)	190	0	38	0								
Hadj (s)	-0.33	0.10	0.02	0.00								
Departure Headway (s)	4.2	4.7	5.1	5.3								
Degree Utilization, x	0.36	0.30	0.20	0.00								
Capacity (veh/h)	822	729	643	595								
Control Delay (s)	9.6	9.7	9.4	8.3								
Approach Delay (s)	9.6	9.7	9.4	0.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.6									
Level of Service			A									
Intersection Capacity Utilization			49.5%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	51	69	101	32	81	121
Future Volume (vph)	51	69	101	32	81	121
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	75	110	35	88	132
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	130	145	220			
Volume Left (vph)	55	0	88			
Volume Right (vph)	75	35	0			
Hadj (s)	-0.23	-0.11	0.11			
Departure Headway (s)	4.5	4.4	4.5			
Degree Utilization, x	0.16	0.18	0.27			
Capacity (veh/h)	738	791	770			
Control Delay (s)	8.4	8.3	9.2			
Approach Delay (s)	8.4	8.3	9.2			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.7			
Level of Service			A			
Intersection Capacity Utilization			35.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	235	1	6	189	40	7	10	11	40	16	10
Future Volume (Veh/h)	8	235	1	6	189	40	7	10	11	40	16	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	255	1	7	205	43	8	11	12	43	17	11
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)	213											
pX, platoon unblocked	0.93						0.93	0.93		0.93	0.93	0.93
vC, conflicting volume	251			267			548	550	274	542	528	234
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	153			267			474	475	274	467	452	134
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			98	98	98	90	96	99
cM capacity (veh/h)	1320			1285			432	442	752	441	455	843
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	265	255	31	71								
Volume Left	9	7	8	43								
Volume Right	1	43	12	11								
cSH	1320	1285	522	480								
Volume to Capacity	0.01	0.01	0.06	0.15								
Queue Length 95th (ft)	1	0	5	13								
Control Delay (s)	0.3	0.3	12.3	13.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.3	12.3	13.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			31.4%	ICU Level of Service				A				
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Oceanside Blvd
E/W Street Name	Oceanside Boulevard
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	21	132	76	0	112	134	101	0	39	226	60	0	110	287	15
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	23	146	84	0	124	149	112	0	43	251	67	0	122	318	17
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		253			385			361			457	
Entry Volume veh/h		248			377			354			448	
Circulating Flow (v_c), pc/h	564			317			291			316		
Exiting Flow (v_{ex}), pc/h	335			209			386			526		
Capacity (C_{pce}), pc/h		643			823			845			824	
Capacity (c), veh/h		630			807			828			808	
v/c Ratio (x)		0.39			0.47			0.43			0.55	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		11.3			10.7			9.7			12.6	
Lane LOS		B			B			A			B	
95% Queue, veh		1.9			2.5			2.2			3.5	
Approach Delay, s/veh	11.3			10.7			9.7			12.6		
Approach LOS	B			B			A			B		
Intersection Delay, s/veh LOS	11.2						B					

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	324	0	16	417	79	8	8	34	243	13	44
Future Volume (vph)	11	324	0	16	417	79	8	8	34	243	13	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.96
Flpb, ped/bikes	1.00	1.00		0.99	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1770	3539		1755	3446			3121			1777	1527
Flt Permitted	0.34	1.00		0.53	1.00			0.92			0.69	1.00
Satd. Flow (perm)	635	3539		979	3446			2886			1293	1527
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	352	0	17	453	86	9	9	37	264	14	48
RTOR Reduction (vph)	0	0	0	0	38	0	0	15	0	0	0	20
Lane Group Flow (vph)	12	352	0	17	501	0	0	40	0	0	278	28
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	13.4	13.4		13.4	13.4			32.1			32.1	32.1
Effective Green, g (s)	13.4	13.4		13.4	13.4			32.1			32.1	32.1
Actuated g/C Ratio	0.24	0.24		0.24	0.24			0.58			0.58	0.58
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	154	862		238	839			1684			754	891
v/s Ratio Prot		0.10			c0.15							
v/s Ratio Perm	0.02			0.02				0.01			c0.22	0.02
v/c Ratio	0.08	0.41		0.07	0.60			0.02			0.37	0.03
Uniform Delay, d1	16.0	17.5		16.0	18.4			4.8			6.1	4.9
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.2	0.3		0.1	1.2			0.0			1.4	0.1
Delay (s)	16.3	17.8		16.1	19.6			4.9			7.5	4.9
Level of Service	B	B		B	B			A			A	A
Approach Delay (s)		17.7			19.5			4.9			7.1	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		15.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.44										
Actuated Cycle Length (s)		55.0			Sum of lost time (s)			9.5				
Intersection Capacity Utilization		61.1%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2035
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Morse Street
E/W Street Name	Morse Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	24	13	17	0	31	8	114	0	3	378	61	0	95	511	17
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	27	14	19	0	34	9	126	0	3	419	68	0	105	567	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		60			169			490			691	
Entry Volume veh/h		59			166			480			677	
Circulating Flow (v_c), pc/h	706			449			146			46		
Exiting Flow (v_{ex}), pc/h	187			31			572			620		
Capacity (C_{pce}), pc/h		558			721			977			1079	
Capacity (c), veh/h		547			707			957			1058	
v/c Ratio (x)		0.11			0.23			0.50			0.64	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.9			7.8			10.0			12.4	
Lane LOS		A			A			A			B	
95% Queue, veh		0.4			0.9			2.9			4.8	
Approach Delay, s/veh	7.9			7.8			10.0			12.4		
Approach LOS	A			A			A			B		
Intersection Delay, s/veh LOS	10.8						B					

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	144	24	38	125	0	21	0	31	0	0	0
Future Volume (Veh/h)	0	144	24	38	125	0	21	0	31	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	157	26	41	136	0	23	0	34	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	252											
pX, platoon unblocked												
vC, conflicting volume	136			183			388	388	170	422	401	136
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	136			183			388	388	170	422	401	136
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			96	100	96	100	100	100
cM capacity (veh/h)	1448			1392			558	531	874	509	522	913
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	183	177	57	0								
Volume Left	0	41	23	0								
Volume Right	26	0	34	0								
cSH	1448	1392	711	1700								
Volume to Capacity	0.00	0.03	0.08	0.00								
Queue Length 95th (ft)	0	2	7	0								
Control Delay (s)	0.0	2.0	10.5	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	2.0	10.5	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay	2.3											
Intersection Capacity Utilization	31.0%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	63	15	4	45	1	26	0	11	1	0	1
Future Volume (Veh/h)	1	63	15	4	45	1	26	0	11	1	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	68	16	4	49	1	28	0	12	1	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	643											
pX, platoon unblocked												
vC, conflicting volume	50			84			136	136	76	148	144	50
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	50			84			136	136	76	148	144	50
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	99	100	100	100
cM capacity (veh/h)	1557			1513			832	752	985	809	745	1019
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	85	54	40	2								
Volume Left	1	4	28	1								
Volume Right	16	1	12	1								
cSH	1557	1513	872	902								
Volume to Capacity	0.00	0.00	0.05	0.00								
Queue Length 95th (ft)	0	0	4	0								
Control Delay (s)	0.1	0.6	9.3	9.0								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.1	0.6	9.3	9.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			2.4									
Intersection Capacity Utilization			14.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	37	106	15	37	132	15
Future Volume (vph)	37	106	15	37	132	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	115	16	40	143	16
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	155	56	159			
Volume Left (vph)	40	0	143			
Volume Right (vph)	115	40	0			
Hadj (s)	-0.36	-0.39	0.21			
Departure Headway (s)	4.0	4.0	4.5			
Degree Utilization, x	0.17	0.06	0.20			
Capacity (veh/h)	850	847	763			
Control Delay (s)	7.9	7.3	8.6			
Approach Delay (s)	7.9	7.3	8.6			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.1			
Level of Service			A			
Intersection Capacity Utilization			30.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	118	91	15	79	3	69	9	15	13	10	5
Future Volume (Veh/h)	3	118	91	15	79	3	69	9	15	13	10	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	128	99	16	86	3	75	10	16	14	11	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	89			227			314	304	178	324	352	88
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			227			314	304	178	324	352	88
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			88	98	98	98	98	99
cM capacity (veh/h)	1506			1341			620	600	866	603	564	971
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	230	105	101	30								
Volume Left	3	16	75	14								
Volume Right	99	3	16	5								
cSH	1506	1341	647	627								
Volume to Capacity	0.00	0.01	0.16	0.05								
Queue Length 95th (ft)	0	1	14	4								
Control Delay (s)	0.1	1.3	11.6	11.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	1.3	11.6	11.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization			28.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	139	9	6	86	2	2	2	17	1	3	1
Future Volume (Veh/h)	0	139	9	6	86	2	2	2	17	1	3	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	151	10	7	93	2	2	2	18	1	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)					249							
pX, platoon unblocked												
vC, conflicting volume	95			161			266	265	156	283	269	94
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	95			161			266	265	156	283	269	94
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	98	100	100	100
cM capacity (veh/h)	1499			1418			680	637	890	652	634	963
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	161	102	22	5								
Volume Left	0	7	2	1								
Volume Right	10	2	18	1								
cSH	1499	1418	836	685								
Volume to Capacity	0.00	0.00	0.03	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.0	0.6	9.4	10.3								
Lane LOS		A	A	B								
Approach Delay (s)	0.0	0.6	9.4	10.3								
Approach LOS			A	B								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			19.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2035
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Cassidy Street
E/W Street Name	Cassidy Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	64	89	55	0	74	41	23	0	69	316	43	0	54	346	13
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	71	99	61	0	82	45	26	0	76	350	48	0	60	384	14
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			4.9763	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		231			153			474			458	
Entry Volume veh/h		226			150			465			449	
Circulating Flow (v_c), pc/h	526			497			230			203		
Exiting Flow (v_{ex}), pc/h	207			135			447			527		
Capacity (C_{pce}), pc/h		668			687			898			1122	
Capacity (c), veh/h		655			674			880			1100	
v/c Ratio (x)		0.35			0.22			0.53			0.41	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		10.1			8.0			11.2			7.6	
Lane LOS		B			A			B			A	
95% Queue, veh		1.5			0.8			3.2			2.0	
Approach Delay, s/veh	10.1			8.0			11.2			7.6		
Approach LOS	B			A			B			A		
Intersection Delay, s/veh LOS	9.4						A					

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	116	28	33	66	13	11	27	28	10	23	19
Future Volume (Veh/h)	16	116	28	33	66	13	11	27	28	10	23	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	126	30	36	72	14	12	29	30	11	25	21
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	280											
pX, platoon unblocked												
vC, conflicting volume	86			156			360	333	141	370	341	79
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	86			156			360	333	141	370	341	79
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			97			98	95	97	98	96	98
cM capacity (veh/h)	1510			1424			548	566	907	530	560	981
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	173	122	71	57								
Volume Left	17	36	12	11								
Volume Right	30	14	30	21								
cSH	1510	1424	668	657								
Volume to Capacity	0.01	0.03	0.11	0.09								
Queue Length 95th (ft)	1	2	9	7								
Control Delay (s)	0.8	2.4	11.0	11.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.8	2.4	11.0	11.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			24.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	62	14	8	38	2	11	22	19	11	11	7
Future Volume (vph)	5	62	14	8	38	2	11	22	19	11	11	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	67	15	9	41	2	12	24	21	12	12	8
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	87	52	57	32								
Volume Left (vph)	5	9	12	12								
Volume Right (vph)	15	2	21	8								
Hadj (s)	-0.06	0.05	-0.14	-0.04								
Departure Headway (s)	4.1	4.2	4.1	4.2								
Degree Utilization, x	0.10	0.06	0.06	0.04								
Capacity (veh/h)	856	828	842	819								
Control Delay (s)	7.5	7.5	7.4	7.4								
Approach Delay (s)	7.5	7.5	7.4	7.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.5								
Level of Service				A								
Intersection Capacity Utilization				14.9%	ICU Level of Service		A					
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	108	4	26	49	15	4	45	108	114	8	5
Future Volume (vph)	5	108	4	26	49	15	4	45	108	114	8	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	117	4	28	53	16	4	49	117	124	9	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	126	97	170	138								
Volume Left (vph)	5	28	4	124								
Volume Right (vph)	4	16	117	5								
Hadj (s)	0.02	-0.01	-0.37	0.19								
Departure Headway (s)	4.8	4.8	4.3	4.8								
Degree Utilization, x	0.17	0.13	0.20	0.19								
Capacity (veh/h)	698	694	796	698								
Control Delay (s)	8.7	8.5	8.3	8.9								
Approach Delay (s)	8.7	8.5	8.3	8.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.6								
Level of Service				A								
Intersection Capacity Utilization				37.9%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	51	33	13	59	67
Future Volume (vph)	0	51	33	13	59	67
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	55	36	14	64	73
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	55	50	137			
Volume Left (vph)	0	0	64			
Volume Right (vph)	55	14	0			
Hadj (s)	-0.57	-0.13	0.13			
Departure Headway (s)	3.7	4.0	4.2			
Degree Utilization, x	0.06	0.06	0.16			
Capacity (veh/h)	914	869	845			
Control Delay (s)	7.0	7.2	8.0			
Approach Delay (s)	7.0	7.2	8.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.6			
Level of Service			A			
Intersection Capacity Utilization			16.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	121	40	256	49	216	29	213	122	183	300	6
Future Volume (vph)	15	121	40	256	49	216	29	213	122	183	300	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	16	16	16
Total Lost time (s)	5.0	5.0	5.0		4.9	4.9	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.95		1.00	1.00	
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2006	1863	1555		1788	1794	1770	3743		2006	3998	
Flt Permitted	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	2006	1863	1555		1788	1794	1770	3743		2006	3998	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	132	43	278	53	235	32	232	133	199	326	7
RTOR Reduction (vph)	0	0	39	0	0	156	0	94	0	0	2	0
Lane Group Flow (vph)	16	132	4	0	331	79	32	271	0	199	331	0
Confl. Peds. (#/hr)			2	2					5			
Confl. Bikes (#/hr)									4			
Turn Type	Split	NA	Perm	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	6.7	6.7	6.7		16.5	23.3	1.4	20.6		6.8	26.0	
Effective Green, g (s)	6.7	6.7	6.7		16.5	23.3	1.4	20.6		6.8	26.0	
Actuated g/C Ratio	0.10	0.10	0.10		0.24	0.33	0.02	0.30		0.10	0.37	
Clearance Time (s)	5.0	5.0	5.0		4.9		4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	192	179	149		423	599	35	1106		195	1491	
v/s Ratio Prot	0.01	c0.07			c0.19	0.04	0.02	0.07		c0.10	c0.08	
v/s Ratio Perm			0.00									
v/c Ratio	0.08	0.74	0.03		0.78	0.13	0.91	0.25		1.02	0.22	
Uniform Delay, d1	28.7	30.6	28.5		24.9	16.2	34.1	18.6		31.5	14.9	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	12.7	0.0		9.1	0.1	115.3	0.5		69.9	0.3	
Delay (s)	28.8	43.4	28.6		34.0	16.3	149.4	19.2		101.3	15.3	
Level of Service	C	D	C		C	B	F	B		F	B	
Approach Delay (s)		38.8			26.7			29.7			47.5	
Approach LOS		D			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			35.3									
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			69.7									
Intersection Capacity Utilization			62.5%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St

07/02/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	8	434	5	16	646	50	0	0	27	28	0	30	
Future Volume (Veh/h)	8	434	5	16	646	50	0	0	27	28	0	30	
Sign Control		Free			Free			Stop			Stop		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	9	472	5	17	702	54	0	0	29	30	0	33	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type	None			TWLTL									
Median storage veh	2												
Upstream signal (ft)	312												
pX, platoon unblocked				0.94				0.94	0.94	0.94	0.94	0.94	
vC, conflicting volume	756			477				1288	1282	474	1284	1258	729
vC1, stage 1 conf vol							492	492			763	763	
vC2, stage 2 conf vol							796	790			522	495	
vCu, unblocked vol	756			412				1275	1269	409	1271	1243	729
tC, single (s)	4.1			4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5			6.1	5.5	
tF (s)	2.2			2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98				100	100	95	91	100	92
cM capacity (veh/h)	855			1078				300	336	604	323	345	423
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	486	773	29	63									
Volume Left	9	17	0	30									
Volume Right	5	54	29	33									
cSH	855	1078	604	368									
Volume to Capacity	0.01	0.02	0.05	0.17									
Queue Length 95th (ft)	1	1	4	15									
Control Delay (s)	0.3	0.4	11.3	16.8									
Lane LOS	A	A	B	C									
Approach Delay (s)	0.3	0.4	11.3	16.8									
Approach LOS				B	C								
Intersection Summary													
Average Delay				1.4									
Intersection Capacity Utilization				62.3%	ICU Level of Service				B				
Analysis Period (min)				15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

07/02/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	11	539	12	36	848	28	12	5	78	33	5	17	
Future Volume (Veh/h)	11	539	12	36	848	28	12	5	78	33	5	17	
Sign Control	Free			Free			Stop			Stop			
Grade	0%			0%			0%			0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	12	586	13	39	922	30	13	5	85	36	5	18	
Pedestrians	1						1						
Lane Width (ft)	12.0						12.0						
Walking Speed (ft/s)	4.0						4.0						
Percent Blockage	0						0						
Right turn flare (veh)													
Median type	TWLTL			TWLTL									
Median storage (veh)	2			2									
Upstream signal (ft)	687												
pX, platoon unblocked				0.98			0.98			0.98	0.98	0.98	
vC, conflicting volume	952			600				1639	1648	594	1712	1639	938
vC1, stage 1 conf vol							618		618	1015		1015	
vC2, stage 2 conf vol							1022		1030	698		624	
vCu, unblocked vol	952			583				1642	1650	577	1716	1642	938
tC, single (s)	4.1			4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1		5.5	6.1		5.5	
tF (s)	2.2			2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			96				94	98	83	83	98	94
cM capacity (veh/h)	722			972				217	251	507	207	256	320
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1							
Volume Total	12	599	39	952	103	59							
Volume Left	12	0	39	0	13	36							
Volume Right	0	13	0	30	85	18							
cSH	722	1700	972	1700	416	237							
Volume to Capacity	0.02	0.35	0.04	0.56	0.25	0.25							
Queue Length 95th (ft)	1	0	3	0	24	24							
Control Delay (s)	10.1	0.0	8.9	0.0	16.5	25.2							
Lane LOS	B			A			C	D					
Approach Delay (s)	0.2			0.3			16.5	25.2					
Approach LOS					C	D							
Intersection Summary													
Average Delay				2.1									
Intersection Capacity Utilization				62.8%		ICU Level of Service			B				
Analysis Period (min)				15									

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	773	0	0	998	147	0	0	0	0	0	24
Future Volume (Veh/h)	31	773	0	0	998	147	0	0	0	0	0	24
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	840	0	0	1085	160	0	0	0	0	0	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL				TWLTL							
Median storage veh	2				2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1245			840			2019	2153	840	2073	2073	1165
vC1, stage 1 conf vol							908	908		1165	1165	
vC2, stage 2 conf vol							1111	1245		908	908	
vCu, unblocked vol	1245			840			2019	2153	840	2073	2073	1165
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			100	100	100	100	100	89
cM capacity (veh/h)	559			795			161	178	365	185	208	236
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	34	840	0	1245	0	26						
Volume Left	34	0	0	0	0	0						
Volume Right	0	0	0	160	0	26						
cSH	559	1700	1700	1700	1700	236						
Volume to Capacity	0.06	0.49	0.00	0.73	0.00	0.11						
Queue Length 95th (ft)	5	0	0	0	0	9						
Control Delay (s)	11.9	0.0	0.0	0.0	0.0	22.1						
Lane LOS	B				A	C						
Approach Delay (s)	0.5		0.0		0.0	22.1						
Approach LOS					A	C						
Intersection Summary												
Average Delay				0.5								
Intersection Capacity Utilization				71.4%	ICU Level of Service			C				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	82	0	0	70	35	306	28	50	692	12
Future Volume (Veh/h)	0	0	82	0	0	70	35	306	28	50	692	12
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	89	0	0	76	38	333	30	54	752	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL		TWLTL			
Median storage veh							2		2			
Upstream signal (ft)									621			
pX, platoon unblocked												
vC, conflicting volume	1185	1306	758	1373	1297	182	765			363		
vC1, stage 1 conf vol	866	866		424	424							
vC2, stage 2 conf vol	318	439		949	873							
vCu, unblocked vol	1185	1306	758	1373	1297	182	765			363		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	75	100	100	91	95			95		
cM capacity (veh/h)	272	307	349	155	287	830	844			1192		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	89	76	38	222	141	54	765					
Volume Left	0	0	38	0	0	54	0					
Volume Right	89	76	0	0	30	0	13					
cSH	349	830	844	1700	1700	1192	1700					
Volume to Capacity	0.25	0.09	0.05	0.13	0.08	0.05	0.45					
Queue Length 95th (ft)	25	8	4	0	0	4	0					
Control Delay (s)	18.8	9.8	9.5	0.0	0.0	8.2	0.0					
Lane LOS	C	A	A			A						
Approach Delay (s)	18.8	9.8	0.9			0.5						
Approach LOS	C	A										
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			48.9%	ICU Level of Service				A				
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Michigan Avenue
E/W Street Name	Michigan Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	84	13	36	0	45	15	8	0	22	234	6	0	6	230	27
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	93	14	40	0	50	17	9	0	24	259	7	0	7	255	30
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		147			76			290			292	
Entry Volume veh/h		144			75			284			286	
Circulating Flow (v_c), pc/h	312			376			114			91		
Exiting Flow (v_{ex}), pc/h	28			71			361			345		
Capacity (C_{pce}), pc/h		827			776			1008			1032	
Capacity (c), veh/h		811			761			988			1011	
v/c Ratio (x)		0.18			0.10			0.29			0.28	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.3			5.7			6.5			6.4	
Lane LOS		A			A			A			A	
95% Queue, veh		0.6			0.3			1.2			1.2	
Approach Delay, s/veh	6.3			5.7			6.5			6.4		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	6.4						A					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - West
E/W Street Name	West Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	16	9	18	0	20	9	18	0	18	132	20	0	18	132	16
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	18	10	20	0	22	10	20	0	20	146	22	0	20	146	18
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		48			52			188			184	
Entry Volume veh/h		47			51			184			180	
Circulating Flow (v_c), pc/h	188			184			48			52		
Exiting Flow (v_{ex}), pc/h	52			48			184			188		
Capacity (C_{pce}), pc/h		936			940			1077			1073	
Capacity (c), veh/h		918			922			1056			1052	
v/c Ratio (x)		0.05			0.06			0.17			0.17	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.4			4.4			5.0			5.0	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.2			0.6			0.6	
Approach Delay, s/veh	4.4			4.4			5.0			5.0		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	4.9						A					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Kelly
E/W Street Name	Kelly Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	14	21	13	0	15	12	96	0	5	154	14	0	88	146	30
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	16	23	14	0	17	13	106	0	6	171	16	0	98	162	33
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		53			136			193			293	
Entry Volume veh/h		52			133			189			287	
Circulating Flow (v_c), pc/h	277			193			137			36		
Exiting Flow (v_{ex}), pc/h	137			52			293			193		
Capacity (C_{pce}), pc/h		857			932			985			1090	
Capacity (c), veh/h		840			913			966			1069	
v/c Ratio (x)		0.06			0.15			0.20			0.27	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.9			5.3			5.6			5.9	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.5			0.7			1.1	
Approach Delay, s/veh	4.9			5.3			5.6			5.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	5.6						A					

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	150	6	32	7	66	8	22	737	18
Future Volume (veh/h)	0	0	0	150	6	32	7	66	8	22	737	18
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h				168	0	0	8	72	0	24	801	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				1328	0	593	148	1692	527	148	1178	527
Arrive On Green				0.36	0.00	0.00	0.08	0.32	0.00	0.08	0.32	0.00
Sat Flow, veh/h				3690	0	1647	1845	5289	1647	1845	3681	1647
Grp Volume(v), veh/h				168	0	0	8	72	0	24	801	0
Grp Sat Flow(s),veh/h/ln				1845	0	1647	1845	1763	1647	1845	1840	1647
Q Serve(g_s), s				1.5	0.0	0.0	0.2	0.5	0.0	0.6	9.5	0.0
Cycle Q Clear(g_c), s				1.5	0.0	0.0	0.2	0.5	0.0	0.6	9.5	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				1328	0	593	148	1692	527	148	1178	527
V/C Ratio(X)				0.13	0.00	0.00	0.05	0.04	0.00	0.16	0.68	0.00
Avail Cap(c_a), veh/h				1328	0	593	148	1692	527	148	1178	527
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				10.7	0.0	0.0	21.3	11.7	0.0	21.4	14.8	0.0
Incr Delay (d2), s/veh				0.2	0.0	0.0	0.7	0.0	0.0	2.4	3.2	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.8	0.0	0.0	0.1	0.2	0.0	0.4	5.3	0.0
LnGrp Delay(d),s/veh				10.9	0.0	0.0	21.9	11.8	0.0	23.8	18.0	0.0
LnGrp LOS				B			C	B		C	B	
Approach Vol, veh/h					168			80			825	
Approach Delay, s/veh					10.9			12.8			18.1	
Approach LOS					B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	8.0	20.0			8.0	20.0		22.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	16.0			4.0	16.0		18.0				
Max Q Clear Time (g_c+I1), s	2.6	2.5			2.2	11.5		3.5				
Green Ext Time (p_c), s	0.0	0.2			0.0	2.2		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				16.6								
HCM 2010 LOS				B								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↑	↔	↑↑					
Traffic Volume (veh/h)	531	188	479	1082	0	0			
Future Volume (veh/h)	531	188	479	1082	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937					
Adj Flow Rate, veh/h	577	204	521	1176					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	1840	823	1074	3313					
Arrive On Green	0.50	0.50	0.30	0.90					
Sat Flow, veh/h	3778	1647	3579	3778					
Grp Volume(v), veh/h	577	204	521	1176					
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840					
Q Serve(g_s), s	3.7	2.8	4.8	1.9					
Cycle Q Clear(g_c), s	3.7	2.8	4.8	1.9					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	1840	823	1074	3313					
V/C Ratio(X)	0.31	0.25	0.49	0.35					
Avail Cap(c_a), veh/h	1840	823	1074	3313					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	5.9	5.7	11.5	0.3					
Incr Delay (d2), s/veh	0.4	0.7	1.6	0.3					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	2.0	1.4	2.5	1.0					
LnGrp Delay(d),s/veh	6.4	6.4	13.0	0.6					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	781			1697					
Approach Delay, s/veh	6.4			4.4					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			16.0	24.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			12.0	20.0				36.0	
Max Q Clear Time (g_c+l1), s			6.8	5.7				3.9	
Green Ext Time (p_c), s			1.0	4.0				10.8	
Intersection Summary									
HCM 2010 Ctrl Delay			5.0						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/11/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑↑	↑	↑		
Traffic Volume (veh/h)	640	67	807	1970	67	1		
Future Volume (veh/h)	640	67	807	1970	67	1		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	696	73	877	2141	73	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	982	439	954	2208	492	439		
Arrive On Green	0.27	0.27	0.27	0.60	0.27	0.00		
Sat Flow, veh/h	3778	1647	3579	3778	1845	1647		
Grp Volume(v), veh/h	696	73	877	2141	73	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840	1845	1647		
Q Serve(g_s), s	10.3	2.0	14.3	33.4	1.8	0.0		
Cycle Q Clear(g_c), s	10.3	2.0	14.3	33.4	1.8	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	982	439	954	2208	492	439		
V/C Ratio(X)	0.71	0.17	0.92	0.97	0.15	0.00		
Avail Cap(c_a), veh/h	982	439	954	2208	492	439		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	19.9	16.9	21.4	11.5	16.8	0.0		
Incr Delay (d2), s/veh	4.3	0.8	15.1	13.2	0.6	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.8	1.0	8.9	20.4	1.0	0.0		
LnGrp Delay(d),s/veh	24.2	17.7	36.5	24.7	17.4	0.0		
LnGrp LOS	C	B	D	C	B			
Approach Vol, veh/h	769			3018	73			
Approach Delay, s/veh	23.6			28.1	17.4			
Approach LOS	C			C	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	20.0	20.0				40.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	16.0	16.0				36.0
Max Q Clear Time (g_c+I1), s		3.8	16.3	12.3				35.4
Green Ext Time (p_c), s		0.1	0.0	1.7				0.6
Intersection Summary								
HCM 2010 Ctrl Delay			27.0					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary
51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	287	3	92	499	172	10	0	111	22	31	32
Future Volume (veh/h)	0	287	3	92	499	172	10	0	111	22	31	32
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1937	1976	1937	1937	1937	1937	0	1937	1937	1937	1937
Adj Flow Rate, veh/h	0	312	3	100	542	0	11	0	121	24	34	35
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1149	11	284	1982	887	0	0	0	568	596	507
Arrive On Green	0.00	0.31	0.31	0.15	0.54	0.00	0.00	0.00	0.00	0.31	0.31	0.31
Sat Flow, veh/h	0	3832	36	1845	3681	1647		0		1845	1937	1647
Grp Volume(v), veh/h	0	154	161	100	542	0		0.0		24	34	35
Grp Sat Flow(s),veh/h/ln	0	1840	1931	1845	1840	1647				1845	1937	1647
Q Serve(g_s), s	0.0	3.3	3.3	2.5	4.1	0.0				0.5	0.6	0.8
Cycle Q Clear(g_c), s	0.0	3.3	3.3	2.5	4.1	0.0				0.5	0.6	0.8
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	566	594	284	1982	887				568	596	507
V/C Ratio(X)	0.00	0.27	0.27	0.35	0.27	0.00				0.04	0.06	0.07
Avail Cap(c_a), veh/h	0	566	594	284	1982	887				568	596	507
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	13.6	13.6	19.7	6.5	0.0				12.6	12.7	12.7
Incr Delay (d2), s/veh	0.0	1.2	1.1	3.4	0.3	0.0				0.1	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.8	1.9	1.5	2.1	0.0				0.3	0.4	0.4
LnGrp Delay(d),s/veh	0.0	14.8	14.7	23.1	6.8	0.0				12.8	12.9	13.0
LnGrp LOS		B	B	C	A					B	B	B
Approach Vol, veh/h		315			642						93	
Approach Delay, s/veh		14.7			9.4						12.9	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			12.0	20.0		20.0		32.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			8.0	16.0		16.0		28.0				
Max Q Clear Time (g_c+I1), s			4.5	5.3		2.8		6.1				
Green Ext Time (p_c), s			0.1	1.3		0.2		3.7				
Intersection Summary												
HCM 2010 Ctrl Delay			11.3									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/13/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	465	5	9	612	355	10	10	19	138	2	57
Future Volume (veh/h)	230	465	5	9	612	355	10	10	19	138	2	57
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1976	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	250	505	5	10	665	386	11	11	21	107	62	62
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	158	960	10	105	841	376	216	216	376	422	203	203
Arrive On Green	0.09	0.26	0.26	0.02	0.08	0.08	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	3734	37	1845	3681	1647	945	945	1647	1845	890	890
Grp Volume(v), veh/h	250	249	261	10	665	386	22	0	21	107	0	124
Grp Sat Flow(s),veh/h/ln	1845	1840	1931	1845	1840	1647	1890	0	1647	1845	0	1780
Q Serve(g_s), s	6.0	8.1	8.1	0.4	12.4	16.0	0.6	0.0	0.7	3.3	0.0	4.0
Cycle Q Clear(g_c), s	6.0	8.1	8.1	0.4	12.4	16.0	0.6	0.0	0.7	3.3	0.0	4.0
Prop In Lane	1.00		0.02	1.00		1.00	0.50		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	158	473	496	105	841	376	432	0	376	422	0	407
V/C Ratio(X)	1.58	0.53	0.53	0.09	0.79	1.03	0.05	0.00	0.06	0.25	0.00	0.30
Avail Cap(c_a), veh/h	158	473	496	105	841	376	432	0	376	422	0	407
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.0	22.3	22.3	32.6	30.7	32.4	21.1	0.0	21.1	22.1	0.0	22.4
Incr Delay (d2), s/veh	289.4	4.1	4.0	1.8	7.5	53.1	0.2	0.0	0.3	1.4	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.7	4.6	4.8	0.2	7.2	12.8	0.4	0.0	0.3	1.9	0.0	2.2
LnGrp Delay(d),s/veh	321.4	26.5	26.3	34.3	38.2	85.4	21.3	0.0	21.4	23.6	0.0	24.3
LnGrp LOS	F	C	C	C	D	F	C		C	C		C
Approach Vol, veh/h		760			1061			43			231	
Approach Delay, s/veh		123.4			55.3			21.3			24.0	
Approach LOS		F			E			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	8.0	22.0		20.0	10.0	20.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	4.0	18.0		16.0	6.0	16.0				
Max Q Clear Time (g_c+I1), s		2.7	2.4	10.1		6.0	8.0	18.0				
Green Ext Time (p_c), s		0.1	0.0	1.9		0.7	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				75.9								
HCM 2010 LOS				E								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Future Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	82	427	316	91	846	199	210	238	87	246	297	211
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	492	362	132	894	400	422	443	376	422	443	376
Arrive On Green	0.02	0.08	0.08	0.07	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	2026	1489	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	82	388	355	91	846	199	210	238	87	246	297	211
Grp Sat Flow(s),veh/h/ln	1845	1840	1674	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	3.1	14.6	14.7	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Cycle Q Clear(g_c), s	3.1	14.6	14.7	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Prop In Lane	1.00		0.89	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	132	447	407	132	894	400	422	443	376	422	443	376
V/C Ratio(X)	0.62	0.87	0.87	0.69	0.95	0.50	0.50	0.54	0.23	0.58	0.67	0.56
Avail Cap(c_a), veh/h	132	447	407	132	894	400	422	443	376	422	443	376
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	31.1	31.1	31.7	26.1	22.8	23.5	23.7	22.0	24.0	24.6	23.9
Incr Delay (d2), s/veh	20.1	19.8	22.1	25.7	19.6	4.4	4.2	4.6	1.4	5.8	7.9	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	9.9	9.3	2.7	10.4	3.8	4.0	4.6	1.5	4.9	6.2	4.2
LnGrp Delay(d),s/veh	53.4	50.8	53.2	57.5	45.7	27.2	27.7	28.4	23.4	29.8	32.5	29.8
LnGrp LOS	D	D	D	E	D	C	C	C	C	C	C	C
Approach Vol, veh/h		825			1136			535			754	
Approach Delay, s/veh		52.1			43.4			27.3			30.9	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	9.0	21.0		20.0	9.0	21.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	5.0	17.0		16.0	5.0	17.0				
Max Q Clear Time (g_c+I1), s		9.6	5.4	16.7		11.8	5.1	17.8				
Green Ext Time (p_c), s		1.3	0.0	0.2		1.4	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			40.0									
HCM 2010 LOS			D									
Notes												

Intersection

Intersection Delay, s/veh 7.7

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	86	7	16	65	39	2	5	6	0	0	0
Future Vol, veh/h	25	86	7	16	65	39	2	5	6	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	93	8	17	71	42	2	5	7	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.8	7.6	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	15%	21%	13%
Vol Thru, %	38%	73%	54%
Vol Right, %	46%	6%	33%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	13	118	120
LT Vol	2	25	16
Through Vol	5	86	65
RT Vol	6	7	39
Lane Flow Rate	14	128	130
Geometry Grp	1	1	1
Degree of Util (X)	0.017	0.145	0.141
Departure Headway (Hd)	4.232	4.064	3.887
Convergence, Y/N	Yes	Yes	Yes
Cap	851	881	920
Service Time	2.232	2.093	1.921
HCM Lane V/C Ratio	0.016	0.145	0.141
HCM Control Delay	7.3	7.8	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.5	0.5

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖						↖	↗
Traffic Vol, veh/h	0	148	69	50	59	0	0	0	0	17	0	55
Future Vol, veh/h	0	148	69	50	59	0	0	0	0	17	0	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	161	75	54	64	0	0	0	0	18	0	60
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	161	0	0				333	333	64
Stage 1	-	-	-	-	-	-				172	172	-
Stage 2	-	-	-	-	-	-				161	161	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1418	-	0				662	587	1000
Stage 1	0	-	-	-	-	0				858	756	-
Stage 2	0	-	-	-	-	0				868	765	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1418	-	-				636	0	1000
Mov Cap-2 Maneuver	-	-	-	-	-	-				636	0	-
Stage 1	-	-	-	-	-	-				825	0	-
Stage 2	-	-	-	-	-	-				868	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.5			9.3					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2						
Capacity (veh/h)	-	-	1418	-	636	1000						
HCM Lane V/C Ratio	-	-	0.038	-	0.029	0.06						
HCM Control Delay (s)	-	-	7.6	0	10.8	8.8						
HCM Lane LOS	-	-	A	A	B	A						
HCM 95th %tile Q(veh)	-	-	0.1	-	0.1	0.2						

HCM 2010 Signalized Intersection Summary

56: I-5 SB On/Off-Ramp & Vista Way

07/02/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↖	↑	↖	↗↗		
Traffic Volume (veh/h)	518	201	1018	1229	17	967		
Future Volume (veh/h)	518	201	1018	1229	17	967		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	563	0	1107	1336	18	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	883	395	1384	1317	394	618		
Arrive On Green	0.24	0.00	0.39	0.68	0.21	0.00		
Sat Flow, veh/h	3778	1647	3579	1937	1845	2898		
Grp Volume(v), veh/h	563	0	1107	1336	18	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1937	1845	1449		
Q Serve(g_s), s	10.3	0.0	20.6	51.0	0.6	0.0		
Cycle Q Clear(g_c), s	10.3	0.0	20.6	51.0	0.6	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	883	395	1384	1317	394	618		
V/C Ratio(X)	0.64	0.00	0.80	1.01	0.05	0.00		
Avail Cap(c_a), veh/h	883	395	1384	1317	394	618		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	25.6	0.0	20.4	12.0	23.4	0.0		
Incr Delay (d2), s/veh	3.5	0.0	4.9	28.4	0.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.7	0.0	11.1	36.7	0.3	0.0		
LnGrp Delay(d),s/veh	29.1	0.0	25.4	40.4	23.7	0.0		
LnGrp LOS	C		C	F	C			
Approach Vol, veh/h	563			2443	18			
Approach Delay, s/veh	29.1			33.6	23.7			
Approach LOS	C			C	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	33.0	22.0				55.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	29.0	18.0				51.0
Max Q Clear Time (g_c+I1), s		2.6	22.6	12.3				53.0
Green Ext Time (p_c), s		0.0	2.6	1.8				0.0
Intersection Summary								
HCM 2010 Ctrl Delay			32.7					
HCM 2010 LOS			C					

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	107	194	477	307	1656	215	37	179	119	73	77
Future Volume (vph)	270	107	194	477	307	1656	215	37	179	119	73	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3019	1441		1786	1583		1807	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3019	1441		1786	1583		1807	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	293	116	211	518	334	1800	234	40	195	129	79	84
RTOR Reduction (vph)	0	0	190	0	491	503	0	0	117	0	0	70
Lane Group Flow (vph)	293	116	21	518	743	397	0	274	78	0	208	14
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	16.9	9.8	9.8	33.7	28.2	28.2		21.2	21.2		17.0	17.0
Effective Green, g (s)	16.9	9.8	9.8	33.7	28.2	28.2		21.2	21.2		17.0	17.0
Actuated g/C Ratio	0.17	0.10	0.10	0.34	0.28	0.28		0.21	0.21		0.17	0.17
Clearance Time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	299	182	155	596	851	406		378	335		307	269
v/s Ratio Prot	0.17	0.06		c0.29	0.25			c0.15			c0.12	
v/s Ratio Perm			0.01			c0.28			0.05			0.01
v/c Ratio	0.98	0.64	0.13	0.87	0.98dr	0.98		0.72	0.23		0.68	0.05
Uniform Delay, d1	41.4	43.4	41.2	31.1	34.2	35.6		36.7	32.7		38.9	34.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	46.0	5.3	0.1	12.8	9.5	38.5		11.5	1.6		11.4	0.4
Delay (s)	87.3	48.7	41.4	43.9	43.7	74.1		48.2	34.3		50.3	35.1
Level of Service	F	D	D	D	D	E		D	C		D	D
Approach Delay (s)		64.5			54.1			42.4			46.0	
Approach LOS		E			D			D			D	

Intersection Summary

HCM 2000 Control Delay	53.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	108.1%	ICU Level of Service	G
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				LT				L			
Volume (V), veh/h	0	0	0	0	0	661	0	327	0	0	443	674	0	563	568	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	0	0	0	0	733	0	355	0	0	491	747	0	624	630	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929		4.6453	4.3276			4.3276		4.6453	4.3276	
Follow-Up Headway (s)		3.1858		2.6667	2.5352			2.5352		2.6667	2.5352	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		0		0	733	355		491	747	624	630	
Entry Volume veh/h		0		0	719	355		481	732	612	618	
Circulating Flow (v_c), pc/h	1987			491			624			733		
Exiting Flow (v_{ex}), pc/h	624			0			491			1363		
Capacity (C_{pce}), pc/h		155		859	935			835		688	762	
Capacity (c), veh/h		152		842	917			819		674	747	
v/c Ratio (x)		0.00		0.00	0.78			0.59		0.91	0.83	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		23.7		4.3	20.4	0.0		13.4	0.0	40.1	27.6	
Lane LOS		C		A	C	A		B	A	E	D	
95% Queue, veh		0.0		0.0	8.2			3.9		11.7	9.2	
Approach Delay, s/veh				13.7			5.3			33.8		
Approach LOS				B			A			D		
Intersection Delay, s/veh LOS	17.8						C					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	21	11	92	36	158	18	105	97	182	142	12
Future Volume (vph)	0	21	11	92	36	158	18	105	97	182	142	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	23	12	100	39	172	20	114	105	198	154	13
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	35	311	239	365								
Volume Left (vph)	0	100	20	198								
Volume Right (vph)	12	172	105	13								
Hadj (s)	-0.17	-0.23	-0.21	0.12								
Departure Headway (s)	6.0	5.3	5.3	5.4								
Degree Utilization, x	0.06	0.46	0.35	0.55								
Capacity (veh/h)	491	625	628	637								
Control Delay (s)	9.3	12.8	11.0	14.6								
Approach Delay (s)	9.3	12.8	11.0	14.6								
Approach LOS	A	B	B	B								
Intersection Summary												
Delay				12.9								
Level of Service				B								
Intersection Capacity Utilization				64.1%	ICU Level of Service	C						
Analysis Period (min)				15								

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Surfrider Way
E/W Street Name	Surfrider Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1
Lane Assignment	LTR				LTR				LTR				LT			
Volume (V), veh/h	0	245	81	102	0	17	71	43	0	72	721	27	0	69	729	177
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	272	90	113	0	19	79	48	0	80	799	30	0	76	808	196
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929		4.5436	4.5436	
Follow-Up Headway (s)		3.1858			3.1858			3.1858		2.5352	2.5352	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		475			146			909		884	196	
Entry Volume veh/h		466			143			891		867	192	
Circulating Flow (v_c), pc/h	903			1151			438			178		
Exiting Flow (v_{ex}), pc/h	196			355			1119			940		
Capacity (C_{pce}), pc/h		458			357			729		1208	1208	
Capacity (c), veh/h		449			350			715		1184	1184	
v/c Ratio (x)		1.04			0.41			1.25		0.73	0.16	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		83.1			19.2			142.3		14.5	4.4	
Lane LOS		F			C			F		B	A	
95% Queue, veh		14.3			1.9			32.4		7.0	0.6	
Approach Delay, s/veh	83.1			19.2			142.3			12.7		
Approach LOS	F			C			F			B		
Intersection Delay, s/veh LOS	71.0						F					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Civic Center Drive
E/W Street Name	Civic Center Drive
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	36	38	32	0	36	45	76	0	27	730	65	0	42	762	30
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	40	42	35	0	40	50	84	0	30	809	72	0	47	845	33
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		117			174			911			925	
Entry Volume veh/h		115			171			893			907	
Circulating Flow (v_c), pc/h	932			879			129			120		
Exiting Flow (v_{ex}), pc/h	161			113			933			920		
Capacity (C_{pce}), pc/h		445			469			993			1002	
Capacity (c), veh/h		436			460			974			983	
v/c Ratio (x)		0.26			0.37			0.92			0.92	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		12.5			14.2			32.9			33.6	
Lane LOS		B			B			D			D	
95% Queue, veh		1.0			1.7			13.9			14.3	
Approach Delay, s/veh	12.5			14.2			32.9			33.6		
Approach LOS	B			B			D			D		
Intersection Delay, s/veh LOS	30.6						D					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	7/11/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Pier View Way
E/W Street Name	Pier View Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	72	27	79	0	4	27	10	0	60	810	9	0	5	810	136
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	80	30	88	0	4	30	11	0	67	898	10	0	6	898	151
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		198			45			975			1055	
Entry Volume veh/h		194			44			956			1034	
Circulating Flow (v_c), pc/h	908			1045			116			101		
Exiting Flow (v_{ex}), pc/h	46			248			989			990		
Capacity (C_{pce}), pc/h		456			397			1006			1021	
Capacity (c), veh/h		447			390			987			1001	
v/c Ratio (x)		0.43			0.11			0.97			1.03	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		16.3			11.0			42.0			57.5	
Lane LOS		C			B			E			F	
95% Queue, veh		2.2			0.4			17.1			21.9	
Approach Delay, s/veh	16.3			11.0			42.0			57.5		
Approach LOS	C			B			E			F		
Intersection Delay, s/veh LOS	46.4						E					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

07/02/2018

																	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR					
Lane Configurations																	
Sign Control	Stop				Stop			Stop			Stop						
Traffic Volume (vph)	15	8	117	57	8	14	40	405	27	14	364	12					
Future Volume (vph)	15	8	117	57	8	14	40	405	27	14	364	12					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92					
Hourly flow rate (vph)	16	9	127	62	9	15	43	440	29	15	396	13					
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2										
Volume Total (vph)	25	127	86	263	249	213	211										
Volume Left (vph)	16	0	62	43	0	15	0										
Volume Right (vph)	0	127	15	0	29	0	13										
Hadj (s)	0.35	-0.67	0.07	0.12	-0.05	0.07	-0.01										
Departure Headway (s)	7.3	6.2	7.0	6.0	5.8	6.0	5.9										
Degree Utilization, x	0.05	0.22	0.17	0.44	0.40	0.36	0.35										
Capacity (veh/h)	453	527	472	586	601	575	583										
Control Delay (s)	9.5	9.8	11.3	12.3	11.4	11.1	10.9										
Approach Delay (s)	9.7		11.3	11.9		11.0											
Approach LOS	A		B	B		B											
Intersection Summary																	
Delay			11.3														
Level of Service			B														
Intersection Capacity Utilization			45.2%	ICU Level of Service						A							
Analysis Period (min)			15														

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	284	100	186	197	73	218
Future Volume (vph)	284	100	186	197	73	218
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	309	109	202	214	79	237
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	309	109	416	316		
Volume Left (vph)	309	0	0	79		
Volume Right (vph)	0	109	214	0		
Hadj (s)	0.53	-0.67	-0.27	0.08		
Departure Headway (s)	7.1	5.8	5.5	6.0		
Degree Utilization, x	0.61	0.18	0.64	0.53		
Capacity (veh/h)	489	586	626	574		
Control Delay (s)	19.1	8.9	17.6	15.4		
Approach Delay (s)	16.4		17.6	15.4		
Approach LOS	C		C	C		
Intersection Summary						
Delay			16.6			
Level of Service			C			
Intersection Capacity Utilization			63.1%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			 		 						 	
Traffic Volume (vph)	45	0	322	83	294	89	0	0	0	0	131	94
Future Volume (vph)	45	0	322	83	294	89	0	0	0	0	131	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5		4.5	4.5	4.5						4.5	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.97						0.94	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3416						3317	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3416						3317	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	0	350	90	320	97	0	0	0	0	142	102
RTOR Reduction (vph)	0	0	307	43	34	0	0	0	0	0	88	0
Lane Group Flow (vph)	49	0	43	47	383	0	0	0	0	0	156	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	7.3		7.3	31.2	31.2						8.0	
Effective Green, g (s)	7.3		7.3	31.2	31.2						8.0	
Actuated g/C Ratio	0.12		0.12	0.52	0.52						0.13	
Clearance Time (s)	4.5		4.5	4.5	4.5						4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	215		339	920	1776						442	
v/s Ratio Prot	c0.03		0.02	0.03	c0.11						c0.05	
v/s Ratio Perm												
v/c Ratio	0.23		0.13	0.05	0.22						0.35	
Uniform Delay, d1	23.8		23.5	7.1	7.8						23.6	
Progression Factor	1.00		1.00	1.00	1.00						1.00	
Incremental Delay, d2	0.5		0.2	0.1	0.3						0.5	
Delay (s)	24.3		23.7	7.2	8.1						24.1	
Level of Service	C		C	A	A						C	
Approach Delay (s)		23.8			7.9			0.0			24.1	
Approach LOS		C			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			16.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.24									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)			13.5			
Intersection Capacity Utilization			33.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↱	↱	↰	↱			↰	↱
Traffic Volume (vph)	0	0	0	193	443	72	272	743	0	0	602	199
Future Volume (vph)	0	0	0	193	443	72	272	743	0	0	602	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	0.95
Frpb, ped/bikes				1.00	1.00	0.96	1.00	1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	3539	1519	1770	1863			1759	1454
Flt Permitted				0.95	1.00	1.00	0.12	1.00			1.00	1.00
Satd. Flow (perm)				1770	3539	1519	219	1863			1759	1454
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	210	482	78	296	808	0	0	654	216
RTOR Reduction (vph)	0	0	0	0	0	60	0	0	0	0	1	59
Lane Group Flow (vph)	0	0	0	210	482	18	296	808	0	0	675	135
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					6
Actuated Green, G (s)				18.0	18.0	18.0	48.4	48.4			29.0	29.0
Effective Green, g (s)				18.0	18.0	18.0	48.4	48.4			29.0	29.0
Actuated g/C Ratio				0.24	0.24	0.24	0.63	0.63			0.38	0.38
Clearance Time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				417	833	357	431	1180			667	551
v/s Ratio Prot				0.12	c0.14		0.13	c0.43			c0.38	
v/s Ratio Perm						0.01	0.31					0.09
v/c Ratio				0.50	0.58	0.05	0.69	0.68			1.01	0.25
Uniform Delay, d1				25.3	25.8	22.6	23.7	9.1			23.7	16.2
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				4.3	2.9	0.3	4.9	1.8			37.8	0.3
Delay (s)				29.6	28.8	22.9	28.6	10.9			61.5	16.5
Level of Service				C	C	C	C	B			E	B
Approach Delay (s)		0.0			28.4			15.6			51.4	
Approach LOS		A			C			B			D	
Intersection Summary												
HCM 2000 Control Delay			30.6									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			76.4								15.0	Sum of lost time (s)
Intersection Capacity Utilization			78.4%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	145	0	132	715	295	16	83	317	411	55	22
Future Volume (vph)	19	145	0	132	715	295	16	83	317	411	55	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.97	
Satd. Flow (prot)	1770	3539		1770	3539	1583		1848	1583	1681	1688	
Flt Permitted	0.26	1.00		0.65	1.00	1.00		0.94	1.00	0.69	0.73	
Satd. Flow (perm)	488	3539		1214	3539	1583		1754	1583	1217	1275	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	158	0	143	777	321	17	90	345	447	60	24
RTOR Reduction (vph)	0	0	0	0	0	206	0	0	184	0	6	0
Lane Group Flow (vph)	21	158	0	143	777	115	0	107	161	259	266	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	20.1	20.1		19.7	19.7	19.7		25.7	25.7	25.7	25.7	
Effective Green, g (s)	20.1	20.1		19.7	19.7	19.7		25.7	25.7	25.7	25.7	
Actuated g/C Ratio	0.37	0.37		0.36	0.36	0.36		0.47	0.47	0.47	0.47	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	178	1293		434	1267	567		819	739	568	595	
v/s Ratio Prot		0.04			c0.22							
v/s Ratio Perm	0.04			0.12		0.07		0.06	0.10	c0.21	0.21	
v/c Ratio	0.12	0.12		0.33	0.61	0.20		0.13	0.22	0.46	0.45	
Uniform Delay, d1	11.6	11.6		12.8	14.5	12.2		8.3	8.7	9.9	9.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.1		0.5	0.9	0.2		0.3	0.7	2.6	2.4	
Delay (s)	12.0	11.6		13.4	15.4	12.4		8.6	9.4	12.5	12.3	
Level of Service	B	B		B	B	B		A	A	B	B	
Approach Delay (s)		11.7			14.4			9.2			12.4	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			12.8				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			55.0				Sum of lost time (s)			9.6		
Intersection Capacity Utilization			55.1%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

07/02/2018

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (veh/h)	281	16	25	58	26	32
Future Volume (Veh/h)	281	16	25	58	26	32
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	305	17	27	63	28	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				238		
pX, platoon unblocked						
vC, conflicting volume			322		430	314
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			322		430	314
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		95	95
cM capacity (veh/h)			1238		569	727
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	322	90	63			
Volume Left	0	27	28			
Volume Right	17	0	35			
cSH	1700	1238	647			
Volume to Capacity	0.19	0.02	0.10			
Queue Length 95th (ft)	0	2	8			
Control Delay (s)	0.0	2.5	11.2			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.5	11.2			
Approach LOS			B			
Intersection Summary						
Average Delay		2.0				
Intersection Capacity Utilization		33.6%	ICU Level of Service	A		
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	368	210	234	0	0	0	97	492	145	155	422	120
Future Volume (vph)	368	210	234	0	0	0	97	492	145	155	422	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.94				1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1493				1770	1863	1552	1770	1863	1516
Flt Permitted	0.95	1.00	1.00				0.50	1.00	1.00	0.21	1.00	1.00
Satd. Flow (perm)	1770	1863	1493				929	1863	1552	383	1863	1516
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	400	228	254	0	0	0	105	535	158	168	459	130
RTOR Reduction (vph)	0	0	165	0	0	0	0	0	84	0	0	65
Lane Group Flow (vph)	400	228	89	0	0	0	105	535	74	168	459	65
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA	Perm				Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4					2	2		1	6	
Permitted Phases			4				2		2	6		6
Actuated Green, G (s)	21.0	21.0	21.0				23.0	23.0	23.0	30.2	30.2	30.2
Effective Green, g (s)	21.0	21.0	21.0				23.0	23.0	23.0	30.2	30.2	30.2
Actuated g/C Ratio	0.35	0.35	0.35				0.38	0.38	0.38	0.50	0.50	0.50
Clearance Time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0				4.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	619	652	522				356	714	594	266	937	763
v/s Ratio Prot	c0.23	0.12						c0.29		0.03	c0.25	
v/s Ratio Perm			0.06				0.11		0.05	0.28		0.04
v/c Ratio	0.65	0.35	0.17				0.29	0.75	0.12	0.63	0.49	0.09
Uniform Delay, d1	16.4	14.4	13.5				12.9	16.0	12.0	10.5	9.8	7.7
Progression Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.1	1.5	0.7				2.1	7.1	0.4	4.8	1.8	0.2
Delay (s)	21.5	15.9	14.2				15.0	23.1	12.4	15.3	11.7	8.0
Level of Service	C	B	B				B	C	B	B	B	A
Approach Delay (s)		18.0			0.0			19.9			11.8	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.7				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			12.8		
Intersection Capacity Utilization			65.5%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	530	35	0	0	0	0	10	35	30	28	0
Future Volume (Veh/h)	16	530	35	0	0	0	0	10	35	30	28	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	576	38	0	0	0	0	11	38	33	30	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	218											
pX, platoon unblocked												
vC, conflicting volume	0			614			644	629	307	366	648	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			614			644	629	307	366	648	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	97	94	94	92	100
cM capacity (veh/h)	1622			961			334	393	689	519	384	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	305	326	49	63								
Volume Left	17	0	0	33								
Volume Right	0	38	38	0								
cSH	1622	1700	590	444								
Volume to Capacity	0.01	0.19	0.08	0.14								
Queue Length 95th (ft)	1	0	7	12								
Control Delay (s)	0.5	0.0	11.7	14.4								
Lane LOS	A		B	B								
Approach Delay (s)	0.2		11.7	14.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			32.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

07/02/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Sign Control		Stop			Stop			Stop			Stop		
Traffic Volume (vph)	37	1148	24	0	0	0	0	13	31	56	49	0	
Future Volume (vph)	37	1148	24	0	0	0	0	13	31	56	49	0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	40	1248	26	0	0	0	0	14	34	61	53	0	
Direction, Lane #	EB 1	EB 2	NB 1	SB 1									
Volume Total (vph)	664	650	48	114									
Volume Left (vph)	40	0	0	61									
Volume Right (vph)	0	26	34	0									
Hadj (s)	0.06	0.01	-0.39	0.14									
Departure Headway (s)	5.1	5.0	5.6	6.0									
Degree Utilization, x	0.93	0.90	0.08	0.19									
Capacity (veh/h)	702	714	628	586									
Control Delay (s)	40.6	35.3	9.1	10.5									
Approach Delay (s)	38.0		9.1	10.5									
Approach LOS	E		A	B									
Intersection Summary													
Delay			34.9										
Level of Service			D										
Intersection Capacity Utilization			52.6%		ICU Level of Service					A			
Analysis Period (min)			15										

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

07/02/2018

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	271	479	13	42	0	20	0	19	12	0	0	0								
Future Volume (vph)	271	479	13	42	0	20	0	19	12	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	295	521	14	46	0	22	0	21	13	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	295	535	68	34																
Volume Left (vph)	295	0	46	0																
Volume Right (vph)	0	14	22	13																
Hadj (s)	0.53	0.02	-0.02	-0.20																
Departure Headway (s)	5.2	4.7	4.7	5.4																
Degree Utilization, x	0.42	0.69	0.09	0.05																
Capacity (veh/h)	690	767	737	623																
Control Delay (s)	10.8	16.3	8.2	8.7																
Approach Delay (s)	14.3		8.2	8.7																
Approach LOS	B		A	A																
Intersection Summary																				
Delay			13.7																	
Level of Service			B																	
Intersection Capacity Utilization			42.9%	ICU Level of Service					A											
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	38	0	0	31	17	576	45	22	527	18
Future Volume (Veh/h)	0	0	38	0	0	31	17	576	45	22	527	18
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	41	0	0	34	18	626	49	24	573	20
Pedestrians	7				7							
Lane Width (ft)	12.0				16.0							
Walking Speed (ft/s)	4.0				4.0							
Percent Blockage	1				1							
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			455		
pX, platoon unblocked	0.87	0.87	0.83	0.87	0.87	0.92	0.83				0.92	
vC, conflicting volume	1334	1356	590	1356	1342	658	600				682	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1106	1132	399	1131	1115	587	411				613	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	92	100	100	93	98				97	
cM capacity (veh/h)	143	166	535	137	169	467	943				884	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	41	34	18	675	24	593						
Volume Left	0	0	18	0	24	0						
Volume Right	41	34	0	49	0	20						
cSH	535	467	943	1700	884	1700						
Volume to Capacity	0.08	0.07	0.02	0.40	0.03	0.35						
Queue Length 95th (ft)	6	6	1	0	2	0						
Control Delay (s)	12.3	13.3	8.9	0.0	9.2	0.0						
Lane LOS	B	B	A			A						
Approach Delay (s)	12.3	13.3	0.2			0.4						
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			43.1%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Washington Avenue
E/W Street Name	Washington Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	14	0	71	0	45	10	13	0	46	577	20	0	25	524	61
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	16	0	79	0	50	11	14	0	51	640	22	0	28	581	68
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		95			75			713			677	
Entry Volume veh/h		93			74			699			664	
Circulating Flow (v_c), pc/h	659			707			44			112		
Exiting Flow (v_{ex}), pc/h	50			130			670			710		
Capacity (C_{pce}), pc/h		585			557			1081			1010	
Capacity (c), veh/h		573			546			1060			990	
v/c Ratio (x)		0.16			0.13			0.66			0.67	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		8.3			8.3			13.0			14.0	
Lane LOS		A			A			B			B	
95% Queue, veh		0.6			0.5			5.2			5.4	
Approach Delay, s/veh	8.3			8.3			13.0			14.0		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh LOS	12.9						B					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	49	76	31	91	6	137	4	287	73	163	177	3
Future Volume (vph)	49	76	31	91	6	137	4	287	73	163	177	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	83	34	99	7	149	4	312	79	177	192	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	170	255	395	372								
Volume Left (vph)	53	99	4	177								
Volume Right (vph)	34	149	79	3								
Hadj (s)	-0.02	-0.24	-0.08	0.12								
Departure Headway (s)	7.0	6.5	6.1	6.3								
Degree Utilization, x	0.33	0.46	0.67	0.65								
Capacity (veh/h)	431	485	559	532								
Control Delay (s)	13.3	14.9	20.4	20.4								
Approach Delay (s)	13.3	14.9	20.4	20.4								
Approach LOS	B	B	C	C								
Intersection Summary												
Delay				18.2								
Level of Service				C								
Intersection Capacity Utilization				68.1%	ICU Level of Service	C						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	334	48	21	233	38	45	70	71	30	94	15
Future Volume (Veh/h)	13	334	48	21	233	38	45	70	71	30	94	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	363	52	23	253	41	49	76	77	33	102	16
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked	0.98						0.98	0.98		0.98	0.98	0.98
vC, conflicting volume	308			422			812	778	396	866	784	288
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	280			422			795	761	396	850	766	260
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			76	76	88	82	67	98
cM capacity (veh/h)	1239			1131			208	312	650	187	309	751
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	429	317	202	151								
Volume Left	14	23	49	33								
Volume Right	52	41	77	16								
cSH	1239	1131	338	286								
Volume to Capacity	0.01	0.02	0.60	0.53								
Queue Length 95th (ft)	1	2	92	72								
Control Delay (s)	0.4	0.8	30.3	30.8								
Lane LOS	A	A	D	D								
Approach Delay (s)	0.4	0.8	30.3	30.8								
Approach LOS			D	D								
Intersection Summary												
Average Delay			10.2									
Intersection Capacity Utilization			45.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Wisconsin Avenue
E/W Street Name	Wisconsin Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	101	124	179	0	118	99	21	0	157	568	128	0	23	568	50
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	112	137	198	0	131	110	23	0	174	630	142	0	26	630	55
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		447			264			946			711	
Entry Volume veh/h		438			259			927			697	
Circulating Flow (v_c), pc/h	787			916			275			415		
Exiting Flow (v_{ex}), pc/h	305			339			765			959		
Capacity (C_{pce}), pc/h		514			452			858			746	
Capacity (c), veh/h		504			443			841			732	
v/c Ratio (x)		0.87			0.58			1.10			0.95	

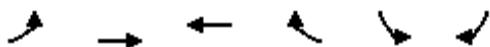
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		42.5			21.8			83.7			46.2	
Lane LOS		E			C			F			E	
95% Queue, veh		9.3			3.6			24.8			14.2	
Approach Delay, s/veh	42.5			21.8			83.7			46.2		
Approach LOS	E			C			F			E		
Intersection Delay, s/veh LOS	57.8						F					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

07/02/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	433	322	23	34	36
Future Volume (Veh/h)	8	433	322	23	34	36
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	471	350	25	37	39
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	383				860	372
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	383				860	372
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				88	94
cM capacity (veh/h)	1168				321	669
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	480	375	76			
Volume Left	9	0	37			
Volume Right	0	25	39			
cSH	1168	1700	438			
Volume to Capacity	0.01	0.22	0.17			
Queue Length 95th (ft)	1	0	16			
Control Delay (s)	0.2	0.0	14.9			
Lane LOS	A		B			
Approach Delay (s)	0.2	0.0	14.9			
Approach LOS			B			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			40.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	443	4	2	296	27	2	1	3	41	0	33
Future Volume (Veh/h)	24	443	4	2	296	27	2	1	3	41	0	33
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	482	4	2	322	29	2	1	3	45	0	36
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	353			486			914	893	484	882	880	340
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	353			486			914	893	484	882	880	340
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			99	100	99	83	100	95
cM capacity (veh/h)	1204			1077			236	274	583	259	278	700
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	512	353	6	81								
Volume Left	26	2	2	45								
Volume Right	4	29	3	36								
cSH	1204	1077	347	360								
Volume to Capacity	0.02	0.00	0.02	0.23								
Queue Length 95th (ft)	2	0	1	21								
Control Delay (s)	0.6	0.1	15.6	17.9								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.6	0.1	15.6	17.9								
Approach LOS			C	C								
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			54.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	265	266	80	192	0	158	0	111	0	0	0
Future Volume (vph)	0	265	266	80	192	0	158	0	111	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	288	289	87	209	0	172	0	121	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	577	296	293	0								
Volume Left (vph)	0	87	172	0								
Volume Right (vph)	289	0	121	0								
Hadj (s)	-0.27	0.09	-0.10	0.00								
Departure Headway (s)	5.1	5.8	6.0	7.0								
Degree Utilization, x	0.82	0.48	0.49	0.00								
Capacity (veh/h)	690	589	560	444								
Control Delay (s)	26.5	14.0	14.7	10.0								
Approach Delay (s)	26.5	14.0	14.7	0.0								
Approach LOS	D	B	B	A								
Intersection Summary												
Delay				20.4								
Level of Service				C								
Intersection Capacity Utilization				76.0%	ICU Level of Service	D						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	69	135	219	101	98	214
Future Volume (vph)	69	135	219	101	98	214
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	75	147	238	110	107	233
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	222	348	340			
Volume Left (vph)	75	0	107			
Volume Right (vph)	147	110	0			
Hadj (s)	-0.30	-0.16	0.10			
Departure Headway (s)	5.2	4.8	5.1			
Degree Utilization, x	0.32	0.47	0.48			
Capacity (veh/h)	622	715	679			
Control Delay (s)	10.7	12.0	12.6			
Approach Delay (s)	10.7	12.0	12.6			
Approach LOS	B	B	B			
Intersection Summary						
Delay			11.9			
Level of Service			B			
Intersection Capacity Utilization			56.5%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

07/02/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	15	358	21	20	296	77	29	46	38	84	28	23	
Future Volume (Veh/h)	15	358	21	20	296	77	29	46	38	84	28	23	
Sign Control		Free			Free			Stop			Stop		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	16	389	23	22	322	84	32	50	41	91	30	25	
Pedestrians		4			8			11			3		
Lane Width (ft)		12.0			12.0			12.0			12.0		
Walking Speed (ft/s)		4.0			4.0			4.0			4.0		
Percent Blockage		0			1			1			0		
Right turn flare (veh)													
Median type		None			None								
Median storage (veh)													
Upstream signal (ft)	213												
pX, platoon unblocked	0.87						0.87	0.87			0.87	0.87	0.87
vC, conflicting volume	409			423			896	896	420	918	866	371	
vC1, stage 1 conf vol													
vC2, stage 2 conf vol													
vCu, unblocked vol	242			423			803	804	420	828	769	198	
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2	
tC, 2 stage (s)													
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3	
p0 queue free %	99			98			86	81	93	53	89	97	
cM capacity (veh/h)	1146			1126			221	262	624	192	275	727	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1									
Volume Total	428	428	123	146									
Volume Left	16	22	32	91									
Volume Right	23	84	41	25									
cSH	1146	1126	307	237									
Volume to Capacity	0.01	0.02	0.40	0.62									
Queue Length 95th (ft)	1	1	46	91									
Control Delay (s)	0.5	0.6	24.4	42.0									
Lane LOS	A	A	C	E									
Approach Delay (s)	0.5	0.6	24.4	42.0									
Approach LOS			C	E									
Intersection Summary													
Average Delay			8.5										
Intersection Capacity Utilization			49.3%	ICU Level of Service				A					
Analysis Period (min)			15										

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Oceanside Blvd
E/W Street Name	Oceanside Boulevard
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	56	218	87	0	261	212	218	0	92	646	168	0	225	549	30
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	62	242	96	0	289	235	242	0	102	716	186	0	249	609	33
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		400			766			1004			891	
Entry Volume veh/h		392			751			984			874	
Circulating Flow (v_c), pc/h	1147			880			553			626		
Exiting Flow (v_{ex}), pc/h	677			370			1020			994		
Capacity (C_{pce}), pc/h		359			469			650			604	
Capacity (c), veh/h		352			460			637			592	
v/c Ratio (x)		1.11			1.63			1.54			1.47	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		117.1			317.2			270.8			242.1	
Lane LOS		F			F			F			F	
95% Queue, veh		14.9			43.0			50.7			42.8	
Approach Delay, s/veh	117.1			317.2			270.8			242.1		
Approach LOS	F			F			F			F		
Intersection Delay, s/veh LOS	254.0						F					

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	606	6	22	674	178	9	16	57	333	13	82
Future Volume (vph)	41	606	6	22	674	178	9	16	57	333	13	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.97			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1770	3532		1761	3418			3119			1776	1527
Flt Permitted	0.21	1.00		0.32	1.00			0.92			0.67	1.00
Satd. Flow (perm)	382	3532		584	3418			2876			1241	1527
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	659	7	24	733	193	10	17	62	362	14	89
RTOR Reduction (vph)	0	1	0	0	48	0	0	33	0	0	0	47
Lane Group Flow (vph)	45	665	0	24	878	0	0	56	0	0	376	42
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	19.5	19.5		19.5	19.5			26.0			26.0	26.0
Effective Green, g (s)	19.5	19.5		19.5	19.5			26.0			26.0	26.0
Actuated g/C Ratio	0.35	0.35		0.35	0.35			0.47			0.47	0.47
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	135	1252		207	1211			1359			586	721
v/s Ratio Prot		0.19			c0.26							
v/s Ratio Perm	0.12			0.04				0.02			c0.30	0.03
v/c Ratio	0.33	0.53		0.12	0.73			0.04			0.64	0.06
Uniform Delay, d1	13.0	14.1		11.9	15.4			7.8			11.0	7.9
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	1.5	0.4		0.3	2.2			0.1			5.3	0.2
Delay (s)	14.5	14.5		12.2	17.6			7.9			16.3	8.0
Level of Service	B	B		B	B			A			B	A
Approach Delay (s)		14.5			17.5			7.9			14.7	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			15.6				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			55.0				Sum of lost time (s)			9.5		
Intersection Capacity Utilization			71.4%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2035
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Morse Street
E/W Street Name	Morse Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	42	16	15	0	56	16	190	0	20	846	103	0	243	881	19
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	47	18	17	0	62	18	211	0	22	938	114	0	269	977	21
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		82			291			1074			1267	
Entry Volume veh/h		80			285			1053			1242	
Circulating Flow (v_c), pc/h	1308			1007			334			102		
Exiting Flow (v_{ex}), pc/h	401			61			1196			1056		
Capacity (C_{pce}), pc/h		306			413			809			1020	
Capacity (c), veh/h		300			405			793			1000	
v/c Ratio (x)		0.27			0.70			1.33			1.24	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		17.7			31.1			173.4			133.4	
Lane LOS		C			D			F			F	
95% Queue, veh		1.1			5.3			41.9			41.5	
Approach Delay, s/veh	17.7			31.1			173.4			133.4		
Approach LOS	C			D			F			F		
Intersection Delay, s/veh LOS	134.8						F					

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	325	35	38	197	0	77	0	65	0	0	0
Future Volume (Veh/h)	0	325	35	38	197	0	77	0	65	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	353	38	41	214	0	84	0	71	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	252											
pX, platoon unblocked												
vC, conflicting volume	214			391			668	668	372	739	687	214
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	214			391			668	668	372	739	687	214
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			96			77	100	89	100	100	100
cM capacity (veh/h)	1356			1168			362	366	674	290	357	826
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	391	255	155	0								
Volume Left	0	41	84	0								
Volume Right	38	0	71	0								
cSH	1356	1168	459	1700								
Volume to Capacity	0.00	0.04	0.34	0.00								
Queue Length 95th (ft)	0	3	37	0								
Control Delay (s)	0.0	1.6	16.8	0.0								
Lane LOS		A	C	A								
Approach Delay (s)	0.0	1.6	16.8	0.0								
Approach LOS			C	A								
Intersection Summary												
Average Delay			3.8									
Intersection Capacity Utilization			49.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	170	59	0	66	0	59	1	18	0	0	0
Future Volume (Veh/h)	0	170	59	0	66	0	59	1	18	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	185	64	0	72	0	64	1	20	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	643											
pX, platoon unblocked												
vC, conflicting volume	72			249			289	289	217	310	321	72
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	72			249			289	289	217	310	321	72
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			90	100	98	100	100	100
cM capacity (veh/h)	1528			1317			663	621	823	627	596	990
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	249	72	85	0								
Volume Left	0	0	64	0								
Volume Right	64	0	20	0								
cSH	1528	1317	694	1700								
Volume to Capacity	0.00	0.00	0.12	0.00								
Queue Length 95th (ft)	0	0	10	0								
Control Delay (s)	0.0	0.0	10.9	0.0								
Lane LOS			B	A								
Approach Delay (s)	0.0	0.0	10.9	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			23.6%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	85	302	27	48	361	27
Future Volume (vph)	85	302	27	48	361	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	328	29	52	392	29
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	420	81	421			
Volume Left (vph)	92	0	392			
Volume Right (vph)	328	52	0			
Hadj (s)	-0.39	-0.35	0.22			
Departure Headway (s)	4.9	5.3	5.4			
Degree Utilization, x	0.57	0.12	0.63			
Capacity (veh/h)	702	608	646			
Control Delay (s)	14.2	9.1	17.0			
Approach Delay (s)	14.2	9.1	17.0			
Approach LOS	B	A	C			
Intersection Summary						
Delay			15.0			
Level of Service			B			
Intersection Capacity Utilization			58.1%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	238	124	17	186	15	169	19	22	4	14	23
Future Volume (Veh/h)	9	238	124	17	186	15	169	19	22	4	14	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	259	135	18	202	16	184	21	24	4	15	25
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)					576							
pX, platoon unblocked												
vC, conflicting volume	218			394			625	600	326	627	660	210
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	218			394			625	600	326	627	660	210
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			50	95	97	99	96	97
cM capacity (veh/h)	1352			1165			367	405	715	361	374	830
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	404	236	229	44								
Volume Left	10	18	184	4								
Volume Right	135	16	24	25								
cSH	1352	1165	390	542								
Volume to Capacity	0.01	0.02	0.59	0.08								
Queue Length 95th (ft)	1	1	90	7								
Control Delay (s)	0.3	0.8	26.5	12.2								
Lane LOS	A	A	D	B								
Approach Delay (s)	0.3	0.8	26.5	12.2								
Approach LOS			D	B								
Intersection Summary												
Average Delay	7.5											
Intersection Capacity Utilization	47.4%				ICU Level of Service				A			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	249	6	18	207	5	4	4	17	2	2	1
Future Volume (Veh/h)	1	249	6	18	207	5	4	4	17	2	2	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	271	7	20	225	5	4	4	18	2	2	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)	249											
pX, platoon unblocked												
vC, conflicting volume	230			278			546	546	274	564	548	228
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	230			278			546	546	274	564	548	228
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			99	99	98	100	100	100
cM capacity (veh/h)	1338			1285			441	438	764	418	437	812
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	279	250	26	5								
Volume Left	1	20	4	2								
Volume Right	7	5	18	1								
cSH	1338	1285	622	472								
Volume to Capacity	0.00	0.02	0.04	0.01								
Queue Length 95th (ft)	0	1	3	1								
Control Delay (s)	0.0	0.8	11.0	12.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.0	0.8	11.0	12.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			34.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2035
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Cassidy Street
E/W Street Name	Cassidy Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	135	152	129	0	125	88	31	0	142	817	99	0	123	648	50
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	150	169	143	0	139	98	34	0	157	906	110	0	136	718	55
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			4.9763	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		462			271			1173			909	
Entry Volume veh/h		453			266			1150			891	
Circulating Flow (v_c), pc/h	993			1213			455			394		
Exiting Flow (v_{ex}), pc/h	415			310			1090			1000		
Capacity (C_{pce}), pc/h		419			336			717			923	
Capacity (c), veh/h		410			329			703			905	
v/c Ratio (x)		1.10			0.81			1.64			0.98	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		107.1			48.0			309.0			47.5	
Lane LOS		F			E			F			E	
95% Queue, veh		16.0			6.8			62.8			17.4	
Approach Delay, s/veh	107.1			48.0			309.0			47.5		
Approach LOS	F			E			F			E		
Intersection Delay, s/veh LOS	166.3						F					

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	222	74	72	100	13	85	82	33	21	32	24
Future Volume (Veh/h)	24	222	74	72	100	13	85	82	33	21	32	24
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	241	80	78	109	14	92	89	36	23	35	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	280											
pX, platoon unblocked												
vC, conflicting volume	123			321			648	612	281	686	645	116
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	123			321			648	612	281	686	645	116
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			94			72	76	95	91	90	97
cM capacity (veh/h)	1464			1239			324	376	758	265	360	936
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	347	201	217	84								
Volume Left	26	78	92	23								
Volume Right	80	14	36	26								
cSH	1464	1239	382	397								
Volume to Capacity	0.02	0.06	0.57	0.21								
Queue Length 95th (ft)	1	5	85	20								
Control Delay (s)	0.7	3.5	26.1	16.5								
Lane LOS	A	A	D	C								
Approach Delay (s)	0.7	3.5	26.1	16.5								
Approach LOS			D	C								
Intersection Summary												
Average Delay			9.4									
Intersection Capacity Utilization			55.2%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	102	25	30	48	7	33	63	30	9	27	14
Future Volume (vph)	20	102	25	30	48	7	33	63	30	9	27	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	111	27	33	52	8	36	68	33	10	29	15
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	160	93	137	54								
Volume Left (vph)	22	33	36	10								
Volume Right (vph)	27	8	33	15								
Hadj (s)	-0.04	0.05	-0.06	-0.10								
Departure Headway (s)	4.4	4.6	4.5	4.6								
Degree Utilization, x	0.20	0.12	0.17	0.07								
Capacity (veh/h)	777	737	754	730								
Control Delay (s)	8.5	8.2	8.4	7.9								
Approach Delay (s)	8.5	8.2	8.4	7.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.3									
Level of Service			A									
Intersection Capacity Utilization			27.1%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	18	167	16	84	72	40	16	110	189	77	23	4
Future Volume (vph)	18	167	16	84	72	40	16	110	189	77	23	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	182	17	91	78	43	17	120	205	84	25	4
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	219	212	342	113								
Volume Left (vph)	20	91	17	84								
Volume Right (vph)	17	43	205	4								
Hadj (s)	0.01	0.00	-0.32	0.16								
Departure Headway (s)	5.5	5.5	5.0	5.8								
Degree Utilization, x	0.33	0.32	0.47	0.18								
Capacity (veh/h)	599	598	670	546								
Control Delay (s)	11.2	11.1	12.4	10.1								
Approach Delay (s)	11.2	11.1	12.4	10.1								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay				11.5								
Level of Service				B								
Intersection Capacity Utilization				58.9%	ICU Level of Service	B						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	116	138	9	76	52
Future Volume (vph)	0	116	138	9	76	52
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	126	150	10	83	57
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	126	160	140			
Volume Left (vph)	0	0	83			
Volume Right (vph)	126	10	0			
Hadj (s)	-0.57	0.00	0.15			
Departure Headway (s)	4.0	4.3	4.5			
Degree Utilization, x	0.14	0.19	0.17			
Capacity (veh/h)	829	801	765			
Control Delay (s)	7.7	8.4	8.4			
Approach Delay (s)	7.7	8.4	8.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.2			
Level of Service			A			
Intersection Capacity Utilization			21.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	154	50	238	122	409	56	743	316	342	624	28
Future Volume (vph)	23	154	50	238	122	409	56	743	316	342	624	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	16	16	16
Total Lost time (s)	5.0	5.0	5.0		4.9	4.9	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2006	1863	1556		1803	1794	1770	3785		2006	3986	
Flt Permitted	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	2006	1863	1556		1803	1794	1770	3785		2006	3986	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	167	54	259	133	445	61	808	343	372	678	30
RTOR Reduction (vph)	0	0	48	0	0	192	0	42	0	0	3	0
Lane Group Flow (vph)	25	167	6	0	392	253	61	1109	0	372	705	0
Confl. Peds. (#/hr)			2	2					5			
Confl. Bikes (#/hr)									4			
Turn Type	Split	NA	Perm	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	12.1	12.1	12.1		24.1	44.9	7.0	30.0		20.8	43.8	
Effective Green, g (s)	12.1	12.1	12.1		24.1	44.9	7.0	30.0		20.8	43.8	
Actuated g/C Ratio	0.11	0.11	0.11		0.23	0.42	0.07	0.28		0.20	0.41	
Clearance Time (s)	5.0	5.0	5.0		4.9		4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	228	212	177		409	759	116	1070		393	1645	
v/s Ratio Prot	0.01	c0.09			c0.22	0.14	0.03	c0.29		c0.19	0.18	
v/s Ratio Perm			0.00									
v/c Ratio	0.11	0.79	0.03		0.96	0.33	0.53	1.04		0.95	0.43	
Uniform Delay, d1	42.2	45.7	41.8		40.5	20.5	47.9	38.0		42.1	22.2	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	16.2	0.0		33.5	0.3	2.0	37.3		31.7	0.8	
Delay (s)	42.2	61.9	41.8		74.0	20.8	49.9	75.3		73.8	23.0	
Level of Service	D		D		E	C	D	E		E	C	
Approach Delay (s)		55.5			45.7			74.1			40.5	
Approach LOS		E			D			E			D	
Intersection Summary												
HCM 2000 Control Delay			54.9									
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			106.1									
Intersection Capacity Utilization			93.4%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	893	32	43	859	77	21	0	43	36	14	81
Future Volume (Veh/h)	13	893	32	43	859	77	21	0	43	36	14	81
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	971	35	47	934	84	23	0	47	39	15	88
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage (veh)					2							
Upstream signal (ft)		312										
pX, platoon unblocked				0.91			0.91	0.91	0.91	0.91	0.91	
vC, conflicting volume	1018			1006			2182	2128	988	2134	2104	976
vC1, stage 1 conf vol							1016	1016		1070	1070	
vC2, stage 2 conf vol							1166	1112		1064	1034	
vCu, unblocked vol	1018			960			2246	2187	941	2193	2160	976
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			93			80	100	84	71	92	71
cM capacity (veh/h)	682			656			116	188	292	135	181	305
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	1020	1065	70	142								
Volume Left	14	47	23	39								
Volume Right	35	84	47	88								
cSH	682	656	195	215								
Volume to Capacity	0.02	0.07	0.36	0.66								
Queue Length 95th (ft)	2	6	38	101								
Control Delay (s)	0.7	2.3	33.5	49.4								
Lane LOS	A	A	D	E								
Approach Delay (s)	0.7	2.3	33.5	49.4								
Approach LOS			D	E								
Intersection Summary												
Average Delay			5.5									
Intersection Capacity Utilization			91.4%	ICU Level of Service					F			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

07/02/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	14	1249	30	72	1228	92	6	5	114	36	5	22	
Future Volume (Veh/h)	14	1249	30	72	1228	92	6	5	114	36	5	22	
Sign Control	Free				Free				Stop		Stop		
Grade	0%				0%				0%		0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	15	1358	33	78	1335	100	7	5	124	39	5	24	
Pedestrians	1						1						
Lane Width (ft)	12.0						12.0						
Walking Speed (ft/s)	4.0						4.0						
Percent Blockage	0						0						
Right turn flare (veh)													
Median type	TWLTL			TWLTL									
Median storage veh)	2			2									
Upstream signal (ft)	687												
pX, platoon unblocked				0.93			0.93			0.93	0.93	0.93	
vC, conflicting volume	1435			1392				2924	2996	1376	3056	2963	1386
vC1, stage 1 conf vol								1406	1406	1541		1541	
vC2, stage 2 conf vol								1518	1591	1514		1422	
vCu, unblocked vol	1435			1384				3030	3108	1366	3171	3072	1386
tC, single (s)	4.1			4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)								6.1	5.5	6.1		5.5	
tF (s)	2.2			2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			83				90	95	26	0	94	86
cM capacity (veh/h)	473			460				73	98	167	1	82	175
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1							
Volume Total	15	1391	78	1435	136	68							
Volume Left	15	0	78	0	7	39							
Volume Right	0	33	0	100	124	24							
cSH	473	1700	460	1700	153	2							
Volume to Capacity	0.03	0.82	0.17	0.84	0.89	31.71							
Queue Length 95th (ft)	2	0	15	0	154	Err							
Control Delay (s)	12.9	0.0	14.4	0.0	103.4	Err							
Lane LOS	B			B	F		F						
Approach Delay (s)	0.1			0.7	103.4		Err						
Approach LOS					F	F							
Intersection Summary													
Average Delay			222.6										
Intersection Capacity Utilization			87.1%		ICU Level of Service			E					
Analysis Period (min)			15										

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	1446	0	0	1488	455	0	0	0	0	0	31
Future Volume (Veh/h)	18	1446	0	0	1488	455	0	0	0	0	0	31
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	1572	0	0	1617	495	0	0	0	0	0	34
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL				TWLTL							
Median storage veh	2				2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2112			1572			3263	3724	1572	3476	3476	1864
vC1, stage 1 conf vol							1612	1612		1864	1864	
vC2, stage 2 conf vol							1651	2112		1612	1612	
vCu, unblocked vol	2112			1572			3263	3724	1572	3476	3476	1864
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			100			100	100	100	100	100	62
cM capacity (veh/h)	259			419			50	61	136	69	89	91
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	20	1572	0	2112	0	34						
Volume Left	20	0	0	0	0	0						
Volume Right	0	0	0	495	0	34						
cSH	259	1700	1700	1700	1700	91						
Volume to Capacity	0.08	0.92	0.00	1.24	0.00	0.38						
Queue Length 95th (ft)	6	0	0	0	0	37						
Control Delay (s)	20.1	0.0	0.0	0.0	0.0	66.8						
Lane LOS	C				A	F						
Approach Delay (s)	0.3		0.0		0.0	66.8						
Approach LOS					A	F						
Intersection Summary												
Average Delay	0.7											
Intersection Capacity Utilization	116.0%				ICU Level of Service				H			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	102	0	0	127	107	994	28	127	797	10
Future Volume (Veh/h)	0	0	102	0	0	127	107	994	28	127	797	10
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	111	0	0	138	116	1080	30	138	866	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL		TWLTL			
Median storage veh							2		2			
Upstream signal (ft)									621			
pX, platoon unblocked												
vC, conflicting volume	2058	2490	872	2580	2480	555	877			1110		
vC1, stage 1 conf vol	1148	1148		1327	1327							
vC2, stage 2 conf vol	910	1342		1253	1153							
vCu, unblocked vol	2058	2490	872	2580	2480	555	877			1110		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	62	100	100	71	85			78		
cM capacity (veh/h)	39	46	294	6	83	475	766			625		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	111	138	116	720	390	138	877					
Volume Left	0	0	116	0	0	138	0					
Volume Right	111	138	0	0	30	0	11					
cSH	294	475	766	1700	1700	625	1700					
Volume to Capacity	0.38	0.29	0.15	0.42	0.23	0.22	0.52					
Queue Length 95th (ft)	42	30	13	0	0	21	0					
Control Delay (s)	24.5	15.6	10.5	0.0	0.0	12.4	0.0					
Lane LOS	C	C	B			B						
Approach Delay (s)	24.5	15.6	1.0			1.7						
Approach LOS	C	C										
Intersection Summary												
Average Delay			3.1									
Intersection Capacity Utilization			55.5%	ICU Level of Service				B				
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Michigan Avenue
E/W Street Name	Michigan Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	187	87	79	0	50	11	24	0	25	537	42	0	18	537	48
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	207	96	88	0	55	12	27	0	28	595	47	0	20	595	53
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		391			94			670			668	
Entry Volume veh/h		383			92			657			655	
Circulating Flow (v_c), pc/h	670			830			323			95		
Exiting Flow (v_{ex}), pc/h	163			93			829			738		
Capacity (C_{pce}), pc/h		578			493			818			1028	
Capacity (c), veh/h		567			483			802			1007	
v/c Ratio (x)		0.68			0.19			0.82			0.65	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		22.0			10.2			25.4			13.2	
Lane LOS		C			B			D			B	
95% Queue, veh		5.1			0.7			9.1			5.0	
Approach Delay, s/veh	22.0			10.2			25.4			13.2		
Approach LOS	C			B			D			B		
Intersection Delay, s/veh LOS	19.4						C					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - West
E/W Street Name	West Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	33	19	36	0	40	19	36	0	36	271	40	0	36	271	33
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	37	21	40	0	44	21	40	0	40	300	44	0	40	300	37
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		98			105			384			377	
Entry Volume veh/h		96			103			376			370	
Circulating Flow (v_c), pc/h	384			377			98			105		
Exiting Flow (v_{ex}), pc/h	105			98			377			384		
Capacity (C_{pce}), pc/h		770			775			1025			1017	
Capacity (c), veh/h		755			760			1004			997	
v/c Ratio (x)		0.13			0.14			0.37			0.37	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.1			6.2			7.6			7.6	
Lane LOS		A			A			A			A	
95% Queue, veh		0.4			0.5			1.8			1.7	
Approach Delay, s/veh	6.1			6.2			7.6			7.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	7.3						A					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Kelly
E/W Street Name	Kelly Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	28	43	27	0	31	26	197	0	10	317	30	0	180	300	62
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	31	48	30	0	34	29	218	0	11	351	33	0	200	333	69
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		109			281			395			602	
Entry Volume veh/h		107			275			387			590	
Circulating Flow (v_c), pc/h	567			393			279			74		
Exiting Flow (v_{ex}), pc/h	281			109			600			397		
Capacity (C_{pce}), pc/h		641			763			855			1049	
Capacity (c), veh/h		628			748			838			1029	
v/c Ratio (x)		0.17			0.37			0.46			0.57	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.7			9.4			10.2			11.0	
Lane LOS		A			A			B			B	
95% Queue, veh		0.6			1.7			2.5			3.8	
Approach Delay, s/veh	7.7			9.4			10.2			11.0		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh LOS	10.2						B					

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	103	0	14	13	1059	13	24	2213	16
Future Volume (veh/h)	0	0	0	103	0	14	13	1059	13	24	2213	16
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h				112	0	0	14	1151	0	26	2405	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				738	0	329	92	3173	988	92	2208	988
Arrive On Green				0.20	0.00	0.00	0.05	0.60	0.00	0.05	0.60	0.00
Sat Flow, veh/h				3690	0	1647	1845	5289	1647	1845	3681	1647
Grp Volume(v), veh/h				112	0	0	14	1151	0	26	2405	0
Grp Sat Flow(s),veh/h/ln				1845	0	1647	1845	1763	1647	1845	1840	1647
Q Serve(g_s), s				2.0	0.0	0.0	0.6	8.9	0.0	1.1	48.0	0.0
Cycle Q Clear(g_c), s				2.0	0.0	0.0	0.6	8.9	0.0	1.1	48.0	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				738	0	329	92	3173	988	92	2208	988
V/C Ratio(X)				0.15	0.00	0.00	0.15	0.36	0.00	0.28	1.09	0.00
Avail Cap(c_a), veh/h				738	0	329	92	3173	988	92	2208	988
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				26.4	0.0	0.0	36.4	8.2	0.0	36.6	16.0	0.0
Incr Delay (d2), s/veh				0.4	0.0	0.0	3.5	0.3	0.0	7.5	48.3	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.1	0.0	0.0	0.4	4.4	0.0	0.7	38.7	0.0
LnGrp Delay(d),s/veh				26.8	0.0	0.0	39.8	8.5	0.0	44.1	64.3	0.0
LnGrp LOS				C			D	A		D	F	
Approach Vol, veh/h					112			1165			2431	
Approach Delay, s/veh					26.8			8.9			64.1	
Approach LOS					C			A			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	8.0	52.0			8.0	52.0		20.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	48.0			4.0	48.0		16.0				
Max Q Clear Time (g_c+I1), s	3.1	10.9			2.6	50.0		4.0				
Green Ext Time (p_c), s	0.0	10.6			0.0	0.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				45.6								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↗	↖↖	↑↑					
Traffic Volume (veh/h)	1123	209	317	1287	0	0			
Future Volume (veh/h)	1123	209	317	1287	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937					
Adj Flow Rate, veh/h	1221	227	345	1399					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	2116	947	805	3313					
Arrive On Green	0.57	0.57	0.22	0.90					
Sat Flow, veh/h	3778	1647	3579	3778					
Grp Volume(v), veh/h	1221	227	345	1399					
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840					
Q Serve(g_s), s	8.4	2.7	3.3	2.5					
Cycle Q Clear(g_c), s	8.4	2.7	3.3	2.5					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	2116	947	805	3313					
V/C Ratio(X)	0.58	0.24	0.43	0.42					
Avail Cap(c_a), veh/h	2116	947	805	3313					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	5.4	4.2	13.3	0.3					
Incr Delay (d2), s/veh	1.2	0.6	1.7	0.4					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	4.4	1.4	1.8	1.2					
LnGrp Delay(d),s/veh	6.6	4.8	15.0	0.7					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	1448			1744					
Approach Delay, s/veh	6.3			3.5					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			13.0	27.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			9.0	23.0				36.0	
Max Q Clear Time (g_c+I1), s			5.3	10.4				4.5	
Green Ext Time (p_c), s			0.5	7.5				13.7	
Intersection Summary									
HCM 2010 Ctrl Delay			4.8						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/11/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑↑	↑	↑		
Traffic Volume (veh/h)	1740	97	305	1324	156	0		
Future Volume (veh/h)	1740	97	305	1324	156	0		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	1891	105	332	1439	170	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1840	823	358	2419	422	376		
Arrive On Green	0.50	0.50	0.10	0.66	0.23	0.00		
Sat Flow, veh/h	3778	1647	3579	3778	1845	1647		
Grp Volume(v), veh/h	1891	105	332	1439	170	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840	1845	1647		
Q Serve(g_s), s	35.0	2.4	6.4	15.4	5.5	0.0		
Cycle Q Clear(g_c), s	35.0	2.4	6.4	15.4	5.5	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1840	823	358	2419	422	376		
V/C Ratio(X)	1.03	0.13	0.93	0.59	0.40	0.00		
Avail Cap(c_a), veh/h	1840	823	358	2419	422	376		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	17.5	9.3	31.2	6.8	22.9	0.0		
Incr Delay (d2), s/veh	28.3	0.3	32.3	1.1	2.9	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	24.9	1.2	4.8	8.0	3.1	0.0		
LnGrp Delay(d),s/veh	45.8	9.7	63.6	7.8	25.8	0.0		
LnGrp LOS	F	A	E	A	C			
Approach Vol, veh/h	1996			1771	170			
Approach Delay, s/veh	43.9			18.3	25.8			
Approach LOS	D			B	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	11.0	39.0				50.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	7.0	35.0				46.0
Max Q Clear Time (g_c+I1), s		7.5	8.4	37.0				17.4
Green Ext Time (p_c), s		0.3	0.0	0.0				13.6
Intersection Summary								
HCM 2010 Ctrl Delay			31.6					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary
 51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	626	6	82	582	108	5	0	31	77	8	49
Future Volume (veh/h)	0	626	6	82	582	108	5	0	31	77	8	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1937	1976	1937	1937	1937	1937	0	1937	1937	1937	1937
Adj Flow Rate, veh/h	0	680	7	89	633	0	5	0	34	90	0	53
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1244	13	217	1949	872	0	0	0	1158	0	517
Arrive On Green	0.00	0.33	0.33	0.12	0.53	0.00	0.00	0.00	0.00	0.31	0.00	0.31
Sat Flow, veh/h	0	3829	38	1845	3681	1647		0		3690	0	1647
Grp Volume(v), veh/h	0	335	352	89	633	0		0.0		90	0	53
Grp Sat Flow(s),veh/h/ln	0	1840	1930	1845	1840	1647				1845	0	1647
Q Serve(g_s), s	0.0	7.6	7.6	2.3	5.0	0.0				0.9	0.0	1.2
Cycle Q Clear(g_c), s	0.0	7.6	7.6	2.3	5.0	0.0				0.9	0.0	1.2
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	613	643	217	1949	872				1158	0	517
V/C Ratio(X)	0.00	0.55	0.55	0.41	0.32	0.00				0.08	0.00	0.10
Avail Cap(c_a), veh/h	0	613	643	217	1949	872				1158	0	517
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	13.9	13.9	20.9	6.8	0.0				12.3	0.0	12.4
Incr Delay (d2), s/veh	0.0	3.5	3.3	5.6	0.4	0.0				0.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.4	4.6	1.5	2.6	0.0				0.5	0.0	0.6
LnGrp Delay(d),s/veh	0.0	17.3	17.2	26.5	7.3	0.0				12.4	0.0	12.8
LnGrp LOS		B	B	C	A					B		B
Approach Vol, veh/h		687			722						143	
Approach Delay, s/veh		17.3			9.6						12.6	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			10.0	21.0		20.0		31.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			6.0	17.0		16.0		27.0				
Max Q Clear Time (g_c+I1), s			4.3	9.6		3.2		7.0				
Green Ext Time (p_c), s			0.0	2.5		0.3		4.3				
Intersection Summary												
HCM 2010 Ctrl Delay			13.3									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	691	9	28	1014	299	9	2	15	292	7	73
Future Volume (veh/h)	179	691	9	28	1014	299	9	2	15	292	7	73
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1976	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	195	751	10	30	1102	325	10	2	16	202	169	79
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	185	1209	16	115	1058	473	329	66	350	369	250	117
Arrive On Green	0.10	0.32	0.32	0.06	0.29	0.29	0.21	0.21	0.21	0.20	0.20	0.20
Sat Flow, veh/h	1845	3719	50	1845	3681	1647	1550	310	1647	1845	1250	584
Grp Volume(v), veh/h	195	372	389	30	1102	325	12	0	16	202	0	248
Grp Sat Flow(s),veh/h/ln	1845	1840	1929	1845	1840	1647	1860	0	1647	1845	0	1834
Q Serve(g_s), s	8.0	13.7	13.7	1.2	23.0	14.0	0.4	0.0	0.6	7.9	0.0	10.0
Cycle Q Clear(g_c), s	8.0	13.7	13.7	1.2	23.0	14.0	0.4	0.0	0.6	7.9	0.0	10.0
Prop In Lane	1.00		0.03	1.00		1.00	0.83		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	185	598	627	115	1058	473	395	0	350	369	0	367
V/C Ratio(X)	1.06	0.62	0.62	0.26	1.04	0.69	0.03	0.00	0.05	0.55	0.00	0.68
Avail Cap(c_a), veh/h	185	598	627	115	1058	473	395	0	350	369	0	367
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.0	22.8	22.8	35.7	28.5	25.3	25.0	0.0	25.0	28.7	0.0	29.6
Incr Delay (d2), s/veh	82.1	4.8	4.6	5.4	39.0	7.9	0.1	0.0	0.2	5.7	0.0	9.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	7.7	8.0	0.8	17.3	7.4	0.2	0.0	0.3	4.6	0.0	6.0
LnGrp Delay(d),s/veh	118.1	27.6	27.4	41.1	67.5	33.2	25.1	0.0	25.3	34.5	0.0	39.2
LnGrp LOS	F	C	C	D	F	C	C		C	C		D
Approach Vol, veh/h		956			1457			28			450	
Approach Delay, s/veh		46.0			59.3			25.2			37.1	
Approach LOS		D			E			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.0	9.0	30.0		20.0	12.0	27.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	5.0	26.0		16.0	8.0	23.0				
Max Q Clear Time (g_c+I1), s		2.6	3.2	15.7		12.0	10.0	25.0				
Green Ext Time (p_c), s		0.0	0.0	3.5		0.8	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				51.1								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	868	283	88	765	185	360	99	141	437	240	390
Future Volume (veh/h)	61	868	283	88	765	185	360	99	141	437	240	390
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	66	943	308	96	832	201	250	306	153	368	411	424
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	123	838	272	98	1080	483	394	413	351	394	413	351
Arrive On Green	0.07	0.31	0.31	0.05	0.29	0.29	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1845	2732	888	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	66	634	617	96	832	201	250	306	153	368	411	424
Grp Sat Flow(s),veh/h/ln	1845	1840	1780	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	2.6	23.0	23.0	3.9	15.5	7.4	9.2	11.1	6.0	14.7	15.9	16.0
Cycle Q Clear(g_c), s	2.6	23.0	23.0	3.9	15.5	7.4	9.2	11.1	6.0	14.7	15.9	16.0
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	123	564	546	98	1080	483	394	413	351	394	413	351
V/C Ratio(X)	0.54	1.12	1.13	0.98	0.77	0.42	0.64	0.74	0.44	0.93	0.99	1.21
Avail Cap(c_a), veh/h	123	564	546	98	1080	483	394	413	351	394	413	351
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	26.0	26.0	35.5	24.2	21.3	26.8	27.6	25.6	29.0	29.5	29.5
Incr Delay (d2), s/veh	15.8	76.4	79.7	84.3	5.3	2.6	7.6	11.3	3.9	31.6	42.9	116.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	23.6	23.3	4.3	8.7	3.7	5.6	7.2	3.1	10.9	13.4	18.6
LnGrp Delay(d),s/veh	49.6	102.4	105.7	119.7	29.5	24.0	34.5	38.9	29.5	60.6	72.4	146.4
LnGrp LOS	D	F	F	F	C	C	C	D	C	E	E	F
Approach Vol, veh/h	1317			1129			709			1203		
Approach Delay, s/veh	101.3			36.2			35.3			94.9		
Approach LOS	F			D			D			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	8.0	27.0		20.0	9.0	26.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	4.0	23.0		16.0	5.0	22.0				
Max Q Clear Time (g_c+I1), s		13.1	5.9	25.0		18.0	4.6	17.5				
Green Ext Time (p_c), s		1.0	0.0	0.0		0.0	0.0	2.5				
Intersection Summary												
HCM 2010 Ctrl Delay	71.9											
HCM 2010 LOS	E											
Notes												

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	78	7	7	86	9	4	5	8	0	0	0
Future Vol, veh/h	23	78	7	7	86	9	4	5	8	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	85	8	8	93	10	4	5	9	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.7	7.6	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	24%	21%	7%
Vol Thru, %	29%	72%	84%
Vol Right, %	47%	6%	9%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	17	108	102
LT Vol	4	23	7
Through Vol	5	78	86
RT Vol	8	7	9
Lane Flow Rate	18	117	111
Geometry Grp	1	1	1
Degree of Util (X)	0.021	0.132	0.124
Departure Headway (Hd)	4.088	4.052	4.014
Convergence, Y/N	Yes	Yes	Yes
Cap	860	884	891
Service Time	2.187	2.083	2.047
HCM Lane V/C Ratio	0.021	0.132	0.125
HCM Control Delay	7.3	7.7	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.5	0.4

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖						↖	↗
Traffic Vol, veh/h	0	195	55	31	35	0	0	0	0	28	0	46
Future Vol, veh/h	0	195	55	31	35	0	0	0	0	28	0	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	212	60	34	38	0	0	0	0	30	0	50
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	212	0	0				318	318	38
Stage 1	-	-	-	-	-	-				106	106	-
Stage 2	-	-	-	-	-	-				212	212	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1358	-	0				675	598	1034
Stage 1	0	-	-	-	-	0				918	807	-
Stage 2	0	-	-	-	-	0				823	727	-
Platoon blocked, %	-	-	-	-	-	-				-	-	-
Mov Cap-1 Maneuver	-	-	-	1358	-	-				657	0	1034
Mov Cap-2 Maneuver	-	-	-	-	-	-				657	0	-
Stage 1	-	-	-	-	-	-				894	0	-
Stage 2	-	-	-	-	-	-				823	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.6			9.5					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT		EBR	WBL	WBT	SBLn1	SBLn2					
Capacity (veh/h)	-		-	1358	-	657	1034					
HCM Lane V/C Ratio	-		-	0.025	-	0.046	0.048					
HCM Control Delay (s)	-		-	7.7	0	10.7	8.7					
HCM Lane LOS	-		-	A	A	B	A					
HCM 95th %tile Q(veh)	-		-	0.1	-	0.1	0.2					

HCM 2010 Signalized Intersection Summary

56: I-5 SB On/Off-Ramp & Vista Way

07/02/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑	↑	↑↑		
Traffic Volume (veh/h)	945	137	935	1632	56	1428		
Future Volume (veh/h)	945	137	935	1632	56	1428		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	1027	0	1016	1774	61	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1302	583	1211	1401	397	624		
Arrive On Green	0.35	0.00	0.34	0.72	0.22	0.00		
Sat Flow, veh/h	3778	1647	3579	1937	1845	2898		
Grp Volume(v), veh/h	1027	0	1016	1774	61	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1937	1845	1449		
Q Serve(g_s), s	32.5	0.0	34.1	94.0	3.5	0.0		
Cycle Q Clear(g_c), s	32.5	0.0	34.1	94.0	3.5	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1302	583	1211	1401	397	624		
V/C Ratio(X)	0.79	0.00	0.84	1.27	0.15	0.00		
Avail Cap(c_a), veh/h	1302	583	1211	1401	397	624		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	37.6	0.0	39.7	18.0	41.4	0.0		
Incr Delay (d2), s/veh	4.9	0.0	7.0	125.7	0.8	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	17.4	0.0	18.0	98.3	1.9	0.0		
LnGrp Delay(d),s/veh	42.5	0.0	46.8	143.7	42.2	0.0		
LnGrp LOS	D		D	F	D			
Approach Vol, veh/h	1027			2790	61			
Approach Delay, s/veh	42.5			108.4	42.2			
Approach LOS	D			F	D			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		32.0	48.0	50.0				98.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		28.0	44.0	46.0				94.0
Max Q Clear Time (g_c+I1), s		5.5	36.1	34.5				96.0
Green Ext Time (p_c), s		0.1	2.8	5.5				0.0
Intersection Summary								
HCM 2010 Ctrl Delay			89.9					
HCM 2010 LOS			F					

Appendix L.1 – Analysis Output Sheets (Future with Project Alternative 2)

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	81	61	93	301	570	169	18	141	83	23	70
Future Volume (vph)	90	81	61	93	301	570	169	18	141	83	23	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3143	1441		1782	1583		1793	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3143	1441		1782	1583		1793	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	88	66	101	327	620	184	20	153	90	25	76
RTOR Reduction (vph)	0	0	58	0	229	256	0	0	91	0	0	58
Lane Group Flow (vph)	98	88	8	101	408	54	0	204	62	0	115	18
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	5.5	8.4	8.4	8.3	12.8	12.8		21.4	21.4		17.2	17.2
Effective Green, g (s)	5.5	8.4	8.4	8.3	12.8	12.8		21.4	21.4		17.2	17.2
Actuated g/C Ratio	0.07	0.11	0.11	0.11	0.17	0.17		0.29	0.29		0.23	0.23
Clearance Time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	132	212	180	199	546	250		518	460		419	369
v/s Ratio Prot	c0.06	0.05		c0.06	c0.13			c0.11			c0.06	
v/s Ratio Perm			0.00			0.04			0.04			0.01
v/c Ratio	0.74	0.42	0.04	0.51	0.75	0.22		0.39	0.13		0.27	0.05
Uniform Delay, d1	33.4	30.3	29.0	30.7	28.9	26.1		20.9	19.3		23.1	21.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	20.0	0.5	0.0	2.0	4.9	0.2		2.2	0.6		1.6	0.2
Delay (s)	53.3	30.8	29.1	32.8	33.7	26.2		23.1	19.9		24.7	22.1
Level of Service	D	C	C	C	C	C		C	B		C	C
Approach Delay (s)		39.1			31.4			21.7			23.7	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			29.8				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			73.6				Sum of lost time (s)		18.3			
Intersection Capacity Utilization			49.7%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				T				L			
Volume (V), veh/h	0	0	0	0	0	413	0	377	0	0	176	469	0	120	164	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	0	0	0	0	458	0	410	0	0	195	520	0	133	182	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929		4.2929	4.1129			4.1129		4.2929	4.1129	
Follow-Up Headway (sec)		3.1858		3.1858	3.1858			3.1858		3.1858	3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		0		0	458	410		195	520	133	182	
Entry Volume veh/h		0		0	449	410		191	510	130	178	
Circulating Flow (Vc), pc/h	773			195			133			458		
Exiting Flow (Vex), pc/h	133			0			195			640		
Capacity (cPCE), pc/h		522		976	986			1030		802	820	
Capacity (c), veh/h		511		957	967			1009		786	804	
v/c Ratio (X)		0.00		0.00	0.46			0.19		0.17	0.22	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.0		3.8	9.2	0.0		5.3	0.0	6.3	6.9	
Lane LOS		A		A	A	A		A	A	A	A	
95% Queue		0.0		0.0	2.5			0.7		0.6	0.8	
Approach Delay, s/veh				4.8			1.5			6.6		
Approach LOS				A			A			A		
Intersection Delay, s/veh / LOS	3.9						A					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	22	4	43	28	84	12	56	62	125	77	6
Future Volume (vph)	2	22	4	43	28	84	12	56	62	125	77	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	24	4	47	30	91	13	61	67	136	84	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	30	168	141	227								
Volume Left (vph)	2	47	13	136								
Volume Right (vph)	4	91	67	7								
Hadj (s)	-0.03	-0.24	-0.23	0.14								
Departure Headway (s)	5.0	4.6	4.4	4.7								
Degree Utilization, x	0.04	0.21	0.17	0.30								
Capacity (veh/h)	652	727	766	731								
Control Delay (s)	8.2	8.8	8.4	9.6								
Approach Delay (s)	8.2	8.8	8.4	9.6								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.0									
Level of Service			A									
Intersection Capacity Utilization			40.3%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

2/24/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↔		↖	↗		↖	↗	↗
Traffic Volume (vph)	173	17	47	9	33	67	44	287	20	26	394	99
Future Volume (vph)	173	17	47	9	33	67	44	287	20	26	394	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.92		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1781	1583		1701		1770	1844		1770	1863	1583
Flt Permitted		0.63	1.00		0.98		0.46	1.00		0.53	1.00	1.00
Satd. Flow (perm)		1174	1583		1668		848	1844		993	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	188	18	51	10	36	73	48	312	22	28	428	108
RTOR Reduction (vph)	0	0	37	0	53	0	0	3	0	0	0	38
Lane Group Flow (vph)	0	206	14	0	66	0	48	331	0	28	428	70
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		22.0	22.0		22.0		50.8	50.8		52.0	52.0	52.0
Effective Green, g (s)		22.0	22.0		22.0		50.8	50.8		52.0	52.0	52.0
Actuated g/C Ratio		0.28	0.28		0.28		0.63	0.63		0.65	0.65	0.65
Clearance Time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		7.0	7.0	7.0
Lane Grp Cap (vph)		322	435		458		538	1170		645	1210	1028
v/s Ratio Prot								0.18			c0.23	
v/s Ratio Perm		c0.18	0.01		0.04		0.06			0.03		0.04
v/c Ratio		0.64	0.03		0.14		0.09	0.28		0.04	0.35	0.07
Uniform Delay, d1		25.5	21.2		21.9		5.6	6.5		5.0	6.4	5.1
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		7.9	0.1		0.5		0.3	0.6		0.1	0.8	0.1
Delay (s)		33.4	21.3		22.4		6.0	7.1		5.2	7.2	5.3
Level of Service		C	C		C		A	A		A	A	A
Approach Delay (s)		31.0			22.4			7.0			6.7	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay			12.9									
HCM 2000 Volume to Capacity ratio			0.45									
Actuated Cycle Length (s)			80.0									
Intersection Capacity Utilization			51.4%									
Analysis Period (min)			15									
c Critical Lane Group												

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Civic Center Drive
E/W Street Name	Civic Center Drive
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	13	10	9	0	23	14	22	0	7	281	28	0	63	334	13
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	14	11	10	0	26	16	24	0	8	312	31	0	70	370	14
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		35			66			351			454	
Entry Volume veh/h		34			65			344			445	
Circulating Flow (Vc), pc/h	466			334			95			50		
Exiting Flow (Vex), pc/h	112			38			350			406		
Capacity (cPCE), pc/h		709			809			1028			1075	
Capacity (c), veh/h		695			793			1007			1054	
v/c Ratio (X)		0.05			0.08			0.34			0.42	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.7			5.3			7.1			8.0	
Lane LOS		A			A			A			A	
95% Queue		0.2			0.3			1.5			2.1	
Approach Delay, s/veh	5.7			5.3			7.1			8.0		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	7.4						A					

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Highway - Pier View Way			
Agency or Co.	IBI Group				E/W Street Name	Pier View Way			
Date Performed	7/12/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	AM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	7	11	11	0	12	17	18	0	8	326	13	0	13	284	22
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	8	12	12	0	13	19	20	0	9	361	14	0	14	315	24
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		32			52			384			353	
Entry Volume veh/h		31			51			376			346	
Circulating Flow (Vc), pc/h	342			378			34			41		
Exiting Flow (Vex), pc/h	40			52			389			340		
Capacity (cPCE), pc/h		803			774			1092			1085	
Capacity (c), veh/h		787			759			1071			1063	
v/c Ratio (X)		0.04			0.07			0.35			0.33	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.0			5.4			6.9			6.6	
Lane LOS		A			A			A			A	
95% Queue		0.1			0.2			1.6			1.4	
Approach Delay, s/veh	5.0			5.4			6.9			6.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	6.6						A					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

11/17/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	3	19	9	5	4	86	216	3	5	148	7
Future Volume (vph)	2	3	19	9	5	4	86	216	3	5	148	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	3	21	10	5	4	93	235	3	5	161	8
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	5	21	19	211	121	86	89					
Volume Left (vph)	2	0	10	93	0	5	0					
Volume Right (vph)	0	21	4	0	3	0	8					
Hadj (s)	0.23	-0.67	0.01	0.25	0.02	0.06	-0.03					
Departure Headway (s)	5.9	5.0	5.6	5.0	4.8	5.0	4.9					
Degree Utilization, x	0.01	0.03	0.03	0.29	0.16	0.12	0.12					
Capacity (veh/h)	563	660	588	705	737	704	720					
Control Delay (s)	7.7	6.9	8.8	8.9	7.5	7.4	7.3					
Approach Delay (s)	7.1		8.8	8.4		7.4						
Approach LOS	A		A	A		A						
Intersection Summary												
Delay			8.0									
Level of Service			A									
Intersection Capacity Utilization			30.7%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	129	57	126	91	33	111
Future Volume (vph)	129	57	126	91	33	111
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	140	62	137	99	36	121
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	140	62	236	157		
Volume Left (vph)	140	0	0	36		
Volume Right (vph)	0	62	99	0		
Hadj (s)	0.53	-0.67	-0.22	0.08		
Departure Headway (s)	6.0	4.8	4.4	4.8		
Degree Utilization, x	0.23	0.08	0.29	0.21		
Capacity (veh/h)	569	708	776	708		
Control Delay (s)	9.5	7.0	9.3	9.1		
Approach Delay (s)	8.8		9.3	9.1		
Approach LOS	A		A	A		
Intersection Summary						
Delay			9.0			
Level of Service			A			
Intersection Capacity Utilization			37.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	0	132	38	169	33	0	0	0	0	31	41
Future Volume (vph)	18	0	132	38	169	33	0	0	0	0	31	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5		4.5	4.5	4.5						4.5	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.98						0.91	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3452						3237	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3452						3237	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	0	143	41	184	36	0	0	0	0	34	45
RTOR Reduction (vph)	0	0	130	16	14	0	0	0	0	0	42	0
Lane Group Flow (vph)	20	0	13	25	206	0	0	0	0	0	37	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	5.3		5.3	37.1	37.1						4.1	
Effective Green, g (s)	5.3		5.3	37.1	37.1						4.1	
Actuated g/C Ratio	0.09		0.09	0.62	0.62						0.07	
Clearance Time (s)	4.5		4.5	4.5	4.5						4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	156		246	1094	2134						221	
v/s Ratio Prot	c0.01		0.00	0.01	c0.06						c0.01	
v/s Ratio Perm												
v/c Ratio	0.13		0.05	0.02	0.10						0.17	
Uniform Delay, d1	25.2		25.0	4.4	4.6						26.3	
Progression Factor	1.00		1.00	1.00	1.00						1.00	
Incremental Delay, d2	0.4		0.1	0.0	0.1						0.4	
Delay (s)	25.6		25.1	4.5	4.7						26.7	
Level of Service	C		C	A	A						C	
Approach Delay (s)		25.2			4.7			0.0			26.7	
Approach LOS		C			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			14.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.11									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)			13.5			
Intersection Capacity Utilization			23.2%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	144	213	73	67	585	0	0	333	30
Future Volume (vph)	0	0	0	144	213	73	67	585	0	0	333	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	0.95
Frpb, ped/bikes				1.00	1.00	0.96	1.00	1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	3539	1525	1770	1863			1767	1460
Flt Permitted				0.95	1.00	1.00	0.37	1.00			1.00	1.00
Satd. Flow (perm)				1770	3539	1525	686	1863			1767	1460
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	157	232	79	73	636	0	0	362	33
RTOR Reduction (vph)	0	0	0	0	0	55	0	0	0	0	1	22
Lane Group Flow (vph)	0	0	0	157	232	24	73	636	0	0	364	8
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					6
Actuated Green, G (s)				18.1	18.1	18.1	32.7	32.7			17.1	17.1
Effective Green, g (s)				18.1	18.1	18.1	32.7	32.7			17.1	17.1
Actuated g/C Ratio				0.30	0.30	0.30	0.54	0.54			0.28	0.28
Clearance Time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				526	1053	453	557	1001			496	410
v/s Ratio Prot				c0.09	0.07		0.02	c0.34			c0.21	
v/s Ratio Perm						0.02	0.05					0.01
v/c Ratio				0.30	0.22	0.05	0.13	0.64			0.73	0.02
Uniform Delay, d1				16.5	16.0	15.2	10.8	9.9			19.8	15.8
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				1.4	0.5	0.2	0.1	1.5			5.9	0.0
Delay (s)				17.9	16.5	15.4	11.0	11.4			25.7	15.8
Level of Service				B	B	B	B	B			C	B
Approach Delay (s)		0.0			16.8			11.3			25.0	
Approach LOS		A			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			16.4									HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			60.8								15.0	
Intersection Capacity Utilization			54.1%									ICU Level of Service A
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	115	1	124	433	199	11	24	188	134	47	6
Future Volume (vph)	23	115	1	124	433	199	11	24	188	134	47	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.98	
Satd. Flow (prot)	1770	3535		1770	3539	1583		1834	1583	1681	1714	
Flt Permitted	0.42	1.00		0.67	1.00	1.00		0.94	1.00	0.73	0.90	
Satd. Flow (perm)	779	3535		1252	3539	1583		1754	1583	1296	1572	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	125	1	135	471	216	12	26	204	146	51	7
RTOR Reduction (vph)	0	1	0	0	0	160	0	0	85	0	3	0
Lane Group Flow (vph)	25	125	0	135	471	56	0	38	119	101	100	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	15.9	15.9		15.5	15.5	15.5		34.9	34.9	34.9	34.9	
Effective Green, g (s)	15.9	15.9		15.5	15.5	15.5		34.9	34.9	34.9	34.9	
Actuated g/C Ratio	0.27	0.27		0.26	0.26	0.26		0.58	0.58	0.58	0.58	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	206	936		323	914	408		1020	920	753	914	
v/s Ratio Prot		0.04			c0.13							
v/s Ratio Perm	0.03			0.11		0.04		0.02	0.07	c0.08	0.06	
v/c Ratio	0.12	0.13		0.42	0.52	0.14		0.04	0.13	0.13	0.11	
Uniform Delay, d1	16.7	16.8		18.5	19.0	17.1		5.4	5.7	5.7	5.6	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.1		1.0	0.6	0.2		0.1	0.3	0.4	0.2	
Delay (s)	17.1	16.9		19.5	19.6	17.3		5.4	6.0	6.1	5.8	
Level of Service	B	B		B	B	B		A	A	A	A	
Approach Delay (s)		16.9			19.0			5.9			6.0	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			14.7				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			9.6		
Intersection Capacity Utilization			38.6%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

9/1/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↙	
Traffic Volume (veh/h)	89	6	21	31	6	8
Future Volume (Veh/h)	89	6	21	31	6	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	97	7	23	34	7	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				238		
pX, platoon unblocked						
vC, conflicting volume			104		180	100
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			104		180	100
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		99	99
cM capacity (veh/h)			1488		796	955
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	104	57	16			
Volume Left	0	23	7			
Volume Right	7	0	9			
cSH	1700	1488	878			
Volume to Capacity	0.06	0.02	0.02			
Queue Length 95th (ft)	0	1	1			
Control Delay (s)	0.0	3.1	9.2			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.1	9.2			
Approach LOS			A			
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			19.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	55	96	0	0	0	27	222	64	75	215	53
Future Volume (vph)	89	55	96	0	0	0	27	222	64	75	215	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.94				1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1494				1770	1863	1551	1770	1863	1515
Flt Permitted	0.95	1.00	1.00				0.61	1.00	1.00	0.42	1.00	1.00
Satd. Flow (perm)	1770	1863	1494				1142	1863	1551	783	1863	1515
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	60	104	0	0	0	29	241	70	82	234	58
RTOR Reduction (vph)	0	0	55	0	0	0	0	0	51	0	0	36
Lane Group Flow (vph)	97	60	49	0	0	0	29	241	19	82	234	22
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA	Perm				Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4					2	2		1	6	
Permitted Phases			4				2		2	6		6
Actuated Green, G (s)	28.0	28.0	28.0				16.0	16.0	16.0	23.2	23.2	23.2
Effective Green, g (s)	28.0	28.0	28.0				16.0	16.0	16.0	23.2	23.2	23.2
Actuated g/C Ratio	0.47	0.47	0.47				0.27	0.27	0.27	0.39	0.39	0.39
Clearance Time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0				4.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	826	869	697				304	496	413	355	720	585
v/s Ratio Prot	c0.05	0.03						c0.13		0.01	c0.13	
v/s Ratio Perm			0.03				0.03		0.01	0.08		0.01
v/c Ratio	0.12	0.07	0.07				0.10	0.49	0.05	0.23	0.33	0.04
Uniform Delay, d1	9.0	8.8	8.8				16.6	18.5	16.3	12.2	12.9	11.5
Progression Factor	1.00	1.00	1.00				0.71	0.70	0.27	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.2	0.2				0.6	3.4	0.2	0.3	1.2	0.1
Delay (s)	9.3	9.0	9.0				12.4	16.3	4.6	12.5	14.1	11.6
Level of Service	A	A	A				B	B	A	B	B	B
Approach Delay (s)		9.1			0.0			13.6			13.4	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			12.3				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.27									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			12.8		
Intersection Capacity Utilization			49.5%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	209	10	0	0	0	0	4	17	20	7	0
Future Volume (Veh/h)	10	209	10	0	0	0	0	4	17	20	7	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	227	11	0	0	0	0	4	18	22	8	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		218										
pX, platoon unblocked												
vC, conflicting volume	0			238			258	254	119	156	260	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			238			258	254	119	156	260	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	99	98	97	99	100
cM capacity (veh/h)	1622			1326			664	644	910	773	639	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	124	124	22	30								
Volume Left	11	0	0	22								
Volume Right	0	11	18	0								
cSH	1622	1700	846	732								
Volume to Capacity	0.01	0.07	0.03	0.04								
Queue Length 95th (ft)	1	0	2	3								
Control Delay (s)	0.7	0.0	9.4	10.1								
Lane LOS	A		A	B								
Approach Delay (s)	0.3		9.4	10.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			21.2%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

9/1/2016

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Sign Control		Stop			Stop			Stop			Stop		
Traffic Volume (vph)	24	473	5	0	0	0	0	4	21	14	12	0	
Future Volume (vph)	24	473	5	0	0	0	0	4	21	14	12	0	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	26	514	5	0	0	0	0	4	23	15	13	0	
Direction, Lane #	EB 1	EB 2	NB 1	SB 1									
Volume Total (vph)	283	262	27	28									
Volume Left (vph)	26	0	0	15									
Volume Right (vph)	0	5	23	0									
Hadj (s)	0.08	0.02	-0.48	0.14									
Departure Headway (s)	4.7	4.7	4.6	5.2									
Degree Utilization, x	0.37	0.34	0.03	0.04									
Capacity (veh/h)	755	761	730	643									
Control Delay (s)	9.3	8.8	7.7	8.4									
Approach Delay (s)	9.1		7.7	8.4									
Approach LOS	A		A	A									
Intersection Summary													
Delay			9.0										
Level of Service			A										
Intersection Capacity Utilization			28.7%		ICU Level of Service					A			
Analysis Period (min)			15										

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

9/1/2016

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	97	187	9	40	0	97	0	47	29	0	0	0								
Future Volume (vph)	97	187	9	40	0	97	0	47	29	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	105	203	10	43	0	105	0	51	32	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	105	213	148	83																
Volume Left (vph)	105	0	43	0																
Volume Right (vph)	0	10	105	32																
Hadj (s)	0.53	0.00	-0.33	-0.20																
Departure Headway (s)	5.4	4.8	4.2	4.7																
Degree Utilization, x	0.16	0.29	0.17	0.11																
Capacity (veh/h)	660	730	821	703																
Control Delay (s)	8.1	8.5	8.1	8.3																
Approach Delay (s)	8.4		8.1	8.3																
Approach LOS	A		A	A																
Intersection Summary																				
Delay			8.3																	
Level of Service			A																	
Intersection Capacity Utilization			32.8%	ICU Level of Service					A											
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	14	0	0	51	14	224	32	23	232	6
Future Volume (Veh/h)	0	0	14	0	0	51	14	224	32	23	232	6
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	15	0	0	55	15	243	35	25	252	7
Pedestrians	7				7							
Lane Width (ft)	12.0				16.0							
Walking Speed (ft/s)	4.0				4.0							
Percent Blockage	1				1							
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			455		
pX, platoon unblocked												
vC, conflicting volume	640	628	262	614	614	268	266				285	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	640	628	262	614	614	268	266				285	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	98	100	100	93	99				98	
cM capacity (veh/h)	346	382	772	380	389	765	1290				1267	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	15	55	15	278	25	259						
Volume Left	0	0	15	0	25	0						
Volume Right	15	55	0	35	0	7						
cSH	772	765	1290	1700	1267	1700						
Volume to Capacity	0.02	0.07	0.01	0.16	0.02	0.15						
Queue Length 95th (ft)	1	6	1	0	2	0						
Control Delay (s)	9.8	10.1	7.8	0.0	7.9	0.0						
Lane LOS	A	B	A	A								
Approach Delay (s)	9.8	10.1	0.4	0.7								
Approach LOS	A	B										
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			23.8%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Washington Avenue			
Agency or Co.	IBI Group				E/W Street Name	Washington Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	AM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	14	2	25	0	59	9	4	0	18	226	11	0	3	235	18
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	16	2	28	0	65	10	4	0	20	251	12	0	3	261	20
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		46			79			283			284	
Entry Volume veh/h		45			77			277			278	
Circulating Flow (Vc), pc/h	329			287			21			95		
Exiting Flow (Vex), pc/h	17			50			271			354		
Capacity (cPCE), pc/h		813			848			1107			1028	
Capacity (c), veh/h		797			831			1085			1007	
v/c Ratio (X)		0.06			0.09			0.26			0.28	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.1			5.2			5.7			6.3	
Lane LOS		A			A			A			A	
95% Queue		0.2			0.3			1.0			1.1	
Approach Delay, s/veh	5.1			5.2			5.7			6.3		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	5.9						A					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	30	16	25	4	79	3	136	39	93	93	1
Future Volume (vph)	20	30	16	25	4	79	3	136	39	93	93	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	33	17	27	4	86	3	148	42	101	101	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	72	117	193	203								
Volume Left (vph)	22	27	3	101								
Volume Right (vph)	17	86	42	1								
Hadj (s)	-0.05	-0.36	-0.09	0.13								
Departure Headway (s)	5.0	4.6	4.5	4.7								
Degree Utilization, x	0.10	0.15	0.24	0.27								
Capacity (veh/h)	657	713	756	722								
Control Delay (s)	8.5	8.4	9.0	9.4								
Approach Delay (s)	8.5	8.4	9.0	9.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.0									
Level of Service			A									
Intersection Capacity Utilization			37.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	202	22	4	93	15	11	23	27	20	32	11
Future Volume (Veh/h)	8	202	22	4	93	15	11	23	27	20	32	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	220	24	4	101	16	12	25	29	22	35	12
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked												
vC, conflicting volume	131			251			404	396	239	422	400	124
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	131			251			404	396	239	422	400	124
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			98	95	96	95	93	99
cM capacity (veh/h)	1437			1307			507	527	795	487	524	915
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	253	121	66	69								
Volume Left	9	4	12	22								
Volume Right	24	16	29	12								
cSH	1437	1307	613	552								
Volume to Capacity	0.01	0.00	0.11	0.13								
Queue Length 95th (ft)	0	0	9	11								
Control Delay (s)	0.3	0.3	11.6	12.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.3	11.6	12.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			28.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Wisconsin Avenue			
Agency or Co.	IBI Group				E/W Street Name	Wisconsin Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	AM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	51	56	131	0	93	30	29	0	64	234	67	0	18	257	17
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	57	62	145	0	103	33	32	0	71	259	74	0	20	285	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		264			168			404			324	
Entry Volume veh/h		259			165			396			318	
Circulating Flow (Vc), pc/h	408			387			139			207		
Exiting Flow (Vex), pc/h	156			123			348			533		
Capacity (cPCE), pc/h		751			767			983			919	
Capacity (c), veh/h		737			752			964			901	
v/c Ratio (X)		0.35			0.22			0.41			0.35	

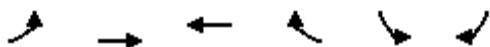
Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.3			7.2			8.4			7.9	
Lane LOS		A			A			A			A	
95% Queue		1.6			0.8			2.0			1.6	
Approach Delay, s/veh	9.3			7.2			8.4			7.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	8.3						A					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

9/1/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	221	214	5	17	15
Future Volume (Veh/h)	9	221	214	5	17	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	240	233	5	18	16
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	246				504	244
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	246				504	244
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	98
cM capacity (veh/h)	1311				519	788
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	250	238	34			
Volume Left	10	0	18			
Volume Right	0	5	16			
cSH	1311	1700	619			
Volume to Capacity	0.01	0.14	0.05			
Queue Length 95th (ft)	1	0	4			
Control Delay (s)	0.4	0.0	11.2			
Lane LOS	A		B			
Approach Delay (s)	0.4	0.0	11.2			
Approach LOS			B			
Intersection Summary						
Average Delay		0.9				
Intersection Capacity Utilization		29.3%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	206	9	20	195	11	6	5	14	36	1	6
Future Volume (Veh/h)	7	206	9	20	195	11	6	5	14	36	1	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	224	10	22	212	12	7	5	15	39	1	7
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	226			234			516	515	229	526	514	222
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	226			234			516	515	229	526	514	222
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			98	99	98	91	100	99
cM capacity (veh/h)	1340			1333			455	452	810	441	453	815
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	242	246	27	47								
Volume Left	8	22	7	39								
Volume Right	10	12	15	7								
cSH	1340	1333	601	473								
Volume to Capacity	0.01	0.02	0.04	0.10								
Queue Length 95th (ft)	0	1	4	8								
Control Delay (s)	0.3	0.8	11.3	13.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.8	11.3	13.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			33.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	114	188	71	144	0	101	0	36	0	0	0
Future Volume (vph)	0	114	188	71	144	0	101	0	36	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	124	204	77	157	0	110	0	39	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	328	234	149	0								
Volume Left (vph)	0	77	110	0								
Volume Right (vph)	204	0	39	0								
Hadj (s)	-0.34	0.10	0.02	0.00								
Departure Headway (s)	4.3	4.8	5.2	5.4								
Degree Utilization, x	0.39	0.31	0.21	0.00								
Capacity (veh/h)	815	720	634	900								
Control Delay (s)	9.9	9.9	9.6	8.4								
Approach Delay (s)	9.9	9.9	9.6	0.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.8								
Level of Service				A								
Intersection Capacity Utilization				51.4%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	48	67	85	30	78	102
Future Volume (vph)	48	67	85	30	78	102
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	73	92	33	85	111
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	125	125	196			
Volume Left (vph)	52	0	85			
Volume Right (vph)	73	33	0			
Hadj (s)	-0.23	-0.12	0.12			
Departure Headway (s)	4.4	4.3	4.5			
Degree Utilization, x	0.15	0.15	0.24			
Capacity (veh/h)	760	803	776			
Control Delay (s)	8.2	8.0	8.9			
Approach Delay (s)	8.2	8.0	8.9			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.4			
Level of Service			A			
Intersection Capacity Utilization			29.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	246	1	6	198	36	7	9	12	36	15	9
Future Volume (Veh/h)	7	246	1	6	198	36	7	9	12	36	15	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	267	1	7	215	39	8	10	13	39	16	10
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					213							
pX, platoon unblocked	0.93						0.93	0.93		0.93	0.93	0.93
vC, conflicting volume	257			279			565	566	286	561	546	242
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	164			279			495	496	286	491	476	148
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			98	98	98	91	96	99
cM capacity (veh/h)	1313			1272			420	432	741	427	444	832
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	276	261	31	65								
Volume Left	8	7	8	39								
Volume Right	1	39	13	10								
cSH	1313	1272	519	466								
Volume to Capacity	0.01	0.01	0.06	0.14								
Queue Length 95th (ft)	0	0	5	12								
Control Delay (s)	0.3	0.3	12.4	14.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.3	12.4	14.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			30.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

2/24/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	139	78	108	141	98	40	202	57	107	256	16
Future Volume (vph)	22	139	78	108	141	98	40	202	57	107	256	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	10	11	11	16	16	16
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.97	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1850	1534	1681	1763	1794	1652	3295		2006	2093	
Flt Permitted		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1850	1534	1681	1763	1794	1652	3295		2006	2093	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	151	85	117	153	107	43	220	62	116	278	17
RTOR Reduction (vph)	0	0	72	0	0	89	0	30	0	0	2	0
Lane Group Flow (vph)	0	175	13	105	165	18	43	252	0	116	293	0
Confl. Peds. (#/hr)			10	10					3			
Confl. Bikes (#/hr)			4						3			
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		11.9	11.9	13.1	13.1	13.1	4.1	25.8		10.4	32.1	
Effective Green, g (s)		11.9	11.9	13.1	13.1	13.1	4.1	25.8		10.4	32.1	
Actuated g/C Ratio		0.15	0.15	0.16	0.16	0.16	0.05	0.32		0.13	0.40	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		275	228	275	288	293	84	1062		260	839	
v/s Ratio Prot		c0.09		0.06	c0.09		0.03	0.08		c0.06	c0.14	
v/s Ratio Perm			0.01			0.01						
v/c Ratio		0.64	0.06	0.38	0.57	0.06	0.51	0.24		0.45	0.35	
Uniform Delay, d1		32.0	29.2	29.8	30.9	28.2	37.0	19.9		32.1	16.7	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.5	0.0	1.0	3.0	0.1	2.2	0.5		1.2	1.1	
Delay (s)		35.5	29.3	30.9	33.8	28.4	39.2	20.4		33.4	17.8	
Level of Service		D	C	C	C	C	D	C		C	B	
Approach Delay (s)		33.5			31.5			22.9			22.2	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			27.0									
HCM 2000 Volume to Capacity ratio			0.48									
Actuated Cycle Length (s)			80.0							18.8		
Intersection Capacity Utilization			52.7%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	12	345	0	16	445	87	8	9	35	267	14	48
Future Volume (vph)	12	345	0	16	445	87	8	9	35	267	14	48
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.96
Flpb, ped/bikes	1.00	1.00		0.99	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1770	3539		1755	3443			3125			1777	1524
Flt Permitted	0.30	1.00		0.49	1.00			0.92			0.69	1.00
Satd. Flow (perm)	557	3539		909	3443			2887			1290	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	13	375	0	17	484	95	9	10	38	290	15	52
RTOR Reduction (vph)	0	0	0	0	34	0	0	16	0	0	0	21
Lane Group Flow (vph)	13	375	0	17	545	0	0	41	0	0	305	31
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	15.0	15.0		15.0	15.0			35.5			35.5	35.5
Effective Green, g (s)	15.0	15.0		15.0	15.0			35.5			35.5	35.5
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.59			0.59	0.59
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	139	884		227	860			1708			763	901
v/s Ratio Prot		0.11			c0.16							
v/s Ratio Perm	0.02			0.02				0.01			c0.24	0.02
v/c Ratio	0.09	0.42		0.07	0.63			0.02			0.40	0.03
Uniform Delay, d1	17.3	18.9		17.2	20.1			5.1			6.6	5.1
Progression Factor	0.82	0.84		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.3	0.3		0.1	1.5			0.0			1.6	0.1
Delay (s)	14.5	16.2		17.3	21.6			5.1			8.1	5.2
Level of Service	B	B		B	C			A			A	A
Approach Delay (s)		16.1			21.5			5.1			7.7	
Approach LOS		B			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		15.8			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.47										
Actuated Cycle Length (s)		60.0			Sum of lost time (s)			9.5				
Intersection Capacity Utilization		62.2%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	12	16	27	8	100	2	330	54	84	445	16
Future Volume (vph)	23	12	16	27	8	100	2	330	54	84	445	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	10	11	16
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		0.99			1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.96			1.00	0.85	1.00	0.98		1.00	0.99	
Flt Protected		0.98			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1737			1792	1794	1770	3912		1652	3404	
Flt Permitted		0.84			0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1484			1822	1794	1770	3912		1652	3404	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	13	17	29	9	109	2	359	59	91	484	17
RTOR Reduction (vph)	0	15	0	0	0	98	0	19	0	0	3	0
Lane Group Flow (vph)	0	40	0	0	38	11	2	399	0	91	498	0
Confl. Peds. (#/hr)			4	4					3			
Confl. Bikes (#/hr)			1						2			
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		3.6			3.6	3.6	0.6	15.9		4.0	19.3	
Effective Green, g (s)		3.6			3.6	3.6	0.6	15.9		4.0	19.3	
Actuated g/C Ratio		0.10			0.10	0.10	0.02	0.43		0.11	0.52	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		143			176	173	28	1672		177	1766	
v/s Ratio Prot							0.00	0.10		c0.06	c0.15	
v/s Ratio Perm		c0.03			0.02	0.01						
v/c Ratio		0.28			0.22	0.06	0.07	0.24		0.51	0.28	
Uniform Delay, d1		15.6			15.5	15.3	18.0	6.8		15.7	5.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			0.2	0.1	1.1	0.1		2.5	0.1	
Delay (s)		16.0			15.7	15.3	19.1	6.9		18.2	5.1	
Level of Service		B			B	B	B	A		B	A	
Approach Delay (s)		16.0			15.4			6.9			7.1	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		8.5			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.32										
Actuated Cycle Length (s)		37.2			Sum of lost time (s)			13.7				
Intersection Capacity Utilization		38.3%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	130	22	34	112	0	19	0	28	0	0	0
Future Volume (Veh/h)	0	130	22	34	112	0	19	0	28	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	141	24	37	122	0	21	0	30	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		252										
pX, platoon unblocked												
vC, conflicting volume	122			165			349	349	153	379	361	122
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	122			165			349	349	153	379	361	122
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			96	100	97	100	100	100
cM capacity (veh/h)	1465			1413			594	560	893	548	551	929
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	165	159	51	0								
Volume Left	0	37	21	0								
Volume Right	24	0	30	0								
cSH	1465	1413	739	1700								
Volume to Capacity	0.00	0.03	0.07	0.00								
Queue Length 95th (ft)	0	2	6	0								
Control Delay (s)	0.0	1.9	10.2	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	1.9	10.2	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			29.3%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Dittmar St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	63	10	2	45	1	17	0	7	1	0	1
Future Volume (Veh/h)	1	63	10	2	45	1	17	0	7	1	0	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	68	11	2	49	1	18	0	8	1	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	50			79			130	130	74	137	134	50
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	50			79			130	130	74	137	134	50
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			98	100	99	100	100	100
cM capacity (veh/h)	1557			1519			841	760	988	826	755	1019
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	80	52	26	2								
Volume Left	1	2	18	1								
Volume Right	11	1	8	1								
cSH	1557	1519	881	912								
Volume to Capacity	0.00	0.00	0.03	0.00								
Queue Length 95th (ft)	0	0	2	0								
Control Delay (s)	0.1	0.3	9.2	9.0								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.1	0.3	9.2	9.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			14.3%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	36	87	14	36	108	14
Future Volume (vph)	36	87	14	36	108	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	95	15	39	117	15
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	134	54	132			
Volume Left (vph)	39	0	117			
Volume Right (vph)	95	39	0			
Hadj (s)	-0.33	-0.40	0.21			
Departure Headway (s)	4.0	3.9	4.4			
Degree Utilization, x	0.15	0.06	0.16			
Capacity (veh/h)	864	870	783			
Control Delay (s)	7.7	7.2	8.3			
Approach Delay (s)	7.7	7.2	8.3			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.9			
Level of Service			A			
Intersection Capacity Utilization			27.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	101	76	12	67	3	57	8	12	12	9	4
Future Volume (Veh/h)	3	101	76	12	67	3	57	8	12	12	9	4
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	110	83	13	73	3	62	9	13	13	10	4
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					576							
pX, platoon unblocked												
vC, conflicting volume	76			193			267	260	152	276	300	74
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	76			193			267	260	152	276	300	74
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			91	99	99	98	98	100
cM capacity (veh/h)	1523			1380			668	638	895	654	606	987
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	196	89	84	27								
Volume Left	3	13	62	13								
Volume Right	83	3	13	4								
cSH	1523	1380	692	668								
Volume to Capacity	0.00	0.01	0.12	0.04								
Queue Length 95th (ft)	0	1	10	3								
Control Delay (s)	0.1	1.2	10.9	10.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	1.2	10.9	10.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			24.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	127	4	3	79	2	1	1	8	1	1	1
Future Volume (Veh/h)	0	127	4	3	79	2	1	1	8	1	1	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	138	4	3	86	2	1	1	9	1	1	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)	249											
pX, platoon unblocked												
vC, conflicting volume	88			142			234	234	140	242	235	87
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	88			142			234	234	140	242	235	87
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	99	100	100	100
cM capacity (veh/h)	1508			1441			717	665	908	702	664	971
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	142	91	11	3								
Volume Left	0	3	1	1								
Volume Right	4	2	9	1								
cSH	1508	1441	859	758								
Volume to Capacity	0.00	0.00	0.01	0.00								
Queue Length 95th (ft)	0	0	1	0								
Control Delay (s)	0.0	0.3	9.2	9.8								
Lane LOS		A	A	A								
Approach Delay (s)	0.0	0.3	9.2	9.8								
Approach LOS			A	A								
Intersection Summary												
Average Delay				0.6								
Intersection Capacity Utilization	16.9%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	78	52	59	36	18	65	278	34	42	305	13
Future Volume (vph)	58	78	52	59	36	18	65	278	34	42	305	13
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.6			5.0		4.2	5.0		4.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.96			0.98		1.00	0.98		1.00	0.99	
Flt Protected		0.98			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1766			1776		1770	3481		1770	3518	
Flt Permitted		0.86			0.77		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1550			1401		1770	3481		1770	3518	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	85	57	64	39	20	71	302	37	46	332	14
RTOR Reduction (vph)	0	22	0	0	10	0	0	14	0	0	4	0
Lane Group Flow (vph)	0	183	0	0	113	0	71	325	0	46	342	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		8.6			8.2		4.4	18.3		1.9	15.6	
Effective Green, g (s)		8.6			8.2		4.4	18.3		1.9	15.6	
Actuated g/C Ratio		0.20			0.19		0.10	0.43		0.04	0.37	
Clearance Time (s)		4.6			5.0		4.2	5.0		4.0	5.0	
Vehicle Extension (s)		3.0			3.5		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		314			270		183	1502		79	1294	
v/s Ratio Prot							c0.04	0.09		c0.03	c0.10	
v/s Ratio Perm		c0.12			0.08							
v/c Ratio		0.58			0.42		0.39	0.22		0.58	0.26	
Uniform Delay, d1		15.3			15.0		17.7	7.6		19.9	9.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		2.8			1.2		0.5	0.1		10.5	0.1	
Delay (s)		18.0			16.2		18.2	7.6		30.3	9.5	
Level of Service		B			B		B	A		C	A	
Approach Delay (s)		18.0			16.2			9.5			11.9	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			12.6				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.39									
Actuated Cycle Length (s)			42.4				Sum of lost time (s)			14.2		
Intersection Capacity Utilization			35.3%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	87	22	26	50	12	9	23	22	9	19	17
Future Volume (Veh/h)	15	87	22	26	50	12	9	23	22	9	19	17
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	95	24	28	54	13	10	25	24	10	21	18
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)	280											
pX, platoon unblocked												
vC, conflicting volume	67			119			284	262	107	292	268	60
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	67			119			284	262	107	292	268	60
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			98	96	97	98	97	98
cM capacity (veh/h)	1535			1469			625	624	947	610	620	1005
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	135	95	59	49								
Volume Left	16	28	10	10								
Volume Right	24	13	24	18								
cSH	1535	1469	725	719								
Volume to Capacity	0.01	0.02	0.08	0.07								
Queue Length 95th (ft)	1	1	7	5								
Control Delay (s)	0.9	2.3	10.4	10.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.9	2.3	10.4	10.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.3									
Intersection Capacity Utilization			20.1%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	51	6	4	31	1	5	8	8	4	4	2
Future Volume (vph)	2	51	6	4	31	1	5	8	8	4	4	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	55	7	4	34	1	5	9	9	4	4	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	64	39	23	10								
Volume Left (vph)	2	4	5	4								
Volume Right (vph)	7	1	9	2								
Hadj (s)	-0.03	0.04	-0.16	-0.01								
Departure Headway (s)	4.0	4.1	4.0	4.1								
Degree Utilization, x	0.07	0.04	0.03	0.01								
Capacity (veh/h)	889	871	873	844								
Control Delay (s)	7.3	7.3	7.1	7.2								
Approach Delay (s)	7.3	7.3	7.1	7.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.2								
Level of Service				A								
Intersection Capacity Utilization				13.5%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	6	100	3	20	46	16	3	43	82	124	8	6
Future Volume (vph)	6	100	3	20	46	16	3	43	82	124	8	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	109	3	22	50	17	3	47	89	135	9	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	119	89	139	151								
Volume Left (vph)	7	22	3	135								
Volume Right (vph)	3	17	89	7								
Hadj (s)	0.03	-0.03	-0.35	0.18								
Departure Headway (s)	4.7	4.7	4.3	4.8								
Degree Utilization, x	0.16	0.12	0.16	0.20								
Capacity (veh/h)	707	707	796	714								
Control Delay (s)	8.6	8.3	8.1	8.9								
Approach Delay (s)	8.6	8.3	8.1	8.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.5									
Level of Service			A									
Intersection Capacity Utilization			36.2%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	45	27	11	50	54
Future Volume (vph)	0	45	27	11	50	54
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	49	29	12	54	59
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	49	41	113			
Volume Left (vph)	0	0	54			
Volume Right (vph)	49	12	0			
Hadj (s)	-0.57	-0.14	0.13			
Departure Headway (s)	3.7	4.0	4.2			
Degree Utilization, x	0.05	0.05	0.13			
Capacity (veh/h)	938	881	850			
Control Delay (s)	6.9	7.2	7.8			
Approach Delay (s)	6.9	7.2	7.8			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.4			
Level of Service			A			
Intersection Capacity Utilization			15.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	116	38	231	47	195	28	198	110	166	279	6
Future Volume (vph)	15	116	38	231	47	195	28	198	110	166	279	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	16	16	16
Total Lost time (s)	5.0	5.0	5.0		4.9	4.9	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.95		1.00	1.00	
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2006	1863	1555		1788	1794	1770	3741		2006	3998	
Flt Permitted	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	2006	1863	1555		1788	1794	1770	3741		2006	3998	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	126	41	251	51	212	30	215	120	180	303	7
RTOR Reduction (vph)	0	0	37	0	0	131	0	59	0	0	1	0
Lane Group Flow (vph)	16	126	4	0	302	81	30	276	0	180	309	0
Confl. Peds. (#/hr)			2	2					5			
Confl. Bikes (#/hr)									4			
Turn Type	Split	NA	Perm	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	9.8	9.8	9.8		22.1	38.7	3.2	33.7		16.6	47.1	
Effective Green, g (s)	9.8	9.8	9.8		22.1	38.7	3.2	33.7		16.6	47.1	
Actuated g/C Ratio	0.10	0.10	0.10		0.22	0.38	0.03	0.33		0.16	0.46	
Clearance Time (s)	5.0	5.0	5.0		4.9		4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	194	180	150		390	685	55	1244		328	1858	
v/s Ratio Prot	0.01	c0.07			c0.17	0.05	0.02	c0.07		c0.09	0.08	
v/s Ratio Perm			0.00									
v/c Ratio	0.08	0.70	0.03		0.77	0.12	0.55	0.22		0.55	0.17	
Uniform Delay, d1	41.7	44.3	41.4		37.3	20.3	48.3	24.4		38.9	15.7	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	9.2	0.0		9.3	0.1	5.8	0.4		1.9	0.2	
Delay (s)	41.7	53.5	41.5		46.5	20.3	54.1	24.8		40.8	15.9	
Level of Service	D	D	D		D	C	D	C		D	B	
Approach Delay (s)		49.8			35.7			27.2			25.0	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay			32.0									
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			101.3									
Intersection Capacity Utilization			56.2%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St

12/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	389	5	16	579	33	0	0	26	18	0	20
Future Volume (Veh/h)	5	389	5	16	579	33	0	0	26	18	0	20
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	423	5	17	629	36	0	0	28	20	0	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage veh					2							
Upstream signal (ft)		312										
pX, platoon unblocked				0.94			0.94	0.94	0.94	0.94	0.94	
vC, conflicting volume	665			428			1138	1134	426	1144	1119	647
vC1, stage 1 conf vol							436	436		681	681	
vC2, stage 2 conf vol							703	699		464	438	
vCu, unblocked vol	665			358			1115	1111	355	1121	1094	647
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			100	100	96	94	100	95
cM capacity (veh/h)	924			1127			353	376	646	363	381	471
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	433	682	28	42								
Volume Left	5	17	0	20								
Volume Right	5	36	28	22								
cSH	924	1127	646	413								
Volume to Capacity	0.01	0.02	0.04	0.10								
Queue Length 95th (ft)	0	1	3	8								
Control Delay (s)	0.2	0.4	10.8	14.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	0.4	10.8	14.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			57.5%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

12/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	481	10	31	758	18	10	4	66	22	4	11
Future Volume (Veh/h)	7	481	10	31	758	18	10	4	66	22	4	11
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	523	11	34	824	20	11	4	72	24	4	12
Pedestrians	1						1					
Lane Width (ft)	12.0						12.0					
Walking Speed (ft/s)	4.0						4.0					
Percent Blockage	0						0					
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage veh	2			2								
Upstream signal (ft)	687											
pX, platoon unblocked				0.96				0.96	0.96	0.96	0.96	0.96
vC, conflicting volume	844				535				1452	1458	530	1515
vC1, stage 1 conf vol							546	546				902
vC2, stage 2 conf vol							907	912				613
vCu, unblocked vol	844				494				1450	1456	488	1516
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1
tC, 2 stage (s)							6.1	5.5				6.1
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5
p0 queue free %	99				97				96	99	87	90
cM capacity (veh/h)	792				1025				264	292	556	251
											293	367
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	8	534	34	844	87	40						
Volume Left	8	0	34	0	11	24						
Volume Right	0	11	0	20	72	12						
cSH	792	1700	1025	1700	470	281						
Volume to Capacity	0.01	0.31	0.03	0.50	0.18	0.14						
Queue Length 95th (ft)	1	0	3	0	17	12						
Control Delay (s)	9.6	0.0	8.6	0.0	14.4	19.9						
Lane LOS	A		A		B	C						
Approach Delay (s)	0.1		0.3		14.4	19.9						
Approach LOS					B	C						
Intersection Summary												
Average Delay				1.6								
Intersection Capacity Utilization				54.6%	ICU Level of Service			A				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

12/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	650	0	0	838	106	0	0	0	0	0	18
Future Volume (Veh/h)	22	650	0	0	838	106	0	0	0	0	0	18
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	707	0	0	911	115	0	0	0	0	0	20
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage veh	2			2								
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1026			707			1686	1781	707	1724	1724	968
vC1, stage 1 conf vol							755	755		968	968	
vC2, stage 2 conf vol							931	1026		755	755	
vCu, unblocked vol	1026			707			1686	1781	707	1724	1724	968
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			100	100	100	100	100	94
cM capacity (veh/h)	677			891			227	240	435	242	263	308
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	24	707	0	1026	0	20						
Volume Left	24	0	0	0	0	0						
Volume Right	0	0	0	115	0	20						
cSH	677	1700	1700	1700	1700	308						
Volume to Capacity	0.04	0.42	0.00	0.60	0.00	0.06						
Queue Length 95th (ft)	3	0	0	0	0	5						
Control Delay (s)	10.5	0.0	0.0	0.0	0.0	17.5						
Lane LOS	B				A	C						
Approach Delay (s)	0.3		0.0		0.0	17.5						
Approach LOS					A	C						
Intersection Summary												
Average Delay	0.3											
Intersection Capacity Utilization	60.5%			ICU Level of Service			B					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

9/1/2016

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	0	0	67	0	0	58	28	270	23	41	612	10	
Future Volume (Veh/h)	0	0	67	0	0	58	28	270	23	41	612	10	
Sign Control		Stop			Stop			Free			Free		
Grade		0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	0	0	73	0	0	63	30	293	25	45	665	11	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type								TWLT					TWLT
Median storage veh								2					2
Upstream signal (ft)													621
pX, platoon unblocked													
vC, conflicting volume	1030	1138	670	1194	1132	159	676				318		
vC1, stage 1 conf vol	760	760		366	366								
vC2, stage 2 conf vol	270	378		828	766								
vCu, unblocked vol	1030	1138	670	1194	1132	159	676				318		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5								
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2		
p0 queue free %	100	100	82	100	100	93	97				96		
cM capacity (veh/h)	322	352	399	220	337	858	911				1239		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2						
Volume Total	73	63	30	195	123	45	676						
Volume Left	0	0	30	0	0	45	0						
Volume Right	73	63	0	0	25	0	11						
cSH	399	858	911	1700	1700	1239	1700						
Volume to Capacity	0.18	0.07	0.03	0.11	0.07	0.04	0.40						
Queue Length 95th (ft)	17	6	3	0	0	3	0						
Control Delay (s)	16.0	9.5	9.1	0.0	0.0	8.0	0.0						
Lane LOS	C	A	A					A					
Approach Delay (s)	16.0	9.5	0.8					0.5					
Approach LOS	C	A											
Intersection Summary													
Average Delay			2.0										
Intersection Capacity Utilization			43.6%	ICU Level of Service				A					
Analysis Period (min)			15										

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection		Coast Hwy - Michigan Avenue		
Agency or Co.	IBI Group				E/W Street Name		Michigan Avenue		
Date Performed	05/23/2016				N/S Street Name		Coast Highway		
Analysis Year	2016				Analysis Time Period (hrs)		0.25		
Time Period	AM Peak Hour				Peak Hour Factor		0.92		
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	84	15	36	0	48	15	8	0	22	243	6	0	6	238	26
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	93	17	40	0	53	17	9	0	24	269	7	0	7	264	29
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929		
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (Ve), pc/h		150			79			300			300		
Entry Volume veh/h		147			77			294			294		
Circulating Flow (Vc), pc/h	324			386			117			94			
Exiting Flow (Vex), pc/h	31			70			371			357			
Capacity (cPCE), pc/h		817			768			1005			1029		
Capacity (c), veh/h		801			753			986			1008		
v/c Ratio (X)		0.18			0.10			0.30			0.29		

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.4			5.8			6.7			6.5	
Lane LOS		A			A			A			A	
95% Queue		0.7			0.3			1.3			1.2	
Approach Delay, s/veh	6.4			5.8			6.7			6.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	6.5						A					

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - West
E/W Street Name	West Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	17	10	14	0	18	10	21	0	14	120	18	0	21	120	16
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	19	11	16	0	20	11	23	0	16	133	20	0	23	133	18
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		46			54			169			174	
Entry Volume veh/h		45			53			166			171	
Circulating Flow (Vc), pc/h	176			168			53			47		
Exiting Flow (Vex), pc/h	54			45			175			169		
Capacity (cPCE), pc/h		948			955			1072			1078	
Capacity (c), veh/h		929			937			1051			1057	
v/c Ratio (X)		0.05			0.06			0.16			0.16	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.3			4.4			4.9			4.9	
Lane LOS		A			A			A			A	
95% Queue		0.2			0.2			0.6			0.6	
Approach Delay, s/veh	4.3			4.4			4.9			4.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	4.7						A					

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Kelly
E/W Street Name	Kelly Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	13	17	11	0	12	10	89	0	4	141	12	0	81	134	27
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	14	19	12	0	13	11	99	0	4	156	13	0	90	149	30
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		45			123			173			269	
Entry Volume veh/h		44			121			170			264	
Circulating Flow (Vc), pc/h	252			174			123			28		
Exiting Flow (Vex), pc/h	122			45			269			174		
Capacity (cPCE), pc/h		878			950			999			1099	
Capacity (c), veh/h		861			931			980			1077	
v/c Ratio (X)		0.05			0.13			0.17			0.24	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.7			5.1			5.3			5.6	
Lane LOS		A			A			A			A	
95% Queue		0.2			0.4			0.6			1.0	
Approach Delay, s/veh	4.7			5.1			5.3			5.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	5.4						A					

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

06/29/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	150	6	32	7	66	8	22	737	18
Future Volume (veh/h)	0	0	0	150	6	32	7	66	8	22	737	18
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h				168	0	0	8	72	0	24	801	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				1328	0	593	148	1692	527	148	1178	527
Arrive On Green				0.36	0.00	0.00	0.08	0.32	0.00	0.08	0.32	0.00
Sat Flow, veh/h				3690	0	1647	1845	5289	1647	1845	3681	1647
Grp Volume(v), veh/h				168	0	0	8	72	0	24	801	0
Grp Sat Flow(s),veh/h/ln				1845	0	1647	1845	1763	1647	1845	1840	1647
Q Serve(g_s), s				1.5	0.0	0.0	0.2	0.5	0.0	0.6	9.5	0.0
Cycle Q Clear(g_c), s				1.5	0.0	0.0	0.2	0.5	0.0	0.6	9.5	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				1328	0	593	148	1692	527	148	1178	527
V/C Ratio(X)				0.13	0.00	0.00	0.05	0.04	0.00	0.16	0.68	0.00
Avail Cap(c_a), veh/h				1328	0	593	148	1692	527	148	1178	527
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				10.7	0.0	0.0	21.3	11.7	0.0	21.4	14.8	0.0
Incr Delay (d2), s/veh				0.2	0.0	0.0	0.7	0.0	0.0	2.4	3.2	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.8	0.0	0.0	0.1	0.2	0.0	0.4	5.3	0.0
LnGrp Delay(d),s/veh				10.9	0.0	0.0	21.9	11.8	0.0	23.8	18.0	0.0
LnGrp LOS				B			C	B		C	B	
Approach Vol, veh/h					168			80			825	
Approach Delay, s/veh					10.9			12.8			18.1	
Approach LOS					B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	8.0	20.0			8.0	20.0		22.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	16.0			4.0	16.0		18.0				
Max Q Clear Time (g_c+I1), s	2.6	2.5			2.2	11.5		3.5				
Green Ext Time (p_c), s	0.0	0.2			0.0	2.2		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				16.6								
HCM 2010 LOS				B								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↗	↙↙	↑↑					
Traffic Volume (veh/h)	531	188	479	1082	0	0			
Future Volume (veh/h)	531	188	479	1082	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937					
Adj Flow Rate, veh/h	577	204	521	1176					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	1840	823	1074	3313					
Arrive On Green	0.50	0.50	0.30	0.90					
Sat Flow, veh/h	3778	1647	3579	3778					
Grp Volume(v), veh/h	577	204	521	1176					
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840					
Q Serve(g_s), s	3.7	2.8	4.8	1.9					
Cycle Q Clear(g_c), s	3.7	2.8	4.8	1.9					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	1840	823	1074	3313					
V/C Ratio(X)	0.31	0.25	0.49	0.35					
Avail Cap(c_a), veh/h	1840	823	1074	3313					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	5.9	5.7	11.5	0.3					
Incr Delay (d2), s/veh	0.4	0.7	1.6	0.3					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	2.0	1.4	2.5	1.0					
LnGrp Delay(d),s/veh	6.4	6.4	13.0	0.6					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	781			1697					
Approach Delay, s/veh	6.4			4.4					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			16.0	24.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			12.0	20.0				36.0	
Max Q Clear Time (g_c+l1), s			6.8	5.7				3.9	
Green Ext Time (p_c), s			1.0	4.0				10.8	
Intersection Summary									
HCM 2010 Ctrl Delay			5.0						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/11/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑↑	↑	↑		
Traffic Volume (veh/h)	640	67	807	1970	67	1		
Future Volume (veh/h)	640	67	807	1970	67	1		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	696	73	877	2141	73	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	982	439	954	2208	492	439		
Arrive On Green	0.27	0.27	0.27	0.60	0.27	0.00		
Sat Flow, veh/h	3778	1647	3579	3778	1845	1647		
Grp Volume(v), veh/h	696	73	877	2141	73	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840	1845	1647		
Q Serve(g_s), s	10.3	2.0	14.3	33.4	1.8	0.0		
Cycle Q Clear(g_c), s	10.3	2.0	14.3	33.4	1.8	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	982	439	954	2208	492	439		
V/C Ratio(X)	0.71	0.17	0.92	0.97	0.15	0.00		
Avail Cap(c_a), veh/h	982	439	954	2208	492	439		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	19.9	16.9	21.4	11.5	16.8	0.0		
Incr Delay (d2), s/veh	4.3	0.8	15.1	13.2	0.6	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.8	1.0	8.9	20.4	1.0	0.0		
LnGrp Delay(d),s/veh	24.2	17.7	36.5	24.7	17.4	0.0		
LnGrp LOS	C	B	D	C	B			
Approach Vol, veh/h	769			3018	73			
Approach Delay, s/veh	23.6			28.1	17.4			
Approach LOS	C			C	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	20.0	20.0				40.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	16.0	16.0				36.0
Max Q Clear Time (g_c+I1), s		3.8	16.3	12.3				35.4
Green Ext Time (p_c), s		0.1	0.0	1.7				0.6
Intersection Summary								
HCM 2010 Ctrl Delay			27.0					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary
 51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	287	3	92	499	172	10	0	111	22	31	32
Future Volume (veh/h)	0	287	3	92	499	172	10	0	111	22	31	32
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1937	1976	1937	1937	1937	1937	0	1937	1937	1937	1937
Adj Flow Rate, veh/h	0	312	3	100	542	0	11	0	121	24	34	35
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1149	11	284	1982	887	0	0	0	568	596	507
Arrive On Green	0.00	0.31	0.31	0.15	0.54	0.00	0.00	0.00	0.00	0.31	0.31	0.31
Sat Flow, veh/h	0	3832	36	1845	3681	1647		0		1845	1937	1647
Grp Volume(v), veh/h	0	154	161	100	542	0		0.0		24	34	35
Grp Sat Flow(s),veh/h/ln	0	1840	1931	1845	1840	1647				1845	1937	1647
Q Serve(g_s), s	0.0	3.3	3.3	2.5	4.1	0.0				0.5	0.6	0.8
Cycle Q Clear(g_c), s	0.0	3.3	3.3	2.5	4.1	0.0				0.5	0.6	0.8
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	566	594	284	1982	887				568	596	507
V/C Ratio(X)	0.00	0.27	0.27	0.35	0.27	0.00				0.04	0.06	0.07
Avail Cap(c_a), veh/h	0	566	594	284	1982	887				568	596	507
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	13.6	13.6	19.7	6.5	0.0				12.6	12.7	12.7
Incr Delay (d2), s/veh	0.0	1.2	1.1	3.4	0.3	0.0				0.1	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.8	1.9	1.5	2.1	0.0				0.3	0.4	0.4
LnGrp Delay(d),s/veh	0.0	14.8	14.7	23.1	6.8	0.0				12.8	12.9	13.0
LnGrp LOS		B	B	C	A					B	B	B
Approach Vol, veh/h		315			642						93	
Approach Delay, s/veh		14.7			9.4						12.9	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			12.0	20.0		20.0		32.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			8.0	16.0		16.0		28.0				
Max Q Clear Time (g_c+I1), s			4.5	5.3		2.8		6.1				
Green Ext Time (p_c), s			0.1	1.3		0.2		3.7				
Intersection Summary												
HCM 2010 Ctrl Delay			11.3									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/13/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	465	5	9	612	355	10	10	19	138	2	57
Future Volume (veh/h)	230	465	5	9	612	355	10	10	19	138	2	57
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1976	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	250	505	5	10	665	386	11	11	21	107	62	62
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	158	960	10	105	841	376	216	216	376	422	203	203
Arrive On Green	0.09	0.26	0.26	0.02	0.08	0.08	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	3734	37	1845	3681	1647	945	945	1647	1845	890	890
Grp Volume(v), veh/h	250	249	261	10	665	386	22	0	21	107	0	124
Grp Sat Flow(s),veh/h/ln	1845	1840	1931	1845	1840	1647	1890	0	1647	1845	0	1780
Q Serve(g_s), s	6.0	8.1	8.1	0.4	12.4	16.0	0.6	0.0	0.7	3.3	0.0	4.0
Cycle Q Clear(g_c), s	6.0	8.1	8.1	0.4	12.4	16.0	0.6	0.0	0.7	3.3	0.0	4.0
Prop In Lane	1.00		0.02	1.00		1.00	0.50		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	158	473	496	105	841	376	432	0	376	422	0	407
V/C Ratio(X)	1.58	0.53	0.53	0.09	0.79	1.03	0.05	0.00	0.06	0.25	0.00	0.30
Avail Cap(c_a), veh/h	158	473	496	105	841	376	432	0	376	422	0	407
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.0	22.3	22.3	32.6	30.7	32.4	21.1	0.0	21.1	22.1	0.0	22.4
Incr Delay (d2), s/veh	289.4	4.1	4.0	1.8	7.5	53.1	0.2	0.0	0.3	1.4	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.7	4.6	4.8	0.2	7.2	12.8	0.4	0.0	0.3	1.9	0.0	2.2
LnGrp Delay(d),s/veh	321.4	26.5	26.3	34.3	38.2	85.4	21.3	0.0	21.4	23.6	0.0	24.3
LnGrp LOS	F	C	C	C	D	F	C		C	C		C
Approach Vol, veh/h		760			1061			43			231	
Approach Delay, s/veh		123.4			55.3			21.3			24.0	
Approach LOS		F			E			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	8.0	22.0		20.0	10.0	20.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	4.0	18.0		16.0	6.0	16.0				
Max Q Clear Time (g_c+I1), s		2.7	2.4	10.1		6.0	8.0	18.0				
Green Ext Time (p_c), s		0.1	0.0	1.9		0.7	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				75.9								
HCM 2010 LOS				E								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Future Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	82	427	316	91	846	199	210	238	87	246	297	211
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	492	362	132	894	400	422	443	376	422	443	376
Arrive On Green	0.02	0.08	0.08	0.07	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	2026	1489	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	82	388	355	91	846	199	210	238	87	246	297	211
Grp Sat Flow(s),veh/h/ln	1845	1840	1674	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	3.1	14.6	14.7	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Cycle Q Clear(g_c), s	3.1	14.6	14.7	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Prop In Lane	1.00		0.89	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	132	447	407	132	894	400	422	443	376	422	443	376
V/C Ratio(X)	0.62	0.87	0.87	0.69	0.95	0.50	0.50	0.54	0.23	0.58	0.67	0.56
Avail Cap(c_a), veh/h	132	447	407	132	894	400	422	443	376	422	443	376
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	31.1	31.1	31.7	26.1	22.8	23.5	23.7	22.0	24.0	24.6	23.9
Incr Delay (d2), s/veh	20.1	19.8	22.1	25.7	19.6	4.4	4.2	4.6	1.4	5.8	7.9	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	9.9	9.3	2.7	10.4	3.8	4.0	4.6	1.5	4.9	6.2	4.2
LnGrp Delay(d),s/veh	53.4	50.8	53.2	57.5	45.7	27.2	27.7	28.4	23.4	29.8	32.5	29.8
LnGrp LOS	D	D	D	E	D	C	C	C	C	C	C	C
Approach Vol, veh/h		825			1136			535			754	
Approach Delay, s/veh		52.1			43.4			27.3			30.9	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	9.0	21.0		20.0	9.0	21.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	5.0	17.0		16.0	5.0	17.0				
Max Q Clear Time (g_c+I1), s		9.6	5.4	16.7		11.8	5.1	17.8				
Green Ext Time (p_c), s		1.3	0.0	0.2		1.4	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			40.0									
HCM 2010 LOS			D									
Notes												

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	86	7	16	65	39	2	5	6	0	0	0
Future Vol, veh/h	25	86	7	16	65	39	2	5	6	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	93	8	17	71	42	2	5	7	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.8	7.6	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	15%	21%	13%
Vol Thru, %	38%	73%	54%
Vol Right, %	46%	6%	33%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	13	118	120
LT Vol	2	25	16
Through Vol	5	86	65
RT Vol	6	7	39
Lane Flow Rate	14	128	130
Geometry Grp	1	1	1
Degree of Util (X)	0.017	0.145	0.141
Departure Headway (Hd)	4.232	4.064	3.887
Convergence, Y/N	Yes	Yes	Yes
Cap	851	881	920
Service Time	2.232	2.093	1.921
HCM Lane V/C Ratio	0.016	0.145	0.141
HCM Control Delay	7.3	7.8	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.5	0.5

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖						↖	↗
Traffic Vol, veh/h	0	148	69	50	59	0	0	0	0	17	0	55
Future Vol, veh/h	0	148	69	50	59	0	0	0	0	17	0	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	161	75	54	64	0	0	0	0	18	0	60
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	161	0	0				333	333	64
Stage 1	-	-	-	-	-	-				172	172	-
Stage 2	-	-	-	-	-	-				161	161	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1418	-	0				662	587	1000
Stage 1	0	-	-	-	-	0				858	756	-
Stage 2	0	-	-	-	-	0				868	765	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1418	-	-				636	0	1000
Mov Cap-2 Maneuver	-	-	-	-	-	-				636	0	-
Stage 1	-	-	-	-	-	-				825	0	-
Stage 2	-	-	-	-	-	-				868	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.5			9.3					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2						
Capacity (veh/h)	-	-	1418	-	636	1000						
HCM Lane V/C Ratio	-	-	0.038	-	0.029	0.06						
HCM Control Delay (s)	-	-	7.6	0	10.8	8.8						
HCM Lane LOS	-	-	A	A	B	A						
HCM 95th %tile Q(veh)	-	-	0.1	-	0.1	0.2						

HCM 2010 Signalized Intersection Summary

56: I-5 SB On/Off-Ramp & Vista Way

06/29/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↵↵	↑	↵	↵↵		
Traffic Volume (veh/h)	518	201	1018	1229	17	967		
Future Volume (veh/h)	518	201	1018	1229	17	967		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	563	0	1107	1336	18	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	883	395	1384	1317	394	618		
Arrive On Green	0.24	0.00	0.39	0.68	0.21	0.00		
Sat Flow, veh/h	3778	1647	3579	1937	1845	2898		
Grp Volume(v), veh/h	563	0	1107	1336	18	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1937	1845	1449		
Q Serve(g_s), s	10.3	0.0	20.6	51.0	0.6	0.0		
Cycle Q Clear(g_c), s	10.3	0.0	20.6	51.0	0.6	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	883	395	1384	1317	394	618		
V/C Ratio(X)	0.64	0.00	0.80	1.01	0.05	0.00		
Avail Cap(c_a), veh/h	883	395	1384	1317	394	618		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	25.6	0.0	20.4	12.0	23.4	0.0		
Incr Delay (d2), s/veh	3.5	0.0	4.9	28.4	0.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.7	0.0	11.1	36.7	0.3	0.0		
LnGrp Delay(d),s/veh	29.1	0.0	25.4	40.4	23.7	0.0		
LnGrp LOS	C		C	F	C			
Approach Vol, veh/h	563			2443	18			
Approach Delay, s/veh	29.1			33.6	23.7			
Approach LOS	C			C	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	33.0	22.0				55.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	29.0	18.0				51.0
Max Q Clear Time (g_c+I1), s		2.6	22.6	12.3				53.0
Green Ext Time (p_c), s		0.0	2.6	1.8				0.0
Intersection Summary								
HCM 2010 Ctrl Delay			32.7					
HCM 2010 LOS			C					

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	273	107	194	477	306	1676	214	38	179	121	74	78
Future Volume (vph)	273	107	194	477	306	1676	214	38	179	121	74	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3018	1441		1787	1583		1807	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3018	1441		1787	1583		1807	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	297	116	211	518	333	1822	233	41	195	132	80	85
RTOR Reduction (vph)	0	0	189	0	477	481	0	0	122	0	0	73
Lane Group Flow (vph)	297	116	22	518	767	430	0	274	73	0	212	12
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	17.0	9.6	9.6	34.2	28.4	28.4		16.3	16.3		13.1	13.1
Effective Green, g (s)	17.0	9.6	9.6	34.2	28.4	28.4		16.3	16.3		13.1	13.1
Actuated g/C Ratio	0.19	0.10	0.10	0.37	0.31	0.31		0.18	0.18		0.14	0.14
Clearance Time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	328	195	166	661	936	447		318	281		258	226
v/s Ratio Prot	c0.17	0.06		0.29	0.25			c0.15			c0.12	
v/s Ratio Perm			0.01			c0.30			0.05			0.01
v/c Ratio	0.91	0.59	0.13	0.78	0.97dr	0.96		0.86	0.26		0.82	0.05
Uniform Delay, d1	36.5	39.1	37.2	25.4	29.2	31.0		36.5	32.4		38.1	33.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	27.0	3.2	0.1	6.1	7.9	34.2		20.0	0.2		17.8	0.0
Delay (s)	63.5	42.3	37.3	31.4	37.1	65.2		56.5	32.6		55.9	33.9
Level of Service	E	D	D	C	D	E		E	C		E	C
Approach Delay (s)		50.7			45.6			46.5			49.6	
Approach LOS		D			D			D			D	

Intersection Summary

HCM 2000 Control Delay	46.8	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	91.5	Sum of lost time (s)	18.3
Intersection Capacity Utilization	109.1%	ICU Level of Service	H
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	PM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				T				L			
Volume (V), veh/h	0	0	0	0	0	669	0	323	0	0	437	681	0	557	561	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	0	0	0	0	742	0	351	0	0	484	755	0	618	622	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929		4.2929	4.1129			4.1129		4.2929	4.1129	
Follow-Up Headway (sec)		3.1858		3.1858	3.1858			3.1858		3.1858	3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		0		0	742	351		484	755	618	622	
Entry Volume veh/h		0		0	727	351		475	740	606	610	
Circulating Flow (Vc), pc/h	1982			484			618			742		
Exiting Flow (Vex), pc/h	618			0			484			1364		
Capacity (cPCE), pc/h		156		786	805			733		648	672	
Capacity (c), veh/h		153		771	789			719		635	659	
v/c Ratio (X)		0.00		0.00	0.92			0.66		0.95	0.93	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		23.6		4.7	38.4	0.0		17.5	0.0	50.5	43.8	
Lane LOS		C		A	E	A		C	A	F	E	
95% Queue		0.0		0.0	13.1			5.0		13.4	12.4	
Approach Delay, s/veh				25.9			6.8			47.2		
Approach LOS				D			A			E		
Intersection Delay, s/veh / LOS	26.7						D					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	21	11	91	36	158	17	102	95	182	139	12
Future Volume (vph)	0	21	11	91	36	158	17	102	95	182	139	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	23	12	99	39	172	18	111	103	198	151	13
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	35	310	232	362								
Volume Left (vph)	0	99	18	198								
Volume Right (vph)	12	172	103	13								
Hadj (s)	-0.17	-0.24	-0.22	0.12								
Departure Headway (s)	5.9	5.3	5.2	5.4								
Degree Utilization, x	0.06	0.46	0.34	0.54								
Capacity (veh/h)	496	629	630	640								
Control Delay (s)	9.3	12.7	10.9	14.4								
Approach Delay (s)	9.3	12.7	10.9	14.4								
Approach LOS	A	B	B	B								
Intersection Summary												
Delay			12.8									
Level of Service			B									
Intersection Capacity Utilization			63.5%	ICU Level of Service					B			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

2/24/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔		↔		↔	↔		↔	↔	↔
Traffic Volume (vph)	251	80	104	17	70	42	73	731	26	67	739	181
Future Volume (vph)	251	80	104	17	70	42	73	731	26	67	739	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1795	1583		1769		1770	1853		1770	1863	1583
Flt Permitted		0.70	1.00		0.95		0.14	1.00		0.13	1.00	1.00
Satd. Flow (perm)		1304	1583		1685		256	1853		249	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	273	87	113	18	76	46	79	795	28	73	803	197
RTOR Reduction (vph)	0	0	72	0	29	0	0	2	0	0	0	91
Lane Group Flow (vph)	0	360	41	0	111	0	79	821	0	73	803	106
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		21.7	21.7		21.7		31.1	31.1		32.3	32.3	32.3
Effective Green, g (s)		21.7	21.7		21.7		31.1	31.1		32.3	32.3	32.3
Actuated g/C Ratio		0.36	0.36		0.36		0.52	0.52		0.54	0.54	0.54
Clearance Time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		7.0	7.0	7.0
Lane Grp Cap (vph)		471	572		609		132	960		134	1002	852
v/s Ratio Prot							c0.44				0.43	
v/s Ratio Perm		c0.28	0.03		0.07		0.31			0.29		0.07
v/c Ratio		0.76	0.07		0.18		0.60	0.86		0.54	0.80	0.12
Uniform Delay, d1		16.9	12.5		13.1		10.1	12.5		9.0	11.2	6.9
Progression Factor		1.00	1.00		1.00		1.03	0.95		1.00	1.00	1.00
Incremental Delay, d2		10.0	0.2		0.5		16.4	8.6		15.0	6.7	0.3
Delay (s)		26.9	12.7		13.6		26.7	20.4		24.0	18.0	7.2
Level of Service		C	B		B		C	C		C	B	A
Approach Delay (s)		23.5			13.6			21.0			16.4	
Approach LOS		C			B			C			B	
Intersection Summary												
HCM 2000 Control Delay			19.2									
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			60.0							7.2		
Intersection Capacity Utilization			78.7%									
Analysis Period (min)			15									
c Critical Lane Group												

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Civic Center Drive			
Agency or Co.	IBI Group				E/W Street Name	Civic Center Drive			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	37	40	34	0	37	47	79	0	28	732	68	0	44	764	31
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	41	44	38	0	41	52	88	0	31	812	75	0	49	847	34
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		123			181			918			930	
Entry Volume veh/h		121			177			900			912	
Circulating Flow (Vc), pc/h	937			884			134			124		
Exiting Flow (Vex), pc/h	168			117			941			926		
Capacity (cPCE), pc/h		443			467			988			998	
Capacity (c), veh/h		434			458			969			979	
v/c Ratio (X)		0.28			0.39			0.93			0.93	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		12.8			14.7			34.9			35.1	
Lane LOS		B			B			D			E	
95% Queue		1.1			1.8			14.6			14.8	
Approach Delay, s/veh	12.8			14.7			34.9			35.1		
Approach LOS	B			B			D			E		
Intersection Delay, s/veh / LOS	32.0						D					

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Highway - Pier View Way			
Agency or Co.	IBI Group				E/W Street Name	Pier View Way			
Date Performed	7/12/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	48	38	53	0	23	38	64	0	40	717	53	0	29	717	90
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	53	42	59	0	26	42	71	0	44	795	59	0	32	795	100
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		154			139			898			927	
Entry Volume veh/h		151			136			880			909	
Circulating Flow (Vc), pc/h	853			892			127			112		
Exiting Flow (Vex), pc/h	133			186			919			880		
Capacity (cPCE), pc/h		482			463			995			1010	
Capacity (c), veh/h		472			454			976			990	
v/c Ratio (X)		0.32			0.30			0.90			0.92	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		12.8			12.8			30.7			32.6	
Lane LOS		B			B			D			D	
95% Queue		1.4			1.2			13.2			14.1	
Approach Delay, s/veh	12.8			12.8			30.7			32.6		
Approach LOS	B			B			D			D		
Intersection Delay, s/veh / LOS	29.1						D					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

11/17/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	14	8	114	55	8	13	39	393	26	13	354	12
Future Volume (vph)	14	8	114	55	8	13	39	393	26	13	354	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	9	124	60	9	14	42	427	28	14	385	13
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	24	124	83	256	242	207	206					
Volume Left (vph)	15	0	60	42	0	14	0					
Volume Right (vph)	0	124	14	0	28	0	13					
Hadj (s)	0.35	-0.67	0.08	0.12	-0.05	0.07	-0.01					
Departure Headway (s)	7.2	6.2	6.9	5.9	5.7	6.0	5.9					
Degree Utilization, x	0.05	0.21	0.16	0.42	0.39	0.34	0.34					
Capacity (veh/h)	459	533	477	591	607	581	589					
Control Delay (s)	9.3	9.6	11.2	11.9	11.1	10.8	10.6					
Approach Delay (s)	9.6		11.2	11.5		10.7						
Approach LOS	A		B	B		B						
Intersection Summary												
Delay			11.0									
Level of Service			B									
Intersection Capacity Utilization			44.3%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	293	100	180	204	73	211
Future Volume (vph)	293	100	180	204	73	211
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	318	109	196	222	79	229
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	318	109	418	308		
Volume Left (vph)	318	0	0	79		
Volume Right (vph)	0	109	222	0		
Hadj (s)	0.53	-0.67	-0.28	0.09		
Departure Headway (s)	7.0	5.8	5.5	6.0		
Degree Utilization, x	0.62	0.18	0.64	0.52		
Capacity (veh/h)	482	588	626	569		
Control Delay (s)	19.8	8.9	17.8	15.3		
Approach Delay (s)	17.0		17.8	15.3		
Approach LOS	C		C	C		
Intersection Summary						
Delay			16.8			
Level of Service			C			
Intersection Capacity Utilization			63.3%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			 		 						 	
Traffic Volume (vph)	46	0	346	90	311	90	0	0	0	0	135	96
Future Volume (vph)	46	0	346	90	311	90	0	0	0	0	135	96
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5		4.5	4.5	4.5						4.5	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.97						0.94	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3420						3319	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3420						3319	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	50	0	376	98	338	98	0	0	0	0	147	104
RTOR Reduction (vph)	0	0	309	71	48	0	0	0	0	0	84	0
Lane Group Flow (vph)	50	0	67	27	388	0	0	0	0	0	167	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	6.8		6.8	10.5	10.5						7.3	
Effective Green, g (s)	6.8		6.8	10.5	10.5						7.3	
Actuated g/C Ratio	0.18		0.18	0.28	0.28						0.19	
Clearance Time (s)	4.5		4.5	4.5	4.5						4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	315		497	487	942						635	
v/s Ratio Prot	c0.03		0.02	0.02	c0.11						c0.05	
v/s Ratio Perm												
v/c Ratio	0.16		0.14	0.06	0.41						0.26	
Uniform Delay, d1	13.2		13.2	10.2	11.3						13.1	
Progression Factor	1.00		1.00	1.00	1.00						1.00	
Incremental Delay, d2	0.2		0.1	0.0	0.3						0.2	
Delay (s)	13.5		13.3	10.2	11.6						13.3	
Level of Service	B		B	B	B						B	
Approach Delay (s)		13.3			11.3			0.0			13.3	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			12.4			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.30									
Actuated Cycle Length (s)			38.1			Sum of lost time (s)			13.5			
Intersection Capacity Utilization			35.2%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	210	436	77	278	745	0	0	625	197
Future Volume (vph)	0	0	0	210	436	77	278	745	0	0	625	197
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	0.95
Frpb, ped/bikes				1.00	1.00	0.96	1.00	1.00			1.00	0.96
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	3539	1515	1770	1863			1760	1451
Flt Permitted				0.95	1.00	1.00	0.12	1.00			1.00	1.00
Satd. Flow (perm)				1770	3539	1515	231	1863			1760	1451
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	228	474	84	302	810	0	0	679	214
RTOR Reduction (vph)	0	0	0	0	0	66	0	0	0	0	1	48
Lane Group Flow (vph)	0	0	0	228	474	18	302	810	0	0	699	145
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					6
Actuated Green, G (s)				18.1	18.1	18.1	57.4	57.4			37.1	37.1
Effective Green, g (s)				18.1	18.1	18.1	57.4	57.4			37.1	37.1
Actuated g/C Ratio				0.21	0.21	0.21	0.67	0.67			0.43	0.43
Clearance Time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				374	749	320	430	1250			763	629
v/s Ratio Prot				0.13	c0.13		0.13	c0.43			c0.40	
v/s Ratio Perm						0.01	0.35					0.10
v/c Ratio				0.61	0.63	0.06	0.70	0.65			0.92	0.23
Uniform Delay, d1				30.5	30.7	26.9	25.1	8.2			22.7	15.2
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				7.2	4.0	0.3	5.5	1.3			15.8	0.3
Delay (s)				37.7	34.7	27.2	30.6	9.5			38.6	15.5
Level of Service				D	C	C	C	A			D	B
Approach Delay (s)		0.0			34.8			15.2			33.6	
Approach LOS		A			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			26.6									
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			85.5									
Intersection Capacity Utilization			79.9%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	151	0	134	744	292	16	82	322	406	54	22
Future Volume (vph)	19	151	0	134	744	292	16	82	322	406	54	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		5.0	5.0	4.0		4.6	4.0	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.97	
Satd. Flow (prot)	1770	3539		1770	3539	1583		1848	1583	1681	1688	
Flt Permitted	0.29	1.00		0.65	1.00	1.00		0.93	1.00	0.69	0.73	
Satd. Flow (perm)	533	3539		1207	3539	1583		1739	1583	1219	1272	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	164	0	146	809	317	17	89	350	441	59	24
RTOR Reduction (vph)	0	0	0	0	0	317	0	0	350	0	7	0
Lane Group Flow (vph)	21	164	0	146	809	0	0	106	0	256	261	0
Turn Type	Perm	NA		Perm	NA	NA	Perm	NA	NA	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	17.2	17.2		16.8	16.8	0.0		16.2	0.0	16.2	16.2	
Effective Green, g (s)	17.2	17.2		16.8	16.8	0.0		16.2	0.0	16.2	16.2	
Actuated g/C Ratio	0.40	0.40		0.39	0.39	0.00		0.38	0.00	0.38	0.38	
Clearance Time (s)	4.6	4.6		5.0	5.0			4.6		4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5			4.0		4.0	4.0	
Lane Grp Cap (vph)	215	1428		476	1395	0		661	0	463	483	
v/s Ratio Prot		0.05			c0.23							
v/s Ratio Perm	0.04			0.12				0.06		c0.21	0.21	
v/c Ratio	0.10	0.11		0.31	0.58	0.00		0.16	0.00	0.55	0.54	
Uniform Delay, d1	7.9	7.9		8.9	10.1	21.3		8.7	21.3	10.4	10.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.0		0.4	0.6	0.0		0.2	0.0	1.8	1.6	
Delay (s)	8.2	8.0		9.3	10.8	21.3		8.9	21.3	12.1	11.8	
Level of Service	A	A		A	B	C		A	C	B	B	
Approach Delay (s)		8.0			13.2			18.4			12.0	
Approach LOS		A			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			13.5			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			42.6			Sum of lost time (s)			9.6			
Intersection Capacity Utilization			55.7%			ICU Level of Service			B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

9/1/2016

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↙	
Traffic Volume (veh/h)	321	16	24	66	25	30
Future Volume (Veh/h)	321	16	24	66	25	30
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	349	17	26	72	27	33
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				238		
pX, platoon unblocked						
vC, conflicting volume			366		482	358
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			366		482	358
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		95	95
cM capacity (veh/h)			1193		532	687
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	366	98	60			
Volume Left	0	26	27			
Volume Right	17	0	33			
cSH	1700	1193	607			
Volume to Capacity	0.22	0.02	0.10			
Queue Length 95th (ft)	0	2	8			
Control Delay (s)	0.0	2.3	11.6			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.3	11.6			
Approach LOS			B			
Intersection Summary						
Average Delay			1.8			
Intersection Capacity Utilization			34.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	355	221	226	0	0	0	94	507	160	170	435	116
Future Volume (vph)	355	221	226	0	0	0	94	507	160	170	435	116
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.94				1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1493				1770	1863	1552	1770	1863	1516
Flt Permitted	0.95	1.00	1.00				0.49	1.00	1.00	0.19	1.00	1.00
Satd. Flow (perm)	1770	1863	1493				917	1863	1552	347	1863	1516
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	386	240	246	0	0	0	102	551	174	185	473	126
RTOR Reduction (vph)	0	0	166	0	0	0	0	0	91	0	0	59
Lane Group Flow (vph)	386	240	80	0	0	0	102	551	83	185	473	67
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA	Perm				Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4					2	2		1	6	
Permitted Phases			4				2		2	6		6
Actuated Green, G (s)	19.5	19.5	19.5				22.7	22.7	22.7	31.7	31.7	31.7
Effective Green, g (s)	19.5	19.5	19.5				22.7	22.7	22.7	31.7	31.7	31.7
Actuated g/C Ratio	0.32	0.32	0.32				0.38	0.38	0.38	0.53	0.53	0.53
Clearance Time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0				4.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	575	605	485				346	704	587	301	984	800
v/s Ratio Prot	c0.22	0.13						c0.30		c0.05	0.25	
v/s Ratio Perm			0.05				0.11		0.05	0.27		0.04
v/c Ratio	0.67	0.40	0.16				0.29	0.78	0.14	0.61	0.48	0.08
Uniform Delay, d1	17.5	15.7	14.4				13.0	16.5	12.3	10.1	8.9	7.0
Progression Factor	1.00	1.00	1.00				1.07	1.07	1.64	1.00	1.00	1.00
Incremental Delay, d2	6.1	1.9	0.7				1.9	7.4	0.4	3.7	1.7	0.2
Delay (s)	23.6	17.6	15.2				15.9	25.1	20.5	13.8	10.6	7.2
Level of Service	C	B	B				B	C	C	B	B	A
Approach Delay (s)		19.6			0.0			23.0			10.8	
Approach LOS		B			A			C			B	
Intersection Summary												
HCM 2000 Control Delay			18.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.72									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			12.8		
Intersection Capacity Utilization			66.4%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze Dr

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	588	36	0	0	0	0	10	36	29	27	0
Future Volume (Veh/h)	16	588	36	0	0	0	0	10	36	29	27	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	639	39	0	0	0	0	11	39	32	29	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		218										
pX, platoon unblocked												
vC, conflicting volume	0			678			707	692	339	398	712	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			678			707	692	339	398	712	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	97	94	93	92	100
cM capacity (veh/h)	1622			910			300	362	657	489	352	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	336	358	50	61								
Volume Left	17	0	0	32								
Volume Right	0	39	39	0								
cSH	1622	1700	557	413								
Volume to Capacity	0.01	0.21	0.09	0.15								
Queue Length 95th (ft)	1	0	7	13								
Control Delay (s)	0.5	0.0	12.1	15.2								
Lane LOS	A		B	C								
Approach Delay (s)	0.2		12.1	15.2								
Approach LOS			B	C								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			34.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	39	1277	26	0	0	0	0	13	33	59	48	0
Future Volume (vph)	39	1277	26	0	0	0	0	13	33	59	48	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	42	1388	28	0	0	0	0	14	36	64	52	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	736	722	50	116								
Volume Left (vph)	42	0	0	64								
Volume Right (vph)	0	28	36	0								
Hadj (s)	0.06	0.01	-0.40	0.14								
Departure Headway (s)	5.1	5.0	5.6	6.0								
Degree Utilization, x	1.00	1.00	0.08	0.19								
Capacity (veh/h)	736	722	628	586								
Control Delay (s)	54.7	54.4	9.1	10.4								
Approach Delay (s)	54.5		9.1	10.4								
Approach LOS	F		A	B								
Intersection Summary												
Delay			50.0									
Level of Service			E									
Intersection Capacity Utilization			56.4%	ICU Level of Service					B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Yield				Stop			Stop			Stop	
Traffic Volume (vph)	291	524	13	43	0	21	0	19	12	0	0	0
Future Volume (vph)	291	524	13	43	0	21	0	19	12	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	316	570	14	47	0	23	0	21	13	0	0	0
Direction, Lane #	EB 1	EB 2	WB 1	NB 1								
Volume Total (vph)	316	584	70	34								
Volume Left (vph)	316	0	47	0								
Volume Right (vph)	0	14	23	13								
Hadj (s)	0.53	0.02	-0.03	-0.20								
Departure Headway (s)	5.2	4.7	4.8	5.4								
Degree Utilization, x	0.46	0.76	0.09	0.05								
Capacity (veh/h)	689	758	732	622								
Control Delay (s)	11.3	19.5	8.3	8.7								
Approach Delay (s)	16.6		8.3	8.7								
Approach LOS	C		A	A								
Intersection Summary												
Delay			15.8									
Level of Service			C									
Intersection Capacity Utilization			45.4%	ICU Level of Service						A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	39	0	0	51	17	549	74	37	503	18
Future Volume (Veh/h)	0	0	39	0	0	51	17	549	74	37	503	18
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	42	0	0	55	18	597	80	40	547	20
Pedestrians	7				7							
Lane Width (ft)	12.0				16.0							
Walking Speed (ft/s)	4.0				4.0							
Percent Blockage	1				1							
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			455		
pX, platoon unblocked	0.85	0.85	0.84	0.85	0.85	0.98	0.84				0.98	
vC, conflicting volume	1332	1364	564	1349	1334	644	574				684	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1247	1284	390	1267	1249	625	402				666	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	92	100	100	88	98				96	
cM capacity (veh/h)	106	130	552	107	137	471	970				896	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	42	55	18	677	40	567						
Volume Left	0	0	18	0	40	0						
Volume Right	42	55	0	80	0	20						
cSH	552	471	970	1700	896	1700						
Volume to Capacity	0.08	0.12	0.02	0.40	0.04	0.33						
Queue Length 95th (ft)	6	10	1	0	3	0						
Control Delay (s)	12.1	13.7	8.8	0.0	9.2	0.0						
Lane LOS	B	B	A			A						
Approach Delay (s)	12.1	13.7	0.2			0.6						
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			43.5%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Period	PM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Washington Avenue
E/W Street Name	Washington Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	14	0	71	0	64	14	12	0	46	540	19	0	24	490	61
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	16	0	79	0	71	16	13	0	51	599	21	0	27	543	68
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		95			100			671			638	
Entry Volume veh/h		93			98			658			625	
Circulating Flow (Vc), pc/h	641			666			43			138		
Exiting Flow (Vex), pc/h	48			135			628			693		
Capacity (cPCE), pc/h		595			581			1082			984	
Capacity (c), veh/h		584			569			1061			965	
v/c Ratio (X)		0.16			0.17			0.62			0.65	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		8.1			8.5			11.9			13.6	
Lane LOS		A			A			B			B	
95% Queue		0.6			0.6			4.5			4.9	
Approach Delay, s/veh	8.1			8.5			11.9			13.6		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh / LOS	12.1						B					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	46	78	26	87	6	135	4	257	70	161	158	2
Future Volume (vph)	46	78	26	87	6	135	4	257	70	161	158	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	85	28	95	7	147	4	279	76	175	172	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	163	249	359	349								
Volume Left (vph)	50	95	4	175								
Volume Right (vph)	28	147	76	2								
Hadj (s)	-0.01	-0.24	-0.09	0.13								
Departure Headway (s)	6.6	6.2	5.9	6.1								
Degree Utilization, x	0.30	0.43	0.59	0.59								
Capacity (veh/h)	458	509	573	549								
Control Delay (s)	12.5	13.7	16.8	17.5								
Approach Delay (s)	12.5	13.7	16.8	17.5								
Approach LOS	B	B	C	C								
Intersection Summary												
Delay				15.7								
Level of Service				C								
Intersection Capacity Utilization				64.7%	ICU Level of Service			C				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	332	43	19	231	35	41	63	65	28	83	14
Future Volume (Veh/h)	12	332	43	19	231	35	41	63	65	28	83	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	361	47	21	251	38	45	68	71	30	90	15
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked												
vC, conflicting volume	303			415			790	762	392	842	767	285
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	303			415			790	762	392	842	767	285
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			80	79	89	85	72	98
cM capacity (veh/h)	1243			1137			226	319	653	202	317	745
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	421	310	184	135								
Volume Left	13	21	45	30								
Volume Right	47	38	71	15								
cSH	1243	1137	353	299								
Volume to Capacity	0.01	0.02	0.52	0.45								
Queue Length 95th (ft)	1	1	72	56								
Control Delay (s)	0.4	0.7	25.7	26.6								
Lane LOS	A	A	D	D								
Approach Delay (s)	0.4	0.7	25.7	26.6								
Approach LOS			D	D								
Intersection Summary												
Average Delay			8.3									
Intersection Capacity Utilization			43.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Wisconsin Avenue			
Agency or Co.	IBI Group				E/W Street Name	Wisconsin Avenue			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	99	130	175	0	126	105	22	0	153	529	138	0	24	529	49
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	110	144	194	0	140	116	24	0	170	586	153	0	27	586	54
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		448			280			909			667	
Entry Volume veh/h		439			275			891			654	
Circulating Flow (Vc), pc/h	753			866			281			426		
Exiting Flow (Vex), pc/h	324			340			720			920		
Capacity (cPCE), pc/h		532			475			853			738	
Capacity (c), veh/h		522			466			836			724	
v/c Ratio (X)		0.84			0.59			1.07			0.90	

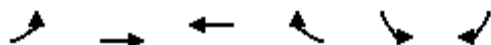
Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		37.8			21.2			71.8			37.8	
Lane LOS		E			C			F			E	
95% Queue		8.7			3.7			22.0			11.9	
Approach Delay, s/veh	37.8			21.2			71.8			37.8		
Approach LOS	E			C			F			E		
Intersection Delay, s/veh / LOS	49.2						E					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

9/1/2016



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	9	460	342	24	36	38
Future Volume (Veh/h)	9	460	342	24	36	38
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	500	372	26	39	41
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	406				914	394
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	406				914	394
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				87	94
cM capacity (veh/h)	1145				298	650
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	510	398	80			
Volume Left	10	0	39			
Volume Right	0	26	41			
cSH	1145	1700	413			
Volume to Capacity	0.01	0.23	0.19			
Queue Length 95th (ft)	1	0	18			
Control Delay (s)	0.3	0.0	15.8			
Lane LOS	A		C			
Approach Delay (s)	0.3	0.0	15.8			
Approach LOS			C			
Intersection Summary						
Average Delay			1.4			
Intersection Capacity Utilization			42.8%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	474	4	2	316	29	2	1	3	44	0	35
Future Volume (Veh/h)	26	474	4	2	316	29	2	1	3	44	0	35
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	515	4	2	343	32	2	1	3	48	0	38
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	377			519			976	954	517	942	940	363
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	377			519			976	954	517	942	940	363
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			99	100	99	80	100	94
cM capacity (veh/h)	1180			1047			213	252	558	236	256	680
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	547	377	6	86								
Volume Left	28	2	2	48								
Volume Right	4	32	3	38								
cSH	1180	1047	320	331								
Volume to Capacity	0.02	0.00	0.02	0.26								
Queue Length 95th (ft)	2	0	1	25								
Control Delay (s)	0.7	0.1	16.5	19.6								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.7	0.1	16.5	19.6								
Approach LOS			C	C								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			58.2%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	272	285	82	196	0	170	0	114	0	0	0
Future Volume (vph)	0	272	285	82	196	0	170	0	114	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	296	310	89	213	0	185	0	124	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	606	302	309	0								
Volume Left (vph)	0	89	185	0								
Volume Right (vph)	310	0	124	0								
Hadj (s)	-0.27	0.09	-0.09	0.00								
Departure Headway (s)	5.2	6.0	6.2	7.2								
Degree Utilization, x	0.87	0.50	0.53	0.00								
Capacity (veh/h)	606	569	551	900								
Control Delay (s)	33.1	14.8	15.9	10.2								
Approach Delay (s)	33.1	14.8	15.9	0.0								
Approach LOS	D	B	C	A								
Intersection Summary												
Delay				24.2								
Level of Service				C								
Intersection Capacity Utilization				79.2%	ICU Level of Service	D						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	64	131	185	94	94	180
Future Volume (vph)	64	131	185	94	94	180
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	70	142	201	102	102	196
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	212	303	298			
Volume Left (vph)	70	0	102			
Volume Right (vph)	142	102	0			
Hadj (s)	-0.30	-0.17	0.10			
Departure Headway (s)	5.0	4.7	4.9			
Degree Utilization, x	0.30	0.39	0.41			
Capacity (veh/h)	653	733	694			
Control Delay (s)	10.1	10.7	11.3			
Approach Delay (s)	10.1	10.7	11.3			
Approach LOS	B	B	B			
Intersection Summary						
Delay			10.8			
Level of Service			B			
Intersection Capacity Utilization			51.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	375	22	20	310	69	30	42	40	75	26	21
Future Volume (Veh/h)	14	375	22	20	310	69	30	42	40	75	26	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	408	24	22	337	75	33	46	43	82	28	23
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					213							
pX, platoon unblocked	0.88						0.88	0.88		0.88	0.88	0.88
vC, conflicting volume	415			443			920	920	439	946	894	382
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	266			443			841	840	439	869	811	228
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			84	82	93	55	89	97
cM capacity (veh/h)	1138			1107			212	253	608	183	263	709
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	447	434	122	133								
Volume Left	15	22	33	82								
Volume Right	24	75	43	23								
cSH	1138	1107	299	227								
Volume to Capacity	0.01	0.02	0.41	0.59								
Queue Length 95th (ft)	1	2	48	83								
Control Delay (s)	0.4	0.6	25.1	41.1								
Lane LOS	A	A	D	E								
Approach Delay (s)	0.4	0.6	25.1	41.1								
Approach LOS			D	E								
Intersection Summary												
Average Delay			7.9									
Intersection Capacity Utilization			49.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

2/24/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗	↗	↖	↖↗		↖	↗	
Traffic Volume (vph)	58	230	90	252	223	211	94	577	162	217	490	30
Future Volume (vph)	58	230	90	252	223	211	94	577	162	217	490	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	10	11	11	16	16	16
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.97	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1844	1534	1681	1761	1794	1652	3295		2006	2093	
Flt Permitted		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1844	1534	1681	1761	1794	1652	3295		2006	2093	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	250	98	274	242	229	102	627	176	236	533	33
RTOR Reduction (vph)	0	0	79	0	0	187	0	28	0	0	3	0
Lane Group Flow (vph)	0	313	19	247	269	42	102	775	0	236	563	0
Confl. Peds. (#/hr)			10	10					3			
Confl. Bikes (#/hr)			4						3			
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		17.4	17.4	16.4	16.4	16.4	6.8	25.6		11.8	30.6	
Effective Green, g (s)		17.4	17.4	16.4	16.4	16.4	6.8	25.6		11.8	30.6	
Actuated g/C Ratio		0.19	0.19	0.18	0.18	0.18	0.08	0.28		0.13	0.34	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		356	296	306	320	326	124	937		263	711	
v/s Ratio Prot		c0.17		0.15	c0.15		0.06	c0.24		0.12	c0.27	
v/s Ratio Perm			0.01			0.02						
v/c Ratio		0.88	0.06	0.81	0.84	0.13	0.82	0.83		0.90	0.79	
Uniform Delay, d1		35.3	29.6	35.3	35.5	30.8	41.0	30.1		38.5	26.8	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		20.5	0.0	14.7	18.1	0.2	32.4	8.3		29.9	8.8	
Delay (s)		55.8	29.7	50.0	53.6	31.0	73.4	38.4		68.4	35.7	
Level of Service		E	C	D	D	C	E	D		E	D	
Approach Delay (s)		49.5			45.5			42.4			45.3	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			45.0									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			90.0							18.8		
Intersection Capacity Utilization			77.0%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	646	6	22	718	196	9	18	58	366	14	90
Future Volume (vph)	45	646	6	22	718	196	9	18	58	366	14	90
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.97			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1770	3533		1761	3415			3131			1776	1524
Flt Permitted	0.19	1.00		0.28	1.00			0.92			0.66	1.00
Satd. Flow (perm)	350	3533		521	3415			2885			1235	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	702	7	24	780	213	10	20	63	398	15	98
RTOR Reduction (vph)	0	1	0	0	44	0	0	32	0	0	0	40
Lane Group Flow (vph)	49	708	0	24	949	0	0	61	0	0	413	58
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	21.3	21.3		21.3	21.3			29.2			29.2	29.2
Effective Green, g (s)	21.3	21.3		21.3	21.3			29.2			29.2	29.2
Actuated g/C Ratio	0.36	0.36		0.36	0.36			0.49			0.49	0.49
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	124	1254		184	1212			1404			601	741
v/s Ratio Prot		0.20			c0.28							
v/s Ratio Perm	0.14			0.05				0.02			c0.33	0.04
v/c Ratio	0.40	0.56		0.13	0.78			0.04			0.69	0.08
Uniform Delay, d1	14.5	15.6		13.1	17.3			8.1			11.9	8.2
Progression Factor	1.02	1.08		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.7	0.2		0.3	3.4			0.1			6.3	0.2
Delay (s)	15.4	17.0		13.4	20.7			8.1			18.2	8.4
Level of Service	B	B		B	C			A			B	A
Approach Delay (s)		16.9			20.5			8.1			16.3	
Approach LOS		B			C			A			B	
Intersection Summary												
HCM 2000 Control Delay			18.0			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.73									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)			9.5			
Intersection Capacity Utilization			73.2%			ICU Level of Service			D			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	15	15	50	15	167	20	737	91	213	768	18
Future Volume (vph)	40	15	15	50	15	167	20	737	91	213	768	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	10	11	16
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1752			1789	1794	1770	3933		1652	3409	
Flt Permitted		0.78			0.81	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1412			1504	1794	1770	3933		1652	3409	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	16	16	54	16	182	22	801	99	232	835	20
RTOR Reduction (vph)	0	12	0	0	0	158	0	11	0	0	1	0
Lane Group Flow (vph)	0	63	0	0	70	24	22	889	0	232	854	0
Confl. Peds. (#/hr)			4	4					3			
Confl. Bikes (#/hr)			1						2			
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		8.4			8.4	8.4	1.3	28.0		13.1	39.8	
Effective Green, g (s)		8.4			8.4	8.4	1.3	28.0		13.1	39.8	
Actuated g/C Ratio		0.13			0.13	0.13	0.02	0.44		0.21	0.63	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		187			199	238	36	1742		342	2146	
v/s Ratio Prot							0.01	c0.23		c0.14	0.25	
v/s Ratio Perm		0.04			c0.05	0.01						
v/c Ratio		0.34			0.35	0.10	0.61	0.51		0.68	0.40	
Uniform Delay, d1		24.9			24.9	24.1	30.7	12.7		23.1	5.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.4			0.4	0.1	27.0	0.3		5.3	0.1	
Delay (s)		25.3			25.3	24.2	57.7	12.9		28.4	5.9	
Level of Service		C			C	C	E	B		C	A	
Approach Delay (s)		25.3			24.5			14.0			10.7	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay		14.0										
HCM 2000 Volume to Capacity ratio		0.53										
Actuated Cycle Length (s)		63.2										
Intersection Capacity Utilization		58.2%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	292	31	34	177	0	69	0	59	0	0	0
Future Volume (Veh/h)	0	292	31	34	177	0	69	0	59	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	317	34	37	192	0	75	0	64	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	252											
pX, platoon unblocked												
vC, conflicting volume	192			351			600	600	334	664	617	192
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	192			351			600	600	334	664	617	192
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			81	100	91	100	100	100
cM capacity (veh/h)	1381			1208			403	402	708	332	393	850
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	351	229	139	0								
Volume Left	0	37	75	0								
Volume Right	34	0	64	0								
cSH	1381	1208	503	1700								
Volume to Capacity	0.00	0.03	0.28	0.00								
Queue Length 95th (ft)	0	2	28	0								
Control Delay (s)	0.0	1.5	14.9	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	1.5	14.9	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			45.9%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	169	38	0	65	0	38	1	12	0	0	0
Future Volume (Veh/h)	0	169	38	0	65	0	38	1	12	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	184	41	0	71	0	41	1	13	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	643											
pX, platoon unblocked												
vC, conflicting volume	71			225			276	276	204	289	296	71
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	71			225			276	276	204	289	296	71
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			94	100	98	100	100	100
cM capacity (veh/h)	1529			1344			677	632	836	652	616	991
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	225	71	55	0								
Volume Left	0	0	41	0								
Volume Right	41	0	13	0								
cSH	1529	1344	708	1700								
Volume to Capacity	0.00	0.00	0.08	0.00								
Queue Length 95th (ft)	0	0	6	0								
Control Delay (s)	0.0	0.0	10.5	0.0								
Lane LOS			B	A								
Approach Delay (s)	0.0	0.0	10.5	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.6									
Intersection Capacity Utilization			21.2%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	82	248	26	47	296	26
Future Volume (vph)	82	248	26	47	296	26
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	89	270	28	51	322	28
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	359	79	350			
Volume Left (vph)	89	0	322			
Volume Right (vph)	270	51	0			
Hadj (s)	-0.37	-0.35	0.22			
Departure Headway (s)	4.6	4.9	5.1			
Degree Utilization, x	0.46	0.11	0.50			
Capacity (veh/h)	731	659	668			
Control Delay (s)	11.6	8.5	13.1			
Approach Delay (s)	11.6	8.5	13.1			
Approach LOS	B	A	B			
Intersection Summary						
Delay			12.0			
Level of Service			B			
Intersection Capacity Utilization			50.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	203	103	14	159	14	140	17	18	4	12	21
Future Volume (Veh/h)	9	203	103	14	159	14	140	17	18	4	12	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	221	112	15	173	15	152	18	20	4	13	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	576											
pX, platoon unblocked												
vC, conflicting volume	188			333			537	515	277	536	564	180
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	188			333			537	515	277	536	564	180
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			64	96	97	99	97	97
cM capacity (veh/h)	1386			1226			426	455	762	423	427	862
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	343	203	190	40								
Volume Left	10	15	152	4								
Volume Right	112	15	20	23								
cSH	1386	1226	449	601								
Volume to Capacity	0.01	0.01	0.42	0.07								
Queue Length 95th (ft)	1	1	52	5								
Control Delay (s)	0.3	0.7	18.7	11.4								
Lane LOS	A	A	C	B								
Approach Delay (s)	0.3	0.7	18.7	11.4								
Approach LOS			C	B								
Intersection Summary												
Average Delay			5.5									
Intersection Capacity Utilization			42.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	227	3	9	189	4	2	2	8	2	1	1
Future Volume (Veh/h)	1	227	3	9	189	4	2	2	8	2	1	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	247	3	10	205	4	2	2	9	2	1	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)	249											
pX, platoon unblocked												
vC, conflicting volume	209			250			479	480	248	488	479	207
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	209			250			479	480	248	488	479	207
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			100	100	99	100	100	100
cM capacity (veh/h)	1362			1316			492	481	790	480	482	833
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	251	219	13	4								
Volume Left	1	10	2	2								
Volume Right	3	4	9	1								
cSH	1362	1316	663	538								
Volume to Capacity	0.00	0.01	0.02	0.01								
Queue Length 95th (ft)	0	1	1	1								
Control Delay (s)	0.0	0.4	10.5	11.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.0	0.4	10.5	11.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			0.6									
Intersection Capacity Utilization			26.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↔	↔		↔	↔	
Traffic Volume (vph)	116	133	122	68	76	24	134	719	78	97	571	47
Future Volume (vph)	116	133	122	68	76	24	134	719	78	97	571	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.6			5.0		4.2	5.0		4.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.96			0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1753			1791		1770	3487		1770	3499	
Flt Permitted		0.83			0.65		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1476			1194		1770	3487		1770	3499	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	126	145	133	74	83	26	146	782	85	105	621	51
RTOR Reduction (vph)	0	25	0	0	9	0	0	12	0	0	9	0
Lane Group Flow (vph)	0	379	0	0	174	0	146	855	0	105	663	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		19.0			18.6		17.9	28.0		8.1	18.0	
Effective Green, g (s)		19.0			18.6		17.9	28.0		8.1	18.0	
Actuated g/C Ratio		0.28			0.27		0.26	0.41		0.12	0.26	
Clearance Time (s)		4.6			5.0		4.2	5.0		4.0	5.0	
Vehicle Extension (s)		3.0			3.5		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		408			323		461	1421		208	916	
v/s Ratio Prot							0.08	c0.25		0.06	c0.19	
v/s Ratio Perm		c0.26			0.15							
v/c Ratio		0.93			0.54		0.32	0.60		0.50	0.72	
Uniform Delay, d1		24.2			21.4		20.5	16.0		28.4	23.1	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		27.1			2.0		0.1	1.9		1.9	5.0	
Delay (s)		51.2			23.3		20.6	17.9		30.3	28.0	
Level of Service		D			C		C	B		C	C	
Approach Delay (s)		51.2			23.3			18.3			28.4	
Approach LOS		D			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			27.6				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			68.7				Sum of lost time (s)		14.2			
Intersection Capacity Utilization			63.9%				ICU Level of Service		B			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	22	167	58	56	75	12	67	69	26	19	27	22
Future Volume (Veh/h)	22	167	58	56	75	12	67	69	26	19	27	22
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	182	63	61	82	13	73	75	28	21	29	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		280										
pX, platoon unblocked												
vC, conflicting volume	95			245			510	478	214	538	504	88
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	95			245			510	478	214	538	504	88
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			95			83	84	97	94	93	98
cM capacity (veh/h)	1499			1321			418	456	827	366	442	970
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	269	156	176	74								
Volume Left	24	61	73	21								
Volume Right	63	13	28	24								
cSH	1499	1321	472	501								
Volume to Capacity	0.02	0.05	0.37	0.15								
Queue Length 95th (ft)	1	4	43	13								
Control Delay (s)	0.8	3.3	17.1	13.4								
Lane LOS	A	A	C	B								
Approach Delay (s)	0.8	3.3	17.1	13.4								
Approach LOS			C	B								
Intersection Summary												
Average Delay			7.0									
Intersection Capacity Utilization			42.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	7	85	11	13	40	2	14	24	13	3	11	5
Future Volume (vph)	7	85	11	13	40	2	14	24	13	3	11	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	92	12	14	43	2	15	26	14	3	12	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	112	59	55	20								
Volume Left (vph)	8	14	15	3								
Volume Right (vph)	12	2	14	5								
Hadj (s)	-0.02	0.06	-0.06	-0.09								
Departure Headway (s)	4.1	4.2	4.2	4.2								
Degree Utilization, x	0.13	0.07	0.06	0.02								
Capacity (veh/h)	854	827	809	808								
Control Delay (s)	7.7	7.6	7.5	7.3								
Approach Delay (s)	7.7	7.6	7.5	7.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			7.6									
Level of Service			A									
Intersection Capacity Utilization			18.0%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	19	154	12	64	66	44	12	104	144	84	22	5
Future Volume (vph)	19	154	12	64	66	44	12	104	144	84	22	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	167	13	70	72	48	13	113	157	91	24	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	201	190	283	120								
Volume Left (vph)	21	70	13	91								
Volume Right (vph)	13	48	157	5								
Hadj (s)	0.02	-0.04	-0.29	0.16								
Departure Headway (s)	5.3	5.2	4.9	5.6								
Degree Utilization, x	0.29	0.28	0.38	0.19								
Capacity (veh/h)	626	630	682	586								
Control Delay (s)	10.5	10.2	10.9	9.8								
Approach Delay (s)	10.5	10.2	10.9	9.8								
Approach LOS	B	B	B	A								
Intersection Summary												
Delay				10.5								
Level of Service				B								
Intersection Capacity Utilization				54.0%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

9/1/2016

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	98	113	7	64	43
Future Volume (vph)	0	98	113	7	64	43
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	107	123	8	70	47
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	107	131	117			
Volume Left (vph)	0	0	70			
Volume Right (vph)	107	8	0			
Hadj (s)	-0.57	0.00	0.15			
Departure Headway (s)	3.9	4.2	4.4			
Degree Utilization, x	0.12	0.15	0.14			
Capacity (veh/h)	871	817	781			
Control Delay (s)	7.4	8.0	8.2			
Approach Delay (s)	7.4	8.0	8.2			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.9			
Level of Service			A			
Intersection Capacity Utilization			19.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	147	48	216	117	369	54	691	286	309	581	26
Future Volume (vph)	22	147	48	216	117	369	54	691	286	309	581	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	16	16	16
Total Lost time (s)	5.0	5.0	5.0		4.9	4.9	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2006	1863	1557		1804	1794	1770	3792		2006	3986	
Flt Permitted	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	2006	1863	1557		1804	1794	1770	3792		2006	3986	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	160	52	235	127	401	59	751	311	336	632	28
RTOR Reduction (vph)	0	0	46	0	0	242	0	49	0	0	3	0
Lane Group Flow (vph)	24	160	6	0	362	159	59	1013	0	336	657	0
Confl. Peds. (#/hr)			2	2					5			
Confl. Bikes (#/hr)									4			
Turn Type	Split	NA	Perm	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	10.0	10.0	10.0		19.2	32.9	5.1	21.2		13.7	29.8	
Effective Green, g (s)	10.0	10.0	10.0		19.2	32.9	5.1	21.2		13.7	29.8	
Actuated g/C Ratio	0.12	0.12	0.12		0.23	0.40	0.06	0.25		0.16	0.36	
Clearance Time (s)	5.0	5.0	5.0		4.9		4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	241	223	187		416	709	108	966		330	1427	
v/s Ratio Prot	0.01	c0.09			c0.20	0.09	0.03	c0.27		c0.17	0.16	
v/s Ratio Perm			0.00									
v/c Ratio	0.10	0.72	0.03		0.87	0.22	0.55	1.05		1.02	0.46	
Uniform Delay, d1	32.6	35.2	32.3		30.8	16.7	37.9	31.0		34.8	20.5	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	8.8	0.0		17.6	0.2	3.0	42.5		54.2	0.2	
Delay (s)	32.7	44.1	32.4		48.4	16.8	40.9	73.5		89.0	20.8	
Level of Service	C	D	C		D	B	D	E		F	C	
Approach Delay (s)		40.3			31.8			71.8			43.8	
Approach LOS		D			C			E			D	
Intersection Summary												
HCM 2000 Control Delay			50.7									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			83.2									Sum of lost time (s) 19.1
Intersection Capacity Utilization			87.3%									ICU Level of Service E
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St

12/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	801	31	42	770	52	21	0	42	24	13	53
Future Volume (Veh/h)	9	801	31	42	770	52	21	0	42	24	13	53
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	871	34	46	837	57	23	0	46	26	14	58
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage (veh)					2							
Upstream signal (ft)		312										
pX, platoon unblocked				0.92			0.92	0.92	0.92	0.92	0.92	
vC, conflicting volume	894			905			1930	1894	888	1912	1882	866
vC1, stage 1 conf vol							908	908		958	958	
vC2, stage 2 conf vol							1022	986		954	925	
vCu, unblocked vol	894			854			1967	1928	836	1947	1915	866
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			94			86	100	86	85	93	84
cM capacity (veh/h)	759			724			168	223	338	170	214	353
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	915	940	69	98								
Volume Left	10	46	23	26								
Volume Right	34	57	46	58								
cSH	759	724	253	256								
Volume to Capacity	0.01	0.06	0.27	0.38								
Queue Length 95th (ft)	1	5	27	43								
Control Delay (s)	0.4	1.8	24.5	27.5								
Lane LOS	A	A	C	D								
Approach Delay (s)	0.4	1.8	24.5	27.5								
Approach LOS			C	D								
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization			83.2%		ICU Level of Service				E			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

12/21/2016

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	9	1116	26	61	1097	61	5	4	97	24	4	15	
Future Volume (Veh/h)	9	1116	26	61	1097	61	5	4	97	24	4	15	
Sign Control	Free			Free			Stop			Stop			
Grade	0%			0%			0%			0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	10	1213	28	66	1192	66	5	4	105	26	4	16	
Pedestrians	1						1						
Lane Width (ft)	12.0						12.0						
Walking Speed (ft/s)	4.0						4.0						
Percent Blockage	0						0						
Right turn flare (veh)													
Median type	TWLTL			TWLTL									
Median storage veh)	2			2									
Upstream signal (ft)	687												
pX, platoon unblocked				0.95			0.95			0.95	0.95	0.95	0.95
vC, conflicting volume	1258			1242				2591	2638	1228	2697	2619	1226
vC1, stage 1 conf vol							1248		1248	1357		1357	
vC2, stage 2 conf vol							1343		1390	1340		1262	
vCu, unblocked vol	1258			1228				2651	2700	1213	2762	2680	1226
tC, single (s)	4.1			4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1		5.5	6.1		5.5	
tF (s)	2.2			2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			88				95	97	50	0	97	93
cM capacity (veh/h)	553			538				109	134	210	20	119	218
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1							
Volume Total	10	1241	66	1258	114	46							
Volume Left	10	0	66	0	5	26							
Volume Right	0	28	0	66	105	16							
cSH	553	1700	538	1700	198	33							
Volume to Capacity	0.02	0.73	0.12	0.74	0.58	1.38							
Queue Length 95th (ft)	1	0	10	0	78	126							
Control Delay (s)	11.6	0.0	12.6	0.0	45.3	472.7							
Lane LOS	B		B		E	F							
Approach Delay (s)	0.1		0.6		45.3	472.7							
Approach LOS					E	F							
Intersection Summary													
Average Delay	10.2												
Intersection Capacity Utilization	77.2%			ICU Level of Service			D						
Analysis Period (min)	15												

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

12/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	1215	0	0	1250	329	0	0	0	0	0	22
Future Volume (Veh/h)	13	1215	0	0	1250	329	0	0	0	0	0	22
Sign Control	Free				Free				Stop		Stop	
Grade	0%				0%				0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	1321	0	0	1359	358	0	0	0	0	0	24
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage veh	2			2								
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1717			1321			2732	3066	1321	2887	2887	1538
vC1, stage 1 conf vol							1349	1349		1538	1538	
vC2, stage 2 conf vol							1383	1717		1349	1349	
vCu, unblocked vol	1717			1321			2732	3066	1321	2887	2887	1538
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			100	100	100	100	100	83
cM capacity (veh/h)	369			523			102	106	191	107	130	142
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	14	1321	0	1717	0	24						
Volume Left	14	0	0	0	0	0						
Volume Right	0	0	0	358	0	24						
cSH	369	1700	1700	1700	1700	142						
Volume to Capacity	0.04	0.78	0.00	1.01	0.00	0.17						
Queue Length 95th (ft)	3	0	0	0	0	15						
Control Delay (s)	15.2	0.0	0.0	0.0	0.0	35.3						
Lane LOS	C				A	E						
Approach Delay (s)	0.2		0.0		0.0	35.3						
Approach LOS					A	E						
Intersection Summary												
Average Delay	0.3											
Intersection Capacity Utilization	95.8%			ICU Level of Service					F			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	83	0	0	104	87	878	23	104	704	8
Future Volume (Veh/h)	0	0	83	0	0	104	87	878	23	104	704	8
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	90	0	0	113	95	954	25	113	765	9
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								TWLT			TWLT	
Median storage veh								2			2	
Upstream signal (ft)											621	
pX, platoon unblocked												
vC, conflicting volume	1776	2164	770	2238	2156	490	774			979		
vC1, stage 1 conf vol	996	996		1156	1156							
vC2, stage 2 conf vol	780	1169		1081	1000							
vCu, unblocked vol	1776	2164	770	2238	2156	490	774			979		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	74	100	100	78	89			84		
cM capacity (veh/h)	115	111	344	47	140	524	837			701		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	90	113	95	636	343	113	774					
Volume Left	0	0	95	0	0	113	0					
Volume Right	90	113	0	0	25	0	9					
cSH	344	524	837	1700	1700	701	1700					
Volume to Capacity	0.26	0.22	0.11	0.37	0.20	0.16	0.46					
Queue Length 95th (ft)	26	20	10	0	0	14	0					
Control Delay (s)	19.2	13.7	9.8	0.0	0.0	11.1	0.0					
Lane LOS	C	B	A			B						
Approach Delay (s)	19.2	13.7	0.9			1.4						
Approach LOS	C	B										
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization			49.3%		ICU Level of Service					A		
Analysis Period (min)			15									

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection		Coast Hwy - Michigan Avenue		
Agency or Co.	IBI Group				E/W Street Name		Michigan Avenue		
Date Performed	05/23/2016				N/S Street Name		Coast Highway		
Analysis Year	2016				Analysis Time Period (hrs)		0.25		
Time Period	PM Peak Hour				Peak Hour Factor		0.92		
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics																
Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	185	91	77	0	52	12	25	0	25	557	44	0	19	557	47
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	205	101	85	0	58	13	28	0	28	618	49	0	21	618	52
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929		
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858		

Flow Computations, Capacity and v/c Ratios													
Approach	EB			WB			NB			SB			
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	
Entry Flow (Ve), pc/h		391			99			695			691		
Entry Volume veh/h		383			97			681			677		
Circulating Flow (Vc), pc/h	697			851			327			99			
Exiting Flow (Vex), pc/h	171			93			851			761			
Capacity (cPCE), pc/h		563			483			815			1024		
Capacity (c), veh/h		552			473			799			1003		
v/c Ratio (X)		0.69			0.21			0.85			0.68		

Delay and Level of Service												
Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		23.5			10.6			28.8			14.1	
Lane LOS		C			B			D			B	
95% Queue		5.4			0.8			10.2			5.5	
Approach Delay, s/veh	23.5			10.6			28.8			14.1		
Approach LOS	C			B			D			B		
Intersection Delay, s/veh / LOS	21.3						C					

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - West			
Agency or Co.	IBI Group				E/W Street Name	West Street			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	34	20	29	0	37	20	43	0	29	246	37	0	43	245	34
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	38	22	32	0	41	22	48	0	32	273	41	0	48	272	38
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		92			111			346			358	
Entry Volume veh/h		90			109			339			351	
Circulating Flow (Vc), pc/h	361			343			108			95		
Exiting Flow (Vex), pc/h	111			92			359			345		
Capacity (cPCE), pc/h		788			802			1014			1028	
Capacity (c), veh/h		772			786			994			1007	
v/c Ratio (X)		0.12			0.14			0.34			0.35	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.9			6.0			7.2			7.2	
Lane LOS		A			A			A			A	
95% Queue		0.4			0.5			1.5			1.6	
Approach Delay, s/veh	5.9			6.0			7.2			7.2		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	6.9						A					

HCS 2010 Roundabout Report

General Information					Site Information				
Analyst					Intersection	Coast Hwy - Kelly Street			
Agency or Co.	IBI Group				E/W Street Name	Kelly Street			
Date Performed	05/23/2016				N/S Street Name	Coast Highway			
Analysis Year	2016				Analysis Time Period (hrs)	0.25			
Time Period	PM Peak Hour				Peak Hour Factor	0.92			
Project Description	35130 - Coast Highway				Jurisdiction				

Volume Adjustment and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment				LTR				LTR				LTR				LTR
Volume (V), veh/h	0	39	16	13	0	8	6	151	0	3	315	8	0	141	305	59
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (vPCE) pc/h	0	43	18	14	0	9	7	167	0	3	349	9	0	156	338	65
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (sec)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (sec)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (Ve), pc/h		75			183			361			559	
Entry Volume veh/h		74			179			354			548	
Circulating Flow (Vc), pc/h	503			395			217			19		
Exiting Flow (Vex), pc/h	183			75			559			361		
Capacity (cPCE), pc/h		683			761			910			1109	
Capacity (c), veh/h		670			746			892			1087	
v/c Ratio (X)		0.11			0.24			0.40			0.50	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Movement	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.6			7.5			8.7			9.2	
Lane LOS		A			A			A			A	
95% Queue		0.4			0.9			1.9			2.9	
Approach Delay, s/veh	6.6			7.5			8.7			9.2		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh / LOS	8.6						A					

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

06/29/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	103	0	14	13	1059	13	24	2213	16
Future Volume (veh/h)	0	0	0	103	0	14	13	1059	13	24	2213	16
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h				112	0	0	14	1151	0	26	2405	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				738	0	329	92	3173	988	92	2208	988
Arrive On Green				0.20	0.00	0.00	0.05	0.60	0.00	0.05	0.60	0.00
Sat Flow, veh/h				3690	0	1647	1845	5289	1647	1845	3681	1647
Grp Volume(v), veh/h				112	0	0	14	1151	0	26	2405	0
Grp Sat Flow(s),veh/h/ln				1845	0	1647	1845	1763	1647	1845	1840	1647
Q Serve(g_s), s				2.0	0.0	0.0	0.6	8.9	0.0	1.1	48.0	0.0
Cycle Q Clear(g_c), s				2.0	0.0	0.0	0.6	8.9	0.0	1.1	48.0	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				738	0	329	92	3173	988	92	2208	988
V/C Ratio(X)				0.15	0.00	0.00	0.15	0.36	0.00	0.28	1.09	0.00
Avail Cap(c_a), veh/h				738	0	329	92	3173	988	92	2208	988
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				26.4	0.0	0.0	36.4	8.2	0.0	36.6	16.0	0.0
Incr Delay (d2), s/veh				0.4	0.0	0.0	3.5	0.3	0.0	7.5	48.3	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.1	0.0	0.0	0.4	4.4	0.0	0.7	38.7	0.0
LnGrp Delay(d),s/veh				26.8	0.0	0.0	39.8	8.5	0.0	44.1	64.3	0.0
LnGrp LOS				C			D	A		D	F	
Approach Vol, veh/h					112			1165			2431	
Approach Delay, s/veh					26.8			8.9			64.1	
Approach LOS					C			A			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	8.0	52.0			8.0	52.0		20.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	48.0			4.0	48.0		16.0				
Max Q Clear Time (g_c+I1), s	3.1	10.9			2.6	50.0		4.0				
Green Ext Time (p_c), s	0.0	10.6			0.0	0.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				45.6								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↗	↖↖	↑↑					
Traffic Volume (veh/h)	1123	209	317	1287	0	0			
Future Volume (veh/h)	1123	209	317	1287	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937					
Adj Flow Rate, veh/h	1221	227	345	1399					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	2116	947	805	3313					
Arrive On Green	0.57	0.57	0.22	0.90					
Sat Flow, veh/h	3778	1647	3579	3778					
Grp Volume(v), veh/h	1221	227	345	1399					
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840					
Q Serve(g_s), s	8.4	2.7	3.3	2.5					
Cycle Q Clear(g_c), s	8.4	2.7	3.3	2.5					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	2116	947	805	3313					
V/C Ratio(X)	0.58	0.24	0.43	0.42					
Avail Cap(c_a), veh/h	2116	947	805	3313					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	5.4	4.2	13.3	0.3					
Incr Delay (d2), s/veh	1.2	0.6	1.7	0.4					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	4.4	1.4	1.8	1.2					
LnGrp Delay(d),s/veh	6.6	4.8	15.0	0.7					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	1448			1744					
Approach Delay, s/veh	6.3			3.5					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			13.0	27.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			9.0	23.0				36.0	
Max Q Clear Time (g_c+I1), s			5.3	10.4				4.5	
Green Ext Time (p_c), s			0.5	7.5				13.7	
Intersection Summary									
HCM 2010 Ctrl Delay			4.8						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/11/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↖	↑↑	↖	↗		
Traffic Volume (veh/h)	1740	97	305	1324	156	0		
Future Volume (veh/h)	1740	97	305	1324	156	0		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	1891	105	332	1439	170	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1840	823	358	2419	422	376		
Arrive On Green	0.50	0.50	0.10	0.66	0.23	0.00		
Sat Flow, veh/h	3778	1647	3579	3778	1845	1647		
Grp Volume(v), veh/h	1891	105	332	1439	170	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840	1845	1647		
Q Serve(g_s), s	35.0	2.4	6.4	15.4	5.5	0.0		
Cycle Q Clear(g_c), s	35.0	2.4	6.4	15.4	5.5	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1840	823	358	2419	422	376		
V/C Ratio(X)	1.03	0.13	0.93	0.59	0.40	0.00		
Avail Cap(c_a), veh/h	1840	823	358	2419	422	376		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	17.5	9.3	31.2	6.8	22.9	0.0		
Incr Delay (d2), s/veh	28.3	0.3	32.3	1.1	2.9	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	24.9	1.2	4.8	8.0	3.1	0.0		
LnGrp Delay(d),s/veh	45.8	9.7	63.6	7.8	25.8	0.0		
LnGrp LOS	F	A	E	A	C			
Approach Vol, veh/h	1996			1771	170			
Approach Delay, s/veh	43.9			18.3	25.8			
Approach LOS	D			B	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	11.0	39.0				50.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	7.0	35.0				46.0
Max Q Clear Time (g_c+I1), s		7.5	8.4	37.0				17.4
Green Ext Time (p_c), s		0.3	0.0	0.0				13.6
Intersection Summary								
HCM 2010 Ctrl Delay			31.6					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary

51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	626	6	82	582	108	5	0	31	77	8	49
Future Volume (veh/h)	0	626	6	82	582	108	5	0	31	77	8	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1937	1976	1937	1937	1937	1937	0	1937	1937	1937	1937
Adj Flow Rate, veh/h	0	680	7	89	633	0	5	0	34	90	0	53
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1244	13	217	1949	872	0	0	0	1158	0	517
Arrive On Green	0.00	0.33	0.33	0.12	0.53	0.00	0.00	0.00	0.00	0.31	0.00	0.31
Sat Flow, veh/h	0	3829	38	1845	3681	1647		0		3690	0	1647
Grp Volume(v), veh/h	0	335	352	89	633	0		0.0		90	0	53
Grp Sat Flow(s),veh/h/ln	0	1840	1930	1845	1840	1647				1845	0	1647
Q Serve(g_s), s	0.0	7.6	7.6	2.3	5.0	0.0				0.9	0.0	1.2
Cycle Q Clear(g_c), s	0.0	7.6	7.6	2.3	5.0	0.0				0.9	0.0	1.2
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	613	643	217	1949	872				1158	0	517
V/C Ratio(X)	0.00	0.55	0.55	0.41	0.32	0.00				0.08	0.00	0.10
Avail Cap(c_a), veh/h	0	613	643	217	1949	872				1158	0	517
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	13.9	13.9	20.9	6.8	0.0				12.3	0.0	12.4
Incr Delay (d2), s/veh	0.0	3.5	3.3	5.6	0.4	0.0				0.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.4	4.6	1.5	2.6	0.0				0.5	0.0	0.6
LnGrp Delay(d),s/veh	0.0	17.3	17.2	26.5	7.3	0.0				12.4	0.0	12.8
LnGrp LOS		B	B	C	A					B		B
Approach Vol, veh/h		687			722						143	
Approach Delay, s/veh		17.3			9.6						12.6	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			10.0	21.0		20.0		31.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			6.0	17.0		16.0		27.0				
Max Q Clear Time (g_c+I1), s			4.3	9.6		3.2		7.0				
Green Ext Time (p_c), s			0.0	2.5		0.3		4.3				
Intersection Summary												
HCM 2010 Ctrl Delay			13.3									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	691	9	28	1014	299	9	2	15	292	7	73
Future Volume (veh/h)	179	691	9	28	1014	299	9	2	15	292	7	73
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1976	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	195	751	10	30	1102	325	10	2	16	202	169	79
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	185	1209	16	115	1058	473	329	66	350	369	250	117
Arrive On Green	0.10	0.32	0.32	0.06	0.29	0.29	0.21	0.21	0.21	0.20	0.20	0.20
Sat Flow, veh/h	1845	3719	50	1845	3681	1647	1550	310	1647	1845	1250	584
Grp Volume(v), veh/h	195	372	389	30	1102	325	12	0	16	202	0	248
Grp Sat Flow(s),veh/h/ln	1845	1840	1929	1845	1840	1647	1860	0	1647	1845	0	1834
Q Serve(g_s), s	8.0	13.7	13.7	1.2	23.0	14.0	0.4	0.0	0.6	7.9	0.0	10.0
Cycle Q Clear(g_c), s	8.0	13.7	13.7	1.2	23.0	14.0	0.4	0.0	0.6	7.9	0.0	10.0
Prop In Lane	1.00		0.03	1.00		1.00	0.83		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	185	598	627	115	1058	473	395	0	350	369	0	367
V/C Ratio(X)	1.06	0.62	0.62	0.26	1.04	0.69	0.03	0.00	0.05	0.55	0.00	0.68
Avail Cap(c_a), veh/h	185	598	627	115	1058	473	395	0	350	369	0	367
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.0	22.8	22.8	35.7	28.5	25.3	25.0	0.0	25.0	28.7	0.0	29.6
Incr Delay (d2), s/veh	82.1	4.8	4.6	5.4	39.0	7.9	0.1	0.0	0.2	5.7	0.0	9.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	7.7	8.0	0.8	17.3	7.4	0.2	0.0	0.3	4.6	0.0	6.0
LnGrp Delay(d),s/veh	118.1	27.6	27.4	41.1	67.5	33.2	25.1	0.0	25.3	34.5	0.0	39.2
LnGrp LOS	F	C	C	D	F	C	C		C	C		D
Approach Vol, veh/h		956			1457			28			450	
Approach Delay, s/veh		46.0			59.3			25.2			37.1	
Approach LOS		D			E			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.0	9.0	30.0		20.0	12.0	27.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	5.0	26.0		16.0	8.0	23.0				
Max Q Clear Time (g_c+I1), s		2.6	3.2	15.7		12.0	10.0	25.0				
Green Ext Time (p_c), s		0.0	0.0	3.5		0.8	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				51.1								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	868	283	88	765	185	360	99	141	437	240	390
Future Volume (veh/h)	61	868	283	88	765	185	360	99	141	437	240	390
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	66	943	308	96	832	201	250	306	153	368	411	424
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	123	838	272	98	1080	483	394	413	351	394	413	351
Arrive On Green	0.07	0.31	0.31	0.05	0.29	0.29	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1845	2732	888	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	66	634	617	96	832	201	250	306	153	368	411	424
Grp Sat Flow(s),veh/h/ln	1845	1840	1780	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	2.6	23.0	23.0	3.9	15.5	7.4	9.2	11.1	6.0	14.7	15.9	16.0
Cycle Q Clear(g_c), s	2.6	23.0	23.0	3.9	15.5	7.4	9.2	11.1	6.0	14.7	15.9	16.0
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	123	564	546	98	1080	483	394	413	351	394	413	351
V/C Ratio(X)	0.54	1.12	1.13	0.98	0.77	0.42	0.64	0.74	0.44	0.93	0.99	1.21
Avail Cap(c_a), veh/h	123	564	546	98	1080	483	394	413	351	394	413	351
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	26.0	26.0	35.5	24.2	21.3	26.8	27.6	25.6	29.0	29.5	29.5
Incr Delay (d2), s/veh	15.8	76.4	79.7	84.3	5.3	2.6	7.6	11.3	3.9	31.6	42.9	116.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	23.6	23.3	4.3	8.7	3.7	5.6	7.2	3.1	10.9	13.4	18.6
LnGrp Delay(d),s/veh	49.6	102.4	105.7	119.7	29.5	24.0	34.5	38.9	29.5	60.6	72.4	146.4
LnGrp LOS	D	F	F	F	C	C	C	D	C	E	E	F
Approach Vol, veh/h	1317			1129			709			1203		
Approach Delay, s/veh	101.3			36.2			35.3			94.9		
Approach LOS	F			D			D			F		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	20.0		8.0	27.0	20.0		9.0	26.0				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	16.0		4.0	23.0	16.0		5.0	22.0				
Max Q Clear Time (g_c+I1), s	13.1		5.9	25.0	18.0		4.6	17.5				
Green Ext Time (p_c), s	1.0		0.0	0.0	0.0		0.0	2.5				
Intersection Summary												
HCM 2010 Ctrl Delay	71.9											
HCM 2010 LOS	E											
Notes												

Intersection	
Intersection Delay, s/veh	7.6
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	78	7	7	86	9	4	5	8	0	0	0
Future Vol, veh/h	23	78	7	7	86	9	4	5	8	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	85	8	8	93	10	4	5	9	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.7	7.6	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	24%	21%	7%
Vol Thru, %	29%	72%	84%
Vol Right, %	47%	6%	9%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	17	108	102
LT Vol	4	23	7
Through Vol	5	78	86
RT Vol	8	7	9
Lane Flow Rate	18	117	111
Geometry Grp	1	1	1
Degree of Util (X)	0.021	0.132	0.124
Departure Headway (Hd)	4.088	4.052	4.014
Convergence, Y/N	Yes	Yes	Yes
Cap	860	884	891
Service Time	2.187	2.083	2.047
HCM Lane V/C Ratio	0.021	0.132	0.125
HCM Control Delay	7.3	7.7	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.5	0.4

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖						↖	↗
Traffic Vol, veh/h	0	195	55	31	35	0	0	0	0	28	0	46
Future Vol, veh/h	0	195	55	31	35	0	0	0	0	28	0	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	212	60	34	38	0	0	0	0	30	0	50
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	212	0	0				318	318	38
Stage 1	-	-	-	-	-	-				106	106	-
Stage 2	-	-	-	-	-	-				212	212	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1358	-	0				675	598	1034
Stage 1	0	-	-	-	-	0				918	807	-
Stage 2	0	-	-	-	-	0				823	727	-
Platoon blocked, %	-	-	-	-	-	-				-	-	-
Mov Cap-1 Maneuver	-	-	-	1358	-	-				657	0	1034
Mov Cap-2 Maneuver	-	-	-	-	-	-				657	0	-
Stage 1	-	-	-	-	-	-				894	0	-
Stage 2	-	-	-	-	-	-				823	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.6			9.5					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT		EBR	WBL	WBT	SBLn1	SBLn2					
Capacity (veh/h)	-		-	1358	-	657	1034					
HCM Lane V/C Ratio	-		-	0.025	-	0.046	0.048					
HCM Control Delay (s)	-		-	7.7	0	10.7	8.7					
HCM Lane LOS	-		-	A	A	B	A					
HCM 95th %tile Q(veh)	-		-	0.1	-	0.1	0.2					

HCM 2010 Signalized Intersection Summary

56: I-5 SB On/Off-Ramp & Vista Way

06/29/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↖	↑	↘	↗↗		
Traffic Volume (veh/h)	945	137	935	1632	56	1428		
Future Volume (veh/h)	945	137	935	1632	56	1428		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	1027	0	1016	1774	61	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1302	583	1211	1401	397	624		
Arrive On Green	0.35	0.00	0.34	0.72	0.22	0.00		
Sat Flow, veh/h	3778	1647	3579	1937	1845	2898		
Grp Volume(v), veh/h	1027	0	1016	1774	61	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1937	1845	1449		
Q Serve(g_s), s	32.5	0.0	34.1	94.0	3.5	0.0		
Cycle Q Clear(g_c), s	32.5	0.0	34.1	94.0	3.5	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1302	583	1211	1401	397	624		
V/C Ratio(X)	0.79	0.00	0.84	1.27	0.15	0.00		
Avail Cap(c_a), veh/h	1302	583	1211	1401	397	624		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	37.6	0.0	39.7	18.0	41.4	0.0		
Incr Delay (d2), s/veh	4.9	0.0	7.0	125.7	0.8	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	17.4	0.0	18.0	98.3	1.9	0.0		
LnGrp Delay(d),s/veh	42.5	0.0	46.8	143.7	42.2	0.0		
LnGrp LOS	D		D	F	D			
Approach Vol, veh/h	1027			2790	61			
Approach Delay, s/veh	42.5			108.4	42.2			
Approach LOS	D			F	D			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		32.0	48.0	50.0				98.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		28.0	44.0	46.0				94.0
Max Q Clear Time (g_c+I1), s		5.5	36.1	34.5				96.0
Green Ext Time (p_c), s		0.1	2.8	5.5				0.0
Intersection Summary								
HCM 2010 Ctrl Delay			89.9					
HCM 2010 LOS			F					

Appendix L.2 – Analysis Output Sheets (Future with Project Alternative 2 Existing SR-78)

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	81	61	94	302	563	169	18	141	82	23	69
Future Volume (vph)	89	81	61	94	302	563	169	18	141	82	23	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3145	1441		1782	1583		1793	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3145	1441		1782	1583		1793	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	88	66	102	328	612	184	20	153	89	25	75
RTOR Reduction (vph)	0	0	58	0	226	253	0	0	91	0	0	57
Lane Group Flow (vph)	97	88	8	102	408	53	0	204	62	0	114	18
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	5.5	8.4	8.4	8.3	12.8	12.8		21.4	21.4		17.2	17.2
Effective Green, g (s)	5.5	8.4	8.4	8.3	12.8	12.8		21.4	21.4		17.2	17.2
Actuated g/C Ratio	0.07	0.11	0.11	0.11	0.17	0.17		0.29	0.29		0.23	0.23
Clearance Time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	132	212	180	199	546	250		518	460		419	369
v/s Ratio Prot	0.05	0.05		c0.06	c0.13			c0.11			c0.06	
v/s Ratio Perm			0.00			0.04			0.04			0.01
v/c Ratio	0.73	0.42	0.04	0.51	0.75	0.21		0.39	0.13		0.27	0.05
Uniform Delay, d1	33.3	30.3	29.0	30.7	28.9	26.1		20.9	19.3		23.1	21.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	19.0	0.5	0.0	2.2	4.9	0.2		2.2	0.6		1.6	0.2
Delay (s)	52.3	30.8	29.1	33.0	33.8	26.2		23.1	19.9		24.7	22.1
Level of Service	D	C	C	C	C	C		C	B		C	C
Approach Delay (s)		38.7			31.5			21.7			23.7	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			29.8				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			73.6				Sum of lost time (s)			18.3		
Intersection Capacity Utilization			49.4%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				LT				L			
Volume (V), veh/h	0	0	0	0	0	409	0	381	0	0	179	464	0	121	166	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	0	0	0	0	453	0	414	0	0	198	514	0	134	184	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929		4.6453	4.3276			4.3276		4.6453	4.3276	
Follow-Up Headway (s)		3.1858		2.6667	2.5352			2.5352		2.6667	2.5352	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		0		0	453	414		198	514	134	184	
Entry Volume veh/h		0		0	444	414		194	504	131	180	
Circulating Flow (v_c), pc/h	771			198			134			453		
Exiting Flow (v_{ex}), pc/h	134			0			198			637		
Capacity (C_{pce}), pc/h		523		1125	1200			1267		890	966	
Capacity (c), veh/h		512		1103	1177			1242		872	947	
v/c Ratio (x)		0.00		0.00	0.38			0.16		0.15	0.19	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.0		3.3	6.8	0.0		4.2	0.0	5.6	5.6	
Lane LOS		A		A	A	A		A	A	A	A	
95% Queue, veh		0.0		0.0	1.8			0.6		0.5	0.7	
Approach Delay, s/veh				3.5			1.2			5.6		
Approach LOS				A			A			A		
Intersection Delay, s/veh LOS	3.0						A					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	21	4	43	27	84	12	58	62	125	79	6
Future Volume (vph)	2	21	4	43	27	84	12	58	62	125	79	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	23	4	47	29	91	13	63	67	136	86	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	29	167	143	229								
Volume Left (vph)	2	47	13	136								
Volume Right (vph)	4	91	67	7								
Hadj (s)	-0.03	-0.24	-0.23	0.13								
Departure Headway (s)	5.0	4.6	4.4	4.7								
Degree Utilization, x	0.04	0.21	0.18	0.30								
Capacity (veh/h)	650	726	767	732								
Control Delay (s)	8.2	8.8	8.4	9.7								
Approach Delay (s)	8.2	8.8	8.4	9.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.0								
Level of Service				A								
Intersection Capacity Utilization				40.4%	ICU Level of Service	A						
Analysis Period (min)				15								

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Surfrider Way
E/W Street Name	Surfrider Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1
Lane Assignment	LTR				LTR				LTR				LT			
Volume (V), veh/h	0	11	8	17	0	2	13	3	0	13	331	2	0	2	360	34
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	12	9	19	0	2	14	3	0	14	367	2	0	2	399	38
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929		4.5436	4.5436	
Follow-Up Headway (s)		3.1858			3.1858			3.1858		2.5352	2.5352	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		40			19			383		401	38	
Entry Volume veh/h		39			19			375		393	37	
Circulating Flow (v_c), pc/h	403			393			23			30		
Exiting Flow (v_{ex}), pc/h	13			66			382			420		
Capacity (C_{pce}), pc/h		755			763			1104		1382	1382	
Capacity (c), veh/h		740			748			1083		1355	1355	
v/c Ratio (x)		0.05			0.02			0.35		0.29	0.03	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.4			5.1			6.8		5.2	2.9	
Lane LOS		A			A			A		A	A	
95% Queue, veh		0.2			0.1			1.6		1.2	0.1	
Approach Delay, s/veh	5.4			5.1			6.8			5.0		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	5.8						A					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Civic Center Drive
E/W Street Name	Civic Center Drive
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	12	9	8	0	22	13	21	0	7	280	27	0	60	333	12
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	13	10	9	0	24	14	23	0	8	310	30	0	67	369	13
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		32			61			348			449	
Entry Volume veh/h		31			60			341			440	
Circulating Flow (v_c), pc/h	460			331			90			46		
Exiting Flow (v_{ex}), pc/h	107			35			346			402		
Capacity (C_{pce}), pc/h		713			812			1033			1079	
Capacity (c), veh/h		699			796			1013			1058	
v/c Ratio (x)		0.04			0.08			0.34			0.42	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.6			5.3			7.0			7.9	
Lane LOS		A			A			A			A	
95% Queue, veh		0.1			0.2			1.5			2.1	
Approach Delay, s/veh	5.6			5.3			7.0			7.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	7.3						A					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	7/11/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Pier View Way
E/W Street Name	Pier View Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	11	8	17	0	2	13	3	0	13	331	2	0	2	360	34
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	12	9	19	0	2	14	3	0	14	367	2	0	2	399	38
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		40			19			383			439	
Entry Volume veh/h		39			19			375			430	
Circulating Flow (v_c), pc/h	403			393			23			30		
Exiting Flow (v_{ex}), pc/h	13			66			382			420		
Capacity (C_{pce}), pc/h		755			763			1104			1097	
Capacity (c), veh/h		740			748			1083			1075	
v/c Ratio (x)		0.05			0.02			0.35			0.40	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.4			5.1			6.8			7.6	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.1			1.6			2.0	
Approach Delay, s/veh	5.4			5.1			6.8			7.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	7.1						A					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop			Stop			Stop			Stop		
Traffic Volume (vph)	2	3	19	9	6	4	89	222	3	5	152	7
Future Volume (vph)	2	3	19	9	6	4	89	222	3	5	152	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	3	21	10	7	4	97	241	3	5	165	8
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	5	21	21	218	124	88	91					
Volume Left (vph)	2	0	10	97	0	5	0					
Volume Right (vph)	0	21	4	0	3	0	8					
Hadj (s)	0.23	-0.67	0.01	0.26	0.02	0.06	-0.03					
Departure Headway (s)	5.9	5.0	5.7	5.0	4.8	5.0	4.9					
Degree Utilization, x	0.01	0.03	0.03	0.30	0.16	0.12	0.12					
Capacity (veh/h)	559	655	585	703	735	701	717					
Control Delay (s)	7.8	7.0	8.9	9.0	7.5	7.5	7.4					
Approach Delay (s)	7.1		8.9	8.5		7.4						
Approach LOS	A		A	A		A						
Intersection Summary												
Delay			8.1									
Level of Service			A									
Intersection Capacity Utilization			31.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	125	57	130	88	33	114
Future Volume (vph)	125	57	130	88	33	114
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	136	62	141	96	36	124
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	136	62	237	160		
Volume Left (vph)	136	0	0	36		
Volume Right (vph)	0	62	96	0		
Hadj (s)	0.53	-0.67	-0.21	0.08		
Departure Headway (s)	6.0	4.8	4.4	4.8		
Degree Utilization, x	0.23	0.08	0.29	0.21		
Capacity (veh/h)	568	706	777	710		
Control Delay (s)	9.5	7.0	9.3	9.1		
Approach Delay (s)	8.7		9.3	9.1		
Approach LOS	A		A	A		
Intersection Summary						
Delay			9.0			
Level of Service			A			
Intersection Capacity Utilization			37.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	18	0	123	35	160	32	0	0	0	0	30	40
Future Volume (vph)	18	0	123	35	160	32	0	0	0	0	30	40
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5		4.5	4.5	4.5						4.5	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.97						0.92	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3450						3239	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3450						3239	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	20	0	134	38	174	35	0	0	0	0	33	43
RTOR Reduction (vph)	0	0	122	14	13	0	0	0	0	0	40	0
Lane Group Flow (vph)	20	0	12	24	196	0	0	0	0	0	36	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	5.2		5.2	37.2	37.2						4.1	
Effective Green, g (s)	5.2		5.2	37.2	37.2						4.1	
Actuated g/C Ratio	0.09		0.09	0.62	0.62						0.07	
Clearance Time (s)	4.5		4.5	4.5	4.5						4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	153		241	1097	2139						221	
v/s Ratio Prot	c0.01		0.00	0.01	c0.06						c0.01	
v/s Ratio Perm												
v/c Ratio	0.13		0.05	0.02	0.09						0.16	
Uniform Delay, d1	25.3		25.1	4.4	4.6						26.3	
Progression Factor	1.00		1.00	1.00	1.00						1.00	
Incremental Delay, d2	0.4		0.1	0.0	0.1						0.3	
Delay (s)	25.7		25.2	4.4	4.7						26.7	
Level of Service	C		C	A	A						C	
Approach Delay (s)		25.3			4.6			0.0			26.7	
Approach LOS		C			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			14.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.10									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)			13.5			
Intersection Capacity Utilization			22.9%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	0	0	0	139	226	72	69	507	0	0	289	32
Future Volume (vph)	0	0	0	139	226	72	69	507	0	0	289	32
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	0.95
Frpb, ped/bikes				1.00	1.00	0.96	1.00	1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	3539	1526	1770	1863			1766	1461
Flt Permitted				0.95	1.00	1.00	0.43	1.00			1.00	1.00
Satd. Flow (perm)				1770	3539	1526	796	1863			1766	1461
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	151	246	78	75	551	0	0	314	35
RTOR Reduction (vph)	0	0	0	0	0	54	0	0	0	0	1	23
Lane Group Flow (vph)	0	0	0	151	246	24	75	551	0	0	317	8
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					6
Actuated Green, G (s)				18.1	18.1	18.1	30.8	30.8			15.7	15.7
Effective Green, g (s)				18.1	18.1	18.1	30.8	30.8			15.7	15.7
Actuated g/C Ratio				0.31	0.31	0.31	0.52	0.52			0.27	0.27
Clearance Time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				543	1087	468	583	974			470	389
v/s Ratio Prot				c0.09	0.07		0.02	c0.30			c0.18	
v/s Ratio Perm						0.02	0.05					0.01
v/c Ratio				0.28	0.23	0.05	0.13	0.57			0.68	0.02
Uniform Delay, d1				15.5	15.2	14.4	9.9	9.5			19.3	15.9
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				1.3	0.5	0.2	0.1	0.9			4.2	0.0
Delay (s)				16.7	15.7	14.6	10.1	10.4			23.5	16.0
Level of Service				B	B	B	B	B			C	B
Approach Delay (s)		0.0			15.8			10.4			22.8	
Approach LOS		A			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			15.2									HCM 2000 Level of Service B
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			58.9								15.0	Sum of lost time (s)
Intersection Capacity Utilization			51.7%									ICU Level of Service A
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	111	1	123	416	202	11	24	185	135	47	6
Future Volume (vph)	23	111	1	123	416	202	11	24	185	135	47	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Flt Protected	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Permitted	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.98	
Satd. Flow (prot)	1770	3535		1770	3539	1583		1834	1583	1681	1714	
Satd. Flow (perm)	846	3535		1257	3539	1583		1752	1583	1296	1570	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	121	1	134	452	220	12	26	201	147	51	7
RTOR Reduction (vph)	0	1	0	0	0	161	0	0	89	0	3	0
Lane Group Flow (vph)	25	121	0	134	452	59	0	38	112	101	101	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	15.1	15.1		14.7	14.7	14.7		30.7	30.7	30.7	30.7	
Effective Green, g (s)	15.1	15.1		14.7	14.7	14.7		30.7	30.7	30.7	30.7	
Actuated g/C Ratio	0.27	0.27		0.27	0.27	0.27		0.56	0.56	0.56	0.56	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	232	970		335	945	423		977	883	723	876	
v/s Ratio Prot		0.03			c0.13							
v/s Ratio Perm	0.03			0.11		0.04		0.02	0.07	c0.08	0.06	
v/c Ratio	0.11	0.13		0.40	0.48	0.14		0.04	0.13	0.14	0.12	
Uniform Delay, d1	14.9	15.0		16.5	16.9	15.3		5.5	5.8	5.8	5.7	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.1		0.9	0.5	0.2		0.1	0.3	0.4	0.3	
Delay (s)	15.2	15.1		17.5	17.4	15.5		5.6	6.1	6.2	6.0	
Level of Service	B	B		B	B	B		A	A	A	A	
Approach Delay (s)		15.1			16.9			6.0			6.1	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			13.3				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			55.0				Sum of lost time (s)			9.6		
Intersection Capacity Utilization			38.5%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

07/02/2018

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (veh/h)	78	6	22	28	6	9
Future Volume (Veh/h)	78	6	22	28	6	9
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	85	7	24	30	7	10
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				238		
pX, platoon unblocked						
vC, conflicting volume			92		166	88
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			92		166	88
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		99	99
cM capacity (veh/h)			1503		811	970
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	92	54	17			
Volume Left	0	24	7			
Volume Right	7	0	10			
cSH	1700	1503	897			
Volume to Capacity	0.05	0.02	0.02			
Queue Length 95th (ft)	0	1	1			
Control Delay (s)	0.0	3.4	9.1			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.4	9.1			
Approach LOS			A			
Intersection Summary						
Average Delay			2.1			
Intersection Capacity Utilization			19.4%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	93	53	99	0	0	0	28	215	58	68	208	55
Future Volume (vph)	93	53	99	0	0	0	28	215	58	68	208	55
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.95				1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1498				1770	1863	1552	1770	1863	1518
Flt Permitted	0.95	1.00	1.00				0.62	1.00	1.00	0.45	1.00	1.00
Satd. Flow (perm)	1770	1863	1498				1150	1863	1552	831	1863	1518
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	101	58	108	0	0	0	30	234	63	74	226	60
RTOR Reduction (vph)	0	0	60	0	0	0	0	0	45	0	0	36
Lane Group Flow (vph)	101	58	48	0	0	0	30	234	18	74	226	24
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA	Perm				Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4					2	2		1	6	
Permitted Phases			4				2		2	6		6
Actuated Green, G (s)	24.3	24.3	24.3				15.5	15.5	15.5	21.9	21.9	21.9
Effective Green, g (s)	24.3	24.3	24.3				15.5	15.5	15.5	21.9	21.9	21.9
Actuated g/C Ratio	0.44	0.44	0.44				0.28	0.28	0.28	0.40	0.40	0.40
Clearance Time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0				4.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	782	823	661				324	525	437	371	741	604
v/s Ratio Prot	c0.06	0.03						c0.13		0.01	c0.12	
v/s Ratio Perm			0.03				0.03		0.01	0.07		0.02
v/c Ratio	0.13	0.07	0.07				0.09	0.45	0.04	0.20	0.30	0.04
Uniform Delay, d1	9.1	8.8	8.9				14.6	16.2	14.3	10.7	11.3	10.1
Progression Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.2	0.2				0.6	2.7	0.2	0.3	1.1	0.1
Delay (s)	9.4	9.0	9.1				15.1	18.9	14.5	10.9	12.4	10.2
Level of Service	A	A	A				B	B	B	B	B	B
Approach Delay (s)		9.2			0.0			17.7			11.7	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			13.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.27									
Actuated Cycle Length (s)			55.0				Sum of lost time (s)			12.8		
Intersection Capacity Utilization			49.5%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	188	9	0	0	0	0	4	16	21	8	0
Future Volume (Veh/h)	11	188	9	0	0	0	0	4	16	21	8	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	204	10	0	0	0	0	4	17	23	9	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		218										
pX, platoon unblocked												
vC, conflicting volume	0			214			238	233	107	145	238	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			214			238	233	107	145	238	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	99	98	97	99	100
cM capacity (veh/h)	1622			1353			686	661	926	787	657	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	114	112	21	32								
Volume Left	12	0	0	23								
Volume Right	0	10	17	0								
cSH	1622	1700	861	745								
Volume to Capacity	0.01	0.07	0.02	0.04								
Queue Length 95th (ft)	1	0	2	3								
Control Delay (s)	0.8	0.0	9.3	10.0								
Lane LOS	A		A	B								
Approach Delay (s)	0.4		9.3	10.0								
Approach LOS			A	B								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			20.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	425	4	0	0	0	0	4	20	14	13	0
Future Volume (vph)	23	425	4	0	0	0	0	4	20	14	13	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	462	4	0	0	0	0	4	22	15	14	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	256	235	26	29								
Volume Left (vph)	25	0	0	15								
Volume Right (vph)	0	4	22	0								
Hadj (s)	0.08	0.02	-0.47	0.14								
Departure Headway (s)	4.7	4.7	4.5	5.1								
Degree Utilization, x	0.34	0.30	0.03	0.04								
Capacity (veh/h)	754	760	744	656								
Control Delay (s)	8.9	8.5	7.6	8.3								
Approach Delay (s)	8.7		7.6	8.3								
Approach LOS	A		A	A								
Intersection Summary												
Delay			8.6									
Level of Service			A									
Intersection Capacity Utilization			27.3%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

07/02/2018

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	90	171	9	39	0	91	0	45	29	0	0	0								
Future Volume (vph)	90	171	9	39	0	91	0	45	29	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	98	186	10	42	0	99	0	49	32	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	98	196	141	81																
Volume Left (vph)	98	0	42	0																
Volume Right (vph)	0	10	99	32																
Hadj (s)	0.53	0.00	-0.33	-0.20																
Departure Headway (s)	5.3	4.8	4.2	4.7																
Degree Utilization, x	0.15	0.26	0.16	0.10																
Capacity (veh/h)	662	732	826	716																
Control Delay (s)	8.0	8.3	8.0	8.2																
Approach Delay (s)	8.2		8.0	8.2																
Approach LOS	A		A	A																
Intersection Summary																				
Delay			8.2																	
Level of Service			A																	
Intersection Capacity Utilization			31.4%	ICU Level of Service					A											
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	13	0	0	31	13	235	20	14	243	6
Future Volume (Veh/h)	0	0	13	0	0	31	13	235	20	14	243	6
Sign Control	Stop			Stop				Free			Free	
Grade	0%			0%				0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	14	0	0	34	14	255	22	15	264	7
Pedestrians	7			7								
Lane Width (ft)	12.0			16.0								
Walking Speed (ft/s)	4.0			4.0								
Percent Blockage	1			1								
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			455		
pX, platoon unblocked												
vC, conflicting volume	622	616	274	609	609	273	278				284	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	622	616	274	609	609	273	278				284	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	98	100	100	96	99				99	
cM capacity (veh/h)	369	391	760	386	395	760	1277				1268	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	14	34	14	277	15	271						
Volume Left	0	0	14	0	15	0						
Volume Right	14	34	0	22	0	7						
cSH	760	760	1277	1700	1268	1700						
Volume to Capacity	0.02	0.04	0.01	0.16	0.01	0.16						
Queue Length 95th (ft)	1	4	1	0	1	0						
Control Delay (s)	9.8	10.0	7.8	0.0	7.9	0.0						
Lane LOS	A	A	A		A							
Approach Delay (s)	9.8	10.0	0.4		0.4							
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			23.6%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Washington Avenue
E/W Street Name	Washington Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	14	2	25	0	37	6	4	0	18	241	11	0	3	251	18
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	16	2	28	0	41	7	4	0	20	267	12	0	3	278	20
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		46			52			299			301	
Entry Volume veh/h		45			51			293			295	
Circulating Flow (v_c), pc/h	322			303			21			68		
Exiting Flow (v_{ex}), pc/h	17			47			287			347		
Capacity (C_{pce}), pc/h		819			835			1107			1056	
Capacity (c), veh/h		803			818			1085			1035	
v/c Ratio (x)		0.06			0.06			0.27			0.29	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.0			5.0			5.9			6.3	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.2			1.1			1.2	
Approach Delay, s/veh	5.0			5.0			5.9			6.3		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	5.9						A					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	22	29	18	26	4	80	3	152	41	95	104	1
Future Volume (vph)	22	29	18	26	4	80	3	152	41	95	104	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	32	20	28	4	87	3	165	45	103	113	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	76	119	213	217								
Volume Left (vph)	24	28	3	103								
Volume Right (vph)	20	87	45	1								
Hadj (s)	-0.06	-0.36	-0.09	0.13								
Departure Headway (s)	5.0	4.7	4.6	4.8								
Degree Utilization, x	0.11	0.15	0.27	0.29								
Capacity (veh/h)	642	695	748	715								
Control Delay (s)	8.6	8.5	9.3	9.7								
Approach Delay (s)	8.6	8.5	9.3	9.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.2								
Level of Service				A								
Intersection Capacity Utilization				39.4%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	204	24	5	94	16	12	26	30	22	36	12
Future Volume (Veh/h)	8	204	24	5	94	16	12	26	30	22	36	12
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	222	26	5	102	17	13	28	33	24	39	13
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	133			255			414	403	242	434	408	126
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	133			255			414	403	242	434	408	126
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			97	95	96	95	92	99
cM capacity (veh/h)	1435			1302			496	522	792	473	519	913
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	257	124	74	76								
Volume Left	9	5	13	24								
Volume Right	26	17	33	13								
cSH	1435	1302	609	542								
Volume to Capacity	0.01	0.00	0.12	0.14								
Queue Length 95th (ft)	0	0	10	12								
Control Delay (s)	0.3	0.3	11.7	12.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.3	11.7	12.7								
Approach LOS												
Intersection Summary												
Average Delay												
Intersection Capacity Utilization												
Analysis Period (min)												
ICU Level of Service												
A												

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Wisconsin Avenue
E/W Street Name	Wisconsin Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	53	53	134	0	87	28	27	0	65	251	62	0	16	276	18
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	59	59	149	0	96	31	30	0	72	278	69	0	18	306	20
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		267			157			419			344	
Entry Volume veh/h		262			154			411			337	
Circulating Flow (v_c), pc/h	420			409			136			199		
Exiting Flow (v_{ex}), pc/h	146			123			367			551		
Capacity (C_{pce}), pc/h		742			751			986			926	
Capacity (c), veh/h		728			736			967			908	
v/c Ratio (x)		0.36			0.21			0.42			0.37	

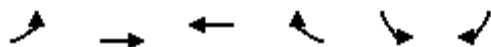
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.5			7.2			8.6			8.1	
Lane LOS		A			A			A			A	
95% Queue, veh		1.6			0.8			2.1			1.7	
Approach Delay, s/veh	9.5			7.2			8.6			8.1		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	8.5						A					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

07/02/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	208	201	5	16	15
Future Volume (Veh/h)	8	208	201	5	16	15
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	226	218	5	17	16
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	231				474	230
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	231				474	230
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	98
cM capacity (veh/h)	1328				542	804
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	235	223	33			
Volume Left	9	0	17			
Volume Right	0	5	16			
cSH	1328	1700	643			
Volume to Capacity	0.01	0.13	0.05			
Queue Length 95th (ft)	1	0	4			
Control Delay (s)	0.4	0.0	10.9			
Lane LOS	A		B			
Approach Delay (s)	0.4	0.0	10.9			
Approach LOS			B			
Intersection Summary						
Average Delay			0.9			
Intersection Capacity Utilization			27.8%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	193	9	20	182	11	5	5	13	33	1	5
Future Volume (Veh/h)	7	193	9	20	182	11	5	5	13	33	1	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	210	10	22	198	12	5	5	14	36	1	5
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	212			220			486	487	215	498	486	208
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	212			220			486	487	215	498	486	208
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			99	99	98	92	100	99
cM capacity (veh/h)	1356			1349			478	469	825	462	470	830
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	228	232	24	42								
Volume Left	8	22	5	36								
Volume Right	10	12	14	5								
cSH	1356	1349	630	488								
Volume to Capacity	0.01	0.02	0.04	0.09								
Queue Length 95th (ft)	0	1	3	7								
Control Delay (s)	0.3	0.9	10.9	13.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.9	10.9	13.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.1									
Intersection Capacity Utilization			32.9%		ICU Level of Service				A			
Analysis Period (min)			15									

24: Wisconsin Ave & Ditmar St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	111	175	69	141	0	94	0	35	0	0	0
Future Volume (vph)	0	111	175	69	141	0	94	0	35	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	121	190	75	153	0	102	0	38	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	311	228	140	0								
Volume Left (vph)	0	75	102	0								
Volume Right (vph)	190	0	38	0								
Hadj (s)	-0.33	0.10	0.02	0.00								
Departure Headway (s)	4.2	4.7	5.1	5.3								
Degree Utilization, x	0.36	0.30	0.20	0.00								
Capacity (veh/h)	822	729	643	595								
Control Delay (s)	9.6	9.7	9.4	8.3								
Approach Delay (s)	9.6	9.7	9.4	0.0								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.6									
Level of Service			A									
Intersection Capacity Utilization			49.5%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	51	69	101	32	81	121
Future Volume (vph)	51	69	101	32	81	121
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	55	75	110	35	88	132
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	130	145	220			
Volume Left (vph)	55	0	88			
Volume Right (vph)	75	35	0			
Hadj (s)	-0.23	-0.11	0.11			
Departure Headway (s)	4.5	4.4	4.5			
Degree Utilization, x	0.16	0.18	0.27			
Capacity (veh/h)	738	791	770			
Control Delay (s)	8.4	8.3	9.2			
Approach Delay (s)	8.4	8.3	9.2			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.7			
Level of Service			A			
Intersection Capacity Utilization			35.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	235	1	6	189	40	7	10	11	40	16	10
Future Volume (Veh/h)	8	235	1	6	189	40	7	10	11	40	16	10
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	255	1	7	205	43	8	11	12	43	17	11
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	213											
pX, platoon unblocked	0.93							0.93	0.93			
vC, conflicting volume	251				267				548	550	274	542
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	153				267				474	475	274	467
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1
tC, 2 stage (s)												
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5
p0 queue free %	99				99				98	98	98	90
cM capacity (veh/h)	1320				1285				432	442	752	441
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	265	255	31	71								
Volume Left	9	7	8	43								
Volume Right	1	43	12	11								
cSH	1320	1285	522	480								
Volume to Capacity	0.01	0.01	0.06	0.15								
Queue Length 95th (ft)	1	0	5	13								
Control Delay (s)	0.3	0.3	12.3	13.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.3	12.3	13.8								
Approach LOS				B	B							
Intersection Summary												
Average Delay				2.4								
Intersection Capacity Utilization				31.4%	ICU Level of Service				A			
Analysis Period (min)				15								

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Oceanside Blvd
E/W Street Name	Oceanside Boulevard
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	21	132	76	0	112	134	101	0	39	226	60	0	110	287	15
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	23	146	84	0	124	149	112	0	43	251	67	0	122	318	17
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		253			385			361			457	
Entry Volume veh/h		248			377			354			448	
Circulating Flow (v_c), pc/h	564			317			291			316		
Exiting Flow (v_{ex}), pc/h	335			209			386			526		
Capacity (C_{pce}), pc/h		643			823			845			824	
Capacity (c), veh/h		630			807			828			808	
v/c Ratio (x)		0.39			0.47			0.43			0.55	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		11.3			10.7			9.7			12.6	
Lane LOS		B			B			A			B	
95% Queue, veh		1.9			2.5			2.2			3.5	
Approach Delay, s/veh	11.3			10.7			9.7			12.6		
Approach LOS	B			B			A			B		
Intersection Delay, s/veh LOS	11.2						B					

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	11	324	0	16	417	79	8	8	34	243	13	44
Future Volume (vph)	11	324	0	16	417	79	8	8	34	243	13	44
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.96
Flpb, ped/bikes	1.00	1.00		0.99	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.98			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1770	3539		1755	3446			3121			1777	1527
Flt Permitted	0.34	1.00		0.53	1.00			0.92			0.69	1.00
Satd. Flow (perm)	635	3539		979	3446			2886			1293	1527
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	12	352	0	17	453	86	9	9	37	264	14	48
RTOR Reduction (vph)	0	0	0	0	38	0	0	15	0	0	0	20
Lane Group Flow (vph)	12	352	0	17	501	0	0	40	0	0	278	28
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	13.4	13.4		13.4	13.4			32.1			32.1	32.1
Effective Green, g (s)	13.4	13.4		13.4	13.4			32.1			32.1	32.1
Actuated g/C Ratio	0.24	0.24		0.24	0.24			0.58			0.58	0.58
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	154	862		238	839			1684			754	891
v/s Ratio Prot		0.10			c0.15							
v/s Ratio Perm	0.02			0.02				0.01			c0.22	0.02
v/c Ratio	0.08	0.41		0.07	0.60			0.02			0.37	0.03
Uniform Delay, d1	16.0	17.5		16.0	18.4			4.8			6.1	4.9
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.2	0.3		0.1	1.2			0.0			1.4	0.1
Delay (s)	16.3	17.8		16.1	19.6			4.9			7.5	4.9
Level of Service	B	B		B	B			A			A	A
Approach Delay (s)		17.7			19.5			4.9			7.1	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		15.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.44										
Actuated Cycle Length (s)		55.0			Sum of lost time (s)			9.5				
Intersection Capacity Utilization		61.1%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2035
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Morse Street
E/W Street Name	Morse Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	24	13	17	0	31	8	114	0	3	378	61	0	95	511	17
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	27	14	19	0	34	9	126	0	3	419	68	0	105	567	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		60			169			490			691	
Entry Volume veh/h		59			166			480			677	
Circulating Flow (v_c), pc/h	706			449			146			46		
Exiting Flow (v_{ex}), pc/h	187			31			572			620		
Capacity (C_{pce}), pc/h		558			721			977			1079	
Capacity (c), veh/h		547			707			957			1058	
v/c Ratio (x)		0.11			0.23			0.50			0.64	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.9			7.8			10.0			12.4	
Lane LOS		A			A			A			B	
95% Queue, veh		0.4			0.9			2.9			4.8	
Approach Delay, s/veh	7.9			7.8			10.0			12.4		
Approach LOS	A			A			A			B		
Intersection Delay, s/veh LOS	10.8						B					

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	144	24	38	125	0	21	0	31	0	0	0
Future Volume (Veh/h)	0	144	24	38	125	0	21	0	31	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	157	26	41	136	0	23	0	34	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)	252											
pX, platoon unblocked												
vC, conflicting volume	136			183			388	388	170	422	401	136
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	136			183			388	388	170	422	401	136
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			96	100	96	100	100	100
cM capacity (veh/h)	1448			1392			558	531	874	509	522	913
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	183	177	57	0								
Volume Left	0	41	23	0								
Volume Right	26	0	34	0								
cSH	1448	1392	711	1700								
Volume to Capacity	0.00	0.03	0.08	0.00								
Queue Length 95th (ft)	0	2	7	0								
Control Delay (s)	0.0	2.0	10.5	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	2.0	10.5	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			31.0%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	63	15	4	45	1	26	0	11	1	0	1
Future Volume (Veh/h)	1	63	15	4	45	1	26	0	11	1	0	1
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	68	16	4	49	1	28	0	12	1	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	643											
pX, platoon unblocked												
vC, conflicting volume	50			84			136	136	76	148	144	50
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	50			84			136	136	76	148	144	50
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	99	100	100	100
cM capacity (veh/h)	1557			1513			832	752	985	809	745	1019
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	85	54	40	2								
Volume Left	1	4	28	1								
Volume Right	16	1	12	1								
cSH	1557	1513	872	902								
Volume to Capacity	0.00	0.00	0.05	0.00								
Queue Length 95th (ft)	0	0	4	0								
Control Delay (s)	0.1	0.6	9.3	9.0								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.1	0.6	9.3	9.0								
Approach LOS			A	A								
Intersection Summary												
Average Delay				2.4								
Intersection Capacity Utilization				14.9%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	37	106	15	37	132	15
Future Volume (vph)	37	106	15	37	132	15
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	115	16	40	143	16
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	155	56	159			
Volume Left (vph)	40	0	143			
Volume Right (vph)	115	40	0			
Hadj (s)	-0.36	-0.39	0.21			
Departure Headway (s)	4.0	4.0	4.5			
Degree Utilization, x	0.17	0.06	0.20			
Capacity (veh/h)	850	847	763			
Control Delay (s)	7.9	7.3	8.6			
Approach Delay (s)	7.9	7.3	8.6			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.1			
Level of Service			A			
Intersection Capacity Utilization			30.0%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	118	91	15	79	3	69	9	15	13	10	5
Future Volume (Veh/h)	3	118	91	15	79	3	69	9	15	13	10	5
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	128	99	16	86	3	75	10	16	14	11	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	576											
pX, platoon unblocked												
vC, conflicting volume	89			227			314	304	178	324	352	88
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			227			314	304	178	324	352	88
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			88	98	98	98	98	99
cM capacity (veh/h)	1506			1341			620	600	866	603	564	971
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	230	105	101	30								
Volume Left	3	16	75	14								
Volume Right	99	3	16	5								
cSH	1506	1341	647	627								
Volume to Capacity	0.00	0.01	0.16	0.05								
Queue Length 95th (ft)	0	1	14	4								
Control Delay (s)	0.1	1.3	11.6	11.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	1.3	11.6	11.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.6									
Intersection Capacity Utilization			28.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	139	9	6	86	2	2	2	17	1	3	1
Future Volume (Veh/h)	0	139	9	6	86	2	2	2	17	1	3	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	151	10	7	93	2	2	2	18	1	3	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
249												
pX, platoon unblocked												
vC, conflicting volume	95			161			266	265	156	283	269	94
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	95			161			266	265	156	283	269	94
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			100	100	98	100	100	100
cM capacity (veh/h)	1499			1418			680	637	890	652	634	963
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	161	102	22	5								
Volume Left	0	7	2	1								
Volume Right	10	2	18	1								
cSH	1499	1418	836	685								
Volume to Capacity	0.00	0.00	0.03	0.01								
Queue Length 95th (ft)	0	0	2	1								
Control Delay (s)	0.0	0.6	9.4	10.3								
Lane LOS		A	A	B								
Approach Delay (s)	0.0	0.6	9.4	10.3								
Approach LOS			A	B								
Intersection Summary												
Average Delay												
1.1												
Intersection Capacity Utilization												
19.6%												
ICU Level of Service												
A												
Analysis Period (min)												
15												

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2035
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Cassidy Street
E/W Street Name	Cassidy Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	64	89	55	0	74	41	23	0	69	316	43	0	54	346	13
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	71	99	61	0	82	45	26	0	76	350	48	0	60	384	14
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			4.9763	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		231			153			474			458	
Entry Volume veh/h		226			150			465			449	
Circulating Flow (v_c), pc/h	526			497			230			203		
Exiting Flow (v_{ex}), pc/h	207			135			447			527		
Capacity (C_{pce}), pc/h		668			687			898			1122	
Capacity (c), veh/h		655			674			880			1100	
v/c Ratio (x)		0.35			0.22			0.53			0.41	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		10.1			8.0			11.2			7.6	
Lane LOS		B			A			B			A	
95% Queue, veh		1.5			0.8			3.2			2.0	
Approach Delay, s/veh	10.1			8.0			11.2			7.6		
Approach LOS	B			A			B			A		
Intersection Delay, s/veh LOS	9.4						A					

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	116	28	33	66	13	11	27	28	10	23	19
Future Volume (Veh/h)	16	116	28	33	66	13	11	27	28	10	23	19
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	126	30	36	72	14	12	29	30	11	25	21
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		280										
pX, platoon unblocked												
vC, conflicting volume	86			156			360	333	141	370	341	79
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	86			156			360	333	141	370	341	79
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			97			98	95	97	98	96	98
cM capacity (veh/h)	1510			1424			548	566	907	530	560	981
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	173	122	71	57								
Volume Left	17	36	12	11								
Volume Right	30	14	30	21								
cSH	1510	1424	668	657								
Volume to Capacity	0.01	0.03	0.11	0.09								
Queue Length 95th (ft)	1	2	9	7								
Control Delay (s)	0.8	2.4	11.0	11.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.8	2.4	11.0	11.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.4									
Intersection Capacity Utilization			24.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Ditmar St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	62	14	8	38	2	11	22	19	11	11	7
Future Volume (vph)	5	62	14	8	38	2	11	22	19	11	11	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	67	15	9	41	2	12	24	21	12	12	8
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	87	52	57	32								
Volume Left (vph)	5	9	12	12								
Volume Right (vph)	15	2	21	8								
Hadj (s)	-0.06	0.05	-0.14	-0.04								
Departure Headway (s)	4.1	4.2	4.1	4.2								
Degree Utilization, x	0.10	0.06	0.06	0.04								
Capacity (veh/h)	856	828	842	819								
Control Delay (s)	7.5	7.5	7.4	7.4								
Approach Delay (s)	7.5	7.5	7.4	7.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.5								
Level of Service				A								
Intersection Capacity Utilization				14.9%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	5	108	4	26	49	15	4	45	108	114	8	5
Future Volume (vph)	5	108	4	26	49	15	4	45	108	114	8	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	5	117	4	28	53	16	4	49	117	124	9	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	126	97	170	138								
Volume Left (vph)	5	28	4	124								
Volume Right (vph)	4	16	117	5								
Hadj (s)	0.02	-0.01	-0.37	0.19								
Departure Headway (s)	4.8	4.8	4.3	4.8								
Degree Utilization, x	0.17	0.13	0.20	0.19								
Capacity (veh/h)	698	694	796	698								
Control Delay (s)	8.7	8.5	8.3	8.9								
Approach Delay (s)	8.7	8.5	8.3	8.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.6								
Level of Service				A								
Intersection Capacity Utilization				37.9%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	51	33	13	59	67
Future Volume (vph)	0	51	33	13	59	67
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	55	36	14	64	73
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	55	50	137			
Volume Left (vph)	0	0	64			
Volume Right (vph)	55	14	0			
Hadj (s)	-0.57	-0.13	0.13			
Departure Headway (s)	3.7	4.0	4.2			
Degree Utilization, x	0.06	0.06	0.16			
Capacity (veh/h)	914	869	845			
Control Delay (s)	7.0	7.2	8.0			
Approach Delay (s)	7.0	7.2	8.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.6			
Level of Service			A			
Intersection Capacity Utilization			16.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	121	40	256	49	216	29	213	122	183	300	6
Future Volume (vph)	15	121	40	256	49	216	29	213	122	183	300	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	16	16	16
Total Lost time (s)	5.0	5.0	5.0		4.9	4.9	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.95		1.00	1.00	
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2006	1863	1555		1788	1794	1770	3743		2006	3998	
Flt Permitted	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	2006	1863	1555		1788	1794	1770	3743		2006	3998	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	132	43	278	53	235	32	232	133	199	326	7
RTOR Reduction (vph)	0	0	39	0	0	156	0	94	0	0	2	0
Lane Group Flow (vph)	16	132	4	0	331	79	32	271	0	199	331	0
Confl. Peds. (#/hr)			2	2					5			
Confl. Bikes (#/hr)									4			
Turn Type	Split	NA	Perm	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	6.7	6.7	6.7		16.5	23.3	1.4	20.6		6.8	26.0	
Effective Green, g (s)	6.7	6.7	6.7		16.5	23.3	1.4	20.6		6.8	26.0	
Actuated g/C Ratio	0.10	0.10	0.10		0.24	0.33	0.02	0.30		0.10	0.37	
Clearance Time (s)	5.0	5.0	5.0		4.9		4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	192	179	149		423	599	35	1106		195	1491	
v/s Ratio Prot	0.01	c0.07			c0.19	0.04	0.02	0.07		c0.10	c0.08	
v/s Ratio Perm			0.00									
v/c Ratio	0.08	0.74	0.03		0.78	0.13	0.91	0.25		1.02	0.22	
Uniform Delay, d1	28.7	30.6	28.5		24.9	16.2	34.1	18.6		31.5	14.9	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	12.7	0.0		9.1	0.1	115.3	0.5		69.9	0.3	
Delay (s)	28.8	43.4	28.6		34.0	16.3	149.4	19.2		101.3	15.3	
Level of Service	C	D	C		C	B	F	B		F	B	
Approach Delay (s)		38.8			26.7			29.7			47.5	
Approach LOS		D			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			35.3									
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			69.7									
Intersection Capacity Utilization			62.5%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	434	5	16	646	50	0	0	27	28	0	30
Future Volume (Veh/h)	8	434	5	16	646	50	0	0	27	28	0	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	472	5	17	702	54	0	0	29	30	0	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage (veh)					2							
Upstream signal (ft)		312										
pX, platoon unblocked				0.94			0.94	0.94	0.94	0.94	0.94	
vC, conflicting volume	756			477			1288	1282	474	1284	1258	729
vC1, stage 1 conf vol							492	492		763	763	
vC2, stage 2 conf vol							796	790		522	495	
vCu, unblocked vol	756			412			1275	1269	409	1271	1243	729
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			100	100	95	91	100	92
cM capacity (veh/h)	855			1078			300	336	604	323	345	423
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	486	773	29	63								
Volume Left	9	17	0	30								
Volume Right	5	54	29	33								
cSH	855	1078	604	368								
Volume to Capacity	0.01	0.02	0.05	0.17								
Queue Length 95th (ft)	1	1	4	15								
Control Delay (s)	0.3	0.4	11.3	16.8								
Lane LOS	A	A	B	C								
Approach Delay (s)	0.3	0.4	11.3	16.8								
Approach LOS			B	C								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			62.3%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

07/02/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	11	539	12	36	848	28	12	5	78	33	5	17	
Future Volume (Veh/h)	11	539	12	36	848	28	12	5	78	33	5	17	
Sign Control	Free			Free			Stop			Stop			
Grade	0%			0%			0%			0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	12	586	13	39	922	30	13	5	85	36	5	18	
Pedestrians	1						1						
Lane Width (ft)	12.0						12.0						
Walking Speed (ft/s)	4.0						4.0						
Percent Blockage	0						0						
Right turn flare (veh)													
Median type	TWLTL			TWLTL									
Median storage veh	2			2									
Upstream signal (ft)	687												
pX, platoon unblocked				0.98			0.98			0.98	0.98	0.98	
vC, conflicting volume	952			600				1639	1648	594	1712	1639	938
vC1, stage 1 conf vol							618		618	1015		1015	
vC2, stage 2 conf vol							1022		1030	698		624	
vCu, unblocked vol	952			583				1642	1650	577	1716	1642	938
tC, single (s)	4.1			4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1		5.5	6.1		5.5	
tF (s)	2.2			2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			96				94	98	83	83	98	94
cM capacity (veh/h)	722			972				217	251	507	207	256	320
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1							
Volume Total	12	599	39	952	103	59							
Volume Left	12	0	39	0	13	36							
Volume Right	0	13	0	30	85	18							
cSH	722	1700	972	1700	416	237							
Volume to Capacity	0.02	0.35	0.04	0.56	0.25	0.25							
Queue Length 95th (ft)	1	0	3	0	24	24							
Control Delay (s)	10.1	0.0	8.9	0.0	16.5	25.2							
Lane LOS	B			A	C		D						
Approach Delay (s)	0.2			0.3	16.5		25.2						
Approach LOS					C	D							
Intersection Summary													
Average Delay				2.1									
Intersection Capacity Utilization				62.8%		ICU Level of Service			B				
Analysis Period (min)				15									

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	773	0	0	998	147	0	0	0	0	0	24
Future Volume (Veh/h)	31	773	0	0	998	147	0	0	0	0	0	24
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	34	840	0	0	1085	160	0	0	0	0	0	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL				TWLTL							
Median storage veh	2				2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1245			840			2019	2153	840	2073	2073	1165
vC1, stage 1 conf vol							908	908		1165	1165	
vC2, stage 2 conf vol							1111	1245		908	908	
vCu, unblocked vol	1245			840			2019	2153	840	2073	2073	1165
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			100			100	100	100	100	100	89
cM capacity (veh/h)	559			795			161	178	365	185	208	236
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	34	840	0	1245	0	26						
Volume Left	34	0	0	0	0	0						
Volume Right	0	0	0	160	0	26						
cSH	559	1700	1700	1700	1700	236						
Volume to Capacity	0.06	0.49	0.00	0.73	0.00	0.11						
Queue Length 95th (ft)	5	0	0	0	0	9						
Control Delay (s)	11.9	0.0	0.0	0.0	0.0	22.1						
Lane LOS	B				A	C						
Approach Delay (s)	0.5		0.0		0.0	22.1						
Approach LOS					A	C						
Intersection Summary												
Average Delay				0.5								
Intersection Capacity Utilization				71.4%	ICU Level of Service			C				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	82	0	0	70	35	306	28	50	692	12
Future Volume (Veh/h)	0	0	82	0	0	70	35	306	28	50	692	12
Sign Control	Stop			Stop				Free			Free	
Grade	0%			0%				0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	89	0	0	76	38	333	30	54	752	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL		TWLTL			
Median storage veh							2		2			
Upstream signal (ft)									621			
pX, platoon unblocked												
vC, conflicting volume	1185	1306	758	1373	1297	182	765			363		
vC1, stage 1 conf vol	866	866		424	424							
vC2, stage 2 conf vol	318	439		949	873							
vCu, unblocked vol	1185	1306	758	1373	1297	182	765			363		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	75	100	100	91	95			95		
cM capacity (veh/h)	272	307	349	155	287	830	844			1192		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	89	76	38	222	141	54	765					
Volume Left	0	0	38	0	0	54	0					
Volume Right	89	76	0	0	30	0	13					
cSH	349	830	844	1700	1700	1192	1700					
Volume to Capacity	0.25	0.09	0.05	0.13	0.08	0.05	0.45					
Queue Length 95th (ft)	25	8	4	0	0	4	0					
Control Delay (s)	18.8	9.8	9.5	0.0	0.0	8.2	0.0					
Lane LOS	C	A	A			A						
Approach Delay (s)	18.8	9.8	0.9			0.5						
Approach LOS	C	A										
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			48.9%	ICU Level of Service				A				
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Michigan Avenue
E/W Street Name	Michigan Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	84	13	36	0	45	15	8	0	22	234	6	0	6	230	27
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	93	14	40	0	50	17	9	0	24	259	7	0	7	255	30
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		147			76			290			292	
Entry Volume veh/h		144			75			284			286	
Circulating Flow (v_c), pc/h	312			376			114			91		
Exiting Flow (v_{ex}), pc/h	28			71			361			345		
Capacity (C_{pce}), pc/h		827			776			1008			1032	
Capacity (c), veh/h		811			761			988			1011	
v/c Ratio (x)		0.18			0.10			0.29			0.28	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.3			5.7			6.5			6.4	
Lane LOS		A			A			A			A	
95% Queue, veh		0.6			0.3			1.2			1.2	
Approach Delay, s/veh	6.3			5.7			6.5			6.4		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	6.4						A					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - West
E/W Street Name	West Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	16	9	18	0	20	9	18	0	18	132	20	0	18	132	16
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	18	10	20	0	22	10	20	0	20	146	22	0	20	146	18
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		48			52			188			184	
Entry Volume veh/h		47			51			184			180	
Circulating Flow (v_c), pc/h	188			184			48			52		
Exiting Flow (v_{ex}), pc/h	52			48			184			188		
Capacity (C_{pce}), pc/h		936			940			1077			1073	
Capacity (c), veh/h		918			922			1056			1052	
v/c Ratio (x)		0.05			0.06			0.17			0.17	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.4			4.4			5.0			5.0	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.2			0.6			0.6	
Approach Delay, s/veh	4.4			4.4			5.0			5.0		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	4.9						A					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Kelly
E/W Street Name	Kelly Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	14	21	13	0	15	12	96	0	5	154	14	0	88	146	30
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	16	23	14	0	17	13	106	0	6	171	16	0	98	162	33
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		53			136			193			293	
Entry Volume veh/h		52			133			189			287	
Circulating Flow (v_c), pc/h	277			193			137			36		
Exiting Flow (v_{ex}), pc/h	137			52			293			193		
Capacity (C_{pce}), pc/h		857			932			985			1090	
Capacity (c), veh/h		840			913			966			1069	
v/c Ratio (x)		0.06			0.15			0.20			0.27	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.9			5.3			5.6			5.9	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.5			0.7			1.1	
Approach Delay, s/veh	4.9			5.3			5.6			5.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	5.6						A					

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	150	6	32	7	66	8	22	737	18
Future Volume (veh/h)	0	0	0	150	6	32	7	66	8	22	737	18
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h				168	0	0	8	72	0	24	801	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				1328	0	593	148	1692	527	148	1178	527
Arrive On Green				0.36	0.00	0.00	0.08	0.32	0.00	0.08	0.32	0.00
Sat Flow, veh/h				3690	0	1647	1845	5289	1647	1845	3681	1647
Grp Volume(v), veh/h				168	0	0	8	72	0	24	801	0
Grp Sat Flow(s),veh/h/ln				1845	0	1647	1845	1763	1647	1845	1840	1647
Q Serve(g_s), s				1.5	0.0	0.0	0.2	0.5	0.0	0.6	9.5	0.0
Cycle Q Clear(g_c), s				1.5	0.0	0.0	0.2	0.5	0.0	0.6	9.5	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				1328	0	593	148	1692	527	148	1178	527
V/C Ratio(X)				0.13	0.00	0.00	0.05	0.04	0.00	0.16	0.68	0.00
Avail Cap(c_a), veh/h				1328	0	593	148	1692	527	148	1178	527
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				10.7	0.0	0.0	21.3	11.7	0.0	21.4	14.8	0.0
Incr Delay (d2), s/veh				0.2	0.0	0.0	0.7	0.0	0.0	2.4	3.2	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.8	0.0	0.0	0.1	0.2	0.0	0.4	5.3	0.0
LnGrp Delay(d),s/veh				10.9	0.0	0.0	21.9	11.8	0.0	23.8	18.0	0.0
LnGrp LOS				B			C	B		C	B	
Approach Vol, veh/h					168			80			825	
Approach Delay, s/veh					10.9			12.8			18.1	
Approach LOS					B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	8.0	20.0			8.0	20.0		22.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	16.0			4.0	16.0		18.0				
Max Q Clear Time (g_c+I1), s	2.6	2.5			2.2	11.5		3.5				
Green Ext Time (p_c), s	0.0	0.2			0.0	2.2		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				16.6								
HCM 2010 LOS				B								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↑	↰↱	↑↑					
Traffic Volume (veh/h)	531	188	479	1082	0	0			
Future Volume (veh/h)	531	188	479	1082	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937					
Adj Flow Rate, veh/h	577	204	521	1176					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	1840	823	1074	3313					
Arrive On Green	0.50	0.50	0.30	0.90					
Sat Flow, veh/h	3778	1647	3579	3778					
Grp Volume(v), veh/h	577	204	521	1176					
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840					
Q Serve(g_s), s	3.7	2.8	4.8	1.9					
Cycle Q Clear(g_c), s	3.7	2.8	4.8	1.9					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	1840	823	1074	3313					
V/C Ratio(X)	0.31	0.25	0.49	0.35					
Avail Cap(c_a), veh/h	1840	823	1074	3313					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	5.9	5.7	11.5	0.3					
Incr Delay (d2), s/veh	0.4	0.7	1.6	0.3					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	2.0	1.4	2.5	1.0					
LnGrp Delay(d),s/veh	6.4	6.4	13.0	0.6					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	781			1697					
Approach Delay, s/veh	6.4			4.4					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			16.0	24.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			12.0	20.0				36.0	
Max Q Clear Time (g_c+l1), s			6.8	5.7				3.9	
Green Ext Time (p_c), s			1.0	4.0				10.8	
Intersection Summary									
HCM 2010 Ctrl Delay			5.0						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/11/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑↑	↑	↑		
Traffic Volume (veh/h)	640	67	807	1970	67	1		
Future Volume (veh/h)	640	67	807	1970	67	1		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	696	73	877	2141	73	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	982	439	954	2208	492	439		
Arrive On Green	0.27	0.27	0.27	0.60	0.27	0.00		
Sat Flow, veh/h	3778	1647	3579	3778	1845	1647		
Grp Volume(v), veh/h	696	73	877	2141	73	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840	1845	1647		
Q Serve(g_s), s	10.3	2.0	14.3	33.4	1.8	0.0		
Cycle Q Clear(g_c), s	10.3	2.0	14.3	33.4	1.8	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	982	439	954	2208	492	439		
V/C Ratio(X)	0.71	0.17	0.92	0.97	0.15	0.00		
Avail Cap(c_a), veh/h	982	439	954	2208	492	439		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	19.9	16.9	21.4	11.5	16.8	0.0		
Incr Delay (d2), s/veh	4.3	0.8	15.1	13.2	0.6	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.8	1.0	8.9	20.4	1.0	0.0		
LnGrp Delay(d),s/veh	24.2	17.7	36.5	24.7	17.4	0.0		
LnGrp LOS	C	B	D	C	B			
Approach Vol, veh/h	769			3018	73			
Approach Delay, s/veh	23.6			28.1	17.4			
Approach LOS	C			C	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	20.0	20.0				40.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	16.0	16.0				36.0
Max Q Clear Time (g_c+I1), s		3.8	16.3	12.3				35.4
Green Ext Time (p_c), s		0.1	0.0	1.7				0.6
Intersection Summary								
HCM 2010 Ctrl Delay			27.0					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary
 51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	287	3	92	499	172	10	0	111	22	31	32
Future Volume (veh/h)	0	287	3	92	499	172	10	0	111	22	31	32
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1937	1976	1937	1937	1937	1937	0	1937	1937	1937	1937
Adj Flow Rate, veh/h	0	312	3	100	542	0	11	0	121	24	34	35
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1149	11	284	1982	887	0	0	0	568	596	507
Arrive On Green	0.00	0.31	0.31	0.15	0.54	0.00	0.00	0.00	0.00	0.31	0.31	0.31
Sat Flow, veh/h	0	3832	36	1845	3681	1647		0		1845	1937	1647
Grp Volume(v), veh/h	0	154	161	100	542	0		0.0		24	34	35
Grp Sat Flow(s),veh/h/ln	0	1840	1931	1845	1840	1647				1845	1937	1647
Q Serve(g_s), s	0.0	3.3	3.3	2.5	4.1	0.0				0.5	0.6	0.8
Cycle Q Clear(g_c), s	0.0	3.3	3.3	2.5	4.1	0.0				0.5	0.6	0.8
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	566	594	284	1982	887				568	596	507
V/C Ratio(X)	0.00	0.27	0.27	0.35	0.27	0.00				0.04	0.06	0.07
Avail Cap(c_a), veh/h	0	566	594	284	1982	887				568	596	507
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	13.6	13.6	19.7	6.5	0.0				12.6	12.7	12.7
Incr Delay (d2), s/veh	0.0	1.2	1.1	3.4	0.3	0.0				0.1	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.8	1.9	1.5	2.1	0.0				0.3	0.4	0.4
LnGrp Delay(d),s/veh	0.0	14.8	14.7	23.1	6.8	0.0				12.8	12.9	13.0
LnGrp LOS		B	B	C	A					B	B	B
Approach Vol, veh/h		315			642						93	
Approach Delay, s/veh		14.7			9.4						12.9	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			12.0	20.0		20.0		32.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			8.0	16.0		16.0		28.0				
Max Q Clear Time (g_c+I1), s			4.5	5.3		2.8		6.1				
Green Ext Time (p_c), s			0.1	1.3		0.2		3.7				
Intersection Summary												
HCM 2010 Ctrl Delay			11.3									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	230	465	5	9	612	355	10	10	19	138	2	57
Future Volume (veh/h)	230	465	5	9	612	355	10	10	19	138	2	57
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1976	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	250	505	5	10	665	386	11	11	21	107	62	62
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	158	960	10	105	841	376	216	216	376	422	203	203
Arrive On Green	0.09	0.26	0.26	0.06	0.23	0.23	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	3734	37	1845	3681	1647	945	945	1647	1845	890	890
Grp Volume(v), veh/h	250	249	261	10	665	386	22	0	21	107	0	124
Grp Sat Flow(s),veh/h/ln	1845	1840	1931	1845	1840	1647	1890	0	1647	1845	0	1780
Q Serve(g_s), s	6.0	8.1	8.1	0.4	11.9	16.0	0.6	0.0	0.7	3.3	0.0	4.0
Cycle Q Clear(g_c), s	6.0	8.1	8.1	0.4	11.9	16.0	0.6	0.0	0.7	3.3	0.0	4.0
Prop In Lane	1.00		0.02	1.00		1.00	0.50		1.00	1.00		0.50
Lane Grp Cap(c), veh/h	158	473	496	105	841	376	432	0	376	422	0	407
V/C Ratio(X)	1.58	0.53	0.53	0.09	0.79	1.03	0.05	0.00	0.06	0.25	0.00	0.30
Avail Cap(c_a), veh/h	158	473	496	105	841	376	432	0	376	422	0	407
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.0	22.3	22.3	31.3	25.4	27.0	21.1	0.0	21.1	22.1	0.0	22.4
Incr Delay (d2), s/veh	289.4	4.1	4.0	1.8	7.5	53.1	0.2	0.0	0.3	1.4	0.0	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	15.7	4.6	4.8	0.2	6.9	12.8	0.4	0.0	0.3	1.9	0.0	2.2
LnGrp Delay(d),s/veh	321.4	26.5	26.3	33.1	32.9	80.1	21.3	0.0	21.4	23.6	0.0	24.3
LnGrp LOS	F	C	C	C	C	F	C		C	C		C
Approach Vol, veh/h		760			1061			43			231	
Approach Delay, s/veh		123.4			50.1			21.3			24.0	
Approach LOS		F			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	8.0	22.0		20.0	10.0	20.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	4.0	18.0		16.0	6.0	16.0				
Max Q Clear Time (g_c+I1), s		2.7	2.4	10.1		6.0	8.0	18.0				
Green Ext Time (p_c), s		0.1	0.0	1.9		0.7	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				73.2								
HCM 2010 LOS				E								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Future Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	82	427	316	91	846	199	210	238	87	246	297	211
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	492	362	132	894	400	422	443	376	422	443	376
Arrive On Green	0.02	0.08	0.08	0.07	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	2026	1489	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	82	388	355	91	846	199	210	238	87	246	297	211
Grp Sat Flow(s),veh/h/ln	1845	1840	1674	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	3.1	14.6	14.7	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Cycle Q Clear(g_c), s	3.1	14.6	14.7	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Prop In Lane	1.00		0.89	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	132	447	407	132	894	400	422	443	376	422	443	376
V/C Ratio(X)	0.62	0.87	0.87	0.69	0.95	0.50	0.50	0.54	0.23	0.58	0.67	0.56
Avail Cap(c_a), veh/h	132	447	407	132	894	400	422	443	376	422	443	376
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	31.1	31.1	31.7	26.1	22.8	23.5	23.7	22.0	24.0	24.6	23.9
Incr Delay (d2), s/veh	20.1	19.8	22.1	25.7	19.6	4.4	4.2	4.6	1.4	5.8	7.9	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	9.9	9.3	2.7	10.4	3.8	4.0	4.6	1.5	4.9	6.2	4.2
LnGrp Delay(d),s/veh	53.4	50.8	53.2	57.5	45.7	27.2	27.7	28.4	23.4	29.8	32.5	29.8
LnGrp LOS	D	D	D	E	D	C	C	C	C	C	C	C
Approach Vol, veh/h		825			1136			535			754	
Approach Delay, s/veh		52.1			43.4			27.3			30.9	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	9.0	21.0		20.0	9.0	21.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	5.0	17.0		16.0	5.0	17.0				
Max Q Clear Time (g_c+I1), s		9.6	5.4	16.7		11.8	5.1	17.8				
Green Ext Time (p_c), s		1.3	0.0	0.2		1.4	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			40.0									
HCM 2010 LOS			D									
Notes												

Intersection

Intersection Delay, s/veh 7.7

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	86	7	16	65	39	2	5	6	0	0	0
Future Vol, veh/h	25	86	7	16	65	39	2	5	6	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	93	8	17	71	42	2	5	7	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.8	7.6	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	15%	21%	13%
Vol Thru, %	38%	73%	54%
Vol Right, %	46%	6%	33%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	13	118	120
LT Vol	2	25	16
Through Vol	5	86	65
RT Vol	6	7	39
Lane Flow Rate	14	128	130
Geometry Grp	1	1	1
Degree of Util (X)	0.017	0.145	0.141
Departure Headway (Hd)	4.232	4.064	3.887
Convergence, Y/N	Yes	Yes	Yes
Cap	851	881	920
Service Time	2.232	2.093	1.921
HCM Lane V/C Ratio	0.016	0.145	0.141
HCM Control Delay	7.3	7.8	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.5	0.5

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖						↖	↗
Traffic Vol, veh/h	0	148	69	50	59	0	0	0	0	17	0	55
Future Vol, veh/h	0	148	69	50	59	0	0	0	0	17	0	55
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	161	75	54	64	0	0	0	0	18	0	60
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	161	0	0				333	333	64
Stage 1	-	-	-	-	-	-				172	172	-
Stage 2	-	-	-	-	-	-				161	161	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1418	-	0				662	587	1000
Stage 1	0	-	-	-	-	0				858	756	-
Stage 2	0	-	-	-	-	0				868	765	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1418	-	-				636	0	1000
Mov Cap-2 Maneuver	-	-	-	-	-	-				636	0	-
Stage 1	-	-	-	-	-	-				825	0	-
Stage 2	-	-	-	-	-	-				868	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.5			9.3					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2						
Capacity (veh/h)	-	-	1418	-	636	1000						
HCM Lane V/C Ratio	-	-	0.038	-	0.029	0.06						
HCM Control Delay (s)	-	-	7.6	0	10.8	8.8						
HCM Lane LOS	-	-	A	A	B	A						
HCM 95th %tile Q(veh)	-	-	0.1	-	0.1	0.2						

HCM 2010 Signalized Intersection Summary

56: I-5 SB On/Off-Ramp & Vista Way

07/02/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑	↑	↑↑		
Traffic Volume (veh/h)	518	201	1018	1229	17	967		
Future Volume (veh/h)	518	201	1018	1229	17	967		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	563	0	1107	1336	18	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	883	395	1384	1317	394	618		
Arrive On Green	0.24	0.00	0.39	0.68	0.21	0.00		
Sat Flow, veh/h	3778	1647	3579	1937	1845	2898		
Grp Volume(v), veh/h	563	0	1107	1336	18	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1937	1845	1449		
Q Serve(g_s), s	10.3	0.0	20.6	51.0	0.6	0.0		
Cycle Q Clear(g_c), s	10.3	0.0	20.6	51.0	0.6	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	883	395	1384	1317	394	618		
V/C Ratio(X)	0.64	0.00	0.80	1.01	0.05	0.00		
Avail Cap(c_a), veh/h	883	395	1384	1317	394	618		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	25.6	0.0	20.4	12.0	23.4	0.0		
Incr Delay (d2), s/veh	3.5	0.0	4.9	28.4	0.2	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	5.7	0.0	11.1	36.7	0.3	0.0		
LnGrp Delay(d),s/veh	29.1	0.0	25.4	40.4	23.7	0.0		
LnGrp LOS	C		C	F	C			
Approach Vol, veh/h	563			2443	18			
Approach Delay, s/veh	29.1			33.6	23.7			
Approach LOS	C			C	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	33.0	22.0				55.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	29.0	18.0				51.0
Max Q Clear Time (g_c+I1), s		2.6	22.6	12.3				53.0
Green Ext Time (p_c), s		0.0	2.6	1.8				0.0
Intersection Summary								
HCM 2010 Ctrl Delay			32.7					
HCM 2010 LOS			C					

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	270	107	194	477	307	1656	215	37	179	119	73	77
Future Volume (vph)	270	107	194	477	307	1656	215	37	179	119	73	77
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3019	1441		1786	1583		1807	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3019	1441		1786	1583		1807	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	293	116	211	518	334	1800	234	40	195	129	79	84
RTOR Reduction (vph)	0	0	190	0	491	503	0	0	117	0	0	70
Lane Group Flow (vph)	293	116	21	518	743	397	0	274	78	0	208	14
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	16.9	9.8	9.8	33.7	28.2	28.2		21.2	21.2		17.0	17.0
Effective Green, g (s)	16.9	9.8	9.8	33.7	28.2	28.2		21.2	21.2		17.0	17.0
Actuated g/C Ratio	0.17	0.10	0.10	0.34	0.28	0.28		0.21	0.21		0.17	0.17
Clearance Time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	299	182	155	596	851	406		378	335		307	269
v/s Ratio Prot	0.17	0.06		c0.29	0.25			c0.15			c0.12	
v/s Ratio Perm			0.01			c0.28			0.05			0.01
v/c Ratio	0.98	0.64	0.13	0.87	0.98dr	0.98		0.72	0.23		0.68	0.05
Uniform Delay, d1	41.4	43.4	41.2	31.1	34.2	35.6		36.7	32.7		38.9	34.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	46.0	5.3	0.1	12.8	9.5	38.5		11.5	1.6		11.4	0.4
Delay (s)	87.3	48.7	41.4	43.9	43.7	74.1		48.2	34.3		50.3	35.1
Level of Service	F	D	D	D	D	E		D	C		D	D
Approach Delay (s)		64.5			54.1			42.4			46.0	
Approach LOS		E			D			D			D	

Intersection Summary

HCM 2000 Control Delay	53.7	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	108.1%	ICU Level of Service	G
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				LT				L			
Volume (V), veh/h	0	0	0	0	0	661	0	327	0	0	443	674	0	563	568	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	0	0	0	0	733	0	355	0	0	491	747	0	624	630	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			4.6453	4.3276			4.3276		4.6453	4.3276
Follow-Up Headway (s)		3.1858			2.6667	2.5352			2.5352		2.6667	2.5352

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		0		0	733	355		491	747	624	630	
Entry Volume veh/h		0		0	719	355		481	732	612	618	
Circulating Flow (v_c), pc/h	1987			491			624			733		
Exiting Flow (v_{ex}), pc/h	624			0			491			1363		
Capacity (C_{pce}), pc/h		155		859	935			835		688	762	
Capacity (c), veh/h		152		842	917			819		674	747	
v/c Ratio (x)		0.00		0.00	0.78			0.59		0.91	0.83	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		23.7		4.3	20.4	0.0		13.4	0.0	40.1	27.6	
Lane LOS		C		A	C	A		B	A	E	D	
95% Queue, veh		0.0		0.0	8.2			3.9		11.7	9.2	
Approach Delay, s/veh				13.7			5.3			33.8		
Approach LOS				B			A			D		
Intersection Delay, s/veh LOS	17.8						C					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	21	11	92	36	158	18	105	97	182	142	12
Future Volume (vph)	0	21	11	92	36	158	18	105	97	182	142	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	23	12	100	39	172	20	114	105	198	154	13
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	35	311	239	365								
Volume Left (vph)	0	100	20	198								
Volume Right (vph)	12	172	105	13								
Hadj (s)	-0.17	-0.23	-0.21	0.12								
Departure Headway (s)	6.0	5.3	5.3	5.4								
Degree Utilization, x	0.06	0.46	0.35	0.55								
Capacity (veh/h)	491	625	628	637								
Control Delay (s)	9.3	12.8	11.0	14.6								
Approach Delay (s)	9.3	12.8	11.0	14.6								
Approach LOS	A	B	B	B								
Intersection Summary												
Delay				12.9								
Level of Service				B								
Intersection Capacity Utilization				64.1%	ICU Level of Service	C						
Analysis Period (min)				15								

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Surfrider Way
E/W Street Name	Surfrider Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	1
Lane Assignment	LTR				LTR				LTR				LT			
Volume (V), veh/h	0	245	81	102	0	17	71	43	0	72	721	27	0	69	729	177
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	272	90	113	0	19	79	48	0	80	799	30	0	76	808	196
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929		4.5436	4.5436	
Follow-Up Headway (s)		3.1858			3.1858			3.1858		2.5352	2.5352	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		475			146			909		884	196	
Entry Volume veh/h		466			143			891		867	192	
Circulating Flow (v_c), pc/h	903			1151			438			178		
Exiting Flow (v_{ex}), pc/h	196			355			1119			940		
Capacity (C_{pce}), pc/h		458			357			729		1208	1208	
Capacity (c), veh/h		449			350			715		1184	1184	
v/c Ratio (x)		1.04			0.41			1.25		0.73	0.16	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		83.1			19.2			142.3		14.5	4.4	
Lane LOS		F			C			F		B	A	
95% Queue, veh		14.3			1.9			32.4		7.0	0.6	
Approach Delay, s/veh	83.1			19.2			142.3			12.7		
Approach LOS	F			C			F			B		
Intersection Delay, s/veh LOS	71.0						F					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Civic Center Drive
E/W Street Name	Civic Center Drive
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	36	38	32	0	36	45	76	0	27	730	65	0	42	762	30
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	40	42	35	0	40	50	84	0	30	809	72	0	47	845	33
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		117			174			911			925	
Entry Volume veh/h		115			171			893			907	
Circulating Flow (v_c), pc/h	932			879			129			120		
Exiting Flow (v_{ex}), pc/h	161			113			933			920		
Capacity (C_{pce}), pc/h		445			469			993			1002	
Capacity (c), veh/h		436			460			974			983	
v/c Ratio (x)		0.26			0.37			0.92			0.92	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		12.5			14.2			32.9			33.6	
Lane LOS		B			B			D			D	
95% Queue, veh		1.0			1.7			13.9			14.3	
Approach Delay, s/veh	12.5			14.2			32.9			33.6		
Approach LOS	B			B			D			D		
Intersection Delay, s/veh LOS	30.6						D					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	7/11/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Pier View Way
E/W Street Name	Pier View Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	72	27	79	0	4	27	10	0	60	810	9	0	5	810	136
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	80	30	88	0	4	30	11	0	67	898	10	0	6	898	151
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		198			45			975			1055	
Entry Volume veh/h		194			44			956			1034	
Circulating Flow (v_c), pc/h	908			1045			116			101		
Exiting Flow (v_{ex}), pc/h	46			248			989			990		
Capacity (C_{pce}), pc/h		456			397			1006			1021	
Capacity (c), veh/h		447			390			987			1001	
v/c Ratio (x)		0.43			0.11			0.97			1.03	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		16.3			11.0			42.0			57.5	
Lane LOS		C			B			E			F	
95% Queue, veh		2.2			0.4			17.1			21.9	
Approach Delay, s/veh	16.3			11.0			42.0			57.5		
Approach LOS	C			B			E			F		
Intersection Delay, s/veh LOS	46.4						E					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

07/02/2018

																	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR					
Lane Configurations																	
Sign Control	Stop			Stop				Stop			Stop						
Traffic Volume (vph)	15	8	117	57	8	14	40	405	27	14	364	12					
Future Volume (vph)	15	8	117	57	8	14	40	405	27	14	364	12					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92					
Hourly flow rate (vph)	16	9	127	62	9	15	43	440	29	15	396	13					
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2										
Volume Total (vph)	25	127	86	263	249	213	211										
Volume Left (vph)	16	0	62	43	0	15	0										
Volume Right (vph)	0	127	15	0	29	0	13										
Hadj (s)	0.35	-0.67	0.07	0.12	-0.05	0.07	-0.01										
Departure Headway (s)	7.3	6.2	7.0	6.0	5.8	6.0	5.9										
Degree Utilization, x	0.05	0.22	0.17	0.44	0.40	0.36	0.35										
Capacity (veh/h)	453	527	472	586	601	575	583										
Control Delay (s)	9.5	9.8	11.3	12.3	11.4	11.1	10.9										
Approach Delay (s)	9.7		11.3	11.9		11.0											
Approach LOS	A		B	B		B											
Intersection Summary																	
Delay			11.3														
Level of Service			B														
Intersection Capacity Utilization			45.2%		ICU Level of Service		A										
Analysis Period (min)			15														

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	284	100	186	197	73	218
Future Volume (vph)	284	100	186	197	73	218
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	309	109	202	214	79	237
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	309	109	416	316		
Volume Left (vph)	309	0	0	79		
Volume Right (vph)	0	109	214	0		
Hadj (s)	0.53	-0.67	-0.27	0.08		
Departure Headway (s)	7.1	5.8	5.5	6.0		
Degree Utilization, x	0.61	0.18	0.64	0.53		
Capacity (veh/h)	489	586	626	574		
Control Delay (s)	19.1	8.9	17.6	15.4		
Approach Delay (s)	16.4		17.6	15.4		
Approach LOS	C		C	C		
Intersection Summary						
Delay			16.6			
Level of Service			C			
Intersection Capacity Utilization			63.1%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	0	322	83	294	89	0	0	0	0	131	94
Future Volume (vph)	45	0	322	83	294	89	0	0	0	0	131	94
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5		4.5	4.5	4.5						4.5	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.97						0.94	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3416						3317	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3416						3317	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	49	0	350	90	320	97	0	0	0	0	142	102
RTOR Reduction (vph)	0	0	307	43	34	0	0	0	0	0	88	0
Lane Group Flow (vph)	49	0	43	47	383	0	0	0	0	0	156	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	7.3		7.3	31.2	31.2						8.0	
Effective Green, g (s)	7.3		7.3	31.2	31.2						8.0	
Actuated g/C Ratio	0.12		0.12	0.52	0.52						0.13	
Clearance Time (s)	4.5		4.5	4.5	4.5						4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	215		339	920	1776						442	
v/s Ratio Prot	c0.03		0.02	0.03	c0.11						c0.05	
v/s Ratio Perm												
v/c Ratio	0.23		0.13	0.05	0.22						0.35	
Uniform Delay, d1	23.8		23.5	7.1	7.8						23.6	
Progression Factor	1.00		1.00	1.00	1.00						1.00	
Incremental Delay, d2	0.5		0.2	0.1	0.3						0.5	
Delay (s)	24.3		23.7	7.2	8.1						24.1	
Level of Service	C		C	A	A						C	
Approach Delay (s)		23.8			7.9			0.0			24.1	
Approach LOS		C			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			16.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.24									
Actuated Cycle Length (s)			60.0			Sum of lost time (s)			13.5			
Intersection Capacity Utilization			33.7%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

07/02/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↶	↷	↰	↶			↷	↰
Traffic Volume (vph)	0	0	0	193	443	72	272	743	0	0	602	199
Future Volume (vph)	0	0	0	193	443	72	272	743	0	0	602	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	0.95
Frpb, ped/bikes				1.00	1.00	0.96	1.00	1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	3539	1519	1770	1863			1759	1454
Flt Permitted				0.95	1.00	1.00	0.12	1.00			1.00	1.00
Satd. Flow (perm)				1770	3539	1519	219	1863			1759	1454
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	210	482	78	296	808	0	0	654	216
RTOR Reduction (vph)	0	0	0	0	0	60	0	0	0	0	1	59
Lane Group Flow (vph)	0	0	0	210	482	18	296	808	0	0	675	135
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					6
Actuated Green, G (s)				18.0	18.0	18.0	48.4	48.4			29.0	29.0
Effective Green, g (s)				18.0	18.0	18.0	48.4	48.4			29.0	29.0
Actuated g/C Ratio				0.24	0.24	0.24	0.63	0.63			0.38	0.38
Clearance Time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				417	833	357	431	1180			667	551
v/s Ratio Prot				0.12	c0.14		0.13	c0.43			c0.38	
v/s Ratio Perm						0.01	0.31					0.09
v/c Ratio				0.50	0.58	0.05	0.69	0.68			1.01	0.25
Uniform Delay, d1				25.3	25.8	22.6	23.7	9.1			23.7	16.2
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				4.3	2.9	0.3	4.9	1.8			37.8	0.3
Delay (s)				29.6	28.8	22.9	28.6	10.9			61.5	16.5
Level of Service				C	C	C	C	B			E	B
Approach Delay (s)		0.0			28.4			15.6			51.4	
Approach LOS		A			C			B			D	
Intersection Summary												
HCM 2000 Control Delay			30.6									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.84									
Actuated Cycle Length (s)			76.4								15.0	Sum of lost time (s)
Intersection Capacity Utilization			78.4%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	145	0	132	715	295	16	83	317	411	55	22
Future Volume (vph)	19	145	0	132	715	295	16	83	317	411	55	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.97	
Satd. Flow (prot)	1770	3539		1770	3539	1583		1848	1583	1681	1688	
Flt Permitted	0.26	1.00		0.65	1.00	1.00		0.94	1.00	0.69	0.73	
Satd. Flow (perm)	488	3539		1214	3539	1583		1754	1583	1217	1275	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	158	0	143	777	321	17	90	345	447	60	24
RTOR Reduction (vph)	0	0	0	0	0	206	0	0	184	0	6	0
Lane Group Flow (vph)	21	158	0	143	777	115	0	107	161	259	266	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	20.1	20.1		19.7	19.7	19.7		25.7	25.7	25.7	25.7	
Effective Green, g (s)	20.1	20.1		19.7	19.7	19.7		25.7	25.7	25.7	25.7	
Actuated g/C Ratio	0.37	0.37		0.36	0.36	0.36		0.47	0.47	0.47	0.47	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	178	1293		434	1267	567		819	739	568	595	
v/s Ratio Prot		0.04			c0.22							
v/s Ratio Perm	0.04			0.12		0.07		0.06	0.10	c0.21	0.21	
v/c Ratio	0.12	0.12		0.33	0.61	0.20		0.13	0.22	0.46	0.45	
Uniform Delay, d1	11.6	11.6		12.8	14.5	12.2		8.3	8.7	9.9	9.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.1		0.5	0.9	0.2		0.3	0.7	2.6	2.4	
Delay (s)	12.0	11.6		13.4	15.4	12.4		8.6	9.4	12.5	12.3	
Level of Service	B	B		B	B	B		A	A	B	B	
Approach Delay (s)		11.7			14.4			9.2			12.4	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			12.8				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.52									
Actuated Cycle Length (s)			55.0				Sum of lost time (s)			9.6		
Intersection Capacity Utilization			55.1%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

07/02/2018

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↗	
Traffic Volume (veh/h)	281	16	25	58	26	32
Future Volume (Veh/h)	281	16	25	58	26	32
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	305	17	27	63	28	35
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				238		
pX, platoon unblocked						
vC, conflicting volume			322		430	314
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			322		430	314
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		95	95
cM capacity (veh/h)			1238		569	727
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	322	90	63			
Volume Left	0	27	28			
Volume Right	17	0	35			
cSH	1700	1238	647			
Volume to Capacity	0.19	0.02	0.10			
Queue Length 95th (ft)	0	2	8			
Control Delay (s)	0.0	2.5	11.2			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.5	11.2			
Approach LOS			B			
Intersection Summary						
Average Delay			2.0			
Intersection Capacity Utilization			33.6%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	368	210	234	0	0	0	97	492	145	155	422	120
Future Volume (vph)	368	210	234	0	0	0	97	492	145	155	422	120
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.94				1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1493				1770	1863	1552	1770	1863	1516
Flt Permitted	0.95	1.00	1.00				0.50	1.00	1.00	0.21	1.00	1.00
Satd. Flow (perm)	1770	1863	1493				929	1863	1552	383	1863	1516
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	400	228	254	0	0	0	105	535	158	168	459	130
RTOR Reduction (vph)	0	0	165	0	0	0	0	0	84	0	0	65
Lane Group Flow (vph)	400	228	89	0	0	0	105	535	74	168	459	65
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA	Perm				Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4					2	2		1	6	
Permitted Phases			4				2		2	6		6
Actuated Green, G (s)	21.0	21.0	21.0				23.0	23.0	23.0	30.2	30.2	30.2
Effective Green, g (s)	21.0	21.0	21.0				23.0	23.0	23.0	30.2	30.2	30.2
Actuated g/C Ratio	0.35	0.35	0.35				0.38	0.38	0.38	0.50	0.50	0.50
Clearance Time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0				4.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	619	652	522				356	714	594	266	937	763
v/s Ratio Prot	c0.23	0.12						c0.29		0.03	c0.25	
v/s Ratio Perm			0.06				0.11		0.05	0.28		0.04
v/c Ratio	0.65	0.35	0.17				0.29	0.75	0.12	0.63	0.49	0.09
Uniform Delay, d1	16.4	14.4	13.5				12.9	16.0	12.0	10.5	9.8	7.7
Progression Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.1	1.5	0.7				2.1	7.1	0.4	4.8	1.8	0.2
Delay (s)	21.5	15.9	14.2				15.0	23.1	12.4	15.3	11.7	8.0
Level of Service	C	B	B				B	C	B	B	B	A
Approach Delay (s)		18.0			0.0			19.9			11.8	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.7				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			12.8		
Intersection Capacity Utilization			65.5%				ICU Level of Service			C		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	16	530	35	0	0	0	0	10	35	30	28	0
Future Volume (Veh/h)	16	530	35	0	0	0	0	10	35	30	28	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	17	576	38	0	0	0	0	11	38	33	30	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	218											
pX, platoon unblocked												
vC, conflicting volume	0			614			644	629	307	366	648	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			614			644	629	307	366	648	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	97	94	94	92	100
cM capacity (veh/h)	1622			961			334	393	689	519	384	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	305	326	49	63								
Volume Left	17	0	0	33								
Volume Right	0	38	38	0								
cSH	1622	1700	590	444								
Volume to Capacity	0.01	0.19	0.08	0.14								
Queue Length 95th (ft)	1	0	7	12								
Control Delay (s)	0.5	0.0	11.7	14.4								
Lane LOS	A		B	B								
Approach Delay (s)	0.2		11.7	14.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			32.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	37	1148	24	0	0	0	0	13	31	56	49	0
Future Volume (vph)	37	1148	24	0	0	0	0	13	31	56	49	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	40	1248	26	0	0	0	0	14	34	61	53	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	664	650	48	114								
Volume Left (vph)	40	0	0	61								
Volume Right (vph)	0	26	34	0								
Hadj (s)	0.06	0.01	-0.39	0.14								
Departure Headway (s)	5.1	5.0	5.6	6.0								
Degree Utilization, x	0.93	0.90	0.08	0.19								
Capacity (veh/h)	702	714	628	586								
Control Delay (s)	40.6	35.3	9.1	10.5								
Approach Delay (s)	38.0		9.1	10.5								
Approach LOS	E		A	B								
Intersection Summary												
Delay			34.9									
Level of Service			D									
Intersection Capacity Utilization			52.6%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

07/02/2018

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	271	479	13	42	0	20	0	19	12	0	0	0								
Future Volume (vph)	271	479	13	42	0	20	0	19	12	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	295	521	14	46	0	22	0	21	13	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	295	535	68	34																
Volume Left (vph)	295	0	46	0																
Volume Right (vph)	0	14	22	13																
Hadj (s)	0.53	0.02	-0.02	-0.20																
Departure Headway (s)	5.2	4.7	4.7	5.4																
Degree Utilization, x	0.42	0.69	0.09	0.05																
Capacity (veh/h)	690	767	737	623																
Control Delay (s)	10.8	16.3	8.2	8.7																
Approach Delay (s)	14.3		8.2	8.7																
Approach LOS	B		A	A																
Intersection Summary																				
Delay			13.7																	
Level of Service			B																	
Intersection Capacity Utilization			42.9%	ICU Level of Service					A											
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	38	0	0	31	17	576	45	22	527	18
Future Volume (Veh/h)	0	0	38	0	0	31	17	576	45	22	527	18
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	41	0	0	34	18	626	49	24	573	20
Pedestrians	7				7							
Lane Width (ft)	12.0				16.0							
Walking Speed (ft/s)	4.0				4.0							
Percent Blockage	1				1							
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			455		
pX, platoon unblocked	0.87	0.87	0.83	0.87	0.87	0.92	0.83				0.92	
vC, conflicting volume	1334	1356	590	1356	1342	658	600				682	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1106	1132	399	1131	1115	587	411				613	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	92	100	100	93	98				97	
cM capacity (veh/h)	143	166	535	137	169	467	943				884	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	41	34	18	675	24	593						
Volume Left	0	0	18	0	24	0						
Volume Right	41	34	0	49	0	20						
cSH	535	467	943	1700	884	1700						
Volume to Capacity	0.08	0.07	0.02	0.40	0.03	0.35						
Queue Length 95th (ft)	6	6	1	0	2	0						
Control Delay (s)	12.3	13.3	8.9	0.0	9.2	0.0						
Lane LOS	B	B	A			A						
Approach Delay (s)	12.3	13.3	0.2			0.4						
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			43.1%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Washington Avenue
E/W Street Name	Washington Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	14	0	71	0	45	10	13	0	46	577	20	0	25	524	61
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	16	0	79	0	50	11	14	0	51	640	22	0	28	581	68
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		95			75			713			677	
Entry Volume veh/h		93			74			699			664	
Circulating Flow (v_c), pc/h	659			707			44			112		
Exiting Flow (v_{ex}), pc/h	50			130			670			710		
Capacity (C_{pce}), pc/h		585			557			1081			1010	
Capacity (c), veh/h		573			546			1060			990	
v/c Ratio (x)		0.16			0.13			0.66			0.67	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		8.3			8.3			13.0			14.0	
Lane LOS		A			A			B			B	
95% Queue, veh		0.6			0.5			5.2			5.4	
Approach Delay, s/veh	8.3			8.3			13.0			14.0		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh LOS	12.9						B					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	49	76	31	91	6	137	4	287	73	163	177	3
Future Volume (vph)	49	76	31	91	6	137	4	287	73	163	177	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	83	34	99	7	149	4	312	79	177	192	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	170	255	395	372								
Volume Left (vph)	53	99	4	177								
Volume Right (vph)	34	149	79	3								
Hadj (s)	-0.02	-0.24	-0.08	0.12								
Departure Headway (s)	7.0	6.5	6.1	6.3								
Degree Utilization, x	0.33	0.46	0.67	0.65								
Capacity (veh/h)	431	485	559	532								
Control Delay (s)	13.3	14.9	20.4	20.4								
Approach Delay (s)	13.3	14.9	20.4	20.4								
Approach LOS	B	B	C	C								
Intersection Summary												
Delay				18.2								
Level of Service				C								
Intersection Capacity Utilization				68.1%	ICU Level of Service		C					
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	334	48	21	233	38	45	70	71	30	94	15
Future Volume (Veh/h)	13	334	48	21	233	38	45	70	71	30	94	15
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	363	52	23	253	41	49	76	77	33	102	16
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked	0.98						0.98	0.98		0.98	0.98	0.98
vC, conflicting volume	308			422			812	778	396	866	784	288
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	280			422			795	761	396	850	766	260
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			76	76	88	82	67	98
cM capacity (veh/h)	1239			1131			208	312	650	187	309	751
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	429	317	202	151								
Volume Left	14	23	49	33								
Volume Right	52	41	77	16								
cSH	1239	1131	338	286								
Volume to Capacity	0.01	0.02	0.60	0.53								
Queue Length 95th (ft)	1	2	92	72								
Control Delay (s)	0.4	0.8	30.3	30.8								
Lane LOS	A	A	D	D								
Approach Delay (s)	0.4	0.8	30.3	30.8								
Approach LOS			D	D								
Intersection Summary												
Average Delay			10.2									
Intersection Capacity Utilization			45.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Wisconsin Avenue
E/W Street Name	Wisconsin Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	101	124	179	0	118	99	21	0	157	568	128	0	23	568	50
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	112	137	198	0	131	110	23	0	174	630	142	0	26	630	55
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		447			264			946			711	
Entry Volume veh/h		438			259			927			697	
Circulating Flow (v_c), pc/h	787			916			275			415		
Exiting Flow (v_{ex}), pc/h	305			339			765			959		
Capacity (C_{pce}), pc/h		514			452			858			746	
Capacity (c), veh/h		504			443			841			732	
v/c Ratio (x)		0.87			0.58			1.10			0.95	

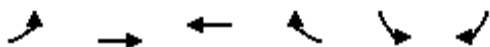
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		42.5			21.8			83.7			46.2	
Lane LOS		E			C			F			E	
95% Queue, veh		9.3			3.6			24.8			14.2	
Approach Delay, s/veh	42.5			21.8			83.7			46.2		
Approach LOS	E			C			F			E		
Intersection Delay, s/veh LOS	57.8						F					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

07/02/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	433	322	23	34	36
Future Volume (Veh/h)	8	433	322	23	34	36
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	471	350	25	37	39
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	383				860	372
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	383				860	372
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				88	94
cM capacity (veh/h)	1168				321	669
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	480	375	76			
Volume Left	9	0	37			
Volume Right	0	25	39			
cSH	1168	1700	438			
Volume to Capacity	0.01	0.22	0.17			
Queue Length 95th (ft)	1	0	16			
Control Delay (s)	0.2	0.0	14.9			
Lane LOS	A		B			
Approach Delay (s)	0.2	0.0	14.9			
Approach LOS			B			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			40.3%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	443	4	2	296	27	2	1	3	41	0	33
Future Volume (Veh/h)	24	443	4	2	296	27	2	1	3	41	0	33
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	482	4	2	322	29	2	1	3	45	0	36
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	353			486			914	893	484	882	880	340
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	353			486			914	893	484	882	880	340
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			99	100	99	83	100	95
cM capacity (veh/h)	1204			1077			236	274	583	259	278	700
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	512	353	6	81								
Volume Left	26	2	2	45								
Volume Right	4	29	3	36								
cSH	1204	1077	347	360								
Volume to Capacity	0.02	0.00	0.02	0.23								
Queue Length 95th (ft)	2	0	1	21								
Control Delay (s)	0.6	0.1	15.6	17.9								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.6	0.1	15.6	17.9								
Approach LOS			C	C								
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			54.6%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	265	266	80	192	0	158	0	111	0	0	0
Future Volume (vph)	0	265	266	80	192	0	158	0	111	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	288	289	87	209	0	172	0	121	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	577	296	293	0								
Volume Left (vph)	0	87	172	0								
Volume Right (vph)	289	0	121	0								
Hadj (s)	-0.27	0.09	-0.10	0.00								
Departure Headway (s)	5.1	5.8	6.0	7.0								
Degree Utilization, x	0.82	0.48	0.49	0.00								
Capacity (veh/h)	690	589	560	444								
Control Delay (s)	26.5	14.0	14.7	10.0								
Approach Delay (s)	26.5	14.0	14.7	0.0								
Approach LOS	D	B	B	A								
Intersection Summary												
Delay				20.4								
Level of Service				C								
Intersection Capacity Utilization				76.0%	ICU Level of Service	D						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	69	135	219	101	98	214
Future Volume (vph)	69	135	219	101	98	214
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	75	147	238	110	107	233
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	222	348	340			
Volume Left (vph)	75	0	107			
Volume Right (vph)	147	110	0			
Hadj (s)	-0.30	-0.16	0.10			
Departure Headway (s)	5.2	4.8	5.1			
Degree Utilization, x	0.32	0.47	0.48			
Capacity (veh/h)	622	715	679			
Control Delay (s)	10.7	12.0	12.6			
Approach Delay (s)	10.7	12.0	12.6			
Approach LOS	B	B	B			
Intersection Summary						
Delay			11.9			
Level of Service			B			
Intersection Capacity Utilization			56.5%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	358	21	20	296	77	29	46	38	84	28	23
Future Volume (Veh/h)	15	358	21	20	296	77	29	46	38	84	28	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	389	23	22	322	84	32	50	41	91	30	25
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	213											
pX, platoon unblocked	0.87							0.87	0.87			
vC, conflicting volume	409				423				896	896	420	918
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	242				423				803	804	420	828
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1
tC, 2 stage (s)												
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5
p0 queue free %	99				98				86	81	93	53
cM capacity (veh/h)	1146				1126				221	262	624	192
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	428	428	123	146								
Volume Left	16	22	32	91								
Volume Right	23	84	41	25								
cSH	1146	1126	307	237								
Volume to Capacity	0.01	0.02	0.40	0.62								
Queue Length 95th (ft)	1	1	46	91								
Control Delay (s)	0.5	0.6	24.4	42.0								
Lane LOS	A	A	C	E								
Approach Delay (s)	0.5	0.6	24.4	42.0								
Approach LOS				C	E							
Intersection Summary												
Average Delay				8.5								
Intersection Capacity Utilization				49.3%	ICU Level of Service				A			
Analysis Period (min)				15								

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Oceanside Blvd
E/W Street Name	Oceanside Boulevard
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	56	218	87	0	261	212	218	0	92	646	168	0	225	549	30
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	62	242	96	0	289	235	242	0	102	716	186	0	249	609	33
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		400			766			1004			891	
Entry Volume veh/h		392			751			984			874	
Circulating Flow (v_c), pc/h	1147			880			553			626		
Exiting Flow (v_{ex}), pc/h	677			370			1020			994		
Capacity (C_{pce}), pc/h		359			469			650			604	
Capacity (c), veh/h		352			460			637			592	
v/c Ratio (x)		1.11			1.63			1.54			1.47	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		117.1			317.2			270.8			242.1	
Lane LOS		F			F			F			F	
95% Queue, veh		14.9			43.0			50.7			42.8	
Approach Delay, s/veh	117.1			317.2			270.8			242.1		
Approach LOS	F			F			F			F		
Intersection Delay, s/veh LOS	254.0						F					

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	606	6	22	674	178	9	16	57	333	13	82
Future Volume (vph)	41	606	6	22	674	178	9	16	57	333	13	82
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.97			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1770	3532		1761	3418			3119			1776	1527
Flt Permitted	0.21	1.00		0.32	1.00			0.92			0.67	1.00
Satd. Flow (perm)	382	3532		584	3418			2876			1241	1527
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	659	7	24	733	193	10	17	62	362	14	89
RTOR Reduction (vph)	0	1	0	0	48	0	0	33	0	0	0	47
Lane Group Flow (vph)	45	665	0	24	878	0	0	56	0	0	376	42
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	19.5	19.5		19.5	19.5			26.0			26.0	26.0
Effective Green, g (s)	19.5	19.5		19.5	19.5			26.0			26.0	26.0
Actuated g/C Ratio	0.35	0.35		0.35	0.35			0.47			0.47	0.47
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	135	1252		207	1211			1359			586	721
v/s Ratio Prot		0.19			c0.26							
v/s Ratio Perm	0.12			0.04				0.02			c0.30	0.03
v/c Ratio	0.33	0.53		0.12	0.73			0.04			0.64	0.06
Uniform Delay, d1	13.0	14.1		11.9	15.4			7.8			11.0	7.9
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	1.5	0.4		0.3	2.2			0.1			5.3	0.2
Delay (s)	14.5	14.5		12.2	17.6			7.9			16.3	8.0
Level of Service	B	B		B	B			A			B	A
Approach Delay (s)		14.5			17.5			7.9			14.7	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			15.6			HCM 2000 Level of Service			B			
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			55.0		Sum of lost time (s)				9.5			
Intersection Capacity Utilization			71.4%		ICU Level of Service				C			
Analysis Period (min)			15									
c Critical Lane Group												

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2035
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Morse Street
E/W Street Name	Morse Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	42	16	15	0	56	16	190	0	20	846	103	0	243	881	19
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	47	18	17	0	62	18	211	0	22	938	114	0	269	977	21
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		82			291			1074			1267	
Entry Volume veh/h		80			285			1053			1242	
Circulating Flow (v_c), pc/h	1308			1007			334			102		
Exiting Flow (v_{ex}), pc/h	401			61			1196			1056		
Capacity (C_{pce}), pc/h		306			413			809			1020	
Capacity (c), veh/h		300			405			793			1000	
v/c Ratio (x)		0.27			0.70			1.33			1.24	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		17.7			31.1			173.4			133.4	
Lane LOS		C			D			F			F	
95% Queue, veh		1.1			5.3			41.9			41.5	
Approach Delay, s/veh	17.7			31.1			173.4			133.4		
Approach LOS	C			D			F			F		
Intersection Delay, s/veh LOS	134.8						F					

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

07/02/2018

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (veh/h)	0	325	35	38	197	0	77	0	65	0	0	0		
Future Volume (Veh/h)	0	325	35	38	197	0	77	0	65	0	0	0		
Sign Control		Free			Free			Stop			Stop			
Grade		0%			0%			0%			0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	0	353	38	41	214	0	84	0	71	0	0	0		
Pedestrians														
Lane Width (ft)														
Walking Speed (ft/s)														
Percent Blockage														
Right turn flare (veh)														
Median type	None				None									
Median storage (veh)														
Upstream signal (ft)	252													
pX, platoon unblocked														
vC, conflicting volume	214				391				668	668	372	739	687	214
vC1, stage 1 conf vol														
vC2, stage 2 conf vol														
vCu, unblocked vol	214				391				668	668	372	739	687	214
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)														
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100				96				77	100	89	100	100	100
cM capacity (veh/h)	1356				1168				362	366	674	290	357	826
Direction, Lane #	EB 1	WB 1	NB 1	SB 1										
Volume Total	391	255	155	0										
Volume Left	0	41	84	0										
Volume Right	38	0	71	0										
cSH	1356	1168	459	1700										
Volume to Capacity	0.00	0.04	0.34	0.00										
Queue Length 95th (ft)	0	3	37	0										
Control Delay (s)	0.0	1.6	16.8	0.0										
Lane LOS		A	C	A										
Approach Delay (s)	0.0	1.6	16.8	0.0										
Approach LOS			C	A										
Intersection Summary														
Average Delay				3.8										
Intersection Capacity Utilization				49.9%	ICU Level of Service				A					
Analysis Period (min)				15										

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	170	59	0	66	0	59	1	18	0	0	0
Future Volume (Veh/h)	0	170	59	0	66	0	59	1	18	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	185	64	0	72	0	64	1	20	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	643											
pX, platoon unblocked												
vC, conflicting volume	72			249			289	289	217	310	321	72
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	72			249			289	289	217	310	321	72
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			90	100	98	100	100	100
cM capacity (veh/h)	1528			1317			663	621	823	627	596	990
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	249	72	85	0								
Volume Left	0	0	64	0								
Volume Right	64	0	20	0								
cSH	1528	1317	694	1700								
Volume to Capacity	0.00	0.00	0.12	0.00								
Queue Length 95th (ft)	0	0	10	0								
Control Delay (s)	0.0	0.0	10.9	0.0								
Lane LOS			B	A								
Approach Delay (s)	0.0	0.0	10.9	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay	2.3											
Intersection Capacity Utilization	23.6%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	85	302	27	48	361	27
Future Volume (vph)	85	302	27	48	361	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	92	328	29	52	392	29
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	420	81	421			
Volume Left (vph)	92	0	392			
Volume Right (vph)	328	52	0			
Hadj (s)	-0.39	-0.35	0.22			
Departure Headway (s)	4.9	5.3	5.4			
Degree Utilization, x	0.57	0.12	0.63			
Capacity (veh/h)	702	608	646			
Control Delay (s)	14.2	9.1	17.0			
Approach Delay (s)	14.2	9.1	17.0			
Approach LOS	B	A	C			
Intersection Summary						
Delay			15.0			
Level of Service			B			
Intersection Capacity Utilization			58.1%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	238	124	17	186	15	169	19	22	4	14	23
Future Volume (Veh/h)	9	238	124	17	186	15	169	19	22	4	14	23
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	259	135	18	202	16	184	21	24	4	15	25
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)					576							
pX, platoon unblocked												
vC, conflicting volume	218			394			625	600	326	627	660	210
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	218			394			625	600	326	627	660	210
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			50	95	97	99	96	97
cM capacity (veh/h)	1352			1165			367	405	715	361	374	830
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	404	236	229	44								
Volume Left	10	18	184	4								
Volume Right	135	16	24	25								
cSH	1352	1165	390	542								
Volume to Capacity	0.01	0.02	0.59	0.08								
Queue Length 95th (ft)	1	1	90	7								
Control Delay (s)	0.3	0.8	26.5	12.2								
Lane LOS	A	A	D	B								
Approach Delay (s)	0.3	0.8	26.5	12.2								
Approach LOS			D	B								
Intersection Summary												
Average Delay	7.5											
Intersection Capacity Utilization	47.4%				ICU Level of Service				A			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	249	6	18	207	5	4	4	17	2	2	1
Future Volume (Veh/h)	1	249	6	18	207	5	4	4	17	2	2	1
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	271	7	20	225	5	4	4	18	2	2	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	249											
pX, platoon unblocked												
vC, conflicting volume	230			278			546	546	274	564	548	228
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	230			278			546	546	274	564	548	228
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			99	99	98	100	100	100
cM capacity (veh/h)	1338			1285			441	438	764	418	437	812
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	279	250	26	5								
Volume Left	1	20	4	2								
Volume Right	7	5	18	1								
cSH	1338	1285	622	472								
Volume to Capacity	0.00	0.02	0.04	0.01								
Queue Length 95th (ft)	0	1	3	1								
Control Delay (s)	0.0	0.8	11.0	12.7								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.0	0.8	11.0	12.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.0									
Intersection Capacity Utilization			34.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2035
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Cassidy Street
E/W Street Name	Cassidy Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	135	152	129	0	125	88	31	0	142	817	99	0	123	648	50
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	150	169	143	0	139	98	34	0	157	906	110	0	136	718	55
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			4.9763	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			2.6087	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		462			271			1173			909	
Entry Volume veh/h		453			266			1150			891	
Circulating Flow (v_c), pc/h	993			1213			455			394		
Exiting Flow (v_{ex}), pc/h	415			310			1090			1000		
Capacity (C_{pce}), pc/h		419			336			717			923	
Capacity (c), veh/h		410			329			703			905	
v/c Ratio (x)		1.10			0.81			1.64			0.98	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		107.1			48.0			309.0			47.5	
Lane LOS		F			E			F			E	
95% Queue, veh		16.0			6.8			62.8			17.4	
Approach Delay, s/veh	107.1			48.0			309.0			47.5		
Approach LOS	F			E			F			E		
Intersection Delay, s/veh LOS	166.3						F					

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	222	74	72	100	13	85	82	33	21	32	24
Future Volume (Veh/h)	24	222	74	72	100	13	85	82	33	21	32	24
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	241	80	78	109	14	92	89	36	23	35	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		280										
pX, platoon unblocked												
vC, conflicting volume	123			321			648	612	281	686	645	116
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	123			321			648	612	281	686	645	116
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			94			72	76	95	91	90	97
cM capacity (veh/h)	1464			1239			324	376	758	265	360	936
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	347	201	217	84								
Volume Left	26	78	92	23								
Volume Right	80	14	36	26								
cSH	1464	1239	382	397								
Volume to Capacity	0.02	0.06	0.57	0.21								
Queue Length 95th (ft)	1	5	85	20								
Control Delay (s)	0.7	3.5	26.1	16.5								
Lane LOS	A	A	D	C								
Approach Delay (s)	0.7	3.5	26.1	16.5								
Approach LOS			D	C								
Intersection Summary												
Average Delay			9.4									
Intersection Capacity Utilization			55.2%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Ditmar St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	102	25	30	48	7	33	63	30	9	27	14
Future Volume (vph)	20	102	25	30	48	7	33	63	30	9	27	14
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	111	27	33	52	8	36	68	33	10	29	15
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	160	93	137	54								
Volume Left (vph)	22	33	36	10								
Volume Right (vph)	27	8	33	15								
Hadj (s)	-0.04	0.05	-0.06	-0.10								
Departure Headway (s)	4.4	4.6	4.5	4.6								
Degree Utilization, x	0.20	0.12	0.17	0.07								
Capacity (veh/h)	777	737	754	730								
Control Delay (s)	8.5	8.2	8.4	7.9								
Approach Delay (s)	8.5	8.2	8.4	7.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			8.3									
Level of Service			A									
Intersection Capacity Utilization			27.1%	ICU Level of Service		A						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	18	167	16	84	72	40	16	110	189	77	23	4
Future Volume (vph)	18	167	16	84	72	40	16	110	189	77	23	4
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	182	17	91	78	43	17	120	205	84	25	4
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	219	212	342	113								
Volume Left (vph)	20	91	17	84								
Volume Right (vph)	17	43	205	4								
Hadj (s)	0.01	0.00	-0.32	0.16								
Departure Headway (s)	5.5	5.5	5.0	5.8								
Degree Utilization, x	0.33	0.32	0.47	0.18								
Capacity (veh/h)	599	598	670	546								
Control Delay (s)	11.2	11.1	12.4	10.1								
Approach Delay (s)	11.2	11.1	12.4	10.1								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay				11.5								
Level of Service				B								
Intersection Capacity Utilization				58.9%	ICU Level of Service	B						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	116	138	9	76	52
Future Volume (vph)	0	116	138	9	76	52
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	126	150	10	83	57
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	126	160	140			
Volume Left (vph)	0	0	83			
Volume Right (vph)	126	10	0			
Hadj (s)	-0.57	0.00	0.15			
Departure Headway (s)	4.0	4.3	4.5			
Degree Utilization, x	0.14	0.19	0.17			
Capacity (veh/h)	829	801	765			
Control Delay (s)	7.7	8.4	8.4			
Approach Delay (s)	7.7	8.4	8.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.2			
Level of Service			A			
Intersection Capacity Utilization			21.7%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	23	154	50	238	122	409	56	743	316	342	624	28
Future Volume (vph)	23	154	50	238	122	409	56	743	316	342	624	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	16	16	16
Total Lost time (s)	5.0	5.0	5.0		4.9	4.9	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2006	1863	1556		1803	1794	1770	3785		2006	3986	
Flt Permitted	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	2006	1863	1556		1803	1794	1770	3785		2006	3986	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	25	167	54	259	133	445	61	808	343	372	678	30
RTOR Reduction (vph)	0	0	48	0	0	192	0	42	0	0	3	0
Lane Group Flow (vph)	25	167	6	0	392	253	61	1109	0	372	705	0
Confl. Peds. (#/hr)			2	2					5			
Confl. Bikes (#/hr)									4			
Turn Type	Split	NA	Perm	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	12.1	12.1	12.1		24.1	44.9	7.0	30.0		20.8	43.8	
Effective Green, g (s)	12.1	12.1	12.1		24.1	44.9	7.0	30.0		20.8	43.8	
Actuated g/C Ratio	0.11	0.11	0.11		0.23	0.42	0.07	0.28		0.20	0.41	
Clearance Time (s)	5.0	5.0	5.0		4.9		4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	228	212	177		409	759	116	1070		393	1645	
v/s Ratio Prot	0.01	c0.09			c0.22	0.14	0.03	c0.29		c0.19	0.18	
v/s Ratio Perm			0.00									
v/c Ratio	0.11	0.79	0.03		0.96	0.33	0.53	1.04		0.95	0.43	
Uniform Delay, d1	42.2	45.7	41.8		40.5	20.5	47.9	38.0		42.1	22.2	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	16.2	0.0		33.5	0.3	2.0	37.3		31.7	0.8	
Delay (s)	42.2	61.9	41.8		74.0	20.8	49.9	75.3		73.8	23.0	
Level of Service	D		D		E	C	D	E		E	C	
Approach Delay (s)		55.5			45.7			74.1			40.5	
Approach LOS		E			D			E			D	
Intersection Summary												
HCM 2000 Control Delay			54.9									
HCM 2000 Volume to Capacity ratio			0.96									
Actuated Cycle Length (s)			106.1									
Intersection Capacity Utilization			93.4%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	893	32	43	859	77	21	0	43	36	14	81
Future Volume (Veh/h)	13	893	32	43	859	77	21	0	43	36	14	81
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	971	35	47	934	84	23	0	47	39	15	88
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage (veh)					2							
Upstream signal (ft)		312										
pX, platoon unblocked				0.91			0.91	0.91	0.91	0.91	0.91	
vC, conflicting volume	1018			1006			2182	2128	988	2134	2104	976
vC1, stage 1 conf vol							1016	1016		1070	1070	
vC2, stage 2 conf vol							1166	1112		1064	1034	
vCu, unblocked vol	1018			960			2246	2187	941	2193	2160	976
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			93			80	100	84	71	92	71
cM capacity (veh/h)	682			656			116	188	292	135	181	305
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	1020	1065	70	142								
Volume Left	14	47	23	39								
Volume Right	35	84	47	88								
cSH	682	656	195	215								
Volume to Capacity	0.02	0.07	0.36	0.66								
Queue Length 95th (ft)	2	6	38	101								
Control Delay (s)	0.7	2.3	33.5	49.4								
Lane LOS	A	A	D	E								
Approach Delay (s)	0.7	2.3	33.5	49.4								
Approach LOS			D	E								
Intersection Summary												
Average Delay			5.5									
Intersection Capacity Utilization			91.4%		ICU Level of Service				F			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

07/02/2018

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (veh/h)	14	1249	30	72	1228	92	6	5	114	36	5	22		
Future Volume (Veh/h)	14	1249	30	72	1228	92	6	5	114	36	5	22		
Sign Control	Free				Free				Stop		Stop			
Grade	0%				0%				0%		0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	15	1358	33	78	1335	100	7	5	124	39	5	24		
Pedestrians	1						1							
Lane Width (ft)	12.0						12.0							
Walking Speed (ft/s)	4.0						4.0							
Percent Blockage	0						0							
Right turn flare (veh)														
Median type	TWLTL			TWLTL										
Median storage veh)	2			2										
Upstream signal (ft)	687													
pX, platoon unblocked				0.93			0.93			0.93	0.93	0.93		
vC, conflicting volume	1435			1392			2924			2996	1376	3056	2963	1386
vC1, stage 1 conf vol							1406			1406		1541	1541	
vC2, stage 2 conf vol							1518			1591		1514	1422	
vCu, unblocked vol	1435			1384			3030			3108	1366	3171	3072	1386
tC, single (s)	4.1			4.1			7.1			6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1			5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5			4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			83			90			95	26	0	94	86
cM capacity (veh/h)	473			460			73			98	167	1	82	175
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1								
Volume Total	15	1391	78	1435	136	68								
Volume Left	15	0	78	0	7	39								
Volume Right	0	33	0	100	124	24								
cSH	473	1700	460	1700	153	2								
Volume to Capacity	0.03	0.82	0.17	0.84	0.89	31.71								
Queue Length 95th (ft)	2	0	15	0	154	Err								
Control Delay (s)	12.9	0.0	14.4	0.0	103.4	Err								
Lane LOS	B		B		F	F								
Approach Delay (s)	0.1		0.7		103.4	Err								
Approach LOS					F	F								
Intersection Summary														
Average Delay			222.6											
Intersection Capacity Utilization			87.1%		ICU Level of Service				E					
Analysis Period (min)			15											

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	1446	0	0	1488	455	0	0	0	0	0	31
Future Volume (Veh/h)	18	1446	0	0	1488	455	0	0	0	0	0	31
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	20	1572	0	0	1617	495	0	0	0	0	0	34
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL				TWLTL							
Median storage veh	2				2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2112			1572			3263	3724	1572	3476	3476	1864
vC1, stage 1 conf vol							1612	1612		1864	1864	
vC2, stage 2 conf vol							1651	2112		1612	1612	
vCu, unblocked vol	2112			1572			3263	3724	1572	3476	3476	1864
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			100			100	100	100	100	100	62
cM capacity (veh/h)	259			419			50	61	136	69	89	91
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	20	1572	0	2112	0	34						
Volume Left	20	0	0	0	0	0						
Volume Right	0	0	0	495	0	34						
cSH	259	1700	1700	1700	1700	91						
Volume to Capacity	0.08	0.92	0.00	1.24	0.00	0.38						
Queue Length 95th (ft)	6	0	0	0	0	37						
Control Delay (s)	20.1	0.0	0.0	0.0	0.0	66.8						
Lane LOS	C				A	F						
Approach Delay (s)	0.3		0.0		0.0	66.8						
Approach LOS					A	F						
Intersection Summary												
Average Delay				0.7								
Intersection Capacity Utilization				116.0%	ICU Level of Service				H			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	102	0	0	127	107	994	28	127	797	10
Future Volume (Veh/h)	0	0	102	0	0	127	107	994	28	127	797	10
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	111	0	0	138	116	1080	30	138	866	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL		TWLTL			
Median storage veh							2		2			
Upstream signal (ft)									621			
pX, platoon unblocked												
vC, conflicting volume	2058	2490	872	2580	2480	555	877			1110		
vC1, stage 1 conf vol	1148	1148		1327	1327							
vC2, stage 2 conf vol	910	1342		1253	1153							
vCu, unblocked vol	2058	2490	872	2580	2480	555	877			1110		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	62	100	100	71	85			78		
cM capacity (veh/h)	39	46	294	6	83	475	766			625		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	111	138	116	720	390	138	877					
Volume Left	0	0	116	0	0	138	0					
Volume Right	111	138	0	0	30	0	11					
cSH	294	475	766	1700	1700	625	1700					
Volume to Capacity	0.38	0.29	0.15	0.42	0.23	0.22	0.52					
Queue Length 95th (ft)	42	30	13	0	0	21	0					
Control Delay (s)	24.5	15.6	10.5	0.0	0.0	12.4	0.0					
Lane LOS	C	C	B			B						
Approach Delay (s)	24.5	15.6	1.0			1.7						
Approach LOS	C	C										
Intersection Summary												
Average Delay			3.1									
Intersection Capacity Utilization			55.5%	ICU Level of Service				B				
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Michigan Avenue
E/W Street Name	Michigan Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	187	87	79	0	50	11	24	0	25	537	42	0	18	537	48
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	207	96	88	0	55	12	27	0	28	595	47	0	20	595	53
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		391			94			670			668	
Entry Volume veh/h		383			92			657			655	
Circulating Flow (v_c), pc/h	670			830			323			95		
Exiting Flow (v_{ex}), pc/h	163			93			829			738		
Capacity (C_{pce}), pc/h		578			493			818			1028	
Capacity (c), veh/h		567			483			802			1007	
v/c Ratio (x)		0.68			0.19			0.82			0.65	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		22.0			10.2			25.4			13.2	
Lane LOS		C			B			D			B	
95% Queue, veh		5.1			0.7			9.1			5.0	
Approach Delay, s/veh	22.0			10.2			25.4			13.2		
Approach LOS	C			B			D			B		
Intersection Delay, s/veh LOS	19.4						C					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - West
E/W Street Name	West Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	33	19	36	0	40	19	36	0	36	271	40	0	36	271	33
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	37	21	40	0	44	21	40	0	40	300	44	0	40	300	37
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		98			105			384			377	
Entry Volume veh/h		96			103			376			370	
Circulating Flow (v_c), pc/h	384			377			98			105		
Exiting Flow (v_{ex}), pc/h	105			98			377			384		
Capacity (C_{pce}), pc/h		770			775			1025			1017	
Capacity (c), veh/h		755			760			1004			997	
v/c Ratio (x)		0.13			0.14			0.37			0.37	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.1			6.2			7.6			7.6	
Lane LOS		A			A			A			A	
95% Queue, veh		0.4			0.5			1.8			1.7	
Approach Delay, s/veh	6.1			6.2			7.6			7.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	7.3						A					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Kelly
E/W Street Name	Kelly Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	28	43	27	0	31	26	197	0	10	317	30	0	180	300	62
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	31	48	30	0	34	29	218	0	11	351	33	0	200	333	69
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		109			281			395			602	
Entry Volume veh/h		107			275			387			590	
Circulating Flow (v_c), pc/h	567			393			279			74		
Exiting Flow (v_{ex}), pc/h	281			109			600			397		
Capacity (C_{pce}), pc/h		641			763			855			1049	
Capacity (c), veh/h		628			748			838			1029	
v/c Ratio (x)		0.17			0.37			0.46			0.57	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.7			9.4			10.2			11.0	
Lane LOS		A			A			B			B	
95% Queue, veh		0.6			1.7			2.5			3.8	
Approach Delay, s/veh	7.7			9.4			10.2			11.0		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh LOS	10.2						B					

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	103	0	14	13	1059	13	24	2213	16
Future Volume (veh/h)	0	0	0	103	0	14	13	1059	13	24	2213	16
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h				112	0	0	14	1151	0	26	2405	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				738	0	329	92	3173	988	92	2208	988
Arrive On Green				0.20	0.00	0.00	0.05	0.60	0.00	0.05	0.60	0.00
Sat Flow, veh/h				3690	0	1647	1845	5289	1647	1845	3681	1647
Grp Volume(v), veh/h				112	0	0	14	1151	0	26	2405	0
Grp Sat Flow(s),veh/h/ln				1845	0	1647	1845	1763	1647	1845	1840	1647
Q Serve(g_s), s				2.0	0.0	0.0	0.6	8.9	0.0	1.1	48.0	0.0
Cycle Q Clear(g_c), s				2.0	0.0	0.0	0.6	8.9	0.0	1.1	48.0	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				738	0	329	92	3173	988	92	2208	988
V/C Ratio(X)				0.15	0.00	0.00	0.15	0.36	0.00	0.28	1.09	0.00
Avail Cap(c_a), veh/h				738	0	329	92	3173	988	92	2208	988
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				26.4	0.0	0.0	36.4	8.2	0.0	36.6	16.0	0.0
Incr Delay (d2), s/veh				0.4	0.0	0.0	3.5	0.3	0.0	7.5	48.3	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.1	0.0	0.0	0.4	4.4	0.0	0.7	38.7	0.0
LnGrp Delay(d),s/veh				26.8	0.0	0.0	39.8	8.5	0.0	44.1	64.3	0.0
LnGrp LOS				C			D	A		D	F	
Approach Vol, veh/h					112			1165			2431	
Approach Delay, s/veh					26.8			8.9			64.1	
Approach LOS					C			A			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	8.0	52.0			8.0	52.0		20.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	48.0			4.0	48.0		16.0				
Max Q Clear Time (g_c+I1), s	3.1	10.9			2.6	50.0		4.0				
Green Ext Time (p_c), s	0.0	10.6			0.0	0.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				45.6								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↗	↖↖	↑↑					
Traffic Volume (veh/h)	1123	209	317	1287	0	0			
Future Volume (veh/h)	1123	209	317	1287	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937					
Adj Flow Rate, veh/h	1221	227	345	1399					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	2116	947	805	3313					
Arrive On Green	0.57	0.57	0.22	0.90					
Sat Flow, veh/h	3778	1647	3579	3778					
Grp Volume(v), veh/h	1221	227	345	1399					
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840					
Q Serve(g_s), s	8.4	2.7	3.3	2.5					
Cycle Q Clear(g_c), s	8.4	2.7	3.3	2.5					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	2116	947	805	3313					
V/C Ratio(X)	0.58	0.24	0.43	0.42					
Avail Cap(c_a), veh/h	2116	947	805	3313					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	5.4	4.2	13.3	0.3					
Incr Delay (d2), s/veh	1.2	0.6	1.7	0.4					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	4.4	1.4	1.8	1.2					
LnGrp Delay(d),s/veh	6.6	4.8	15.0	0.7					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	1448			1744					
Approach Delay, s/veh	6.3			3.5					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			13.0	27.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			9.0	23.0				36.0	
Max Q Clear Time (g_c+I1), s			5.3	10.4				4.5	
Green Ext Time (p_c), s			0.5	7.5				13.7	
Intersection Summary									
HCM 2010 Ctrl Delay			4.8						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary

50: I-5 NB On/Off-Ramp & SR-76 ramps

02/11/2019

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑↑	↑	↑		
Traffic Volume (veh/h)	1740	97	305	1324	156	0		
Future Volume (veh/h)	1740	97	305	1324	156	0		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	1891	105	332	1439	170	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1840	823	358	2419	422	376		
Arrive On Green	0.50	0.50	0.10	0.66	0.23	0.00		
Sat Flow, veh/h	3778	1647	3579	3778	1845	1647		
Grp Volume(v), veh/h	1891	105	332	1439	170	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840	1845	1647		
Q Serve(g_s), s	35.0	2.4	6.4	15.4	5.5	0.0		
Cycle Q Clear(g_c), s	35.0	2.4	6.4	15.4	5.5	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1840	823	358	2419	422	376		
V/C Ratio(X)	1.03	0.13	0.93	0.59	0.40	0.00		
Avail Cap(c_a), veh/h	1840	823	358	2419	422	376		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	17.5	9.3	31.2	6.8	22.9	0.0		
Incr Delay (d2), s/veh	28.3	0.3	32.3	1.1	2.9	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	24.9	1.2	4.8	8.0	3.1	0.0		
LnGrp Delay(d),s/veh	45.8	9.7	63.6	7.8	25.8	0.0		
LnGrp LOS	F	A	E	A	C			
Approach Vol, veh/h	1996			1771	170			
Approach Delay, s/veh	43.9			18.3	25.8			
Approach LOS	D			B	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	11.0	39.0				50.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	7.0	35.0				46.0
Max Q Clear Time (g_c+I1), s		7.5	8.4	37.0				17.4
Green Ext Time (p_c), s		0.3	0.0	0.0				13.6
Intersection Summary								
HCM 2010 Ctrl Delay			31.6					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary

51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	626	6	82	582	108	5	0	31	77	8	49
Future Volume (veh/h)	0	626	6	82	582	108	5	0	31	77	8	49
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1937	1976	1937	1937	1937	1937	0	1937	1937	1937	1937
Adj Flow Rate, veh/h	0	680	7	89	633	0	5	0	34	90	0	53
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1244	13	217	1949	872	0	0	0	1158	0	517
Arrive On Green	0.00	0.33	0.33	0.12	0.53	0.00	0.00	0.00	0.00	0.31	0.00	0.31
Sat Flow, veh/h	0	3829	38	1845	3681	1647		0		3690	0	1647
Grp Volume(v), veh/h	0	335	352	89	633	0		0.0		90	0	53
Grp Sat Flow(s),veh/h/ln	0	1840	1930	1845	1840	1647				1845	0	1647
Q Serve(g_s), s	0.0	7.6	7.6	2.3	5.0	0.0				0.9	0.0	1.2
Cycle Q Clear(g_c), s	0.0	7.6	7.6	2.3	5.0	0.0				0.9	0.0	1.2
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	613	643	217	1949	872				1158	0	517
V/C Ratio(X)	0.00	0.55	0.55	0.41	0.32	0.00				0.08	0.00	0.10
Avail Cap(c_a), veh/h	0	613	643	217	1949	872				1158	0	517
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	13.9	13.9	20.9	6.8	0.0				12.3	0.0	12.4
Incr Delay (d2), s/veh	0.0	3.5	3.3	5.6	0.4	0.0				0.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.4	4.6	1.5	2.6	0.0				0.5	0.0	0.6
LnGrp Delay(d),s/veh	0.0	17.3	17.2	26.5	7.3	0.0				12.4	0.0	12.8
LnGrp LOS		B	B	C	A					B		B
Approach Vol, veh/h		687			722						143	
Approach Delay, s/veh		17.3			9.6						12.6	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			10.0	21.0		20.0		31.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			6.0	17.0		16.0		27.0				
Max Q Clear Time (g_c+I1), s			4.3	9.6		3.2		7.0				
Green Ext Time (p_c), s			0.0	2.5		0.3		4.3				
Intersection Summary												
HCM 2010 Ctrl Delay			13.3									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	179	691	9	28	1014	299	9	2	15	292	7	73
Future Volume (veh/h)	179	691	9	28	1014	299	9	2	15	292	7	73
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1976	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	195	751	10	30	1102	325	10	2	16	202	169	79
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	185	1209	16	115	1058	473	329	66	350	369	250	117
Arrive On Green	0.10	0.32	0.32	0.06	0.29	0.29	0.21	0.21	0.21	0.20	0.20	0.20
Sat Flow, veh/h	1845	3719	50	1845	3681	1647	1550	310	1647	1845	1250	584
Grp Volume(v), veh/h	195	372	389	30	1102	325	12	0	16	202	0	248
Grp Sat Flow(s),veh/h/ln	1845	1840	1929	1845	1840	1647	1860	0	1647	1845	0	1834
Q Serve(g_s), s	8.0	13.7	13.7	1.2	23.0	14.0	0.4	0.0	0.6	7.9	0.0	10.0
Cycle Q Clear(g_c), s	8.0	13.7	13.7	1.2	23.0	14.0	0.4	0.0	0.6	7.9	0.0	10.0
Prop In Lane	1.00		0.03	1.00		1.00	0.83		1.00	1.00		0.32
Lane Grp Cap(c), veh/h	185	598	627	115	1058	473	395	0	350	369	0	367
V/C Ratio(X)	1.06	0.62	0.62	0.26	1.04	0.69	0.03	0.00	0.05	0.55	0.00	0.68
Avail Cap(c_a), veh/h	185	598	627	115	1058	473	395	0	350	369	0	367
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.0	22.8	22.8	35.7	28.5	25.3	25.0	0.0	25.0	28.7	0.0	29.6
Incr Delay (d2), s/veh	82.1	4.8	4.6	5.4	39.0	7.9	0.1	0.0	0.2	5.7	0.0	9.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	7.7	8.0	0.8	17.3	7.4	0.2	0.0	0.3	4.6	0.0	6.0
LnGrp Delay(d),s/veh	118.1	27.6	27.4	41.1	67.5	33.2	25.1	0.0	25.3	34.5	0.0	39.2
LnGrp LOS	F	C	C	D	F	C	C		C	C		D
Approach Vol, veh/h		956			1457			28			450	
Approach Delay, s/veh		46.0			59.3			25.2			37.1	
Approach LOS		D			E			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.0	9.0	30.0		20.0	12.0	27.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	5.0	26.0		16.0	8.0	23.0				
Max Q Clear Time (g_c+I1), s		2.6	3.2	15.7		12.0	10.0	25.0				
Green Ext Time (p_c), s		0.0	0.0	3.5		0.8	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				51.1								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	868	283	88	765	185	360	99	141	437	240	390
Future Volume (veh/h)	61	868	283	88	765	185	360	99	141	437	240	390
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	66	943	308	96	832	201	250	306	153	368	411	424
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	123	838	272	98	1080	483	394	413	351	394	413	351
Arrive On Green	0.07	0.31	0.31	0.05	0.29	0.29	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1845	2732	888	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	66	634	617	96	832	201	250	306	153	368	411	424
Grp Sat Flow(s),veh/h/ln	1845	1840	1780	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	2.6	23.0	23.0	3.9	15.5	7.4	9.2	11.1	6.0	14.7	15.9	16.0
Cycle Q Clear(g_c), s	2.6	23.0	23.0	3.9	15.5	7.4	9.2	11.1	6.0	14.7	15.9	16.0
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	123	564	546	98	1080	483	394	413	351	394	413	351
V/C Ratio(X)	0.54	1.12	1.13	0.98	0.77	0.42	0.64	0.74	0.44	0.93	0.99	1.21
Avail Cap(c_a), veh/h	123	564	546	98	1080	483	394	413	351	394	413	351
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	26.0	26.0	35.5	24.2	21.3	26.8	27.6	25.6	29.0	29.5	29.5
Incr Delay (d2), s/veh	15.8	76.4	79.7	84.3	5.3	2.6	7.6	11.3	3.9	31.6	42.9	116.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	23.6	23.3	4.3	8.7	3.7	5.6	7.2	3.1	10.9	13.4	18.6
LnGrp Delay(d),s/veh	49.6	102.4	105.7	119.7	29.5	24.0	34.5	38.9	29.5	60.6	72.4	146.4
LnGrp LOS	D	F	F	F	C	C	C	D	C	E	E	F
Approach Vol, veh/h	1317				1129				709			
Approach Delay, s/veh	101.3				36.2				35.3			
Approach LOS	F				D				D			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6			7	8			
Phs Duration (G+Y+Rc), s	20.0		8.0	27.0	20.0			9.0	26.0			
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0			4.0	4.0			
Max Green Setting (Gmax), s	16.0		4.0	23.0	16.0			5.0	22.0			
Max Q Clear Time (g_c+I1), s	13.1		5.9	25.0	18.0			4.6	17.5			
Green Ext Time (p_c), s	1.0		0.0	0.0	0.0			0.0	2.5			
Intersection Summary												
HCM 2010 Ctrl Delay	71.9											
HCM 2010 LOS	E											
Notes												

Intersection

Intersection Delay, s/veh 7.6

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	78	7	7	86	9	4	5	8	0	0	0
Future Vol, veh/h	23	78	7	7	86	9	4	5	8	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	25	85	8	8	93	10	4	5	9	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.7	7.6	7.3
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	24%	21%	7%
Vol Thru, %	29%	72%	84%
Vol Right, %	47%	6%	9%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	17	108	102
LT Vol	4	23	7
Through Vol	5	78	86
RT Vol	8	7	9
Lane Flow Rate	18	117	111
Geometry Grp	1	1	1
Degree of Util (X)	0.021	0.132	0.124
Departure Headway (Hd)	4.088	4.052	4.014
Convergence, Y/N	Yes	Yes	Yes
Cap	860	884	891
Service Time	2.187	2.083	2.047
HCM Lane V/C Ratio	0.021	0.132	0.125
HCM Control Delay	7.3	7.7	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0.1	0.5	0.4

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖						↖	↗
Traffic Vol, veh/h	0	195	55	31	35	0	0	0	0	28	0	46
Future Vol, veh/h	0	195	55	31	35	0	0	0	0	28	0	46
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	212	60	34	38	0	0	0	0	30	0	50
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	212	0	0				318	318	38
Stage 1	-	-	-	-	-	-				106	106	-
Stage 2	-	-	-	-	-	-				212	212	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1358	-	0				675	598	1034
Stage 1	0	-	-	-	-	0				918	807	-
Stage 2	0	-	-	-	-	0				823	727	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1358	-	-				657	0	1034
Mov Cap-2 Maneuver	-	-	-	-	-	-				657	0	-
Stage 1	-	-	-	-	-	-				894	0	-
Stage 2	-	-	-	-	-	-				823	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.6			9.5					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2						
Capacity (veh/h)	-	-	1358	-	657	1034						
HCM Lane V/C Ratio	-	-	0.025	-	0.046	0.048						
HCM Control Delay (s)	-	-	7.7	0	10.7	8.7						
HCM Lane LOS	-	-	A	A	B	A						
HCM 95th %tile Q(veh)	-	-	0.1	-	0.1	0.2						

HCM 2010 Signalized Intersection Summary

56: I-5 SB On/Off-Ramp & Vista Way

07/02/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑	↑	↑↑		
Traffic Volume (veh/h)	945	137	935	1632	56	1428		
Future Volume (veh/h)	945	137	935	1632	56	1428		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	1027	0	1016	1774	61	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1302	583	1211	1401	397	624		
Arrive On Green	0.35	0.00	0.34	0.72	0.22	0.00		
Sat Flow, veh/h	3778	1647	3579	1937	1845	2898		
Grp Volume(v), veh/h	1027	0	1016	1774	61	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1937	1845	1449		
Q Serve(g_s), s	32.5	0.0	34.1	94.0	3.5	0.0		
Cycle Q Clear(g_c), s	32.5	0.0	34.1	94.0	3.5	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1302	583	1211	1401	397	624		
V/C Ratio(X)	0.79	0.00	0.84	1.27	0.15	0.00		
Avail Cap(c_a), veh/h	1302	583	1211	1401	397	624		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	37.6	0.0	39.7	18.0	41.4	0.0		
Incr Delay (d2), s/veh	4.9	0.0	7.0	125.7	0.8	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	17.4	0.0	18.0	98.3	1.9	0.0		
LnGrp Delay(d),s/veh	42.5	0.0	46.8	143.7	42.2	0.0		
LnGrp LOS	D		D	F	D			
Approach Vol, veh/h	1027			2790	61			
Approach Delay, s/veh	42.5			108.4	42.2			
Approach LOS	D			F	D			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		32.0	48.0	50.0				98.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		28.0	44.0	46.0				94.0
Max Q Clear Time (g_c+I1), s		5.5	36.1	34.5				96.0
Green Ext Time (p_c), s		0.1	2.8	5.5				0.0
Intersection Summary								
HCM 2010 Ctrl Delay			89.9					
HCM 2010 LOS			F					

Appendix M.1 – Analysis Output Sheets (Future with Project Alternative 3)

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	81	61	94	301	569	169	18	141	83	23	70
Future Volume (vph)	90	81	61	94	301	569	169	18	141	83	23	70
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3143	1441		1782	1583		1793	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3143	1441		1782	1583		1793	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	88	66	102	327	618	184	20	153	90	25	76
RTOR Reduction (vph)	0	0	58	0	228	255	0	0	91	0	0	58
Lane Group Flow (vph)	98	88	8	102	408	54	0	204	62	0	115	18
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	5.5	8.4	8.4	8.3	12.8	12.8		21.4	21.4		17.2	17.2
Effective Green, g (s)	5.5	8.4	8.4	8.3	12.8	12.8		21.4	21.4		17.2	17.2
Actuated g/C Ratio	0.07	0.11	0.11	0.11	0.17	0.17		0.29	0.29		0.23	0.23
Clearance Time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	132	212	180	199	546	250		518	460		419	369
v/s Ratio Prot	0.06	0.05		c0.06	c0.13			c0.11			c0.06	
v/s Ratio Perm			0.00			0.04			0.04			0.01
v/c Ratio	0.74	0.42	0.04	0.51	0.75	0.21		0.39	0.13		0.27	0.05
Uniform Delay, d1	33.4	30.3	29.0	30.7	28.9	26.1		20.9	19.3		23.1	21.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	20.0	0.5	0.0	2.2	4.9	0.2		2.2	0.6		1.6	0.2
Delay (s)	53.3	30.8	29.1	33.0	33.7	26.2		23.1	19.9		24.7	22.1
Level of Service	D	C	C	C	C	C		C	B		C	C
Approach Delay (s)		39.1			31.4			21.7			23.7	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			29.8				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			73.6				Sum of lost time (s)		18.3			
Intersection Capacity Utilization			49.7%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				LT				L			
Volume (V), veh/h	0	0	0	0	0	416	0	377	0	0	177	472	0	120	164	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	0	0	0	0	461	0	410	0	0	196	523	0	133	182	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			4.6453	4.3276			4.3276		4.6453	4.3276
Follow-Up Headway (s)		3.1858			2.6667	2.5352			2.5352		2.6667	2.5352

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		0		0	461	410		196	523	133	182	
Entry Volume veh/h		0		0	452	410		192	513	130	178	
Circulating Flow (v_c), pc/h	776			196			133			461		
Exiting Flow (v_{ex}), pc/h	133			0			196			643		
Capacity (C_{pce}), pc/h		520		1127	1202			1268		883	960	
Capacity (c), veh/h		510		1105	1179			1243		866	941	
v/c Ratio (x)		0.00		0.00	0.38			0.15		0.15	0.19	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.1		3.3	6.9	0.0		4.2	0.0	5.6	5.7	
Lane LOS		A		A	A	A		A	A	A	A	
95% Queue, veh		0.0		0.0	1.8			0.5		0.5	0.7	
Approach Delay, s/veh				3.6			1.1			5.7		
Approach LOS				A			A			A		
Intersection Delay, s/veh LOS	3.0						A					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	22	4	44	28	85	12	58	63	127	80	6
Future Volume (vph)	2	22	4	44	28	85	12	58	63	127	80	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	24	4	48	30	92	13	63	68	138	87	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	30	170	144	232								
Volume Left (vph)	2	48	13	138								
Volume Right (vph)	4	92	68	7								
Hadj (s)	-0.03	-0.23	-0.23	0.13								
Departure Headway (s)	5.0	4.6	4.4	4.7								
Degree Utilization, x	0.04	0.22	0.18	0.30								
Capacity (veh/h)	647	723	764	729								
Control Delay (s)	8.2	8.9	8.4	9.7								
Approach Delay (s)	8.2	8.9	8.4	9.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.1									
Level of Service			A									
Intersection Capacity Utilization			45.0%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	172	15	47	8	28	54	44	292	16	21	401	98
Future Volume (vph)	172	15	47	8	28	54	44	292	16	21	401	98
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.92		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1781	1583		1704		1770	1849		1770	1863	1583
Flt Permitted		0.72	1.00		0.97		0.45	1.00		0.54	1.00	1.00
Satd. Flow (perm)		1349	1583		1668		840	1849		1015	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	187	16	51	9	30	59	48	317	17	23	436	107
RTOR Reduction (vph)	0	0	37	0	43	0	0	2	0	0	0	41
Lane Group Flow (vph)	0	203	14	0	55	0	48	332	0	23	436	66
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		15.1	15.1		15.1		32.7	32.7		33.9	33.9	33.9
Effective Green, g (s)		15.1	15.1		15.1		32.7	32.7		33.9	33.9	33.9
Actuated g/C Ratio		0.27	0.27		0.27		0.59	0.59		0.62	0.62	0.62
Clearance Time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		7.0	7.0	7.0
Lane Grp Cap (vph)		370	434		457		499	1099		625	1148	975
v/s Ratio Prot								0.18			c0.23	
v/s Ratio Perm		c0.15	0.01		0.03		0.06			0.02		0.04
v/c Ratio		0.55	0.03		0.12		0.10	0.30		0.04	0.38	0.07
Uniform Delay, d1		17.0	14.6		15.0		4.8	5.5		4.1	5.3	4.2
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		4.6	0.1		0.4		0.4	0.7		0.1	1.0	0.1
Delay (s)		21.6	14.7		15.4		5.2	6.2		4.3	6.2	4.4
Level of Service		C	B		B		A	A		A	A	A
Approach Delay (s)		20.2			15.4			6.1			5.8	
Approach LOS		C			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.4		HCM 2000 Level of Service					A		
HCM 2000 Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			55.0		Sum of lost time (s)					7.2		
Intersection Capacity Utilization			51.6%		ICU Level of Service					A		
Analysis Period (min)			15									
c Critical Lane Group												

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Civic Center Drive
E/W Street Name	Civic Center Drive
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	11	7	7	0	15	10	13	0	6	292	18	0	38	347	11
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	12	8	8	0	17	11	14	0	7	324	20	0	42	385	12
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		28			42			351			439	
Entry Volume veh/h		27			41			344			430	
Circulating Flow (v_c), pc/h	444			343			62			35		
Exiting Flow (v_{ex}), pc/h	70			30			350			410		
Capacity (C_{pce}), pc/h		725			802			1062			1091	
Capacity (c), veh/h		711			786			1041			1070	
v/c Ratio (x)		0.04			0.05			0.33			0.40	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.5			5.1			6.8			7.6	
Lane LOS		A			A			A			A	
95% Queue, veh		0.1			0.2			1.5			2.0	
Approach Delay, s/veh	5.5			5.1			6.8			7.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	7.1						A					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	7/11/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Pier View Way
E/W Street Name	Pier View Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	16	12	23	0	2	18	3	0	18	329	2	0	2	358	47
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	18	13	26	0	2	20	3	0	20	365	2	0	2	397	52
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		57			25			387			451	
Entry Volume veh/h		56			25			379			442	
Circulating Flow (v_c), pc/h	401			403			33			42		
Exiting Flow (v_{ex}), pc/h	17			92			386			425		
Capacity (C_{pce}), pc/h		757			755			1093			1084	
Capacity (c), veh/h		742			740			1072			1062	
v/c Ratio (x)		0.08			0.03			0.35			0.42	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.6			5.2			7.0			7.9	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.1			1.6			2.1	
Approach Delay, s/veh	5.6			5.2			7.0			7.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	7.3						A					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	3	4	26	10	8	4	122	219	4	5	150	9
Future Volume (vph)	3	4	26	10	8	4	122	219	4	5	150	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	4	28	11	9	4	133	238	4	5	163	10
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	7	28	24	252	123	87	92					
Volume Left (vph)	3	0	11	133	0	5	0					
Volume Right (vph)	0	28	4	0	4	0	10					
Hadj (s)	0.25	-0.67	0.03	0.30	0.01	0.06	-0.04					
Departure Headway (s)	6.0	5.1	5.8	5.1	4.8	5.1	4.9					
Degree Utilization, x	0.01	0.04	0.04	0.36	0.16	0.12	0.13					
Capacity (veh/h)	548	640	573	692	729	689	706					
Control Delay (s)	7.9	7.1	9.0	9.7	7.6	7.6	7.5					
Approach Delay (s)	7.3		9.0	9.0		7.5						
Approach LOS	A		A	A		A						
Intersection Summary												
Delay			8.5									
Level of Service			A									
Intersection Capacity Utilization			32.2%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	128	57	128	90	34	113
Future Volume (vph)	128	57	128	90	34	113
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	139	62	139	98	37	123
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	139	62	237	160		
Volume Left (vph)	139	0	0	37		
Volume Right (vph)	0	62	98	0		
Hadj (s)	0.53	-0.67	-0.21	0.08		
Departure Headway (s)	6.0	4.8	4.4	4.8		
Degree Utilization, x	0.23	0.08	0.29	0.21		
Capacity (veh/h)	568	706	776	708		
Control Delay (s)	9.5	7.0	9.3	9.1		
Approach Delay (s)	8.8		9.3	9.1		
Approach LOS	A		A	A		
Intersection Summary						
Delay			9.1			
Level of Service			A			
Intersection Capacity Utilization			37.1%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			 		 						 	
Traffic Volume (vph)	17	0	126	34	166	31	0	0	0	0	29	39
Future Volume (vph)	17	0	126	34	166	31	0	0	0	0	29	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5		4.5	4.5	4.5						4.5	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.98						0.91	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3455						3238	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3455						3238	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	0	137	37	180	34	0	0	0	0	32	42
RTOR Reduction (vph)	0	0	128	15	14	0	0	0	0	0	39	0
Lane Group Flow (vph)	18	0	9	22	200	0	0	0	0	0	35	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	3.3		3.3	29.3	29.3						3.9	
Effective Green, g (s)	3.3		3.3	29.3	29.3						3.9	
Actuated g/C Ratio	0.07		0.07	0.59	0.59						0.08	
Clearance Time (s)	4.5		4.5	4.5	4.5						4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	116		183	1037	2024						252	
v/s Ratio Prot	c0.01		0.00	0.01	c0.06						c0.01	
v/s Ratio Perm												
v/c Ratio	0.16		0.05	0.02	0.10						0.14	
Uniform Delay, d1	22.0		21.9	4.3	4.5						21.5	
Progression Factor	1.00		1.00	1.00	1.00						1.00	
Incremental Delay, d2	0.6		0.1	0.0	0.1						0.3	
Delay (s)	22.7		22.0	4.4	4.6						21.7	
Level of Service	C		C	A	A						C	
Approach Delay (s)		22.1			4.6			0.0			21.7	
Approach LOS		C			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			12.9			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.11									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)			13.5			
Intersection Capacity Utilization			23.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					 							
Traffic Volume (vph)	0	0	0	125	204	65	65	495	0	0	282	30
Future Volume (vph)	0	0	0	125	204	65	65	495	0	0	282	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	0.95
Frpb, ped/bikes				1.00	1.00	0.96	1.00	1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	3539	1526	1770	1863			1767	1461
Flt Permitted				0.95	1.00	1.00	0.44	1.00			1.00	1.00
Satd. Flow (perm)				1770	3539	1526	816	1863			1767	1461
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	136	222	71	71	538	0	0	307	33
RTOR Reduction (vph)	0	0	0	0	0	49	0	0	0	0	1	22
Lane Group Flow (vph)	0	0	0	136	222	22	71	538	0	0	309	8
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					6
Actuated Green, G (s)				18.1	18.1	18.1	30.6	30.6			15.5	15.5
Effective Green, g (s)				18.1	18.1	18.1	30.6	30.6			15.5	15.5
Actuated g/C Ratio				0.31	0.31	0.31	0.52	0.52			0.26	0.26
Clearance Time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				545	1091	470	589	971			466	385
v/s Ratio Prot				c0.08	0.06		0.02	c0.29			c0.18	
v/s Ratio Perm						0.01	0.04					0.01
v/c Ratio				0.25	0.20	0.05	0.12	0.55			0.66	0.02
Uniform Delay, d1				15.2	15.0	14.2	9.7	9.5			19.3	16.0
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				1.1	0.4	0.2	0.1	0.8			3.9	0.0
Delay (s)				16.3	15.4	14.4	9.9	10.3			23.2	16.0
Level of Service				B	B	B	A	B			C	B
Approach Delay (s)		0.0			15.5			10.3			22.5	
Approach LOS		A			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			14.9		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			58.7		Sum of lost time (s)					15.0		
Intersection Capacity Utilization			51.3%		ICU Level of Service					A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	116	1	131	434	214	11	25	198	144	50	6
Future Volume (vph)	24	116	1	131	434	214	11	25	198	144	50	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Flt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.98	1.00	0.95	0.98	
Satd. Flow (prot)	1770	3535		1770	3539	1583		1835	1583	1681	1714	
Flt Permitted	0.44	1.00		0.67	1.00	1.00		0.94	1.00	0.73	0.89	
Satd. Flow (perm)	815	3535		1251	3539	1583		1752	1583	1295	1562	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	126	1	142	472	233	12	27	215	157	54	7
RTOR Reduction (vph)	0	1	0	0	0	169	0	0	96	0	3	0
Lane Group Flow (vph)	26	126	0	142	472	64	0	39	119	107	108	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	15.4	15.4		15.0	15.0	15.0		30.4	30.4	30.4	30.4	
Effective Green, g (s)	15.4	15.4		15.0	15.0	15.0		30.4	30.4	30.4	30.4	
Actuated g/C Ratio	0.28	0.28		0.27	0.27	0.27		0.55	0.55	0.55	0.55	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	228	989		341	965	431		968	874	715	863	
v/s Ratio Prot		0.04			c0.13							
v/s Ratio Perm	0.03			0.11		0.04		0.02	0.08	c0.08	0.07	
v/c Ratio	0.11	0.13		0.42	0.49	0.15		0.04	0.14	0.15	0.12	
Uniform Delay, d1	14.7	14.8		16.4	16.8	15.2		5.6	5.9	6.0	5.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.1		1.0	0.5	0.2		0.1	0.3	0.4	0.3	
Delay (s)	15.0	14.9		17.4	17.2	15.3		5.7	6.3	6.4	6.2	
Level of Service	B	B		B	B	B		A	A	A	A	
Approach Delay (s)		14.9			16.7			6.2			6.3	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			13.2				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.26									
Actuated Cycle Length (s)			55.0				Sum of lost time (s)			9.6		
Intersection Capacity Utilization			39.3%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

07/02/2018

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↙	
Traffic Volume (veh/h)	78	5	19	28	5	8
Future Volume (Veh/h)	78	5	19	28	5	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	85	5	21	30	5	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				238		
pX, platoon unblocked						
vC, conflicting volume			90		160	88
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			90		160	88
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	99
cM capacity (veh/h)			1505		820	971
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	90	51	14			
Volume Left	0	21	5			
Volume Right	5	0	9			
cSH	1700	1505	911			
Volume to Capacity	0.05	0.01	0.02			
Queue Length 95th (ft)	0	1	1			
Control Delay (s)	0.0	3.1	9.0			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.1	9.0			
Approach LOS			A			
Intersection Summary						
Average Delay		1.8				
Intersection Capacity Utilization		19.2%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	51	86	0	0	0	24	220	61	71	213	47
Future Volume (vph)	80	51	86	0	0	0	24	220	61	71	213	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.95				1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1498				1770	1863	1552	1770	1863	1518
Flt Permitted	0.95	1.00	1.00				0.61	1.00	1.00	0.44	1.00	1.00
Satd. Flow (perm)	1770	1863	1498				1144	1863	1552	824	1863	1518
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	55	93	0	0	0	26	239	66	77	232	51
RTOR Reduction (vph)	0	0	52	0	0	0	0	0	47	0	0	31
Lane Group Flow (vph)	87	55	41	0	0	0	26	239	19	77	232	20
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA	Perm				Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4					2	2		1	6	
Permitted Phases			4				2		2	6		6
Actuated Green, G (s)	24.1	24.1	24.1				15.7	15.7	15.7	22.1	22.1	22.1
Effective Green, g (s)	24.1	24.1	24.1				15.7	15.7	15.7	22.1	22.1	22.1
Actuated g/C Ratio	0.44	0.44	0.44				0.29	0.29	0.29	0.40	0.40	0.40
Clearance Time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0				4.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	775	816	656				326	531	443	372	748	609
v/s Ratio Prot	c0.05	0.03						c0.13		0.01	c0.12	
v/s Ratio Perm			0.03				0.02		0.01	0.07		0.01
v/c Ratio	0.11	0.07	0.06				0.08	0.45	0.04	0.21	0.31	0.03
Uniform Delay, d1	9.1	8.9	8.9				14.4	16.1	14.2	10.6	11.2	10.0
Progression Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.2	0.2				0.5	2.7	0.2	0.3	1.1	0.1
Delay (s)	9.4	9.1	9.1				14.8	18.9	14.4	10.9	12.3	10.1
Level of Service	A	A	A				B	B	B	B	B	B
Approach Delay (s)		9.2			0.0			17.7			11.7	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			13.2				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.26									
Actuated Cycle Length (s)			55.0				Sum of lost time (s)			12.8		
Intersection Capacity Utilization			49.5%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	199	10	0	0	0	0	4	17	18	7	0
Future Volume (Veh/h)	9	199	10	0	0	0	0	4	17	18	7	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	216	11	0	0	0	0	4	18	20	8	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		218										
pX, platoon unblocked												
vC, conflicting volume	0			227			246	242	114	148	247	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			227			246	242	114	148	247	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	99	98	97	99	100
cM capacity (veh/h)	1622			1339			678	655	918	783	650	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	118	119	22	28								
Volume Left	10	0	0	20								
Volume Right	0	11	18	0								
cSH	1622	1700	855	740								
Volume to Capacity	0.01	0.07	0.03	0.04								
Queue Length 95th (ft)	0	0	2	3								
Control Delay (s)	0.7	0.0	9.3	10.1								
Lane LOS	A		A	B								
Approach Delay (s)	0.3		9.3	10.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			20.8%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	462	5	0	0	0	0	4	21	14	12	0
Future Volume (vph)	23	462	5	0	0	0	0	4	21	14	12	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	502	5	0	0	0	0	4	23	15	13	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	276	256	27	28								
Volume Left (vph)	25	0	0	15								
Volume Right (vph)	0	5	23	0								
Hadj (s)	0.08	0.02	-0.48	0.14								
Departure Headway (s)	4.7	4.7	4.6	5.2								
Degree Utilization, x	0.36	0.33	0.03	0.04								
Capacity (veh/h)	755	761	733	646								
Control Delay (s)	9.2	8.8	7.7	8.4								
Approach Delay (s)	9.0		7.7	8.4								
Approach LOS	A		A	A								
Intersection Summary												
Delay			8.9									
Level of Service			A									
Intersection Capacity Utilization			28.3%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

07/02/2018

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	97	187	8	36	0	97	0	44	27	0	0	0								
Future Volume (vph)	97	187	8	36	0	97	0	44	27	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	105	203	9	39	0	105	0	48	29	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	105	212	144	77																
Volume Left (vph)	105	0	39	0																
Volume Right (vph)	0	9	105	29																
Hadj (s)	0.53	0.00	-0.35	-0.19																
Departure Headway (s)	5.3	4.8	4.2	4.7																
Degree Utilization, x	0.16	0.28	0.17	0.10																
Capacity (veh/h)	663	733	829	705																
Control Delay (s)	8.1	8.5	8.0	8.2																
Approach Delay (s)	8.4		8.0	8.2																
Approach LOS	A		A	A																
Intersection Summary																				
Delay			8.3																	
Level of Service			A																	
Intersection Capacity Utilization			32.3%	ICU Level of Service				A												
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	15	0	0	32	15	219	21	15	226	7
Future Volume (Veh/h)	0	0	15	0	0	32	15	219	21	15	226	7
Sign Control	Stop			Stop				Free			Free	
Grade	0%			0%				0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	16	0	0	35	16	238	23	16	246	8
Pedestrians	7			7								
Lane Width (ft)	12.0			16.0								
Walking Speed (ft/s)	4.0			4.0								
Percent Blockage	1			1								
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			455		
pX, platoon unblocked												
vC, conflicting volume	594	589	257	582	582	256	261				268	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	594	589	257	582	582	256	261				268	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	98	100	100	95	99				99	
cM capacity (veh/h)	384	405	777	400	409	776	1296				1286	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	16	35	16	261	16	254						
Volume Left	0	0	16	0	16	0						
Volume Right	16	35	0	23	0	8						
cSH	777	776	1296	1700	1286	1700						
Volume to Capacity	0.02	0.05	0.01	0.15	0.01	0.15						
Queue Length 95th (ft)	2	4	1	0	1	0						
Control Delay (s)	9.7	9.9	7.8	0.0	7.8	0.0						
Lane LOS	A	A	A		A							
Approach Delay (s)	9.7	9.9	0.5		0.5							
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.3									
Intersection Capacity Utilization			23.0%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Washington Avenue
E/W Street Name	Washington Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	13	2	22	0	39	6	4	0	16	214	11	0	3	224	16
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	14	2	24	0	43	7	4	0	18	237	12	0	3	248	18
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		40			54			267			269	
Entry Volume veh/h		39			53			262			264	
Circulating Flow (v_c), pc/h	294			269			19			68		
Exiting Flow (v_{ex}), pc/h	17			43			255			315		
Capacity (C_{pce}), pc/h		842			863			1109			1056	
Capacity (c), veh/h		826			847			1087			1035	
v/c Ratio (x)		0.05			0.06			0.24			0.25	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.8			4.8			5.6			5.9	
Lane LOS		A			A			A			A	
95% Queue, veh		0.1			0.2			0.9			1.0	
Approach Delay, s/veh	4.8			4.8			5.6			5.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	5.6						A					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	29	17	25	3	77	3	140	39	90	96	1
Future Volume (vph)	20	29	17	25	3	77	3	140	39	90	96	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	32	18	27	3	84	3	152	42	98	104	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	72	114	197	203								
Volume Left (vph)	22	27	3	98								
Volume Right (vph)	18	84	42	1								
Hadj (s)	-0.05	-0.36	-0.09	0.13								
Departure Headway (s)	4.9	4.6	4.5	4.7								
Degree Utilization, x	0.10	0.15	0.25	0.27								
Capacity (veh/h)	657	711	757	723								
Control Delay (s)	8.5	8.4	9.0	9.4								
Approach Delay (s)	8.5	8.4	9.0	9.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				9.0								
Level of Service				A								
Intersection Capacity Utilization				37.7%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	195	18	3	90	15	9	20	23	21	28	11
Future Volume (Veh/h)	8	195	18	3	90	15	9	20	23	21	28	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	212	20	3	98	16	10	22	25	23	30	12
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked												
vC, conflicting volume	128			239			387	381	229	402	383	121
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	128			239			387	381	229	402	383	121
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			98	96	97	95	94	99
cM capacity (veh/h)	1441			1320			526	537	806	508	536	919
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	241	117	57	65								
Volume Left	9	3	10	23								
Volume Right	20	16	25	12								
cSH	1441	1320	627	569								
Volume to Capacity	0.01	0.00	0.09	0.11								
Queue Length 95th (ft)	0	0	7	10								
Control Delay (s)	0.3	0.2	11.3	12.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.2	11.3	12.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay			3.2									
Intersection Capacity Utilization			28.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Wisconsin Avenue
E/W Street Name	Wisconsin Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	52	59	133	0	98	32	30	0	65	213	70	0	18	235	17
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	58	65	147	0	109	35	33	0	72	236	78	0	20	261	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		270			177			386			300	
Entry Volume veh/h		265			174			378			294	
Circulating Flow (v_c), pc/h	390			366			143			216		
Exiting Flow (v_{ex}), pc/h	163			126			327			517		
Capacity (C_{pce}), pc/h		765			784			979			910	
Capacity (c), veh/h		750			768			960			893	
v/c Ratio (x)		0.35			0.23			0.39			0.33	

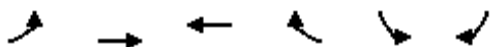
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.2			7.2			8.1			7.6	
Lane LOS		A			A			A			A	
95% Queue, veh		1.6			0.9			1.9			1.4	
Approach Delay, s/veh	9.2			7.2			8.1			7.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	8.1						A					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

07/02/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	242	234	5	16	14
Future Volume (Veh/h)	8	242	234	5	16	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	263	254	5	17	15
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage veh						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	267				546	266
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	267				546	266
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	98
cM capacity (veh/h)	1288				491	767
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	272	259	32			
Volume Left	9	0	17			
Volume Right	0	5	15			
cSH	1288	1700	591			
Volume to Capacity	0.01	0.15	0.05			
Queue Length 95th (ft)	1	0	4			
Control Delay (s)	0.3	0.0	11.4			
Lane LOS	A		B			
Approach Delay (s)	0.3	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			29.5%		ICU Level of Service	
Analysis Period (min)			15		A	

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	228	10	21	215	13	6	5	14	40	1	6
Future Volume (Veh/h)	8	228	10	21	215	13	6	5	14	40	1	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	248	11	23	234	14	7	5	15	43	1	7
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	250			259			568	568	254	578	566	245
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	250			259			568	568	254	578	566	245
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			98	99	98	89	100	99
cM capacity (veh/h)	1313			1306			420	421	785	406	422	791
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	268	271	27	51								
Volume Left	9	23	7	43								
Volume Right	11	14	15	7								
cSH	1313	1306	567	436								
Volume to Capacity	0.01	0.02	0.05	0.12								
Queue Length 95th (ft)	1	1	4	10								
Control Delay (s)	0.3	0.8	11.7	14.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.8	11.7	14.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			36.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	118	202	73	150	0	109	0	37	0	0	0
Future Volume (vph)	0	118	202	73	150	0	109	0	37	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	128	220	79	163	0	118	0	40	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	348	242	158	0								
Volume Left (vph)	0	79	118	0								
Volume Right (vph)	220	0	40	0								
Hadj (s)	-0.35	0.10	0.03	0.00								
Departure Headway (s)	4.3	4.8	5.3	5.5								
Degree Utilization, x	0.42	0.32	0.23	0.00								
Capacity (veh/h)	808	711	614	564								
Control Delay (s)	10.3	10.1	9.8	8.5								
Approach Delay (s)	10.3	10.1	9.8	0.0								
Approach LOS	B	B	A	A								
Intersection Summary												
Delay				10.2								
Level of Service				B								
Intersection Capacity Utilization				53.7%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	49	69	88	31	81	105
Future Volume (vph)	49	69	88	31	81	105
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	75	96	34	88	114
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	128	130	202			
Volume Left (vph)	53	0	88			
Volume Right (vph)	75	34	0			
Hadj (s)	-0.23	-0.12	0.12			
Departure Headway (s)	4.4	4.3	4.5			
Degree Utilization, x	0.16	0.16	0.25			
Capacity (veh/h)	755	799	774			
Control Delay (s)	8.2	8.1	9.0			
Approach Delay (s)	8.2	8.1	9.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.5			
Level of Service			A			
Intersection Capacity Utilization			30.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	240	1	6	193	37	7	10	11	37	15	9
Future Volume (Veh/h)	7	240	1	6	193	37	7	10	11	37	15	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	261	1	7	210	40	8	11	12	40	16	10
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	213											
pX, platoon unblocked	0.93							0.93	0.93			
vC, conflicting volume	253				273				554	556	280	550
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	160				273				484	485	280	480
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1
tC, 2 stage (s)												
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5
p0 queue free %	99				99				98	97	98	91
cM capacity (veh/h)	1317				1278				428	438	746	434
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	270	257	31	66								
Volume Left	8	7	8	40								
Volume Right	1	40	12	10								
cSH	1317	1278	518	473								
Volume to Capacity	0.01	0.01	0.06	0.14								
Queue Length 95th (ft)	0	0	5	12								
Control Delay (s)	0.3	0.3	12.4	13.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.3	12.4	13.8								
Approach LOS				B	B							
Intersection Summary												
Average Delay				2.3								
Intersection Capacity Utilization				30.7%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↗	↘	↗	↘	↗	↘	↕		↗	↘	
Traffic Volume (vph)	20	128	72	88	129	75	37	154	47	82	195	14
Future Volume (vph)	20	128	72	88	129	75	37	154	47	82	195	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	10	11	11	16	16	16
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.97	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1850	1534	1681	1764	1794	1652	3287		2006	2090	
Flt Permitted		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1850	1534	1681	1764	1794	1652	3287		2006	2090	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	139	78	96	140	82	40	167	51	89	212	15
RTOR Reduction (vph)	0	0	67	0	0	69	0	32	0	0	2	0
Lane Group Flow (vph)	0	161	11	86	150	13	40	186	0	89	225	0
Confl. Peds. (#/hr)			10	10					3			
Confl. Bikes (#/hr)			4						3			
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		11.3	11.3	12.5	12.5	12.5	4.3	28.5		8.9	33.1	
Effective Green, g (s)		11.3	11.3	12.5	12.5	12.5	4.3	28.5		8.9	33.1	
Actuated g/C Ratio		0.14	0.14	0.16	0.16	0.16	0.05	0.36		0.11	0.41	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		261	216	262	275	280	88	1170		223	864	
v/s Ratio Prot		c0.09		0.05	c0.09		0.02	0.06		c0.04	c0.11	
v/s Ratio Perm			0.01			0.01						
v/c Ratio		0.62	0.05	0.33	0.55	0.05	0.45	0.16		0.40	0.26	
Uniform Delay, d1		32.3	29.7	30.0	31.1	28.7	36.7	17.6		33.1	15.4	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.0	0.0	0.9	2.5	0.1	1.4	0.3		1.2	0.7	
Delay (s)		35.3	29.7	30.9	33.6	28.8	38.1	17.9		34.2	16.1	
Level of Service		D	C	C	C	C	D	B		C	B	
Approach Delay (s)		33.5			31.6			21.0			21.2	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			26.7									
HCM 2000 Volume to Capacity ratio			0.41									
Actuated Cycle Length (s)			80.0							18.8		
Intersection Capacity Utilization			50.2%							A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	336	0	17	433	105	8	10	37	322	16	58
Future Volume (vph)	14	336	0	17	433	105	8	10	37	322	16	58
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.96
Flpb, ped/bikes	1.00	1.00		0.99	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.97			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1770	3539		1756	3425			3128			1777	1527
Flt Permitted	0.31	1.00		0.52	1.00			0.91			0.69	1.00
Satd. Flow (perm)	579	3539		960	3425			2879			1284	1527
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	365	0	18	471	114	9	11	40	350	17	63
RTOR Reduction (vph)	0	0	0	0	49	0	0	17	0	0	0	27
Lane Group Flow (vph)	15	365	0	18	536	0	0	43	0	0	367	36
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	14.1	14.1		14.1	14.1			31.4			31.4	31.4
Effective Green, g (s)	14.1	14.1		14.1	14.1			31.4			31.4	31.4
Actuated g/C Ratio	0.26	0.26		0.26	0.26			0.57			0.57	0.57
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	148	907		246	878			1643			733	871
v/s Ratio Prot		0.10			c0.16							
v/s Ratio Perm	0.03			0.02				0.01			c0.29	0.02
v/c Ratio	0.10	0.40		0.07	0.61			0.03			0.50	0.04
Uniform Delay, d1	15.6	17.0		15.5	18.0			5.1			7.1	5.2
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.3	0.3		0.1	1.3			0.0			2.4	0.1
Delay (s)	15.9	17.3		15.6	19.3			5.2			9.5	5.3
Level of Service	B	B		B	B			A			A	A
Approach Delay (s)		17.2			19.2			5.2			8.9	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		15.1			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.53										
Actuated Cycle Length (s)		55.0			Sum of lost time (s)			9.5				
Intersection Capacity Utilization		62.4%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	15	16	37	9	141	2	230	74	117	310	16
Future Volume (vph)	24	15	16	37	9	141	2	230	74	117	310	16
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	10	11	16
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.96			1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected		0.98			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1744			1788	1794	1770	3842		1652	3397	
Flt Permitted		0.83			0.73	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1487			1356	1794	1770	3842		1652	3397	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	16	17	40	10	153	2	250	80	127	337	17
RTOR Reduction (vph)	0	15	0	0	0	131	0	48	0	0	5	0
Lane Group Flow (vph)	0	44	0	0	50	22	2	282	0	127	349	0
Confl. Peds. (#/hr)			4	4					3			
Confl. Bikes (#/hr)			1						2			
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		5.3			5.3	5.3	0.7	14.4		3.9	17.6	
Effective Green, g (s)		5.3			5.3	5.3	0.7	14.4		3.9	17.6	
Actuated g/C Ratio		0.14			0.14	0.14	0.02	0.39		0.10	0.47	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		211			192	254	33	1483		172	1602	
v/s Ratio Prot							0.00	0.07		c0.08	c0.10	
v/s Ratio Perm		0.03			c0.04	0.01						
v/c Ratio		0.21			0.26	0.09	0.06	0.19		0.74	0.22	
Uniform Delay, d1		14.1			14.3	13.9	18.0	7.6		16.2	5.8	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.3	0.1	0.8	0.1		15.2	0.1	
Delay (s)		14.3			14.5	13.9	18.7	7.6		31.4	5.9	
Level of Service		B			B	B	B	A		C	A	
Approach Delay (s)		14.3			14.1			7.7			12.6	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay		11.5										
HCM 2000 Volume to Capacity ratio		0.30										
Actuated Cycle Length (s)		37.3										
Intersection Capacity Utilization		38.1%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	169	45	70	146	0	39	0	57	0	0	0
Future Volume (Veh/h)	0	169	45	70	146	0	39	0	57	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	184	49	76	159	0	42	0	62	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	252											
pX, platoon unblocked												
vC, conflicting volume	159			233			520	520	208	582	544	159
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	159			233			520	520	208	582	544	159
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			94			91	100	93	100	100	100
cM capacity (veh/h)	1420			1335			447	435	832	376	421	886
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	233	235	104	0								
Volume Left	0	76	42	0								
Volume Right	49	0	62	0								
cSH	1420	1335	617	1700								
Volume to Capacity	0.00	0.06	0.17	0.00								
Queue Length 95th (ft)	0	5	15	0								
Control Delay (s)	0.0	2.9	12.0	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	2.9	12.0	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			3.4									
Intersection Capacity Utilization			38.8%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	77	12	3	55	2	20	0	9	2	0	2
Future Volume (Veh/h)	2	77	12	3	55	2	20	0	9	2	0	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	84	13	3	60	2	22	0	10	2	0	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage veh												
Upstream signal (ft)	643											
pX, platoon unblocked												
vC, conflicting volume	62			97			164	162	90	172	168	61
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	62			97			164	162	90	172	168	61
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	99	100	100	100
cM capacity (veh/h)	1541			1496			798	727	967	782	722	1004
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	99	65	32	4								
Volume Left	2	3	22	2								
Volume Right	13	2	10	2								
cSH	1541	1496	844	879								
Volume to Capacity	0.00	0.00	0.04	0.00								
Queue Length 95th (ft)	0	0	3	0								
Control Delay (s)	0.2	0.4	9.4	9.1								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.2	0.4	9.4	9.1								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization			15.4%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	29	90	12	29	111	12
Future Volume (vph)	29	90	12	29	111	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	98	13	32	121	13
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	130	45	134			
Volume Left (vph)	32	0	121			
Volume Right (vph)	98	32	0			
Hadj (s)	-0.37	-0.39	0.21			
Departure Headway (s)	3.9	3.9	4.4			
Degree Utilization, x	0.14	0.05	0.16			
Capacity (veh/h)	875	873	787			
Control Delay (s)	7.6	7.1	8.3			
Approach Delay (s)	7.6	7.1	8.3			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.8			
Level of Service			A			
Intersection Capacity Utilization			27.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	81	115	18	54	4	87	13	18	19	15	7
Future Volume (Veh/h)	4	81	115	18	54	4	87	13	18	19	15	7
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	88	125	20	59	4	95	14	20	21	16	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	576											
pX, platoon unblocked												
vC, conflicting volume	63			213			276	262	150	286	322	61
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	63			213			276	262	150	286	322	61
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			85	98	98	97	97	99
cM capacity (veh/h)	1540			1357			649	632	896	631	585	1004
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	217	83	129	45								
Volume Left	4	20	95	21								
Volume Right	125	4	20	8								
cSH	1540	1357	676	656								
Volume to Capacity	0.00	0.01	0.19	0.07								
Queue Length 95th (ft)	0	1	18	6								
Control Delay (s)	0.2	1.9	11.6	10.9								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	1.9	11.6	10.9								
Approach LOS			B	B								
Intersection Summary												
Average Delay				4.6								
Intersection Capacity Utilization				30.8%	ICU Level of Service			A				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	64	17	12	40	5	5	5	34	2	6	2
Future Volume (Veh/h)	0	64	17	12	40	5	5	5	34	2	6	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	70	18	13	43	5	5	5	37	2	7	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)					249							
pX, platoon unblocked												
vC, conflicting volume	48			88			156	153	79	190	160	46
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	48			88			156	153	79	190	160	46
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	99	96	100	99	100
cM capacity (veh/h)	1559			1508			798	732	981	732	726	1024
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	88	61	47	11								
Volume Left	0	13	5	2								
Volume Right	18	5	37	2								
cSH	1559	1508	925	768								
Volume to Capacity	0.00	0.01	0.05	0.01								
Queue Length 95th (ft)	0	1	4	1								
Control Delay (s)	0.0	1.6	9.1	9.8								
Lane LOS		A	A	A								
Approach Delay (s)	0.0	1.6	9.1	9.8								
Approach LOS			A	A								
Intersection Summary												
Average Delay			3.1									
Intersection Capacity Utilization			19.7%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	46	25	53	22	13	32	156	25	31	171	6
Future Volume (vph)	42	46	25	53	22	13	32	156	25	31	171	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.6			5.0		4.2	5.0		4.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.97			0.98		1.00	0.98		1.00	0.99	
Flt Protected		0.98			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1774			1773		1770	3466		1770	3520	
Flt Permitted		0.84			0.79		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1512			1451		1770	3466		1770	3520	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	50	27	58	24	14	35	170	27	34	186	7
RTOR Reduction (vph)	0	17	0	0	10	0	0	15	0	0	3	0
Lane Group Flow (vph)	0	106	0	0	86	0	35	182	0	34	190	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		5.0			4.6		0.9	15.3		0.7	14.9	
Effective Green, g (s)		5.0			4.6		0.9	15.3		0.7	14.9	
Actuated g/C Ratio		0.14			0.13		0.03	0.44		0.02	0.43	
Clearance Time (s)		4.6			5.0		4.2	5.0		4.0	5.0	
Vehicle Extension (s)		3.0			3.5		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		218			192		46	1532		35	1515	
v/s Ratio Prot							c0.02	0.05		c0.02	c0.05	
v/s Ratio Perm		c0.07			0.06							
v/c Ratio		0.49			0.45		0.76	0.12		0.97	0.13	
Uniform Delay, d1		13.6			13.8		16.7	5.7		16.9	5.9	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.7			1.9		48.2	0.0		140.0	0.0	
Delay (s)		15.3			15.8		64.9	5.7		156.9	6.0	
Level of Service		B			B		E	A		F	A	
Approach Delay (s)		15.3			15.8			14.6			28.6	
Approach LOS		B			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			19.6				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.26									
Actuated Cycle Length (s)			34.6				Sum of lost time (s)			14.2		
Intersection Capacity Utilization			31.5%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	107	29	34	61	28	12	40	29	22	33	39
Future Volume (Veh/h)	33	107	29	34	61	28	12	40	29	22	33	39
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	36	116	32	37	66	30	13	43	32	24	36	42
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		280										
pX, platoon unblocked												
vC, conflicting volume	96			148			419	374	132	412	375	81
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	96			148			419	374	132	412	375	81
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			97	92	97	95	93	96
cM capacity (veh/h)	1498			1434			476	529	917	479	529	979
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	184	133	88	102								
Volume Left	36	37	13	24								
Volume Right	32	30	32	42								
cSH	1498	1434	613	633								
Volume to Capacity	0.02	0.03	0.14	0.16								
Queue Length 95th (ft)	2	2	12	14								
Control Delay (s)	1.6	2.3	11.8	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	1.6	2.3	11.8	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			5.6									
Intersection Capacity Utilization			26.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	70	18	11	43	1	14	18	25	5	9	3
Future Volume (vph)	2	70	18	11	43	1	14	18	25	5	9	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	76	20	12	47	1	15	20	27	5	10	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	98	60	62	18								
Volume Left (vph)	2	12	15	5								
Volume Right (vph)	20	1	27	3								
Hadj (s)	-0.08	0.06	-0.18	-0.01								
Departure Headway (s)	4.0	4.2	4.1	4.3								
Degree Utilization, x	0.11	0.07	0.07	0.02								
Capacity (veh/h)	865	828	840	801								
Control Delay (s)	7.5	7.6	7.4	7.4								
Approach Delay (s)	7.5	7.6	7.4	7.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.5								
Level of Service				A								
Intersection Capacity Utilization				19.2%	ICU Level of Service		A					
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	6	99	3	22	45	18	3	49	90	140	9	6
Future Volume (vph)	6	99	3	22	45	18	3	49	90	140	9	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	7	108	3	24	49	20	3	53	98	152	10	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	118	93	154	169								
Volume Left (vph)	7	24	3	152								
Volume Right (vph)	3	20	98	7								
Hadj (s)	0.03	-0.04	-0.34	0.19								
Departure Headway (s)	4.8	4.8	4.3	4.8								
Degree Utilization, x	0.16	0.12	0.18	0.23								
Capacity (veh/h)	690	693	788	709								
Control Delay (s)	8.7	8.5	8.3	9.2								
Approach Delay (s)	8.7	8.5	8.3	9.2								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.7								
Level of Service				A								
Intersection Capacity Utilization				38.2%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	72	36	16	86	72
Future Volume (vph)	0	72	36	16	86	72
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	78	39	17	93	78
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	78	56	171			
Volume Left (vph)	0	0	93			
Volume Right (vph)	78	17	0			
Hadj (s)	-0.57	-0.15	0.14			
Departure Headway (s)	3.8	4.1	4.3			
Degree Utilization, x	0.08	0.06	0.20			
Capacity (veh/h)	885	848	827			
Control Delay (s)	7.2	7.4	8.3			
Approach Delay (s)	7.2	7.4	8.3			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.9			
Level of Service			A			
Intersection Capacity Utilization			18.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	130	43	244	53	205	31	215	116	174	303	7
Future Volume (vph)	17	130	43	244	53	205	31	215	116	174	303	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	16	16	16
Total Lost time (s)	5.0	5.0	5.0		4.9	4.9	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.95		1.00	1.00	
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2006	1863	1555		1789	1794	1770	3753		2006	3997	
Flt Permitted	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	2006	1863	1555		1789	1794	1770	3753		2006	3997	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	141	47	265	58	223	34	234	126	189	329	8
RTOR Reduction (vph)	0	0	42	0	0	149	0	85	0	0	2	0
Lane Group Flow (vph)	18	141	5	0	323	74	34	275	0	189	335	0
Confl. Peds. (#/hr)			2	2					5			
Confl. Bikes (#/hr)									4			
Turn Type	Split	NA	Perm	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	7.0	7.0	7.0		16.3	23.0	1.3	20.6		6.7	26.0	
Effective Green, g (s)	7.0	7.0	7.0		16.3	23.0	1.3	20.6		6.7	26.0	
Actuated g/C Ratio	0.10	0.10	0.10		0.23	0.33	0.02	0.30		0.10	0.37	
Clearance Time (s)	5.0	5.0	5.0		4.9		4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	201	187	156		418	591	33	1109		192	1490	
v/s Ratio Prot	0.01	c0.08			c0.18	0.04	0.02	0.07		c0.09	c0.08	
v/s Ratio Perm			0.00									
v/c Ratio	0.09	0.75	0.03		0.77	0.12	1.03	0.25		0.98	0.22	
Uniform Delay, d1	28.5	30.5	28.3		25.0	16.3	34.2	18.7		31.4	15.0	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	14.1	0.0		8.6	0.1	166.0	0.5		60.0	0.4	
Delay (s)	28.5	44.6	28.3		33.6	16.4	200.2	19.2		91.4	15.3	
Level of Service	C	D	C		C	B	F	B		F	B	
Approach Delay (s)		39.5			26.6			34.8			42.7	
Approach LOS		D			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			35.2									
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			69.7									
Intersection Capacity Utilization			62.0%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	349	5	16	520	52	0	0	27	29	0	31
Future Volume (Veh/h)	9	349	5	16	520	52	0	0	27	29	0	31
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	379	5	17	565	57	0	0	29	32	0	34
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage (veh)					2							
Upstream signal (ft)		312										
pX, platoon unblocked				0.95			0.95	0.95	0.95	0.95	0.95	
vC, conflicting volume	622			384			1063	1058	382	1058	1032	594
vC1, stage 1 conf vol							402	402		628	628	
vC2, stage 2 conf vol							662	656		430	404	
vCu, unblocked vol	622			322			1039	1033	320	1034	1006	594
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			100	100	96	92	100	93
cM capacity (veh/h)	959			1173			364	393	683	389	405	505
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	394	639	29	66								
Volume Left	10	17	0	32								
Volume Right	5	57	29	34								
cSH	959	1173	683	442								
Volume to Capacity	0.01	0.01	0.04	0.15								
Queue Length 95th (ft)	1	1	3	13								
Control Delay (s)	0.3	0.4	10.5	14.6								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.4	10.5	14.6								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.5									
Intersection Capacity Utilization			54.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

07/02/2018

																	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR					
Lane Configurations																	
Traffic Volume (veh/h)	12	421	10	31	663	29	10	4	66	35	4	18					
Future Volume (Veh/h)	12	421	10	31	663	29	10	4	66	35	4	18					
Sign Control	Free			Free			Stop			Stop							
Grade	0%			0%			0%			0%							
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92					
Hourly flow rate (vph)	13	458	11	34	721	32	11	4	72	38	4	20					
Pedestrians	1						1										
Lane Width (ft)	12.0						12.0										
Walking Speed (ft/s)	4.0						4.0										
Percent Blockage	0						0										
Right turn flare (veh)																	
Median type	TWLTL			TWLTL													
Median storage veh	2			2													
Upstream signal (ft)	687																
pX, platoon unblocked																	
vC, conflicting volume	753			470			1302	1312	464	1363	1301	738					
vC1, stage 1 conf vol							490	490			805	805					
vC2, stage 2 conf vol							812	821			558	496					
vCu, unblocked vol	753			470			1302	1312	464	1363	1301	738					
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2					
tC, 2 stage (s)							6.1	5.5			6.1	5.5					
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3					
p0 queue free %	98			97			96	99	88	87	99	95					
cM capacity (veh/h)	857			1091			293	321	597	284	327	418					
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1											
Volume Total	13	469	34	753	87	62											
Volume Left	13	0	34	0	11	38											
Volume Right	0	11	0	32	72	20											
cSH	857	1700	1091	1700	510	320											
Volume to Capacity	0.02	0.28	0.03	0.44	0.17	0.19											
Queue Length 95th (ft)	1	0	2	0	15	18											
Control Delay (s)	9.3	0.0	8.4	0.0	13.5	18.9											
Lane LOS	A			A			B	C									
Approach Delay (s)	0.2			0.4	13.5	18.9											
Approach LOS						B	C										
Intersection Summary																	
Average Delay				1.9													
Intersection Capacity Utilization				53.2%	ICU Level of Service				A								
Analysis Period (min)				15													

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	602	0	0	776	119	0	0	0	0	0	20
Future Volume (Veh/h)	25	602	0	0	776	119	0	0	0	0	0	20
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	27	654	0	0	843	129	0	0	0	0	0	22
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL				TWLTL							
Median storage veh	2				2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	972			654			1573	1680	654	1616	1616	908
vC1, stage 1 conf vol							708	708		908	908	
vC2, stage 2 conf vol							865	972		708	708	
vCu, unblocked vol	972			654			1573	1680	654	1616	1616	908
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			100	100	100	100	100	93
cM capacity (veh/h)	709			933			247	255	467	262	281	334
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	27	654	0	972	0	22						
Volume Left	27	0	0	0	0	0						
Volume Right	0	0	0	129	0	22						
cSH	709	1700	1700	1700	1700	334						
Volume to Capacity	0.04	0.38	0.00	0.57	0.00	0.07						
Queue Length 95th (ft)	3	0	0	0	0	5						
Control Delay (s)	10.3	0.0	0.0	0.0	0.0	16.5						
Lane LOS	B				A	C						
Approach Delay (s)	0.4		0.0		0.0	16.5						
Approach LOS					A	C						
Intersection Summary												
Average Delay				0.4								
Intersection Capacity Utilization				58.1%	ICU Level of Service				B			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	81	0	0	56	34	258	22	39	584	12
Future Volume (Veh/h)	0	0	81	0	0	56	34	258	22	39	584	12
Sign Control	Stop			Stop				Free			Free	
Grade	0%			0%				0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	88	0	0	61	37	280	24	42	635	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL			TWLTL		
Median storage veh)							2			2		
Upstream signal (ft)										621		
pX, platoon unblocked												
vC, conflicting volume	1000	1104	642	1173	1098	152	648			304		
vC1, stage 1 conf vol	726	726		366	366							
vC2, stage 2 conf vol	275	378		807	732							
vCu, unblocked vol	1000	1104	642	1173	1098	152	648			304		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	79	100	100	93	96			97		
cM capacity (veh/h)	336	363	417	213	344	867	934			1254		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	88	61	37	187	117	42	648					
Volume Left	0	0	37	0	0	42	0					
Volume Right	88	61	0	0	24	0	13					
cSH	417	867	934	1700	1700	1254	1700					
Volume to Capacity	0.21	0.07	0.04	0.11	0.07	0.03	0.38					
Queue Length 95th (ft)	20	6	3	0	0	3	0					
Control Delay (s)	15.9	9.5	9.0	0.0	0.0	8.0	0.0					
Lane LOS	C	A	A			A						
Approach Delay (s)	15.9	9.5	1.0			0.5						
Approach LOS	C	A										
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			43.1%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Michigan Avenue
E/W Street Name	Michigan Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	89	14	38	0	47	15	8	0	23	238	6	0	6	234	28
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	99	16	42	0	52	17	9	0	26	264	7	0	7	259	31
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		157			78			297			297	
Entry Volume veh/h		154			76			291			291	
Circulating Flow (v_c), pc/h	318			389			122			95		
Exiting Flow (v_{ex}), pc/h	30			74			372			353		
Capacity (C_{pce}), pc/h		822			766			1000			1028	
Capacity (c), veh/h		806			751			981			1007	
v/c Ratio (x)		0.19			0.10			0.30			0.29	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.5			5.8			6.7			6.5	
Lane LOS		A			A			A			A	
95% Queue, veh		0.7			0.3			1.2			1.2	
Approach Delay, s/veh	6.5			5.8			6.7			6.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	6.5						A					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - West
E/W Street Name	West Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	17	10	8	0	14	10	31	0	8	93	14	0	31	93	17
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	19	11	9	0	16	11	34	0	9	103	16	0	34	103	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		39			61			128			156	
Entry Volume veh/h		38			60			125			153	
Circulating Flow (v_c), pc/h	153			131			64			36		
Exiting Flow (v_{ex}), pc/h	61			39			156			128		
Capacity (C_{pce}), pc/h		970			991			1060			1090	
Capacity (c), veh/h		951			972			1039			1069	
v/c Ratio (x)		0.04			0.06			0.12			0.14	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.1			4.3			4.5			4.6	
Lane LOS		A			A			A			A	
95% Queue, veh		0.1			0.2			0.4			0.5	
Approach Delay, s/veh	4.1			4.3			4.5			4.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	4.5						A					

HCM Unsignalized Intersection Capacity Analysis

47: Coast Hwy & Kelly St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	20	24	10	16	24	13	75	10	20	64	24
Future Volume (Veh/h)	9	20	24	10	16	24	13	75	10	20	64	24
Sign Control	Stop				Stop				Free		Free	
Grade	0%				0%				0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	22	26	11	17	26	14	82	11	22	70	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							737			527		
pX, platoon unblocked												
vC, conflicting volume	230	248	48	232	256	46	96				93	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	230	248	48	232	256	46	96				93	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	98	97	97	98	97	97	99				99	
cM capacity (veh/h)	660	638	1011	655	632	1013	1496				1499	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	58	54	55	52	57	61						
Volume Left	10	11	14	0	22	0						
Volume Right	26	26	0	11	0	26						
cSH	770	778	1496	1700	1499	1700						
Volume to Capacity	0.08	0.07	0.01	0.03	0.01	0.04						
Queue Length 95th (ft)	6	6	1	0	1	0						
Control Delay (s)	10.1	10.0	1.9	0.0	2.9	0.0						
Lane LOS	B	A	A		A							
Approach Delay (s)	10.1	10.0	1.0		1.4							
Approach LOS	B	A										
Intersection Summary												
Average Delay			4.1									
Intersection Capacity Utilization			Err%	ICU Level of Service					H			
Analysis Period (min)			15									

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	147	6	32	7	66	7	22	736	17
Future Volume (veh/h)	0	0	0	147	6	32	7	66	7	22	736	17
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h				165	0	0	8	72	0	24	800	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				1328	0	593	148	1692	527	148	1178	527
Arrive On Green				0.36	0.00	0.00	0.08	0.32	0.00	0.08	0.32	0.00
Sat Flow, veh/h				3690	0	1647	1845	5289	1647	1845	3681	1647
Grp Volume(v), veh/h				165	0	0	8	72	0	24	800	0
Grp Sat Flow(s),veh/h/ln				1845	0	1647	1845	1763	1647	1845	1840	1647
Q Serve(g_s), s				1.5	0.0	0.0	0.2	0.5	0.0	0.6	9.4	0.0
Cycle Q Clear(g_c), s				1.5	0.0	0.0	0.2	0.5	0.0	0.6	9.4	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				1328	0	593	148	1692	527	148	1178	527
V/C Ratio(X)				0.12	0.00	0.00	0.05	0.04	0.00	0.16	0.68	0.00
Avail Cap(c_a), veh/h				1328	0	593	148	1692	527	148	1178	527
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				10.7	0.0	0.0	21.3	11.7	0.0	21.4	14.8	0.0
Incr Delay (d2), s/veh				0.2	0.0	0.0	0.7	0.0	0.0	2.4	3.2	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.8	0.0	0.0	0.1	0.2	0.0	0.4	5.3	0.0
LnGrp Delay(d),s/veh				10.9	0.0	0.0	21.9	11.8	0.0	23.8	17.9	0.0
LnGrp LOS				B			C	B		C	B	
Approach Vol, veh/h					165			80			824	
Approach Delay, s/veh					10.9			12.8			18.1	
Approach LOS					B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	8.0	20.0			8.0	20.0		22.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	16.0			4.0	16.0		18.0				
Max Q Clear Time (g_c+I1), s	2.6	2.5			2.2	11.4		3.5				
Green Ext Time (p_c), s	0.0	0.2			0.0	2.2		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				16.6								
HCM 2010 LOS				B								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↗	↙↙	↑↑					
Traffic Volume (veh/h)	529	192	454	1080	0	0			
Future Volume (veh/h)	529	192	454	1080	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937					
Adj Flow Rate, veh/h	575	209	493	1174					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	1840	823	1074	3313					
Arrive On Green	0.50	0.50	0.30	0.90					
Sat Flow, veh/h	3778	1647	3579	3778					
Grp Volume(v), veh/h	575	209	493	1174					
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840					
Q Serve(g_s), s	3.7	2.9	4.5	1.9					
Cycle Q Clear(g_c), s	3.7	2.9	4.5	1.9					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	1840	823	1074	3313					
V/C Ratio(X)	0.31	0.25	0.46	0.35					
Avail Cap(c_a), veh/h	1840	823	1074	3313					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	5.9	5.7	11.4	0.3					
Incr Delay (d2), s/veh	0.4	0.7	1.4	0.3					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	2.0	1.4	2.4	1.0					
LnGrp Delay(d),s/veh	6.4	6.5	12.8	0.6					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	784			1667					
Approach Delay, s/veh	6.4			4.2					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			16.0	24.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			12.0	20.0				36.0	
Max Q Clear Time (g_c+l1), s			6.5	5.7				3.9	
Green Ext Time (p_c), s			1.0	4.0				10.8	
Intersection Summary									
HCM 2010 Ctrl Delay			4.9						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary 50: I-5 NB On/Off-Ramp & SR-76 ramps

07/02/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑↑	↑	↑		
Traffic Volume (veh/h)	553	67	748	1700	67	1		
Future Volume (veh/h)	553	67	748	1700	67	1		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	601	73	813	1848	73	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	982	439	954	2208	492	439		
Arrive On Green	0.27	0.27	0.27	0.60	0.27	0.00		
Sat Flow, veh/h	3778	1647	3579	3778	1845	1647		
Grp Volume(v), veh/h	601	73	813	1848	73	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840	1845	1647		
Q Serve(g_s), s	8.6	2.0	12.9	24.2	1.8	0.0		
Cycle Q Clear(g_c), s	8.6	2.0	12.9	24.2	1.8	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	982	439	954	2208	492	439		
V/C Ratio(X)	0.61	0.17	0.85	0.84	0.15	0.00		
Avail Cap(c_a), veh/h	982	439	954	2208	492	439		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	19.3	16.9	20.9	9.6	16.8	0.0		
Incr Delay (d2), s/veh	2.8	0.8	9.5	4.0	0.6	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	4.7	1.0	7.6	13.3	1.0	0.0		
LnGrp Delay(d),s/veh	22.1	17.7	30.4	13.6	17.4	0.0		
LnGrp LOS	C	B	C	B	B			
Approach Vol, veh/h	674			2661	73			
Approach Delay, s/veh	21.7			18.7	17.4			
Approach LOS	C			B	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	20.0	20.0				40.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	16.0	16.0				36.0
Max Q Clear Time (g_c+I1), s		3.8	14.9	10.6				26.2
Green Ext Time (p_c), s		0.1	0.4	2.0				8.0
Intersection Summary								
HCM 2010 Ctrl Delay			19.3					
HCM 2010 LOS			B					

HCM 2010 Signalized Intersection Summary
51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	294	3	94	510	155	10	0	112	19	31	31
Future Volume (veh/h)	0	294	3	94	510	155	10	0	112	19	31	31
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1937	1976	1937	1937	1937	1937	0	1937	1937	1937	1937
Adj Flow Rate, veh/h	0	320	3	102	554	0	11	0	122	21	34	34
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1150	11	284	1982	887	0	0	0	568	596	507
Arrive On Green	0.00	0.31	0.31	0.15	0.54	0.00	0.00	0.00	0.00	0.31	0.31	0.31
Sat Flow, veh/h	0	3833	35	1845	3681	1647		0		1845	1937	1647
Grp Volume(v), veh/h	0	158	165	102	554	0		0.0		21	34	34
Grp Sat Flow(s),veh/h/ln	0	1840	1931	1845	1840	1647				1845	1937	1647
Q Serve(g_s), s	0.0	3.4	3.4	2.6	4.3	0.0				0.4	0.6	0.8
Cycle Q Clear(g_c), s	0.0	3.4	3.4	2.6	4.3	0.0				0.4	0.6	0.8
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	566	594	284	1982	887				568	596	507
V/C Ratio(X)	0.00	0.28	0.28	0.36	0.28	0.00				0.04	0.06	0.07
Avail Cap(c_a), veh/h	0	566	594	284	1982	887				568	596	507
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	13.6	13.6	19.7	6.5	0.0				12.6	12.7	12.7
Incr Delay (d2), s/veh	0.0	1.2	1.2	3.5	0.4	0.0				0.1	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.9	2.0	1.6	2.3	0.0				0.2	0.4	0.4
LnGrp Delay(d),s/veh	0.0	14.8	14.8	23.2	6.9	0.0				12.7	12.9	13.0
LnGrp LOS		B	B	C	A					B	B	B
Approach Vol, veh/h		323			656						89	
Approach Delay, s/veh		14.8			9.4						12.9	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			12.0	20.0		20.0		32.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			8.0	16.0		16.0		28.0				
Max Q Clear Time (g_c+I1), s			4.6	5.4		2.8		6.3				
Green Ext Time (p_c), s			0.1	1.3		0.2		3.8				
Intersection Summary												
HCM 2010 Ctrl Delay			11.3									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	236	499	5	9	657	332	10	10	19	129	2	58
Future Volume (veh/h)	236	499	5	9	657	332	10	10	19	129	2	58
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1976	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	257	542	5	10	714	361	11	11	21	102	54	63
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	271	1146	11	98	785	351	202	202	351	394	174	203
Arrive On Green	0.15	0.31	0.31	0.05	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1845	3737	34	1845	3681	1647	945	945	1647	1845	817	953
Grp Volume(v), veh/h	257	267	280	10	714	361	22	0	21	102	0	117
Grp Sat Flow(s),veh/h/ln	1845	1840	1931	1845	1840	1647	1890	0	1647	1845	0	1769
Q Serve(g_s), s	10.4	8.8	8.8	0.4	14.2	16.0	0.7	0.0	0.8	3.5	0.0	4.2
Cycle Q Clear(g_c), s	10.4	8.8	8.8	0.4	14.2	16.0	0.7	0.0	0.8	3.5	0.0	4.2
Prop In Lane	1.00		0.02	1.00		1.00	0.50		1.00	1.00		0.54
Lane Grp Cap(c), veh/h	271	564	592	98	785	351	403	0	351	394	0	377
V/C Ratio(X)	0.95	0.47	0.47	0.10	0.91	1.03	0.05	0.00	0.06	0.26	0.00	0.31
Avail Cap(c_a), veh/h	271	564	592	98	785	351	403	0	351	394	0	377
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	31.7	21.1	21.1	33.8	28.8	29.5	23.5	0.0	23.5	24.6	0.0	24.9
Incr Delay (d2), s/veh	43.2	2.8	2.7	2.1	16.4	55.3	0.3	0.0	0.3	1.6	0.0	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	4.9	5.1	0.3	8.9	12.6	0.4	0.0	0.4	1.9	0.0	2.3
LnGrp Delay(d),s/veh	74.9	23.9	23.8	35.8	45.2	84.8	23.7	0.0	23.8	26.2	0.0	27.0
LnGrp LOS	E	C	C	D	D	F	C		C	C		C
Approach Vol, veh/h		804			1085			43			219	
Approach Delay, s/veh		40.2			58.3			23.8			26.6	
Approach LOS		D			E			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	8.0	27.0		20.0	15.0	20.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	4.0	23.0		16.0	11.0	16.0				
Max Q Clear Time (g_c+I1), s		2.8	2.4	10.8		6.2	12.4	18.0				
Green Ext Time (p_c), s		0.1	0.0	2.6		0.6	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				47.6								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	412	293	84	815	172	260	128	80	212	269	189
Future Volume (veh/h)	73	412	293	84	815	172	260	128	80	212	269	189
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	79	448	318	91	886	187	211	240	87	230	292	205
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	105	472	333	132	894	400	448	470	400	422	443	376
Arrive On Green	0.06	0.23	0.23	0.07	0.24	0.24	0.24	0.24	0.24	0.23	0.23	0.23
Sat Flow, veh/h	1845	2064	1457	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	79	399	367	91	886	187	211	240	87	230	292	205
Grp Sat Flow(s),veh/h/ln	1845	1840	1680	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	3.0	15.0	15.1	3.4	16.8	6.8	6.8	7.5	3.0	7.7	9.6	7.7
Cycle Q Clear(g_c), s	3.0	15.0	15.1	3.4	16.8	6.8	6.8	7.5	3.0	7.7	9.6	7.7
Prop In Lane	1.00		0.87	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	105	421	384	132	894	400	448	470	400	422	443	376
V/C Ratio(X)	0.75	0.95	0.95	0.69	0.99	0.47	0.47	0.51	0.22	0.55	0.66	0.54
Avail Cap(c_a), veh/h	105	421	384	132	894	400	448	470	400	422	443	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.5	26.6	26.6	31.7	26.4	22.6	22.7	22.9	21.2	23.8	24.5	23.8
Incr Delay (d2), s/veh	38.1	32.8	35.9	25.7	28.0	3.9	3.5	3.9	1.2	5.0	7.5	5.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	11.4	10.8	2.7	12.0	3.5	3.9	4.5	1.5	4.5	6.0	4.1
LnGrp Delay(d),s/veh	70.6	59.4	62.5	57.5	54.5	26.5	26.2	26.8	22.4	28.8	32.0	29.4
LnGrp LOS	E	E	E	E	D	C	C	C	C	C	C	C
Approach Vol, veh/h		845			1164			538			727	
Approach Delay, s/veh		61.8			50.2			25.9			30.3	
Approach LOS		E			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.0	9.0	20.0		20.0	8.0	21.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	5.0	16.0		16.0	4.0	17.0				
Max Q Clear Time (g_c+I1), s		9.5	5.4	17.1		11.6	5.0	18.8				
Green Ext Time (p_c), s		1.5	0.0	0.0		1.4	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			44.8									
HCM 2010 LOS			D									
Notes												

Intersection

Intersection Delay, s/veh 7.6

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	88	7	14	66	40	2	2	5	0	0	0
Future Vol, veh/h	25	88	7	14	66	40	2	2	5	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	96	8	15	72	43	2	2	5	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.8	7.5	7.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	22%	21%	12%
Vol Thru, %	22%	73%	55%
Vol Right, %	56%	6%	33%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	9	120	120
LT Vol	2	25	14
Through Vol	2	88	66
RT Vol	5	7	40
Lane Flow Rate	10	130	130
Geometry Grp	1	1	1
Degree of Util (X)	0.011	0.147	0.14
Departure Headway (Hd)	4.19	4.055	3.872
Convergence, Y/N	Yes	Yes	Yes
Cap	859	884	925
Service Time	2.19	2.08	1.902
HCM Lane V/C Ratio	0.012	0.147	0.141
HCM Control Delay	7.2	7.8	7.5
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	0.5	0.5

Intersection												
Int Delay, s/veh	2.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖						↖	↗
Traffic Vol, veh/h	0	133	66	43	54	0	0	0	0	16	0	54
Future Vol, veh/h	0	133	66	43	54	0	0	0	0	16	0	54
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	145	72	47	59	0	0	0	0	17	0	59
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	145	0	0				298	298	59
Stage 1	-	-	-	-	-	-				153	153	-
Stage 2	-	-	-	-	-	-				145	145	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1437	-	0				693	614	1007
Stage 1	0	-	-	-	-	0				875	771	-
Stage 2	0	-	-	-	-	0				882	777	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1437	-	-				669	0	1007
Mov Cap-2 Maneuver	-	-	-	-	-	-				669	0	-
Stage 1	-	-	-	-	-	-				845	0	-
Stage 2	-	-	-	-	-	-				882	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.4			9.2					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2						
Capacity (veh/h)	-	-	1437	-	669	1007						
HCM Lane V/C Ratio	-	-	0.033	-	0.026	0.058						
HCM Control Delay (s)	-	-	7.6	0	10.5	8.8						
HCM Lane LOS	-	-	A	A	B	A						
HCM 95th %tile Q(veh)	-	-	0.1	-	0.1	0.2						

HCM 2010 Signalized Intersection Summary

56: I-5 SB On/Off-Ramp & Vista Way

07/02/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑	↑	↑↑		
Traffic Volume (veh/h)	392	145	179	932	12	170		
Future Volume (veh/h)	392	145	179	932	12	170		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	426	0	195	1013	13	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1595	714	358	1162	492	773		
Arrive On Green	0.43	0.00	0.10	0.60	0.27	0.00		
Sat Flow, veh/h	3778	1647	3579	1937	1845	2898		
Grp Volume(v), veh/h	426	0	195	1013	13	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1937	1845	1449		
Q Serve(g_s), s	4.5	0.0	3.1	26.3	0.3	0.0		
Cycle Q Clear(g_c), s	4.5	0.0	3.1	26.3	0.3	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1595	714	358	1162	492	773		
V/C Ratio(X)	0.27	0.00	0.54	0.87	0.03	0.00		
Avail Cap(c_a), veh/h	1595	714	358	1162	492	773		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	10.9	0.0	25.7	10.1	16.2	0.0		
Incr Delay (d2), s/veh	0.4	0.0	5.9	9.1	0.1	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	2.3	0.0	1.8	16.7	0.2	0.0		
LnGrp Delay(d),s/veh	11.3	0.0	31.6	19.1	16.3	0.0		
LnGrp LOS	B		C	B	B			
Approach Vol, veh/h	426			1208	13			
Approach Delay, s/veh	11.3			21.1	16.3			
Approach LOS	B			C	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	10.0	30.0				40.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	6.0	26.0				36.0
Max Q Clear Time (g_c+I1), s		2.3	5.1	6.5				28.3
Green Ext Time (p_c), s		0.0	0.1	2.7				4.5
Intersection Summary								
HCM 2010 Ctrl Delay			18.6					
HCM 2010 LOS			B					

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	272	107	194	477	306	1673	214	38	179	121	74	78
Future Volume (vph)	272	107	194	477	306	1673	214	38	179	121	74	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3018	1441		1787	1583		1807	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3018	1441		1787	1583		1807	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	296	116	211	518	333	1818	233	41	195	132	80	85
RTOR Reduction (vph)	0	0	190	0	496	501	0	0	117	0	0	71
Lane Group Flow (vph)	296	116	21	518	746	408	0	274	78	0	212	14
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	16.9	9.8	9.8	33.7	28.2	28.2		21.2	21.2		17.0	17.0
Effective Green, g (s)	16.9	9.8	9.8	33.7	28.2	28.2		21.2	21.2		17.0	17.0
Actuated g/C Ratio	0.17	0.10	0.10	0.34	0.28	0.28		0.21	0.21		0.17	0.17
Clearance Time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	299	182	155	596	851	406		378	335		307	269
v/s Ratio Prot	0.17	0.06		c0.29	0.25			c0.15			c0.12	
v/s Ratio Perm			0.01			c0.28			0.05			0.01
v/c Ratio	0.99	0.64	0.13	0.87	0.99dr	1.00		0.72	0.23		0.69	0.05
Uniform Delay, d1	41.5	43.4	41.2	31.1	34.2	35.9		36.7	32.7		39.0	34.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	48.7	5.3	0.1	12.8	9.8	45.8		11.5	1.6		12.0	0.4
Delay (s)	90.2	48.7	41.4	43.9	44.0	81.7		48.2	34.3		51.1	35.1
Level of Service	F	D	D	D	D	F		D	C		D	D
Approach Delay (s)		65.9			56.8			42.4			46.5	
Approach LOS		E			E			D			D	

Intersection Summary

HCM 2000 Control Delay	55.8	HCM 2000 Level of Service	E
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	108.9%	ICU Level of Service	G
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				LT				L			
Volume (V), veh/h	0	0	0	0	0	673	0	324	0	0	438	685	0	557	561	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	0	0	0	0	746	0	352	0	0	486	759	0	618	622	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929		4.6453	4.3276			4.3276		4.6453	4.3276	
Follow-Up Headway (s)		3.1858		2.6667	2.5352			2.5352		2.6667	2.5352	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		0		0	746	352		486	759	618	622	
Entry Volume veh/h		0		0	731	352		476	744	606	610	
Circulating Flow (v_c), pc/h	1986			486			618			746		
Exiting Flow (v_{ex}), pc/h	618			0			486			1368		
Capacity (C_{pce}), pc/h		155		863	939			840		680	753	
Capacity (c), veh/h		152		846	921			823		666	738	
v/c Ratio (x)		0.00		0.00	0.79			0.58		0.91	0.83	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		23.7		4.3	21.1	0.0		13.1	0.0	40.8	27.7	
Lane LOS		C		A	C	A		B	A	E	D	
95% Queue, veh		0.0		0.0	8.5			3.8		11.8	9.1	
Approach Delay, s/veh				14.2			5.1			34.2		
Approach LOS				B			A			D		
Intersection Delay, s/veh LOS	18.0						C					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	21	11	93	37	161	18	105	98	185	143	12
Future Volume (vph)	0	21	11	93	37	161	18	105	98	185	143	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	23	12	101	40	175	20	114	107	201	155	13
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	35	316	241	369								
Volume Left (vph)	0	101	20	201								
Volume Right (vph)	12	175	107	13								
Hadj (s)	-0.17	-0.23	-0.22	0.12								
Departure Headway (s)	6.0	5.4	5.3	5.4								
Degree Utilization, x	0.06	0.47	0.35	0.55								
Capacity (veh/h)	487	623	625	635								
Control Delay (s)	9.4	13.0	11.1	14.9								
Approach Delay (s)	9.4	13.0	11.1	14.9								
Approach LOS	A	B	B	B								
Intersection Summary												
Delay				13.1								
Level of Service				B								
Intersection Capacity Utilization				64.6%	ICU Level of Service	C						
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	248	67	104	14	59	34	73	742	21	54	750	179
Future Volume (vph)	248	67	104	14	59	34	73	742	21	54	750	179
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1792	1583		1771		1770	1855		1770	1863	1583
Flt Permitted		0.72	1.00		0.95		0.14	1.00		0.14	1.00	1.00
Satd. Flow (perm)		1344	1583		1695		255	1855		255	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	270	73	113	15	64	37	79	807	23	59	815	195
RTOR Reduction (vph)	0	0	73	0	24	0	0	1	0	0	0	88
Lane Group Flow (vph)	0	343	40	0	92	0	79	829	0	59	815	107
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		21.2	21.2		21.2		31.6	31.6		32.8	32.8	32.8
Effective Green, g (s)		21.2	21.2		21.2		31.6	31.6		32.8	32.8	32.8
Actuated g/C Ratio		0.35	0.35		0.35		0.53	0.53		0.55	0.55	0.55
Clearance Time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		7.0	7.0	7.0
Lane Grp Cap (vph)		474	559		598		134	976		139	1018	865
v/s Ratio Prot							c0.45				0.44	
v/s Ratio Perm		c0.26	0.03		0.05		0.31			0.23		0.07
v/c Ratio		0.72	0.07		0.15		0.59	0.85		0.42	0.80	0.12
Uniform Delay, d1		16.9	12.9		13.3		9.7	12.2		8.0	11.0	6.6
Progression Factor		1.00	1.00		1.00		0.71	0.76		1.00	1.00	1.00
Incremental Delay, d2		8.5	0.2		0.4		15.7	8.2		9.2	6.6	0.3
Delay (s)		25.3	13.1		13.7		22.6	17.4		17.3	17.6	6.9
Level of Service		C	B		B		C	B		B	B	A
Approach Delay (s)		22.3			13.7			17.8			15.6	
Approach LOS		C			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			17.5		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			60.0		Sum of lost time (s)					7.2		
Intersection Capacity Utilization			77.7%		ICU Level of Service					D		
Analysis Period (min)			15									
c Critical Lane Group												

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Civic Center Drive
E/W Street Name	Civic Center Drive
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	30	29	28	0	24	34	48	0	23	761	44	0	27	794	26
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	33	32	31	0	27	38	53	0	26	844	49	0	30	880	29
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		96			118			919			939	
Entry Volume veh/h		94			116			901			921	
Circulating Flow (v_c), pc/h	937			903			95			91		
Exiting Flow (v_{ex}), pc/h	111			93			930			938		
Capacity (C_{pce}), pc/h		443			458			1028			1032	
Capacity (c), veh/h		434			449			1007			1011	
v/c Ratio (x)		0.22			0.26			0.89			0.91	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		11.7			12.1			29.0			31.1	
Lane LOS		B			B			D			D	
95% Queue, veh		0.8			1.0			12.9			13.7	
Approach Delay, s/veh	11.7			12.1			29.0			31.1		
Approach LOS	B			B			D			D		
Intersection Delay, s/veh LOS	28.2						D					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	7/11/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Pier View Way
E/W Street Name	Pier View Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	99	39	109	0	4	39	10	0	83	804	8	0	5	804	188
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	110	43	121	0	4	43	11	0	92	891	9	0	6	891	208
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		274			58			992			1105	
Entry Volume veh/h		269			57			973			1083	
Circulating Flow (v_c), pc/h	901			1093			159			139		
Exiting Flow (v_{ex}), pc/h	58			343			1012			1016		
Capacity (C_{pce}), pc/h		459			379			964			983	
Capacity (c), veh/h		450			371			945			964	
v/c Ratio (x)		0.60			0.15			1.03			1.12	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		22.1			12.2			57.9			88.2	
Lane LOS		C			B			F			F	
95% Queue, veh		3.8			0.5			20.9			28.9	
Approach Delay, s/veh	22.1			12.2			57.9			88.2		
Approach LOS	C			B			F			F		
Intersection Delay, s/veh LOS	66.5						F					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

07/02/2018

																	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR					
Lane Configurations																	
Sign Control	Stop			Stop				Stop			Stop						
Traffic Volume (vph)	18	11	160	64	11	14	55	399	30	14	359	15					
Future Volume (vph)	18	11	160	64	11	14	55	399	30	14	359	15					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92					
Hourly flow rate (vph)	20	12	174	70	12	15	60	434	33	15	390	16					
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2										
Volume Total (vph)	32	174	97	277	250	210	211										
Volume Left (vph)	20	0	70	60	0	15	0										
Volume Right (vph)	0	174	15	0	33	0	16										
Hadj (s)	0.35	-0.67	0.09	0.14	-0.06	0.07	-0.02										
Departure Headway (s)	7.4	6.4	7.2	6.3	6.1	6.3	6.3										
Degree Utilization, x	0.07	0.31	0.19	0.48	0.42	0.37	0.37										
Capacity (veh/h)	448	520	455	547	574	543	551										
Control Delay (s)	9.7	11.0	11.9	13.8	12.2	11.8	11.6										
Approach Delay (s)	10.8		11.9	13.1		11.7											
Approach LOS	B		B	B		B											
Intersection Summary																	
Delay			12.2														
Level of Service			B														
Intersection Capacity Utilization			46.0%	ICU Level of Service		A											
Analysis Period (min)			15														

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	290	101	184	202	73	215
Future Volume (vph)	290	101	184	202	73	215
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	315	110	200	220	79	234
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	315	110	420	313		
Volume Left (vph)	315	0	0	79		
Volume Right (vph)	0	110	220	0		
Hadj (s)	0.53	-0.67	-0.28	0.08		
Departure Headway (s)	7.1	5.8	5.5	6.0		
Degree Utilization, x	0.62	0.18	0.64	0.52		
Capacity (veh/h)	489	585	625	570		
Control Delay (s)	19.6	8.9	17.9	15.5		
Approach Delay (s)	16.8		17.9	15.5		
Approach LOS	C		C	C		
Intersection Summary						
Delay			16.9			
Level of Service			C			
Intersection Capacity Utilization			63.5%	ICU Level of Service	B	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	0	332	81	305	85	0	0	0	0	126	93
Future Volume (vph)	44	0	332	81	305	85	0	0	0	0	126	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5		4.5	4.5	4.5						4.5	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.97						0.94	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3424						3314	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3424						3314	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	0	361	88	332	92	0	0	0	0	137	101
RTOR Reduction (vph)	0	0	329	45	38	0	0	0	0	0	86	0
Lane Group Flow (vph)	48	0	32	43	386	0	0	0	0	0	152	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	4.5		4.5	24.4	24.4						7.6	
Effective Green, g (s)	4.5		4.5	24.4	24.4						7.6	
Actuated g/C Ratio	0.09		0.09	0.49	0.49						0.15	
Clearance Time (s)	4.5		4.5	4.5	4.5						4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	159		250	863	1670						503	
v/s Ratio Prot	c0.03		0.01	0.02	c0.11						c0.05	
v/s Ratio Perm												
v/c Ratio	0.30		0.13	0.05	0.23						0.30	
Uniform Delay, d1	21.3		20.9	6.7	7.4						18.8	
Progression Factor	1.00		1.00	1.00	1.00						1.00	
Incremental Delay, d2	1.1		0.2	0.1	0.3						0.3	
Delay (s)	22.4		21.2	6.8	7.7						19.2	
Level of Service	C		C	A	A						B	
Approach Delay (s)		21.3			7.6			0.0			19.2	
Approach LOS		C			A			A			B	
Intersection Summary												
HCM 2000 Control Delay			14.8			HCM 2000 Level of Service					B	
HCM 2000 Volume to Capacity ratio			0.25									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)				13.5		
Intersection Capacity Utilization			33.8%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↶	↷	↰	↶			↷	↰
Traffic Volume (vph)	0	0	0	174	399	65	258	726	0	0	588	186
Future Volume (vph)	0	0	0	174	399	65	258	726	0	0	588	186
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	0.95
Frpb, ped/bikes				1.00	1.00	0.96	1.00	1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	3539	1519	1770	1863			1760	1455
Flt Permitted				0.95	1.00	1.00	0.12	1.00			1.00	1.00
Satd. Flow (perm)				1770	3539	1519	219	1863			1760	1455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	189	434	71	280	789	0	0	639	202
RTOR Reduction (vph)	0	0	0	0	0	54	0	0	0	0	1	59
Lane Group Flow (vph)	0	0	0	189	434	17	280	789	0	0	658	123
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					6
Actuated Green, G (s)				18.0	18.0	18.0	48.0	48.0			29.0	29.0
Effective Green, g (s)				18.0	18.0	18.0	48.0	48.0			29.0	29.0
Actuated g/C Ratio				0.24	0.24	0.24	0.63	0.63			0.38	0.38
Clearance Time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				419	838	359	424	1176			671	555
v/s Ratio Prot				0.11	c0.12		0.12	c0.42			c0.37	
v/s Ratio Perm						0.01	0.30					0.08
v/c Ratio				0.45	0.52	0.05	0.66	0.67			0.98	0.22
Uniform Delay, d1				24.8	25.2	22.4	23.0	9.0			23.2	15.9
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				3.5	2.3	0.2	4.2	1.7			29.8	0.3
Delay (s)				28.3	27.5	22.6	27.2	10.6			53.0	16.2
Level of Service				C	C	C	C	B			D	B
Approach Delay (s)		0.0			27.2			15.0			45.0	
Approach LOS		A			C			B			D	
Intersection Summary												
HCM 2000 Control Delay			27.9									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			76.0								15.0	Sum of lost time (s)
Intersection Capacity Utilization			76.7%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	152	0	141	747	313	16	88	339	436	58	23
Future Volume (vph)	19	152	0	141	747	313	16	88	339	436	58	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.97	
Satd. Flow (prot)	1770	3539		1770	3539	1583		1849	1583	1681	1688	
Flt Permitted	0.25	1.00		0.65	1.00	1.00		0.94	1.00	0.68	0.72	
Satd. Flow (perm)	459	3539		1206	3539	1583		1755	1583	1211	1264	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	165	0	153	812	340	17	96	368	474	63	25
RTOR Reduction (vph)	0	0	0	0	0	216	0	0	199	0	6	0
Lane Group Flow (vph)	21	165	0	153	812	124	0	113	169	275	281	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	20.5	20.5		20.1	20.1	20.1		25.3	25.3	25.3	25.3	
Effective Green, g (s)	20.5	20.5		20.1	20.1	20.1		25.3	25.3	25.3	25.3	
Actuated g/C Ratio	0.37	0.37		0.37	0.37	0.37		0.46	0.46	0.46	0.46	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	171	1319		440	1293	578		807	728	557	581	
v/s Ratio Prot		0.05			c0.23							
v/s Ratio Perm	0.05			0.13		0.08		0.06	0.11	c0.23	0.22	
v/c Ratio	0.12	0.13		0.35	0.63	0.21		0.14	0.23	0.49	0.48	
Uniform Delay, d1	11.3	11.3		12.7	14.4	12.0		8.6	9.0	10.4	10.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.1		0.6	1.0	0.2		0.4	0.7	3.1	2.9	
Delay (s)	11.8	11.4		13.3	15.4	12.2		8.9	9.7	13.5	13.2	
Level of Service	B	B		B	B	B		A	A	B	B	
Approach Delay (s)		11.5			14.3			9.5			13.3	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			13.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			55.0				Sum of lost time (s)			9.6		
Intersection Capacity Utilization			56.8%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

07/02/2018

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (veh/h)	282	15	22	58	23	28
Future Volume (Veh/h)	282	15	22	58	23	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	307	16	24	63	25	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				238		
pX, platoon unblocked						
vC, conflicting volume			323		426	315
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			323		426	315
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		96	96
cM capacity (veh/h)			1237		574	725
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	323	87	55			
Volume Left	0	24	25			
Volume Right	16	0	30			
cSH	1700	1237	648			
Volume to Capacity	0.19	0.02	0.08			
Queue Length 95th (ft)	0	1	7			
Control Delay (s)	0.0	2.3	11.1			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.3	11.1			
Approach LOS			B			
Intersection Summary						
Average Delay		1.7				
Intersection Capacity Utilization		32.4%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	319	201	203	0	0	0	84	502	151	161	431	104
Future Volume (vph)	319	201	203	0	0	0	84	502	151	161	431	104
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.94				1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1493				1770	1863	1552	1770	1863	1516
Flt Permitted	0.95	1.00	1.00				0.49	1.00	1.00	0.20	1.00	1.00
Satd. Flow (perm)	1770	1863	1493				921	1863	1552	368	1863	1516
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	347	218	221	0	0	0	91	546	164	175	468	113
RTOR Reduction (vph)	0	0	147	0	0	0	0	0	88	0	0	54
Lane Group Flow (vph)	347	218	74	0	0	0	91	546	76	175	468	59
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA	Perm				Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4					2	2		1	6	
Permitted Phases			4				2		2	6		6
Actuated Green, G (s)	20.1	20.1	20.1				23.1	23.1	23.1	31.1	31.1	31.1
Effective Green, g (s)	20.1	20.1	20.1				23.1	23.1	23.1	31.1	31.1	31.1
Actuated g/C Ratio	0.34	0.34	0.34				0.39	0.39	0.39	0.52	0.52	0.52
Clearance Time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0				4.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	592	624	500				354	717	597	284	965	785
v/s Ratio Prot	c0.20	0.12						c0.29		0.04	c0.25	
v/s Ratio Perm			0.05				0.10		0.05	0.28		0.04
v/c Ratio	0.59	0.35	0.15				0.26	0.76	0.13	0.62	0.48	0.07
Uniform Delay, d1	16.5	15.0	14.0				12.6	16.1	11.9	10.2	9.3	7.2
Progression Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.2	1.5	0.6				1.8	7.5	0.4	3.9	1.7	0.2
Delay (s)	20.7	16.6	14.6				14.3	23.5	12.4	14.2	11.0	7.4
Level of Service	C	B	B				B	C	B	B	B	A
Approach Delay (s)		17.8			0.0			20.2			11.2	
Approach LOS		B			A			C			B	
Intersection Summary												
HCM 2000 Control Delay			16.5				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.68									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			12.8		
Intersection Capacity Utilization			63.7%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	561	36	0	0	0	0	9	37	26	26	0
Future Volume (Veh/h)	14	561	36	0	0	0	0	9	37	26	26	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	610	39	0	0	0	0	10	40	28	28	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		218										
pX, platoon unblocked												
vC, conflicting volume	0			649			674	660	324	380	679	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			649			674	660	324	380	679	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	97	94	94	92	100
cM capacity (veh/h)	1622			933			319	378	671	505	369	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	320	344	50	56								
Volume Left	15	0	0	28								
Volume Right	0	39	40	0								
cSH	1622	1700	581	426								
Volume to Capacity	0.01	0.20	0.09	0.13								
Queue Length 95th (ft)	1	0	7	11								
Control Delay (s)	0.4	0.0	11.8	14.7								
Lane LOS	A		B	B								
Approach Delay (s)	0.2		11.8	14.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			33.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	36	1249	26	0	0	0	0	12	33	57	45	0
Future Volume (vph)	36	1249	26	0	0	0	0	12	33	57	45	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	1358	28	0	0	0	0	13	36	62	49	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	718	707	49	111								
Volume Left (vph)	39	0	0	62								
Volume Right (vph)	0	28	36	0								
Hadj (s)	0.06	0.01	-0.41	0.15								
Departure Headway (s)	5.1	5.0	5.6	6.0								
Degree Utilization, x	1.01	0.98	0.08	0.18								
Capacity (veh/h)	704	707	630	586								
Control Delay (s)	56.9	50.1	9.0	10.3								
Approach Delay (s)	53.5		9.0	10.3								
Approach LOS	F		A	B								
Intersection Summary												
Delay			49.1									
Level of Service			E									
Intersection Capacity Utilization			55.3%	ICU Level of Service					B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

07/02/2018

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	291	524	12	39	0	21	0	18	11	0	0	0								
Future Volume (vph)	291	524	12	39	0	21	0	18	11	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	316	570	13	42	0	23	0	20	12	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	316	583	65	32																
Volume Left (vph)	316	0	42	0																
Volume Right (vph)	0	13	23	12																
Hadj (s)	0.53	0.02	-0.05	-0.19																
Departure Headway (s)	5.2	4.7	4.8	5.4																
Degree Utilization, x	0.45	0.75	0.09	0.05																
Capacity (veh/h)	691	760	737	623																
Control Delay (s)	11.2	19.3	8.2	8.7																
Approach Delay (s)	16.5		8.2	8.7																
Approach LOS	C		A	A																
Intersection Summary																				
Delay			15.7																	
Level of Service			C																	
Intersection Capacity Utilization			45.1%	ICU Level of Service						A										
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	43	0	0	32	19	535	47	23	490	20
Future Volume (Veh/h)	0	0	43	0	0	32	19	535	47	23	490	20
Sign Control	Stop			Stop				Free			Free	
Grade	0%			0%				0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	47	0	0	35	21	582	51	25	533	22
Pedestrians	7			7								
Lane Width (ft)	12.0			16.0								
Walking Speed (ft/s)	4.0			4.0								
Percent Blockage	1			1								
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			455		
pX, platoon unblocked	0.84	0.84	0.84	0.84	0.84		0.84					
vC, conflicting volume	1260	1283	551	1286	1268	614	562				640	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1213	1241	366	1245	1223	614	379				640	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	92	100	100	93	98				97	
cM capacity (veh/h)	117	138	565	110	141	488	981				937	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	47	35	21	633	25	555						
Volume Left	0	0	21	0	25	0						
Volume Right	47	35	0	51	0	22						
cSH	565	488	981	1700	937	1700						
Volume to Capacity	0.08	0.07	0.02	0.37	0.03	0.33						
Queue Length 95th (ft)	7	6	2	0	2	0						
Control Delay (s)	11.9	13.0	8.7	0.0	8.9	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s)	11.9	13.0	0.3		0.4							
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			41.1%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Washington Avenue
E/W Street Name	Washington Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	13	0	64	0	45	10	12	0	42	513	19	0	24	466	55
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	14	0	71	0	50	11	13	0	47	569	21	0	27	517	61
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		85			74			637			605	
Entry Volume veh/h		83			73			625			593	
Circulating Flow (v_c), pc/h	594			630			41			108		
Exiting Flow (v_{ex}), pc/h	48			119			596			638		
Capacity (C_{pce}), pc/h		624			602			1085			1014	
Capacity (c), veh/h		612			590			1063			994	
v/c Ratio (x)		0.14			0.12			0.59			0.60	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.5			7.6			11.0			11.8	
Lane LOS		A			A			B			B	
95% Queue, veh		0.5			0.4			4.0			4.1	
Approach Delay, s/veh	7.5			7.6			11.0			11.8		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh LOS	11.0						B					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	46	74	28	87	6	131	4	264	70	156	163	2
Future Volume (vph)	46	74	28	87	6	131	4	264	70	156	163	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	80	30	95	7	142	4	287	76	170	177	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	160	244	367	349								
Volume Left (vph)	50	95	4	170								
Volume Right (vph)	30	142	76	2								
Hadj (s)	-0.02	-0.24	-0.09	0.13								
Departure Headway (s)	6.6	6.2	5.8	6.1								
Degree Utilization, x	0.30	0.42	0.60	0.59								
Capacity (veh/h)	458	507	577	551								
Control Delay (s)	12.4	13.6	17.1	17.4								
Approach Delay (s)	12.4	13.6	17.1	17.4								
Approach LOS	B	B	C	C								
Intersection Summary												
Delay			15.8									
Level of Service			C									
Intersection Capacity Utilization			64.7%	ICU Level of Service		C						
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	320	35	16	223	35	34	55	54	28	73	14
Future Volume (Veh/h)	12	320	35	16	223	35	34	55	54	28	73	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	348	38	17	242	38	37	60	59	30	79	15
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked	0.98						0.98	0.98		0.98	0.98	0.98
vC, conflicting volume	294			393			750	728	374	791	728	276
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	272			393			737	714	374	778	714	254
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			85	82	91	87	76	98
cM capacity (veh/h)	1253			1159			254	336	668	232	336	761
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	399	297	156	124								
Volume Left	13	17	37	30								
Volume Right	38	38	59	15								
cSH	1253	1159	378	323								
Volume to Capacity	0.01	0.01	0.41	0.38								
Queue Length 95th (ft)	1	1	49	44								
Control Delay (s)	0.4	0.6	21.1	23.0								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.4	0.6	21.1	23.0								
Approach LOS			C	C								
Intersection Summary												
Average Delay			6.6									
Intersection Capacity Utilization			40.1%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Wisconsin Avenue
E/W Street Name	Wisconsin Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	100	137	177	0	133	110	23	0	156	483	144	0	25	483	49
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	111	152	196	0	147	122	26	0	173	536	160	0	28	536	54
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		459			295			869			618	
Entry Volume veh/h		450			289			852			606	
Circulating Flow (v_c), pc/h	711			820			291			442		
Exiting Flow (v_{ex}), pc/h	340			349			673			879		
Capacity (C_{pce}), pc/h		555			498			845			726	
Capacity (c), veh/h		544			488			828			712	
v/c Ratio (x)		0.83			0.59			1.03			0.85	

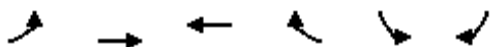
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		34.9			20.5			61.1			31.1	
Lane LOS		D			C			F			D	
95% Queue, veh		8.4			3.8			19.4			9.8	
Approach Delay, s/veh	34.9			20.5			61.1			31.1		
Approach LOS	D			C			F			D		
Intersection Delay, s/veh LOS	42.1						E					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

07/02/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	505	376	23	34	35
Future Volume (Veh/h)	8	505	376	23	34	35
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	549	409	25	37	38
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	442				998	430
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	442				998	430
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				86	94
cM capacity (veh/h)	1111				266	620
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	558	434	75			
Volume Left	9	0	37			
Volume Right	0	25	38			
cSH	1111	1700	375			
Volume to Capacity	0.01	0.26	0.20			
Queue Length 95th (ft)	1	0	18			
Control Delay (s)	0.2	0.0	17.0			
Lane LOS	A		C			
Approach Delay (s)	0.2	0.0	17.0			
Approach LOS			C			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			44.0%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	524	4	2	350	33	2	1	4	49	0	39
Future Volume (Veh/h)	29	524	4	2	350	33	2	1	4	49	0	39
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	570	4	2	380	36	2	1	4	53	0	42
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	418			574			1082	1058	572	1044	1042	402
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	418			574			1082	1058	572	1044	1042	402
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			99	100	99	73	100	93
cM capacity (veh/h)	1139			999			178	218	520	199	222	646
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	606	418	7	95								
Volume Left	32	2	2	53								
Volume Right	4	36	4	42								
cSH	1139	999	297	287								
Volume to Capacity	0.03	0.00	0.02	0.33								
Queue Length 95th (ft)	2	0	2	35								
Control Delay (s)	0.8	0.1	17.4	23.6								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.8	0.1	17.4	23.6								
Approach LOS			C	C								
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization			64.9%		ICU Level of Service				C			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	282	307	84	204	0	183	0	117	0	0	0
Future Volume (vph)	0	282	307	84	204	0	183	0	117	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	307	334	91	222	0	199	0	127	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	641	313	326	0								
Volume Left (vph)	0	91	199	0								
Volume Right (vph)	334	0	127	0								
Hadj (s)	-0.28	0.09	-0.08	0.00								
Departure Headway (s)	5.3	6.1	6.3	7.6								
Degree Utilization, x	0.95	0.53	0.57	0.00								
Capacity (veh/h)	668	574	547	426								
Control Delay (s)	45.3	15.9	17.5	10.6								
Approach Delay (s)	45.3	15.9	17.5	0.0								
Approach LOS	E	C	C	A								
Intersection Summary												
Delay				31.0								
Level of Service				D								
Intersection Capacity Utilization				83.0%	ICU Level of Service	E						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	66	135	192	97	98	187
Future Volume (vph)	66	135	192	97	98	187
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	147	209	105	107	203
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	219	314	310			
Volume Left (vph)	72	0	107			
Volume Right (vph)	147	105	0			
Hadj (s)	-0.30	-0.17	0.10			
Departure Headway (s)	5.1	4.7	5.0			
Degree Utilization, x	0.31	0.41	0.43			
Capacity (veh/h)	645	726	688			
Control Delay (s)	10.3	11.0	11.7			
Approach Delay (s)	10.3	11.0	11.7			
Approach LOS	B	B	B			
Intersection Summary						
Delay			11.1			
Level of Service			B			
Intersection Capacity Utilization			53.2%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	366	21	19	302	70	29	42	38	77	26	21
Future Volume (Veh/h)	14	366	21	19	302	70	29	42	38	77	26	21
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	398	23	21	328	76	32	46	41	84	28	23
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					213							
pX, platoon unblocked	0.88						0.88	0.88		0.88	0.88	0.88
vC, conflicting volume	407			432			900	900	428	922	873	373
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	256			432			816	816	428	843	786	217
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			86	82	93	56	90	97
cM capacity (veh/h)	1147			1117			221	262	616	193	272	719
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	436	425	119	135								
Volume Left	15	21	32	84								
Volume Right	23	76	41	23								
cSH	1147	1117	308	237								
Volume to Capacity	0.01	0.02	0.39	0.57								
Queue Length 95th (ft)	1	1	44	80								
Control Delay (s)	0.4	0.6	23.9	38.6								
Lane LOS	A	A	C	E								
Approach Delay (s)	0.4	0.6	23.9	38.6								
Approach LOS			C	E								
Intersection Summary												
Average Delay			7.6									
Intersection Capacity Utilization			48.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↖	↗	↖	↖↗		↖	↗	
Traffic Volume (vph)	53	211	83	205	205	162	87	441	132	167	375	28
Future Volume (vph)	53	211	83	205	205	162	87	441	132	167	375	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	10	11	11	16	16	16
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.97	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1844	1537	1681	1762	1794	1652	3289		2006	2089	
Flt Permitted		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1844	1537	1681	1762	1794	1652	3289		2006	2089	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	229	90	223	223	176	95	479	143	182	408	30
RTOR Reduction (vph)	0	0	72	0	0	143	0	35	0	0	3	0
Lane Group Flow (vph)	0	287	18	201	245	33	95	587	0	182	435	0
Confl. Peds. (#/hr)			10	10					3			
Confl. Bikes (#/hr)			4						3			
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		15.6	15.6	15.2	15.2	15.2	6.7	22.3		8.1	23.7	
Effective Green, g (s)		15.6	15.6	15.2	15.2	15.2	6.7	22.3		8.1	23.7	
Actuated g/C Ratio		0.19	0.19	0.19	0.19	0.19	0.08	0.28		0.10	0.30	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		359	299	319	334	340	138	916		203	618	
v/s Ratio Prot		c0.16		0.12	c0.14		0.06	0.18		c0.09	c0.21	
v/s Ratio Perm			0.01			0.02						
v/c Ratio		0.80	0.06	0.63	0.73	0.10	0.69	0.64		0.90	0.70	
Uniform Delay, d1		30.7	26.2	29.8	30.5	26.7	35.6	25.3		35.5	25.0	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		11.0	0.0	4.2	8.3	0.2	10.8	3.4		35.8	6.6	
Delay (s)		41.7	26.3	34.0	38.8	26.9	46.4	28.8		71.3	31.6	
Level of Service		D	C	C	D	C	D	C		E	C	
Approach Delay (s)		38.0			33.9			31.1			43.3	
Approach LOS		D			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			36.2									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			80.0							18.8		
Intersection Capacity Utilization			67.3%									ICU Level of Service C
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	54	629	6	24	699	236	9	20	62	441	16	108
Future Volume (vph)	54	629	6	24	699	236	9	20	62	441	16	108
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.96			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1770	3532		1761	3393			3133			1776	1524
Flt Permitted	0.19	1.00		0.29	1.00			0.91			0.66	1.00
Satd. Flow (perm)	348	3532		543	3393			2877			1226	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	59	684	7	26	760	257	10	22	67	479	17	117
RTOR Reduction (vph)	0	1	0	0	59	0	0	35	0	0	0	42
Lane Group Flow (vph)	59	690	0	26	958	0	0	64	0	0	496	75
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	21.4	21.4		21.4	21.4			29.1			29.1	29.1
Effective Green, g (s)	21.4	21.4		21.4	21.4			29.1			29.1	29.1
Actuated g/C Ratio	0.36	0.36		0.36	0.36			0.49			0.49	0.49
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	124	1259		193	1210			1395			594	739
v/s Ratio Prot		0.20			c0.28							
v/s Ratio Perm	0.17			0.05				0.02			c0.40	0.05
v/c Ratio	0.48	0.55		0.13	0.79			0.05			0.84	0.10
Uniform Delay, d1	15.0	15.4		13.0	17.3			8.1			13.4	8.4
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	2.9	0.5		0.3	3.6			0.1			13.0	0.3
Delay (s)	17.8	15.9		13.4	20.9			8.2			26.4	8.6
Level of Service	B	B		B	C			A			C	A
Approach Delay (s)		16.1			20.8			8.2			23.0	
Approach LOS		B			C			A			C	
Intersection Summary												
HCM 2000 Control Delay		19.4										
HCM 2000 Volume to Capacity ratio		0.82										
Actuated Cycle Length (s)		60.0										
Intersection Capacity Utilization		74.6%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	19	15	68	19	235	20	514	125	299	536	19
Future Volume (vph)	42	19	15	68	19	235	20	514	125	299	536	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	10	11	16
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes		1.00			1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1760			1789	1794	1770	3873		1652	3403	
Flt Permitted		0.78			0.80	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1403			1484	1794	1770	3873		1652	3403	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	21	16	74	21	255	22	559	136	325	583	21
RTOR Reduction (vph)	0	13	0	0	0	216	0	27	0	0	2	0
Lane Group Flow (vph)	0	70	0	0	95	39	22	668	0	325	602	0
Confl. Peds. (#/hr)			4	4					3			
Confl. Bikes (#/hr)			1						2			
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		9.0			9.0	9.0	0.6	22.0		14.1	35.5	
Effective Green, g (s)		9.0			9.0	9.0	0.6	22.0		14.1	35.5	
Actuated g/C Ratio		0.15			0.15	0.15	0.01	0.37		0.24	0.60	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		214			227	274	18	1449		396	2054	
v/s Ratio Prot							0.01	c0.17		c0.20	0.18	
v/s Ratio Perm		0.05			c0.06	0.02						
v/c Ratio		0.33			0.42	0.14	1.22	0.46		0.82	0.29	
Uniform Delay, d1		22.2			22.5	21.6	29.1	13.9		21.2	5.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.5	0.1	289.8	0.2		12.8	0.1	
Delay (s)		22.5			23.0	21.6	318.9	14.1		33.9	5.7	
Level of Service		C			C	C	F	B		C	A	
Approach Delay (s)		22.5			22.0			23.5			15.6	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM 2000 Control Delay		19.7										
HCM 2000 Volume to Capacity ratio		0.56										
Actuated Cycle Length (s)		58.8										
Intersection Capacity Utilization		58.2%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	380	65	70	231	0	143	0	121	0	0	0
Future Volume (Veh/h)	0	380	65	70	231	0	143	0	121	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	413	71	76	251	0	155	0	132	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	252											
pX, platoon unblocked												
vC, conflicting volume	251			484			852	852	448	984	887	251
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	251			484			852	852	448	984	887	251
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			41	100	78	100	100	100
cM capacity (veh/h)	1314			1079			265	276	610	169	263	788
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	484	327	287	0								
Volume Left	0	76	155	0								
Volume Right	71	0	132	0								
cSH	1314	1079	358	1700								
Volume to Capacity	0.00	0.07	0.80	0.00								
Queue Length 95th (ft)	0	6	171	0								
Control Delay (s)	0.0	2.5	45.4	0.0								
Lane LOS		A	E	A								
Approach Delay (s)	0.0	2.5	45.4	0.0								
Approach LOS			E	A								
Intersection Summary												
Average Delay			12.6									
Intersection Capacity Utilization			65.3%	ICU Level of Service					C			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	206	47	0	80	0	47	2	15	0	0	0
Future Volume (Veh/h)	0	206	47	0	80	0	47	2	15	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	224	51	0	87	0	51	2	16	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	87			275			336	336	250	354	362	87
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	87			275			336	336	250	354	362	87
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			92	100	98	100	100	100
cM capacity (veh/h)	1509			1288			617	584	789	588	565	971
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	275	87	69	0								
Volume Left	0	0	51	0								
Volume Right	51	0	16	0								
cSH	1509	1288	649	1700								
Volume to Capacity	0.00	0.00	0.11	0.00								
Queue Length 95th (ft)	0	0	9	0								
Control Delay (s)	0.0	0.0	11.2	0.0								
Lane LOS			B	A								
Approach Delay (s)	0.0	0.0	11.2	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			1.8									
Intersection Capacity Utilization			24.0%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	66	256	21	38	306	21
Future Volume (vph)	66	256	21	38	306	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	278	23	41	333	23
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	350	64	356			
Volume Left (vph)	72	0	333			
Volume Right (vph)	278	41	0			
Hadj (s)	-0.40	-0.35	0.22			
Departure Headway (s)	4.6	4.9	5.1			
Degree Utilization, x	0.45	0.09	0.50			
Capacity (veh/h)	739	663	676			
Control Delay (s)	11.2	8.4	13.1			
Approach Delay (s)	11.2	8.4	13.1			
Approach LOS	B	A	B			
Intersection Summary						
Delay			11.8			
Level of Service			B			
Intersection Capacity Utilization			50.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	163	156	21	128	22	212	28	27	6	20	34
Future Volume (Veh/h)	13	163	156	21	128	22	212	28	27	6	20	34
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	177	170	23	139	24	230	30	29	7	22	37
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	576											
pX, platoon unblocked												
vC, conflicting volume	163			347			535	499	262	531	572	151
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	163			347			535	499	262	531	572	151
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			44	93	96	98	95	96
cM capacity (veh/h)	1416			1212			411	460	777	411	418	895
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	361	186	289	66								
Volume Left	14	23	230	7								
Volume Right	170	24	29	37								
cSH	1416	1212	436	594								
Volume to Capacity	0.01	0.02	0.66	0.11								
Queue Length 95th (ft)	1	1	117	9								
Control Delay (s)	0.4	1.1	28.0	11.8								
Lane LOS	A	A	D	B								
Approach Delay (s)	0.4	1.1	28.0	11.8								
Approach LOS			D	B								
Intersection Summary												
Average Delay	10.2											
Intersection Capacity Utilization	48.8%			ICU Level of Service					A			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	114	12	36	95	13	7	11	34	6	5	2
Future Volume (Veh/h)	2	114	12	36	95	13	7	11	34	6	5	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	124	13	39	103	14	8	12	37	7	5	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	117			137			327	330	130	366	329	110
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	117			137			327	330	130	366	329	110
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			99	98	96	99	99	100
cM capacity (veh/h)	1471			1447			607	573	919	546	573	943
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	139	156	57	14								
Volume Left	2	39	8	7								
Volume Right	13	14	37	2								
cSH	1471	1447	766	592								
Volume to Capacity	0.00	0.03	0.07	0.02								
Queue Length 95th (ft)	0	2	6	2								
Control Delay (s)	0.1	2.1	10.1	11.2								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	2.1	10.1	11.2								
Approach LOS			B	B								
Intersection Summary												
Average Delay	2.9											
Intersection Capacity Utilization	28.0%				ICU Level of Service				A			
Analysis Period (min)	15											

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	90	79	59	93	46	18	66	403	57	72	319	23
Future Volume (vph)	90	79	59	93	46	18	66	403	57	72	319	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.6			5.0		4.2	5.0		4.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.97			0.98		1.00	0.98		1.00	0.99	
Flt Protected		0.98			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1763			1781		1770	3473		1770	3504	
Flt Permitted		0.84			0.70		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1505			1283		1770	3473		1770	3504	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	98	86	64	101	50	20	72	438	62	78	347	25
RTOR Reduction (vph)	0	19	0	0	7	0	0	17	0	0	7	0
Lane Group Flow (vph)	0	229	0	0	164	0	72	483	0	78	365	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		10.2			9.8		5.1	16.9		3.8	15.4	
Effective Green, g (s)		10.2			9.8		5.1	16.9		3.8	15.4	
Actuated g/C Ratio		0.23			0.22		0.11	0.38		0.09	0.35	
Clearance Time (s)		4.6			5.0		4.2	5.0		4.0	5.0	
Vehicle Extension (s)		3.0			3.5		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		344			282		202	1318		151	1212	
v/s Ratio Prot							0.04	c0.14		c0.04	0.10	
v/s Ratio Perm		c0.15			0.13							
v/c Ratio		0.66			0.58		0.36	0.37		0.52	0.30	
Uniform Delay, d1		15.6			15.5		18.2	9.9		19.5	10.6	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		4.8			3.2		0.4	0.2		3.0	0.1	
Delay (s)		20.4			18.8		18.6	10.1		22.4	10.8	
Level of Service		C			B		B	B		C	B	
Approach Delay (s)		20.4			18.8			11.2			12.8	
Approach LOS		C			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			14.2									
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			44.5									
Intersection Capacity Utilization			42.1%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	50	204	75	75	92	28	87	119	34	44	46	50
Future Volume (Veh/h)	50	204	75	75	92	28	87	119	34	44	46	50
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	54	222	82	82	100	30	95	129	37	48	50	54
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		280										
pX, platoon unblocked												
vC, conflicting volume	130			304			729	665	263	752	691	115
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	130			304			729	665	263	752	691	115
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			93			64	62	95	77	85	94
cM capacity (veh/h)	1455			1257			261	343	776	204	331	937
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	358	212	261	152								
Volume Left	54	82	95	48								
Volume Right	82	30	37	54								
cSH	1455	1257	331	343								
Volume to Capacity	0.04	0.07	0.79	0.44								
Queue Length 95th (ft)	3	5	161	55								
Control Delay (s)	1.4	3.5	46.5	23.6								
Lane LOS	A	A	E	C								
Approach Delay (s)	1.4	3.5	46.5	23.6								
Approach LOS			E	C								
Intersection Summary												
Average Delay			17.3									
Intersection Capacity Utilization			47.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	116	32	39	55	3	43	53	39	4	23	7
Future Volume (vph)	10	116	32	39	55	3	43	53	39	4	23	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	126	35	42	60	3	47	58	42	4	25	8
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	172	105	147	37								
Volume Left (vph)	11	42	47	4								
Volume Right (vph)	35	3	42	8								
Hadj (s)	-0.08	0.10	-0.07	-0.07								
Departure Headway (s)	4.4	4.6	4.5	4.7								
Degree Utilization, x	0.21	0.14	0.18	0.05								
Capacity (veh/h)	784	732	750	711								
Control Delay (s)	8.6	8.4	8.5	7.9								
Approach Delay (s)	8.6	8.4	8.5	7.9								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.5								
Level of Service				A								
Intersection Capacity Utilization				38.1%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	22	153	13	70	66	50	13	118	158	95	25	5
Future Volume (vph)	22	153	13	70	66	50	13	118	158	95	25	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	166	14	76	72	54	14	128	172	103	27	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	204	202	314	135								
Volume Left (vph)	24	76	14	103								
Volume Right (vph)	14	54	172	5								
Hadj (s)	0.02	-0.05	-0.29	0.16								
Departure Headway (s)	5.5	5.4	5.0	5.7								
Degree Utilization, x	0.31	0.30	0.43	0.21								
Capacity (veh/h)	601	608	669	570								
Control Delay (s)	10.9	10.7	11.8	10.2								
Approach Delay (s)	10.9	10.7	11.8	10.2								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay				11.1								
Level of Service				B								
Intersection Capacity Utilization				57.3%	ICU Level of Service		B					
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	166	150	10	110	57
Future Volume (vph)	0	166	150	10	110	57
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	180	163	11	120	62
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	180	174	182			
Volume Left (vph)	0	0	120			
Volume Right (vph)	180	11	0			
Hadj (s)	-0.57	0.00	0.17			
Departure Headway (s)	4.2	4.5	4.7			
Degree Utilization, x	0.21	0.22	0.24			
Capacity (veh/h)	798	760	732			
Control Delay (s)	8.3	8.8	9.1			
Approach Delay (s)	8.3	8.8	9.1			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.7			
Level of Service			A			
Intersection Capacity Utilization			25.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	165	55	227	131	388	61	750	301	325	630	30
Future Volume (vph)	25	165	55	227	131	388	61	750	301	325	630	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	16	16	16
Total Lost time (s)	5.0	5.0	5.0		4.9	4.9	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2006	1863	1556		1805	1794	1770	3792		2006	3983	
Flt Permitted	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	2006	1863	1556		1805	1794	1770	3792		2006	3983	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	179	60	247	142	422	66	815	327	353	685	33
RTOR Reduction (vph)	0	0	53	0	0	171	0	35	0	0	3	0
Lane Group Flow (vph)	27	179	7	0	389	251	66	1107	0	353	715	0
Confl. Peds. (#/hr)			2	2					5			
Confl. Bikes (#/hr)									4			
Turn Type	Split	NA	Perm	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	13.5	13.5	13.5		26.7	48.4	7.7	36.0		21.7	50.0	
Effective Green, g (s)	13.5	13.5	13.5		26.7	48.4	7.7	36.0		21.7	50.0	
Actuated g/C Ratio	0.12	0.12	0.12		0.23	0.41	0.07	0.31		0.19	0.43	
Clearance Time (s)	5.0	5.0	5.0		4.9		4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	231	214	179		411	742	116	1166		372	1702	
v/s Ratio Prot	0.01	c0.10			c0.22	0.14	0.04	c0.29		c0.18	0.18	
v/s Ratio Perm			0.00									
v/c Ratio	0.12	0.84	0.04		0.95	0.34	0.57	0.95		0.95	0.42	
Uniform Delay, d1	46.4	50.7	46.0		44.4	23.4	53.0	39.6		47.1	23.4	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	22.8	0.0		30.7	0.3	3.8	16.7		33.2	0.8	
Delay (s)	46.5	73.5	46.0		75.2	23.7	56.8	56.3		80.3	24.1	
Level of Service	D	E	D		E	C	E	E		F	C	
Approach Delay (s)		64.5			48.4			56.3			42.7	
Approach LOS		E			D			E			D	
Intersection Summary												
HCM 2000 Control Delay			50.7									
HCM 2000 Volume to Capacity ratio			0.93									
Actuated Cycle Length (s)			117.0									
Intersection Capacity Utilization			92.6%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	718	32	43	690	81	21	0	43	38	14	85
Future Volume (Veh/h)	14	718	32	43	690	81	21	0	43	38	14	85
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	780	35	47	750	88	23	0	47	41	15	92
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			TWLTL								
Median storage (veh)				2								
Upstream signal (ft)	312											
pX, platoon unblocked				0.91				0.91	0.91	0.91	0.91	0.91
vC, conflicting volume	838				815				1815	1760	798	1762
vC1, stage 1 conf vol							828	828				888
vC2, stage 2 conf vol							988	932				874
vCu, unblocked vol	838				747				1846	1785	727	1789
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1
tC, 2 stage (s)							6.1	5.5				6.1
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5
p0 queue free %	98				94				86	100	88	79
cM capacity (veh/h)	796				783				164	240	385	194
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	830	885	70	148								
Volume Left	15	47	23	41								
Volume Right	35	88	47	92								
cSH	796	783	267	289								
Volume to Capacity	0.02	0.06	0.26	0.51								
Queue Length 95th (ft)	1	5	26	68								
Control Delay (s)	0.5	1.6	23.2	29.9								
Lane LOS	A	A	C	D								
Approach Delay (s)	0.5	1.6	23.2	29.9								
Approach LOS				C	D							
Intersection Summary												
Average Delay				4.1								
Intersection Capacity Utilization				81.4%	ICU Level of Service			D				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	976	25	61	960	97	5	4	97	38	4	23
Future Volume (Veh/h)	15	976	25	61	960	97	5	4	97	38	4	23
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	1061	27	66	1043	105	5	4	105	41	4	25
Pedestrians	1						1					
Lane Width (ft)	12.0						12.0					
Walking Speed (ft/s)	4.0						4.0					
Percent Blockage	0						0					
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage (veh)	2			2								
Upstream signal (ft)	687											
pX, platoon unblocked				0.93				0.93	0.93	0.93	0.93	0.93
vC, conflicting volume	1148				1089				2310	2388	1076	2428
vC1, stage 1 conf vol							1108	1108				1228
vC2, stage 2 conf vol							1203	1280				1200
vCu, unblocked vol	1148				1056				2376	2459	1041	2502
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1
tC, 2 stage (s)							6.1	5.5				6.1
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5
p0 queue free %	97				89				96	97	59	23
cM capacity (veh/h)	609				610				129	153	258	53
											144	259
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	16	1088	66	1148	114	70						
Volume Left	16	0	66	0	5	41						
Volume Right	0	27	0	105	105	25						
cSH	609	1700	610	1700	242	78						
Volume to Capacity	0.03	0.64	0.11	0.68	0.47	0.90						
Queue Length 95th (ft)	2	0	9	0	58	116						
Control Delay (s)	11.1	0.0	11.6	0.0	32.5	165.8						
Lane LOS	B		B		D	F						
Approach Delay (s)	0.2		0.6		32.5	165.8						
Approach LOS					D	F						
Intersection Summary												
Average Delay				6.5								
Intersection Capacity Utilization				73.5%	ICU Level of Service			D				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	1125	0	0	1158	370	0	0	0	0	0	25
Future Volume (Veh/h)	14	1125	0	0	1158	370	0	0	0	0	0	25
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	1223	0	0	1259	402	0	0	0	0	0	27
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL				TWLTL							
Median storage veh	2				2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1661			1223			2539	2914	1223	2713	2713	1460
vC1, stage 1 conf vol							1253	1253		1460	1460	
vC2, stage 2 conf vol							1286	1661		1253	1253	
vCu, unblocked vol	1661			1223			2539	2914	1223	2713	2713	1460
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			100	100	100	100	100	83
cM capacity (veh/h)	387			570			117	115	219	120	144	158
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	15	1223	0	1661	0	27						
Volume Left	15	0	0	0	0	0						
Volume Right	0	0	0	402	0	27						
cSH	387	1700	1700	1700	1700	158						
Volume to Capacity	0.04	0.72	0.00	0.98	0.00	0.17						
Queue Length 95th (ft)	3	0	0	0	0	15						
Control Delay (s)	14.7	0.0	0.0	0.0	0.0	32.3						
Lane LOS	B				A	D						
Approach Delay (s)	0.2		0.0		0.0	32.3						
Approach LOS					A	D						
Intersection Summary												
Average Delay				0.4								
Intersection Capacity Utilization				93.5%	ICU Level of Service			F				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

07/02/2018

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (veh/h)	0	0	101	0	0	101	106	839	22	101	673	10	
Future Volume (Veh/h)	0	0	101	0	0	101	106	839	22	101	673	10	
Sign Control	Stop				Stop				Free				
Grade	0%				0%				0%				
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	
Hourly flow rate (vph)	0	0	110	0	0	110	115	912	24	110	732	11	
Pedestrians													
Lane Width (ft)													
Walking Speed (ft/s)													
Percent Blockage													
Right turn flare (veh)													
Median type							TWLTL		TWLTL				
Median storage veh							2		2				
Upstream signal (ft)									621				
pX, platoon unblocked													
vC, conflicting volume	1754	2124	738	2216	2117	468	743						936
vC1, stage 1 conf vol	958	958		1154	1154								
vC2, stage 2 conf vol	796	1166		1062	963								
vCu, unblocked vol	1754	2124	738	2216	2117	468	743						936
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1						4.1
tC, 2 stage (s)	6.5	5.5		6.5	5.5								
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2						2.2
p0 queue free %	100	100	69	100	100	80	87						85
cM capacity (veh/h)	114	111	361	25	136	542	860						727
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2						
Volume Total	110	110	115	608	328	110	743						
Volume Left	0	0	115	0	0	110	0						
Volume Right	110	110	0	0	24	0	11						
cSH	361	542	860	1700	1700	727	1700						
Volume to Capacity	0.31	0.20	0.13	0.36	0.19	0.15	0.44						
Queue Length 95th (ft)	32	19	12	0	0	13	0						
Control Delay (s)	19.3	13.3	9.8	0.0	0.0	10.8	0.0						
Lane LOS	C	B	A					B					
Approach Delay (s)	19.3	13.3	1.1					1.4					
Approach LOS	C	B											
Intersection Summary													
Average Delay			2.8										
Intersection Capacity Utilization			48.9%	ICU Level of Service				A					
Analysis Period (min)			15										

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Michigan Avenue
E/W Street Name	Michigan Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	199	91	83	0	52	12	25	0	27	547	44	0	19	547	50
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	221	101	92	0	58	13	28	0	30	606	49	0	21	606	55
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		414			99			685			682	
Entry Volume veh/h		406			97			672			669	
Circulating Flow (v_c), pc/h	685			857			343			101		
Exiting Flow (v_{ex}), pc/h	171			98			855			756		
Capacity (C_{pce}), pc/h		570			480			802			1021	
Capacity (c), veh/h		558			470			786			1001	
v/c Ratio (x)		0.73			0.21			0.85			0.67	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		25.3			10.7			29.3			13.8	
Lane LOS		D			B			D			B	
95% Queue, veh		6.1			0.8			10.2			5.3	
Approach Delay, s/veh	25.3			10.7			29.3			13.8		
Approach LOS	D			B			D			B		
Intersection Delay, s/veh LOS	21.8						C					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - West
E/W Street Name	West Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	34	20	15	0	28	20	63	0	15	189	28	0	63	189	34
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	38	22	17	0	31	22	70	0	17	210	31	0	70	210	38
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		77			123			258			318	
Entry Volume veh/h		75			121			253			312	
Circulating Flow (v_c), pc/h	311			265			130			70		
Exiting Flow (v_{ex}), pc/h	123			77			318			258		
Capacity (C_{pce}), pc/h		828			867			992			1054	
Capacity (c), veh/h		812			850			973			1033	
v/c Ratio (x)		0.09			0.14			0.26			0.30	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.4			5.6			6.3			6.5	
Lane LOS		A			A			A			A	
95% Queue, veh		0.3			0.5			1.0			1.3	
Approach Delay, s/veh	5.4			5.6			6.3			6.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	6.2						A					

HCM Unsignalized Intersection Capacity Analysis

47: Coast Hwy & Kelly St

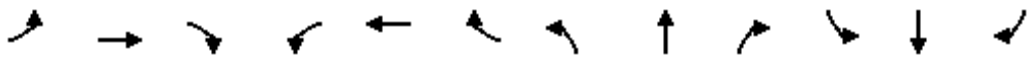
07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	41	49	21	32	49	26	154	21	41	130	50
Future Volume (Veh/h)	19	41	49	21	32	49	26	154	21	41	130	50
Sign Control	Stop				Stop				Free		Free	
Grade	0%				0%				0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	21	45	53	23	35	53	28	167	23	45	141	54
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage veh												
Upstream signal (ft)							737			527		
pX, platoon unblocked												
vC, conflicting volume	468	504	98	470	520	95	195				190	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	468	504	98	470	520	95	195				190	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	95	90	94	94	92	94	98				97	
cM capacity (veh/h)	407	444	940	398	435	943	1375				1381	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	119	111	112	106	116	124						
Volume Left	21	23	28	0	45	0						
Volume Right	53	53	0	23	0	54						
cSH	569	571	1375	1700	1381	1700						
Volume to Capacity	0.21	0.19	0.02	0.06	0.03	0.07						
Queue Length 95th (ft)	20	18	2	0	3	0						
Control Delay (s)	13.0	12.8	2.0	0.0	3.2	0.0						
Lane LOS	B	B	A	A								
Approach Delay (s)	13.0	12.8	1.0	1.5								
Approach LOS	B	B										
Intersection Summary												
Average Delay			5.2									
Intersection Capacity Utilization			Err%	ICU Level of Service				H				
Analysis Period (min)			15									

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	101	0	14	13	1058	13	24	2210	16
Future Volume (veh/h)	0	0	0	101	0	14	13	1058	13	24	2210	16
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h				110	0	0	14	1150	0	26	2402	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				738	0	329	92	3173	988	92	2208	988
Arrive On Green				0.20	0.00	0.00	0.05	0.60	0.00	0.05	0.60	0.00
Sat Flow, veh/h				3690	0	1647	1845	5289	1647	1845	3681	1647
Grp Volume(v), veh/h				110	0	0	14	1150	0	26	2402	0
Grp Sat Flow(s),veh/h/ln				1845	0	1647	1845	1763	1647	1845	1840	1647
Q Serve(g_s), s				2.0	0.0	0.0	0.6	8.9	0.0	1.1	48.0	0.0
Cycle Q Clear(g_c), s				2.0	0.0	0.0	0.6	8.9	0.0	1.1	48.0	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				738	0	329	92	3173	988	92	2208	988
V/C Ratio(X)				0.15	0.00	0.00	0.15	0.36	0.00	0.28	1.09	0.00
Avail Cap(c_a), veh/h				738	0	329	92	3173	988	92	2208	988
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				26.4	0.0	0.0	36.4	8.2	0.0	36.6	16.0	0.0
Incr Delay (d2), s/veh				0.4	0.0	0.0	3.5	0.3	0.0	7.5	47.8	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.0	0.0	0.0	0.4	4.4	0.0	0.7	38.6	0.0
LnGrp Delay(d),s/veh				26.8	0.0	0.0	39.8	8.5	0.0	44.1	63.8	0.0
LnGrp LOS				C			D	A		D	F	
Approach Vol, veh/h					110			1164			2428	
Approach Delay, s/veh					26.8			8.9			63.6	
Approach LOS					C			A			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	8.0	52.0			8.0	52.0		20.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	48.0			4.0	48.0		16.0				
Max Q Clear Time (g_c+I1), s	3.1	10.9			2.6	50.0		4.0				
Green Ext Time (p_c), s	0.0	10.6			0.0	0.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				45.3								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↗	↙↙	↑↑					
Traffic Volume (veh/h)	1120	213	300	1284	0	0			
Future Volume (veh/h)	1120	213	300	1284	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937					
Adj Flow Rate, veh/h	1217	232	326	1396					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	2116	947	805	3313					
Arrive On Green	0.57	0.57	0.22	0.90					
Sat Flow, veh/h	3778	1647	3579	3778					
Grp Volume(v), veh/h	1217	232	326	1396					
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840					
Q Serve(g_s), s	8.4	2.8	3.1	2.4					
Cycle Q Clear(g_c), s	8.4	2.8	3.1	2.4					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	2116	947	805	3313					
V/C Ratio(X)	0.58	0.25	0.40	0.42					
Avail Cap(c_a), veh/h	2116	947	805	3313					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	5.4	4.2	13.2	0.3					
Incr Delay (d2), s/veh	1.1	0.6	1.5	0.4					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	4.4	1.4	1.7	1.2					
LnGrp Delay(d),s/veh	6.5	4.8	14.7	0.7					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	1449			1722					
Approach Delay, s/veh	6.3			3.4					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			13.0	27.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			9.0	23.0				36.0	
Max Q Clear Time (g_c+I1), s			5.1	10.4				4.4	
Green Ext Time (p_c), s			0.4	7.5				13.7	
Intersection Summary									
HCM 2010 Ctrl Delay			4.7						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary 50: I-5 NB On/Off-Ramp & SR-76 ramps

07/02/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑↑	↑	↑		
Traffic Volume (veh/h)	1502	96	282	1143	154	0		
Future Volume (veh/h)	1502	96	282	1143	154	0		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	1633	104	307	1242	167	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1595	714	298	2147	523	467		
Arrive On Green	0.43	0.43	0.08	0.58	0.28	0.00		
Sat Flow, veh/h	3778	1647	3579	3778	1845	1647		
Grp Volume(v), veh/h	1633	104	307	1242	167	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840	1845	1647		
Q Serve(g_s), s	26.0	2.3	5.0	12.7	4.3	0.0		
Cycle Q Clear(g_c), s	26.0	2.3	5.0	12.7	4.3	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1595	714	298	2147	523	467		
V/C Ratio(X)	1.02	0.15	1.03	0.58	0.32	0.00		
Avail Cap(c_a), veh/h	1595	714	298	2147	523	467		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	17.0	10.3	27.5	7.9	16.9	0.0		
Incr Delay (d2), s/veh	28.8	0.4	59.9	1.1	1.6	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	19.4	1.1	4.9	6.7	2.4	0.0		
LnGrp Delay(d),s/veh	45.8	10.7	87.4	9.0	18.5	0.0		
LnGrp LOS	F	B	F	A	B			
Approach Vol, veh/h	1737			1549	167			
Approach Delay, s/veh	43.7			24.5	18.5			
Approach LOS	D			C	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		21.0	9.0	30.0				39.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		17.0	5.0	26.0				35.0
Max Q Clear Time (g_c+I1), s		6.3	7.0	28.0				14.7
Green Ext Time (p_c), s		0.3	0.0	0.0				9.5
Intersection Summary								
HCM 2010 Ctrl Delay			33.9					
HCM 2010 LOS			C					

HCM 2010 Signalized Intersection Summary
 51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	641	6	83	596	97	5	0	32	70	8	47
Future Volume (veh/h)	0	641	6	83	596	97	5	0	32	70	8	47
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1937	1976	1937	1937	1937	1937	0	1937	1937	1937	1937
Adj Flow Rate, veh/h	0	697	7	90	648	0	5	0	35	82	0	51
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1245	12	217	1949	872	0	0	0	1158	0	517
Arrive On Green	0.00	0.33	0.33	0.12	0.53	0.00	0.00	0.00	0.00	0.31	0.00	0.31
Sat Flow, veh/h	0	3830	37	1845	3681	1647		0		3690	0	1647
Grp Volume(v), veh/h	0	344	360	90	648	0		0.0		82	0	51
Grp Sat Flow(s),veh/h/ln	0	1840	1931	1845	1840	1647				1845	0	1647
Q Serve(g_s), s	0.0	7.8	7.8	2.3	5.1	0.0				0.8	0.0	1.1
Cycle Q Clear(g_c), s	0.0	7.8	7.8	2.3	5.1	0.0				0.8	0.0	1.1
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	613	644	217	1949	872				1158	0	517
V/C Ratio(X)	0.00	0.56	0.56	0.41	0.33	0.00				0.07	0.00	0.10
Avail Cap(c_a), veh/h	0	613	644	217	1949	872				1158	0	517
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	13.9	13.9	20.9	6.9	0.0				12.3	0.0	12.4
Incr Delay (d2), s/veh	0.0	3.7	3.5	5.7	0.5	0.0				0.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.5	4.7	1.5	2.6	0.0				0.4	0.0	0.6
LnGrp Delay(d),s/veh	0.0	17.6	17.4	26.6	7.3	0.0				12.4	0.0	12.8
LnGrp LOS		B	B	C	A					B		B
Approach Vol, veh/h		704			738						133	
Approach Delay, s/veh		17.5			9.7						12.5	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			10.0	21.0		20.0		31.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			6.0	17.0		16.0		27.0				
Max Q Clear Time (g_c+I1), s			4.3	9.8		3.1		7.1				
Green Ext Time (p_c), s			0.0	2.5		0.3		4.4				
Intersection Summary												
HCM 2010 Ctrl Delay			13.4									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	183	742	10	28	1089	279	9	2	15	273	6	75
Future Volume (veh/h)	183	742	10	28	1089	279	9	2	15	273	6	75
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1976	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	199	807	11	30	1184	303	10	2	16	193	153	82
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	185	1255	17	115	1104	494	310	62	329	369	238	127
Arrive On Green	0.10	0.34	0.34	0.06	0.30	0.30	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1845	3718	51	1845	3681	1647	1550	310	1647	1845	1188	637
Grp Volume(v), veh/h	199	399	419	30	1184	303	12	0	16	193	0	235
Grp Sat Flow(s),veh/h/ln	1845	1840	1928	1845	1840	1647	1860	0	1647	1845	0	1825
Q Serve(g_s), s	8.0	14.7	14.7	1.2	24.0	12.6	0.4	0.0	0.6	7.5	0.0	9.5
Cycle Q Clear(g_c), s	8.0	14.7	14.7	1.2	24.0	12.6	0.4	0.0	0.6	7.5	0.0	9.5
Prop In Lane	1.00		0.03	1.00		1.00	0.83		1.00	1.00		0.35
Lane Grp Cap(c), veh/h	185	621	651	115	1104	494	372	0	329	369	0	365
V/C Ratio(X)	1.08	0.64	0.64	0.26	1.07	0.61	0.03	0.00	0.05	0.52	0.00	0.64
Avail Cap(c_a), veh/h	185	621	651	115	1104	494	372	0	329	369	0	365
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.0	22.4	22.4	35.7	28.0	24.0	25.8	0.0	25.9	28.6	0.0	29.4
Incr Delay (d2), s/veh	88.7	5.1	4.8	5.4	48.7	5.6	0.2	0.0	0.3	5.2	0.0	8.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	8.3	8.7	0.8	19.6	6.5	0.2	0.0	0.3	4.3	0.0	5.6
LnGrp Delay(d),s/veh	124.7	27.5	27.3	41.1	76.7	29.6	25.9	0.0	26.1	33.8	0.0	37.9
LnGrp LOS	F	C	C	D	F	C	C		C	C		D
Approach Vol, veh/h	1017				1517				28		428	
Approach Delay, s/veh	46.4				66.6				26.0		36.0	
Approach LOS	D				E				C		D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	20.0		9.0	31.0	20.0		12.0	28.0				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	16.0		5.0	27.0	16.0		8.0	24.0				
Max Q Clear Time (g_c+I1), s	2.6		3.2	16.7	11.5		10.0	26.0				
Green Ext Time (p_c), s	0.0		0.0	3.7	0.8		0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	55.0											
HCM 2010 LOS	D											
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	908	285	88	800	174	363	97	141	410	236	381
Future Volume (veh/h)	59	908	285	88	800	174	363	97	141	410	236	381
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	64	987	310	96	870	189	250	308	153	352	389	414
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	115	898	280	92	1150	515	415	436	370	369	387	329
Arrive On Green	0.06	0.32	0.32	0.05	0.31	0.31	0.22	0.22	0.22	0.20	0.20	0.20
Sat Flow, veh/h	1845	2763	863	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	64	656	641	96	870	189	250	308	153	352	389	414
Grp Sat Flow(s),veh/h/ln	1845	1840	1785	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	2.7	26.0	26.0	4.0	17.0	7.1	9.7	11.7	6.4	15.1	16.0	16.0
Cycle Q Clear(g_c), s	2.7	26.0	26.0	4.0	17.0	7.1	9.7	11.7	6.4	15.1	16.0	16.0
Prop In Lane	1.00		0.48	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	115	598	580	92	1150	515	415	436	371	369	387	329
V/C Ratio(X)	0.56	1.10	1.11	1.04	0.76	0.37	0.60	0.71	0.41	0.95	1.00	1.26
Avail Cap(c_a), veh/h	115	598	580	92	1150	515	415	436	371	369	387	329
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.4	27.0	27.0	38.0	24.8	21.4	27.8	28.6	26.5	31.6	32.0	32.0
Incr Delay (d2), s/veh	17.9	65.8	69.7	105.2	4.7	2.0	6.3	9.3	3.4	36.6	46.7	138.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	24.1	24.0	4.7	9.3	3.5	5.7	7.4	3.2	11.4	13.5	19.9
LnGrp Delay(d),s/veh	54.3	92.8	96.7	143.9	29.4	23.4	34.1	37.9	29.9	68.2	78.7	170.1
LnGrp LOS	D	F	F	F	C	C	C	D	C	E	F	F
Approach Vol, veh/h	1361				1155				711			
Approach Delay, s/veh	92.8				37.9				34.8			
Approach LOS	F				D				C			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	22.0		8.0	30.0	20.0		9.0	29.0				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	18.0		4.0	26.0	16.0		5.0	25.0				
Max Q Clear Time (g_c+I1), s	13.7		6.0	28.0	18.0		4.7	19.0				
Green Ext Time (p_c), s	1.3		0.0	0.0	0.0		0.0	3.2				
Intersection Summary												
HCM 2010 Ctrl Delay	73.0											
HCM 2010 LOS	E											
Notes												

Intersection

Intersection Delay, s/veh 7.6

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	81	6	6	88	9	4	2	7	0	0	0
Future Vol, veh/h	24	81	6	6	88	9	4	2	7	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	88	7	7	96	10	4	2	8	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.7	7.6	7.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	31%	22%	6%
Vol Thru, %	15%	73%	85%
Vol Right, %	54%	5%	9%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	13	111	103
LT Vol	4	24	6
Through Vol	2	81	88
RT Vol	7	6	9
Lane Flow Rate	14	121	112
Geometry Grp	1	1	1
Degree of Util (X)	0.016	0.136	0.125
Departure Headway (Hd)	4.17	4.054	4.009
Convergence, Y/N	Yes	Yes	Yes
Cap	864	884	893
Service Time	2.17	2.081	2.039
HCM Lane V/C Ratio	0.016	0.137	0.125
HCM Control Delay	7.2	7.7	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	0.5	0.4

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖						↖	↗
Traffic Vol, veh/h	0	176	53	27	32	0	0	0	0	26	0	45
Future Vol, veh/h	0	176	53	27	32	0	0	0	0	26	0	45
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	191	58	29	35	0	0	0	0	28	0	49
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	191	0	0				284	284	35
Stage 1	-	-	-	-	-	-				93	93	-
Stage 2	-	-	-	-	-	-				191	191	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1383	-	0				706	625	1038
Stage 1	0	-	-	-	-	0				931	818	-
Stage 2	0	-	-	-	-	0				841	742	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1383	-	-				691	0	1038
Mov Cap-2 Maneuver	-	-	-	-	-	-				691	0	-
Stage 1	-	-	-	-	-	-				911	0	-
Stage 2	-	-	-	-	-	-				841	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.5			9.3					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT		EBR	WBL	WBT	SBLn1	SBLn2					
Capacity (veh/h)	-		-	1383	-	691	1038					
HCM Lane V/C Ratio	-		-	0.021	-	0.041	0.047					
HCM Control Delay (s)	-		-	7.7	0	10.4	8.6					
HCM Lane LOS	-		-	A	A	B	A					
HCM 95th %tile Q(veh)	-		-	0.1	-	0.1	0.1					

HCM 2010 Signalized Intersection Summary

56: I-5 SB On/Off-Ramp & Vista Way

07/02/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑	↑	↑↑		
Traffic Volume (veh/h)	717	99	165	1237	40	252		
Future Volume (veh/h)	717	99	165	1237	40	252		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	779	0	179	1345	43	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1963	878	334	1317	394	618		
Arrive On Green	0.53	0.00	0.09	0.68	0.21	0.00		
Sat Flow, veh/h	3778	1647	3579	1937	1845	2898		
Grp Volume(v), veh/h	779	0	179	1345	43	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1937	1845	1449		
Q Serve(g_s), s	9.4	0.0	3.6	51.0	1.4	0.0		
Cycle Q Clear(g_c), s	9.4	0.0	3.6	51.0	1.4	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1963	878	334	1317	394	618		
V/C Ratio(X)	0.40	0.00	0.54	1.02	0.11	0.00		
Avail Cap(c_a), veh/h	1963	878	334	1317	394	618		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	10.4	0.0	32.4	12.0	23.8	0.0		
Incr Delay (d2), s/veh	0.6	0.0	6.0	30.2	0.6	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	4.9	0.0	2.0	37.4	0.8	0.0		
LnGrp Delay(d),s/veh	11.0	0.0	38.5	42.2	24.3	0.0		
LnGrp LOS	B		D	F	C			
Approach Vol, veh/h	779			1524	43			
Approach Delay, s/veh	11.0			41.8	24.3			
Approach LOS	B			D	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	11.0	44.0				55.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	7.0	40.0				51.0
Max Q Clear Time (g_c+I1), s		3.4	5.6	11.4				53.0
Green Ext Time (p_c), s		0.0	0.1	6.1				0.0
Intersection Summary								
HCM 2010 Ctrl Delay			31.2					
HCM 2010 LOS			C					

Appendix M.2 – Analysis Output Sheets (Future with Project Alternative 3 Existing SR-78)

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	89	81	61	94	300	568	169	18	141	83	23	69
Future Volume (vph)	89	81	61	94	300	568	169	18	141	83	23	69
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.93	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3143	1441		1782	1583		1793	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.96	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3143	1441		1782	1583		1793	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	97	88	66	102	326	617	184	20	153	90	25	75
RTOR Reduction (vph)	0	0	58	0	228	254	0	0	91	0	0	57
Lane Group Flow (vph)	97	88	8	102	407	54	0	204	62	0	115	18
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	5.5	8.4	8.4	8.3	12.8	12.8		21.4	21.4		17.2	17.2
Effective Green, g (s)	5.5	8.4	8.4	8.3	12.8	12.8		21.4	21.4		17.2	17.2
Actuated g/C Ratio	0.07	0.11	0.11	0.11	0.17	0.17		0.29	0.29		0.23	0.23
Clearance Time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	132	212	180	199	546	250		518	460		419	369
v/s Ratio Prot	0.05	0.05		c0.06	c0.13			c0.11			c0.06	
v/s Ratio Perm			0.00			0.04			0.04			0.01
v/c Ratio	0.73	0.42	0.04	0.51	0.75	0.21		0.39	0.13		0.27	0.05
Uniform Delay, d1	33.3	30.3	29.0	30.7	28.9	26.1		20.9	19.3		23.1	21.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	19.0	0.5	0.0	2.2	4.8	0.2		2.2	0.6		1.6	0.2
Delay (s)	52.3	30.8	29.1	33.0	33.7	26.2		23.1	19.9		24.7	22.1
Level of Service	D	C	C	C	C	C		C	B		C	C
Approach Delay (s)		38.7			31.4			21.7			23.7	
Approach LOS		D			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			29.7				HCM 2000 Level of Service			C		
HCM 2000 Volume to Capacity ratio			0.46									
Actuated Cycle Length (s)			73.6				Sum of lost time (s)		18.3			
Intersection Capacity Utilization			49.6%				ICU Level of Service		A			
Analysis Period (min)			15									
c Critical Lane Group												

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				LT				L			
Volume (V), veh/h	0	0	0	0	0	415	0	377	0	0	177	471	0	120	164	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	0	0	0	0	460	0	410	0	0	196	522	0	133	182	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929		4.6453	4.3276			4.3276		4.6453	4.3276	
Follow-Up Headway (s)		3.1858		2.6667	2.5352			2.5352		2.6667	2.5352	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		0		0	460	410		196	522	133	182	
Entry Volume veh/h		0		0	451	410		192	512	130	178	
Circulating Flow (v_c), pc/h	775			196			133			460		
Exiting Flow (v_{ex}), pc/h	133			0			196			642		
Capacity (C_{pce}), pc/h		521		1127	1202			1268		884	960	
Capacity (c), veh/h		510		1105	1179			1243		867	942	
v/c Ratio (x)		0.00		0.00	0.38			0.15		0.15	0.19	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.1		3.3	6.8	0.0		4.2	0.0	5.6	5.7	
Lane LOS		A		A	A	A		A	A	A	A	
95% Queue, veh		0.0		0.0	1.8			0.5		0.5	0.7	
Approach Delay, s/veh				3.6			1.1			5.7		
Approach LOS				A			A			A		
Intersection Delay, s/veh LOS	3.0						A					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	22	4	43	28	85	12	58	63	127	79	6
Future Volume (vph)	2	22	4	43	28	85	12	58	63	127	79	6
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	24	4	47	30	92	13	63	68	138	86	7
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	30	169	144	231								
Volume Left (vph)	2	47	13	138								
Volume Right (vph)	4	92	68	7								
Hadj (s)	-0.03	-0.24	-0.23	0.14								
Departure Headway (s)	5.0	4.6	4.4	4.7								
Degree Utilization, x	0.04	0.22	0.18	0.30								
Capacity (veh/h)	648	724	764	730								
Control Delay (s)	8.2	8.8	8.4	9.7								
Approach Delay (s)	8.2	8.8	8.4	9.7								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay			9.0									
Level of Service			A									
Intersection Capacity Utilization			44.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↔		↖	↗		↖	↗	↗
Traffic Volume (vph)	174	15	48	8	29	55	45	295	17	22	404	99
Future Volume (vph)	174	15	48	8	29	55	45	295	17	22	404	99
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.92		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		1.00		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1781	1583		1706		1770	1848		1770	1863	1583
Flt Permitted		0.73	1.00		0.98		0.43	1.00		0.53	1.00	1.00
Satd. Flow (perm)		1368	1583		1674		803	1848		987	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	189	16	52	9	32	60	49	321	18	24	439	108
RTOR Reduction (vph)	0	0	35	0	41	0	0	3	0	0	0	46
Lane Group Flow (vph)	0	205	17	0	60	0	49	336	0	24	439	62
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		17.5	17.5		17.5		30.3	30.3		31.5	31.5	31.5
Effective Green, g (s)		17.5	17.5		17.5		30.3	30.3		31.5	31.5	31.5
Actuated g/C Ratio		0.32	0.32		0.32		0.55	0.55		0.57	0.57	0.57
Clearance Time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		7.0	7.0	7.0
Lane Grp Cap (vph)		435	503		532		442	1018		565	1066	906
v/s Ratio Prot								0.18			c0.24	
v/s Ratio Perm		c0.15	0.01		0.04		0.06			0.02		0.04
v/c Ratio		0.47	0.03		0.11		0.11	0.33		0.04	0.41	0.07
Uniform Delay, d1		15.0	12.9		13.3		5.9	6.8		5.1	6.6	5.2
Progression Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Incremental Delay, d2		2.8	0.1		0.3		0.5	0.9		0.1	1.2	0.1
Delay (s)		17.9	13.0		13.6		6.4	7.6		5.3	7.7	5.4
Level of Service		B	B		B		A	A		A	A	A
Approach Delay (s)		16.9			13.6			7.5			7.2	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			9.7									
HCM 2000 Volume to Capacity ratio			0.44									
Actuated Cycle Length (s)			55.0							7.2		
Intersection Capacity Utilization			51.9%									
Analysis Period (min)			15									
c Critical Lane Group												

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Civic Center Drive
E/W Street Name	Civic Center Drive
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	11	7	7	0	15	10	13	0	6	293	18	0	39	349	11
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	12	8	8	0	17	11	14	0	7	325	20	0	43	387	12
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		28			42			352			442	
Entry Volume veh/h		27			41			345			433	
Circulating Flow (v_c), pc/h	447			344			63			35		
Exiting Flow (v_{ex}), pc/h	71			30			351			412		
Capacity (C_{pce}), pc/h		723			801			1061			1091	
Capacity (c), veh/h		709			785			1040			1070	
v/c Ratio (x)		0.04			0.05			0.33			0.41	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.5			5.1			6.8			7.7	
Lane LOS		A			A			A			A	
95% Queue, veh		0.1			0.2			1.5			2.0	
Approach Delay, s/veh	5.5			5.1			6.8			7.7		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	7.1						A					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	7/11/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Pier View Way
E/W Street Name	Pier View Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	16	12	23	0	2	18	3	0	18	331	2	0	2	360	47
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	18	13	26	0	2	20	3	0	20	367	2	0	2	399	52
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		57			25			389			453	
Entry Volume veh/h		56			25			381			444	
Circulating Flow (v_c), pc/h	403			405			33			42		
Exiting Flow (v_{ex}), pc/h	17			92			388			427		
Capacity (C_{pce}), pc/h		755			754			1093			1084	
Capacity (c), veh/h		740			739			1072			1062	
v/c Ratio (x)		0.08			0.03			0.36			0.42	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.6			5.2			7.0			7.9	
Lane LOS		A			A			A			A	
95% Queue, veh		0.2			0.1			1.6			2.1	
Approach Delay, s/veh	5.6			5.2			7.0			7.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	7.3						A					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control	Stop				Stop			Stop			Stop	
Traffic Volume (vph)	3	4	26	10	8	4	121	219	4	6	150	9
Future Volume (vph)	3	4	26	10	8	4	121	219	4	6	150	9
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	3	4	28	11	9	4	132	238	4	7	163	10
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	7	28	24	251	123	89	92					
Volume Left (vph)	3	0	11	132	0	7	0					
Volume Right (vph)	0	28	4	0	4	0	10					
Hadj (s)	0.25	-0.67	0.03	0.30	0.01	0.07	-0.04					
Departure Headway (s)	6.0	5.1	5.8	5.1	4.8	5.1	4.9					
Degree Utilization, x	0.01	0.04	0.04	0.36	0.16	0.12	0.13					
Capacity (veh/h)	548	640	572	692	729	687	706					
Control Delay (s)	7.9	7.1	9.0	9.7	7.6	7.6	7.5					
Approach Delay (s)	7.3		9.0	9.0		7.5						
Approach LOS	A		A	A		A						
Intersection Summary												
Delay			8.5									
Level of Service			A									
Intersection Capacity Utilization			32.2%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	131	58	129	92	34	113
Future Volume (vph)	131	58	129	92	34	113
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	142	63	140	100	37	123
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	142	63	240	160		
Volume Left (vph)	142	0	0	37		
Volume Right (vph)	0	63	100	0		
Hadj (s)	0.53	-0.67	-0.22	0.08		
Departure Headway (s)	6.0	4.8	4.5	4.8		
Degree Utilization, x	0.24	0.08	0.30	0.21		
Capacity (veh/h)	567	705	774	705		
Control Delay (s)	9.6	7.0	9.3	9.2		
Approach Delay (s)	8.8		9.3	9.2		
Approach LOS	A		A	A		
Intersection Summary						
Delay			9.1			
Level of Service			A			
Intersection Capacity Utilization			37.5%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			 		 						 	
Traffic Volume (vph)	17	0	127	34	167	31	0	0	0	0	28	39
Future Volume (vph)	17	0	127	34	167	31	0	0	0	0	28	39
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5		4.5	4.5	4.5						4.5	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.98						0.91	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3456						3230	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3456						3230	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	0	138	37	182	34	0	0	0	0	30	42
RTOR Reduction (vph)	0	0	129	15	14	0	0	0	0	0	39	0
Lane Group Flow (vph)	18	0	9	22	202	0	0	0	0	0	33	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	3.3		3.3	29.3	29.3						3.9	
Effective Green, g (s)	3.3		3.3	29.3	29.3						3.9	
Actuated g/C Ratio	0.07		0.07	0.59	0.59						0.08	
Clearance Time (s)	4.5		4.5	4.5	4.5						4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	116		183	1037	2025						251	
v/s Ratio Prot	c0.01		0.00	0.01	c0.06						c0.01	
v/s Ratio Perm												
v/c Ratio	0.16		0.05	0.02	0.10						0.13	
Uniform Delay, d1	22.0		21.9	4.3	4.6						21.5	
Progression Factor	1.00		1.00	1.00	1.00						1.00	
Incremental Delay, d2	0.6		0.1	0.0	0.1						0.2	
Delay (s)	22.7		22.0	4.4	4.6						21.7	
Level of Service	C		C	A	A						C	
Approach Delay (s)		22.1			4.6			0.0			21.7	
Approach LOS		C			A			A			C	
Intersection Summary												
HCM 2000 Control Delay			12.8			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.11									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)			13.5			
Intersection Capacity Utilization			23.1%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations					 							
Traffic Volume (vph)	0	0	0	126	206	65	66	497	0	0	283	30
Future Volume (vph)	0	0	0	126	206	65	66	497	0	0	283	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	0.95
Frpb, ped/bikes				1.00	1.00	0.96	1.00	1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	3539	1526	1770	1863			1767	1461
Flt Permitted				0.95	1.00	1.00	0.44	1.00			1.00	1.00
Satd. Flow (perm)				1770	3539	1526	813	1863			1767	1461
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	137	224	71	72	540	0	0	308	33
RTOR Reduction (vph)	0	0	0	0	0	49	0	0	0	0	1	22
Lane Group Flow (vph)	0	0	0	137	224	22	72	540	0	0	310	8
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					6
Actuated Green, G (s)				18.1	18.1	18.1	30.6	30.6			15.5	15.5
Effective Green, g (s)				18.1	18.1	18.1	30.6	30.6			15.5	15.5
Actuated g/C Ratio				0.31	0.31	0.31	0.52	0.52			0.26	0.26
Clearance Time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				545	1091	470	588	971			466	385
v/s Ratio Prot				c0.08	0.06		0.02	c0.29			c0.18	
v/s Ratio Perm						0.01	0.04					0.01
v/c Ratio				0.25	0.21	0.05	0.12	0.56			0.67	0.02
Uniform Delay, d1				15.2	15.0	14.2	9.8	9.5			19.3	16.0
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				1.1	0.4	0.2	0.1	0.9			3.9	0.0
Delay (s)				16.3	15.4	14.4	9.9	10.3			23.2	16.0
Level of Service				B	B	B	A	B			C	B
Approach Delay (s)		0.0			15.5			10.3			22.6	
Approach LOS		A			B			B			C	
Intersection Summary												
HCM 2000 Control Delay			14.9		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.50									
Actuated Cycle Length (s)			58.7		Sum of lost time (s)					15.0		
Intersection Capacity Utilization			51.4%		ICU Level of Service					A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	116	1	132	434	214	11	26	200	144	50	6
Future Volume (vph)	24	116	1	132	434	214	11	26	200	144	50	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.98	
Satd. Flow (prot)	1770	3535		1770	3539	1583		1835	1583	1681	1714	
Flt Permitted	0.44	1.00		0.67	1.00	1.00		0.94	1.00	0.73	0.89	
Satd. Flow (perm)	815	3535		1251	3539	1583		1754	1583	1294	1561	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	126	1	143	472	233	12	28	217	157	54	7
RTOR Reduction (vph)	0	1	0	0	0	169	0	0	97	0	3	0
Lane Group Flow (vph)	26	126	0	143	472	64	0	40	120	107	108	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	15.4	15.4		15.0	15.0	15.0		30.4	30.4	30.4	30.4	
Effective Green, g (s)	15.4	15.4		15.0	15.0	15.0		30.4	30.4	30.4	30.4	
Actuated g/C Ratio	0.28	0.28		0.27	0.27	0.27		0.55	0.55	0.55	0.55	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	228	989		341	965	431		969	874	715	862	
v/s Ratio Prot		0.04			c0.13							
v/s Ratio Perm	0.03			0.11		0.04		0.02	0.08	c0.08	0.07	
v/c Ratio	0.11	0.13		0.42	0.49	0.15		0.04	0.14	0.15	0.13	
Uniform Delay, d1	14.7	14.8		16.4	16.8	15.2		5.6	6.0	6.0	5.9	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.3	0.1		1.0	0.5	0.2		0.1	0.3	0.4	0.3	
Delay (s)	15.0	14.9		17.4	17.2	15.3		5.7	6.3	6.4	6.2	
Level of Service	B	B		B	B	B		A	A	A	A	
Approach Delay (s)		14.9			16.8			6.2			6.3	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay			13.2				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.26									
Actuated Cycle Length (s)			55.0				Sum of lost time (s)			9.6		
Intersection Capacity Utilization			39.3%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

07/02/2018

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱			↱	↘↙	
Traffic Volume (veh/h)	79	5	20	28	5	8
Future Volume (Veh/h)	79	5	20	28	5	8
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	86	5	22	30	5	9
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				238		
pX, platoon unblocked						
vC, conflicting volume			91		162	88
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			91		162	88
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			99		99	99
cM capacity (veh/h)			1504		816	970
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	91	52	14			
Volume Left	0	22	5			
Volume Right	5	0	9			
cSH	1700	1504	909			
Volume to Capacity	0.05	0.01	0.02			
Queue Length 95th (ft)	0	1	1			
Control Delay (s)	0.0	3.2	9.0			
Lane LOS		A	A			
Approach Delay (s)	0.0	3.2	9.0			
Approach LOS			A			
Intersection Summary						
Average Delay			1.9			
Intersection Capacity Utilization			19.2%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	80	50	85	0	0	0	24	217	60	70	210	47
Future Volume (vph)	80	50	85	0	0	0	24	217	60	70	210	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.95				1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1498				1770	1863	1552	1770	1863	1518
Flt Permitted	0.95	1.00	1.00				0.62	1.00	1.00	0.44	1.00	1.00
Satd. Flow (perm)	1770	1863	1498				1148	1863	1552	826	1863	1518
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	87	54	92	0	0	0	26	236	65	76	228	51
RTOR Reduction (vph)	0	0	51	0	0	0	0	0	47	0	0	31
Lane Group Flow (vph)	87	54	41	0	0	0	26	236	18	76	228	20
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA	Perm				Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4					2	2		1	6	
Permitted Phases			4				2		2	6		6
Actuated Green, G (s)	24.3	24.3	24.3				15.5	15.5	15.5	21.9	21.9	21.9
Effective Green, g (s)	24.3	24.3	24.3				15.5	15.5	15.5	21.9	21.9	21.9
Actuated g/C Ratio	0.44	0.44	0.44				0.28	0.28	0.28	0.40	0.40	0.40
Clearance Time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0				4.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	782	823	661				323	525	437	370	741	604
v/s Ratio Prot	c0.05	0.03						c0.13		0.01	c0.12	
v/s Ratio Perm			0.03				0.02		0.01	0.07		0.01
v/c Ratio	0.11	0.07	0.06				0.08	0.45	0.04	0.21	0.31	0.03
Uniform Delay, d1	9.0	8.8	8.8				14.5	16.2	14.4	10.7	11.4	10.1
Progression Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.3	0.2	0.2				0.5	2.8	0.2	0.3	1.1	0.1
Delay (s)	9.3	9.0	9.0				15.0	19.0	14.5	11.0	12.4	10.2
Level of Service	A	A	A				B	B	B	B	B	B
Approach Delay (s)		9.1			0.0			17.8			11.8	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			13.3				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.26									
Actuated Cycle Length (s)			55.0				Sum of lost time (s)			12.8		
Intersection Capacity Utilization			49.5%				ICU Level of Service			A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	198	10	0	0	0	0	4	17	18	7	0
Future Volume (Veh/h)	9	198	10	0	0	0	0	4	17	18	7	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	215	11	0	0	0	0	4	18	20	8	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	218											
pX, platoon unblocked												
vC, conflicting volume	0			226			244	240	113	148	246	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0			226			244	240	113	148	246	0
tC, single (s)	4.1			4.1			7.5	6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			100	99	98	97	99	100
cM capacity (veh/h)	1622			1340			679	656	918	783	651	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	118	118	22	28								
Volume Left	10	0	0	20								
Volume Right	0	11	18	0								
cSH	1622	1700	856	740								
Volume to Capacity	0.01	0.07	0.03	0.04								
Queue Length 95th (ft)	0	0	2	3								
Control Delay (s)	0.7	0.0	9.3	10.1								
Lane LOS	A		A	B								
Approach Delay (s)	0.3		9.3	10.1								
Approach LOS			A	B								
Intersection Summary												
Average Delay				2.0								
Intersection Capacity Utilization				20.8%	ICU Level of Service				A			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis
15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	23	459	4	0	0	0	0	4	21	14	12	0
Future Volume (vph)	23	459	4	0	0	0	0	4	21	14	12	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	25	499	4	0	0	0	0	4	23	15	13	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	275	254	27	28								
Volume Left (vph)	25	0	0	15								
Volume Right (vph)	0	4	23	0								
Hadj (s)	0.08	0.02	-0.48	0.14								
Departure Headway (s)	4.7	4.7	4.6	5.2								
Degree Utilization, x	0.36	0.33	0.03	0.04								
Capacity (veh/h)	755	760	734	647								
Control Delay (s)	9.2	8.7	7.7	8.4								
Approach Delay (s)	9.0		7.7	8.4								
Approach LOS	A		A	A								
Intersection Summary												
Delay			8.9									
Level of Service			A									
Intersection Capacity Utilization			28.2%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

07/02/2018

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	95	188	9	40	0	96	0	46	30	0	0	0								
Future Volume (vph)	95	188	9	40	0	96	0	46	30	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	103	204	10	43	0	104	0	50	33	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	103	214	147	83																
Volume Left (vph)	103	0	43	0																
Volume Right (vph)	0	10	104	33																
Hadj (s)	0.53	0.00	-0.33	-0.20																
Departure Headway (s)	5.4	4.8	4.2	4.7																
Degree Utilization, x	0.15	0.29	0.17	0.11																
Capacity (veh/h)	661	730	821	705																
Control Delay (s)	8.1	8.5	8.1	8.3																
Approach Delay (s)	8.4		8.1	8.3																
Approach LOS	A		A	A																
Intersection Summary																				
Delay			8.3																	
Level of Service			A																	
Intersection Capacity Utilization			32.8%	ICU Level of Service					A											
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	15	0	0	31	15	218	20	14	226	7
Future Volume (Veh/h)	0	0	15	0	0	31	15	218	20	14	226	7
Sign Control	Stop			Stop				Free			Free	
Grade	0%			0%				0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	16	0	0	34	16	237	22	15	246	8
Pedestrians	7			7								
Lane Width (ft)	12.0			16.0								
Walking Speed (ft/s)	4.0			4.0								
Percent Blockage	1			1								
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			455		
pX, platoon unblocked												
vC, conflicting volume	590	585	257	579	578	255	261				266	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	590	585	257	579	578	255	261				266	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	98	100	100	96	99				99	
cM capacity (veh/h)	387	407	777	403	411	778	1296				1288	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	16	34	16	259	15	254						
Volume Left	0	0	16	0	15	0						
Volume Right	16	34	0	22	0	8						
cSH	777	778	1296	1700	1288	1700						
Volume to Capacity	0.02	0.04	0.01	0.15	0.01	0.15						
Queue Length 95th (ft)	2	3	1	0	1	0						
Control Delay (s)	9.7	9.8	7.8	0.0	7.8	0.0						
Lane LOS	A	A	A		A							
Approach Delay (s)	9.7	9.8	0.5		0.4							
Approach LOS	A	A										
Intersection Summary												
Average Delay			1.2									
Intersection Capacity Utilization			22.9%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Washington Avenue
E/W Street Name	Washington Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	13	2	22	0	37	6	4	0	16	213	11	0	3	222	16
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	14	2	24	0	41	7	4	0	18	236	12	0	3	246	18
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		40			52			266			267	
Entry Volume veh/h		39			51			261			262	
Circulating Flow (v_c), pc/h	290			268			19			66		
Exiting Flow (v_{ex}), pc/h	17			43			254			311		
Capacity (C_{pce}), pc/h		846			864			1109			1058	
Capacity (c), veh/h		829			847			1087			1037	
v/c Ratio (x)		0.05			0.06			0.24			0.25	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.8			4.8			5.6			5.9	
Lane LOS		A			A			A			A	
95% Queue, veh		0.1			0.2			0.9			1.0	
Approach Delay, s/veh	4.8			4.8			5.6			5.9		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	5.6						A					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	20	28	17	25	3	76	3	140	39	90	95	1
Future Volume (vph)	20	28	17	25	3	76	3	140	39	90	95	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	22	30	18	27	3	83	3	152	42	98	103	1
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	70	113	197	202								
Volume Left (vph)	22	27	3	98								
Volume Right (vph)	18	83	42	1								
Hadj (s)	-0.06	-0.36	-0.09	0.13								
Departure Headway (s)	4.9	4.6	4.5	4.7								
Degree Utilization, x	0.10	0.14	0.25	0.26								
Capacity (veh/h)	658	712	759	725								
Control Delay (s)	8.5	8.4	9.0	9.4								
Approach Delay (s)	8.5	8.4	9.0	9.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.9								
Level of Service				A								
Intersection Capacity Utilization				37.6%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	191	18	3	88	15	9	20	23	21	28	11
Future Volume (Veh/h)	8	191	18	3	88	15	9	20	23	21	28	11
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	208	20	3	96	16	10	22	25	23	30	12
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)	265											
pX, platoon unblocked												
vC, conflicting volume	126			235			381	375	225	396	377	119
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	126			235			381	375	225	396	377	119
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			100			98	96	97	96	94	99
cM capacity (veh/h)	1443			1325			531	542	810	513	540	921
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	237	115	57	65								
Volume Left	9	3	10	23								
Volume Right	20	16	25	12								
cSH	1443	1325	631	573								
Volume to Capacity	0.01	0.00	0.09	0.11								
Queue Length 95th (ft)	0	0	7	10								
Control Delay (s)	0.3	0.2	11.3	12.1								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.2	11.3	12.1								
Approach LOS			B	B								
Intersection Summary												
Average Delay				3.2								
Intersection Capacity Utilization				27.8%	ICU Level of Service				A			
Analysis Period (min)				15								

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Wisconsin Avenue
E/W Street Name	Wisconsin Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	52	58	130	0	97	31	30	0	64	212	70	0	18	234	17
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	58	64	144	0	108	34	33	0	71	235	78	0	20	259	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		266			175			384			298	
Entry Volume veh/h		261			172			376			292	
Circulating Flow (v_c), pc/h	387			364			142			213		
Exiting Flow (v_{ex}), pc/h	162			124			326			511		
Capacity (C_{pce}), pc/h		767			785			980			913	
Capacity (c), veh/h		752			770			961			895	
v/c Ratio (x)		0.35			0.22			0.39			0.33	

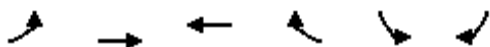
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		9.0			7.1			8.1			7.6	
Lane LOS		A			A			A			A	
95% Queue, veh		1.6			0.9			1.9			1.4	
Approach Delay, s/veh	9.0			7.1			8.1			7.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	8.0						A					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

07/02/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	241	233	5	16	14
Future Volume (Veh/h)	8	241	233	5	16	14
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	262	253	5	17	15
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	266				544	264
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	266				544	264
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				97	98
cM capacity (veh/h)	1289				493	768
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	271	258	32			
Volume Left	9	0	17			
Volume Right	0	5	15			
cSH	1289	1700	592			
Volume to Capacity	0.01	0.15	0.05			
Queue Length 95th (ft)	1	0	4			
Control Delay (s)	0.3	0.0	11.4			
Lane LOS	A		B			
Approach Delay (s)	0.3	0.0	11.4			
Approach LOS			B			
Intersection Summary						
Average Delay			0.8			
Intersection Capacity Utilization			29.5%		ICU Level of Service	
Analysis Period (min)			15		A	

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	227	10	21	214	13	6	5	14	40	1	6
Future Volume (Veh/h)	8	227	10	21	214	13	6	5	14	40	1	6
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	247	11	23	233	14	7	5	15	43	1	7
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	249			258			566	566	252	576	564	244
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	249			258			566	566	252	576	564	244
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			98	99	98	89	100	99
cM capacity (veh/h)	1314			1307			421	423	786	407	423	792
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	267	270	27	51								
Volume Left	9	23	7	43								
Volume Right	11	14	15	7								
cSH	1314	1307	568	437								
Volume to Capacity	0.01	0.02	0.05	0.12								
Queue Length 95th (ft)	1	1	4	10								
Control Delay (s)	0.3	0.8	11.7	14.3								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.8	11.7	14.3								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.2									
Intersection Capacity Utilization			35.9%	ICU Level of Service						A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	119	199	73	151	0	107	0	37	0	0	0
Future Volume (vph)	0	119	199	73	151	0	107	0	37	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	129	216	79	164	0	116	0	40	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	345	243	156	0								
Volume Left (vph)	0	79	116	0								
Volume Right (vph)	216	0	40	0								
Hadj (s)	-0.34	0.10	0.03	0.00								
Departure Headway (s)	4.3	4.8	5.2	5.5								
Degree Utilization, x	0.41	0.33	0.23	0.00								
Capacity (veh/h)	808	712	615	565								
Control Delay (s)	10.3	10.1	9.8	8.5								
Approach Delay (s)	10.3	10.1	9.8	0.0								
Approach LOS	B	B	A	A								
Intersection Summary												
Delay				10.1								
Level of Service				B								
Intersection Capacity Utilization				53.5%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	49	69	89	31	80	107
Future Volume (vph)	49	69	89	31	80	107
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	53	75	97	34	87	116
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	128	131	203			
Volume Left (vph)	53	0	87			
Volume Right (vph)	75	34	0			
Hadj (s)	-0.23	-0.12	0.12			
Departure Headway (s)	4.4	4.3	4.5			
Degree Utilization, x	0.16	0.16	0.25			
Capacity (veh/h)	754	799	774			
Control Delay (s)	8.2	8.1	9.0			
Approach Delay (s)	8.2	8.1	9.0			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.5			
Level of Service			A			
Intersection Capacity Utilization			30.3%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	240	1	6	193	37	7	10	11	37	15	9
Future Volume (Veh/h)	7	240	1	6	193	37	7	10	11	37	15	9
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	261	1	7	210	40	8	11	12	40	16	10
Pedestrians		4			8			11			3	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		0			1			1			0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)	213											
pX, platoon unblocked	0.93						0.93	0.93		0.93	0.93	0.93
vC, conflicting volume	253			273			554	556	280	550	536	237
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	160			273			484	485	280	480	464	143
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			98	97	98	91	96	99
cM capacity (veh/h)	1317			1278			428	438	746	434	450	837
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	270	257	31	66								
Volume Left	8	7	8	40								
Volume Right	1	40	12	10								
cSH	1317	1278	518	473								
Volume to Capacity	0.01	0.01	0.06	0.14								
Queue Length 95th (ft)	0	0	5	12								
Control Delay (s)	0.3	0.3	12.4	13.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.3	12.4	13.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			30.7%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	20	127	72	88	129	75	37	156	47	82	198	14
Future Volume (vph)	20	127	72	88	129	75	37	156	47	82	198	14
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	10	11	11	16	16	16
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.97	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1850	1534	1681	1764	1794	1652	3289		2006	2090	
Flt Permitted		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1850	1534	1681	1764	1794	1652	3289		2006	2090	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	22	138	78	96	140	82	40	170	51	89	215	15
RTOR Reduction (vph)	0	0	67	0	0	69	0	32	0	0	2	0
Lane Group Flow (vph)	0	160	11	86	150	13	40	189	0	89	228	0
Confl. Peds. (#/hr)			10	10					3			
Confl. Bikes (#/hr)			4						3			
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		11.3	11.3	12.5	12.5	12.5	4.3	28.5		8.9	33.1	
Effective Green, g (s)		11.3	11.3	12.5	12.5	12.5	4.3	28.5		8.9	33.1	
Actuated g/C Ratio		0.14	0.14	0.16	0.16	0.16	0.05	0.36		0.11	0.41	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		261	216	262	275	280	88	1171		223	864	
v/s Ratio Prot		c0.09		0.05	c0.09		0.02	0.06		c0.04	c0.11	
v/s Ratio Perm			0.01			0.01						
v/c Ratio		0.61	0.05	0.33	0.55	0.05	0.45	0.16		0.40	0.26	
Uniform Delay, d1		32.3	29.7	30.0	31.1	28.7	36.7	17.6		33.1	15.4	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		3.0	0.0	0.9	2.5	0.1	1.4	0.3		1.2	0.7	
Delay (s)		35.3	29.7	30.9	33.6	28.8	38.1	17.9		34.2	16.2	
Level of Service		D	C	C	C	C	D	B		C	B	
Approach Delay (s)		33.5			31.6			21.0			21.2	
Approach LOS		C			C			C			C	
Intersection Summary												
HCM 2000 Control Delay			26.6									
HCM 2000 Volume to Capacity ratio			0.42									
Actuated Cycle Length (s)			80.0							18.8		
Intersection Capacity Utilization			50.2%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	331	0	17	426	103	8	10	36	316	16	57
Future Volume (vph)	14	331	0	17	426	103	8	10	36	316	16	57
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.96
Flpb, ped/bikes	1.00	1.00		0.99	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.97			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1770	3539		1756	3425			3131			1777	1527
Flt Permitted	0.32	1.00		0.52	1.00			0.91			0.69	1.00
Satd. Flow (perm)	589	3539		968	3425			2882			1286	1527
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	360	0	18	463	112	9	11	39	343	17	62
RTOR Reduction (vph)	0	0	0	0	49	0	0	17	0	0	0	26
Lane Group Flow (vph)	15	360	0	18	526	0	0	42	0	0	360	36
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	13.9	13.9		13.9	13.9			31.6			31.6	31.6
Effective Green, g (s)	13.9	13.9		13.9	13.9			31.6			31.6	31.6
Actuated g/C Ratio	0.25	0.25		0.25	0.25			0.57			0.57	0.57
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	148	894		244	865			1655			738	877
v/s Ratio Prot		0.10			c0.15							
v/s Ratio Perm	0.03			0.02				0.01			c0.28	0.02
v/c Ratio	0.10	0.40		0.07	0.61			0.03			0.49	0.04
Uniform Delay, d1	15.8	17.1		15.6	18.1			5.1			6.9	5.1
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	0.3	0.3		0.1	1.2			0.0			2.3	0.1
Delay (s)	16.1	17.4		15.8	19.4			5.1			9.2	5.2
Level of Service	B	B		B	B			A			A	A
Approach Delay (s)		17.3			19.3			5.1			8.6	
Approach LOS		B			B			A			A	
Intersection Summary												
HCM 2000 Control Delay		15.1			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.52										
Actuated Cycle Length (s)		55.0			Sum of lost time (s)			9.5				
Intersection Capacity Utilization		62.1%			ICU Level of Service			B				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	15	17	37	9	142	3	235	75	119	317	17
Future Volume (vph)	25	15	17	37	9	142	3	235	75	119	317	17
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	10	11	16
Total Lost time (s)		4.6				4.6	4.6	4.2	4.9		4.2	4.9
Lane Util. Factor		1.00				1.00	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes		1.00				1.00	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00				1.00	1.00	1.00	1.00		1.00	1.00
Frt		0.96				1.00	0.85	1.00	0.96		1.00	0.99
Flt Protected		0.98				0.96	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)		1742				1788	1794	1770	3841		1652	3396
Flt Permitted		0.83				0.73	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)		1484				1353	1794	1770	3841		1652	3396
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	16	18	40	10	154	3	255	82	129	345	18
RTOR Reduction (vph)	0	15	0	0	0	132	0	48	0	0	5	0
Lane Group Flow (vph)	0	46	0	0	50	22	3	289	0	129	358	0
Confl. Peds. (#/hr)			4	4					3			
Confl. Bikes (#/hr)			1						2			
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		5.3			5.3	5.3	0.6	14.6		3.9	17.9	
Effective Green, g (s)		5.3			5.3	5.3	0.6	14.6		3.9	17.9	
Actuated g/C Ratio		0.14			0.14	0.14	0.02	0.39		0.10	0.48	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		209			191	253	28	1495		171	1621	
v/s Ratio Prot							0.00	0.08		c0.08	c0.11	
v/s Ratio Perm		0.03			c0.04	0.01						
v/c Ratio		0.22			0.26	0.09	0.11	0.19		0.75	0.22	
Uniform Delay, d1		14.3			14.4	14.0	18.2	7.6		16.3	5.7	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			0.3	0.1	1.7	0.1		17.1	0.1	
Delay (s)		14.5			14.6	14.0	19.9	7.6		33.4	5.8	
Level of Service		B			B	B	B	A		C	A	
Approach Delay (s)		14.5			14.2			7.7			13.0	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			11.7		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.30									
Actuated Cycle Length (s)			37.5		Sum of lost time (s)					13.7		
Intersection Capacity Utilization			38.4%		ICU Level of Service					A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	172	44	68	149	0	38	0	56	0	0	0
Future Volume (Veh/h)	0	172	44	68	149	0	38	0	56	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	187	48	74	162	0	41	0	61	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	252											
pX, platoon unblocked												
vC, conflicting volume	162			235			521	521	211	582	545	162
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	162			235			521	521	211	582	545	162
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			94			91	100	93	100	100	100
cM capacity (veh/h)	1417			1332			446	434	829	376	421	883
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	235	236	102	0								
Volume Left	0	74	41	0								
Volume Right	48	0	61	0								
cSH	1417	1332	616	1700								
Volume to Capacity	0.00	0.06	0.17	0.00								
Queue Length 95th (ft)	0	4	15	0								
Control Delay (s)	0.0	2.8	12.0	0.0								
Lane LOS		A	B	A								
Approach Delay (s)	0.0	2.8	12.0	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			3.3									
Intersection Capacity Utilization			38.9%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	1	79	13	3	56	1	23	0	10	1	0	1
Future Volume (Veh/h)	1	79	13	3	56	1	23	0	10	1	0	1
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	1	86	14	3	61	1	25	0	11	1	0	1
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	643											
pX, platoon unblocked												
vC, conflicting volume	62			100			164	163	93	174	170	62
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	62			100			164	163	93	174	170	62
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			97	100	99	100	100	100
cM capacity (veh/h)	1541			1493			799	728	964	779	722	1004
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	101	65	36	2								
Volume Left	1	3	25	1								
Volume Right	14	1	11	1								
cSH	1541	1493	843	877								
Volume to Capacity	0.00	0.00	0.04	0.00								
Queue Length 95th (ft)	0	0	3	0								
Control Delay (s)	0.1	0.4	9.5	9.1								
Lane LOS	A	A	A	A								
Approach Delay (s)	0.1	0.4	9.5	9.1								
Approach LOS			A	A								
Intersection Summary												
Average Delay			1.9									
Intersection Capacity Utilization			15.3%	ICU Level of Service				A				
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	29	91	12	29	113	12
Future Volume (vph)	29	91	12	29	113	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	99	13	32	123	13
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	131	45	136			
Volume Left (vph)	32	0	123			
Volume Right (vph)	99	32	0			
Hadj (s)	-0.37	-0.39	0.21			
Departure Headway (s)	3.9	3.9	4.4			
Degree Utilization, x	0.14	0.05	0.17			
Capacity (veh/h)	874	870	787			
Control Delay (s)	7.6	7.1	8.3			
Approach Delay (s)	7.6	7.1	8.3			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.8			
Level of Service			A			
Intersection Capacity Utilization			27.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	82	118	19	55	4	89	13	19	19	15	7
Future Volume (Veh/h)	4	82	118	19	55	4	89	13	19	19	15	7
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	4	89	128	21	60	4	97	14	21	21	16	8
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	576											
pX, platoon unblocked												
vC, conflicting volume	64			217			281	267	153	293	329	62
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	64			217			281	267	153	293	329	62
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			98			85	98	98	97	97	99
cM capacity (veh/h)	1538			1353			643	627	893	624	579	1003
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	221	85	132	45								
Volume Left	4	21	97	21								
Volume Right	128	4	21	8								
cSH	1538	1353	671	650								
Volume to Capacity	0.00	0.02	0.20	0.07								
Queue Length 95th (ft)	0	1	18	6								
Control Delay (s)	0.2	2.0	11.7	11.0								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.2	2.0	11.7	11.0								
Approach LOS			B	B								
Intersection Summary												
Average Delay			4.6									
Intersection Capacity Utilization			31.8%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	61	20	14	38	6	6	5	39	2	7	2
Future Volume (Veh/h)	0	61	20	14	38	6	6	5	39	2	7	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	66	22	15	41	7	7	5	42	2	8	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
249												
pX, platoon unblocked												
vC, conflicting volume	48			88			158	155	77	196	162	44
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	48			88			158	155	77	196	162	44
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			99			99	99	96	100	99	100
cM capacity (veh/h)	1559			1508			794	730	984	721	723	1025
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	88	63	54	12								
Volume Left	0	15	7	2								
Volume Right	22	7	42	2								
cSH	1559	1508	925	760								
Volume to Capacity	0.00	0.01	0.06	0.02								
Queue Length 95th (ft)	0	1	5	1								
Control Delay (s)	0.0	1.8	9.1	9.8								
Lane LOS		A	A	A								
Approach Delay (s)	0.0	1.8	9.1	9.8								
Approach LOS			A	A								
Intersection Summary												
Average Delay												
3.3												
Intersection Capacity Utilization												
20.1%												
ICU Level of Service												
A												
Analysis Period (min)												
15												

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	41	47	24	54	22	14	30	160	27	33	175	6
Future Volume (vph)	41	47	24	54	22	14	30	160	27	33	175	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.6			5.0		4.2	5.0		4.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	0.95		1.00	0.95	
Frt		0.97			0.98		1.00	0.98		1.00	0.99	
Flt Protected		0.98			0.97		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1776			1771		1770	3463		1770	3520	
Flt Permitted		0.84			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1515			1824		1770	3463		1770	3520	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	45	51	26	59	24	15	33	174	29	36	190	7
RTOR Reduction (vph)	0	17	0	0	12	0	0	15	0	0	3	0
Lane Group Flow (vph)	0	105	0	0	86	0	33	188	0	36	194	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		3.5			3.1		0.8	15.6		0.6	15.2	
Effective Green, g (s)		3.5			3.1		0.8	15.6		0.6	15.2	
Actuated g/C Ratio		0.11			0.09		0.02	0.47		0.02	0.46	
Clearance Time (s)		4.6			5.0		4.2	5.0		4.0	5.0	
Vehicle Extension (s)		3.0			3.5		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		159			169		42	1622		31	1606	
v/s Ratio Prot							c0.02	0.05		c0.02	c0.06	
v/s Ratio Perm		c0.07			0.05							
v/c Ratio		0.66			0.51		0.79	0.12		1.16	0.12	
Uniform Delay, d1		14.3			14.4		16.2	5.0		16.3	5.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		9.8			3.0		58.6	0.0		214.2	0.0	
Delay (s)		24.2			17.4		74.8	5.0		230.6	5.2	
Level of Service		C			B		E	A		F	A	
Approach Delay (s)		24.2			17.4			14.8			40.1	
Approach LOS		C			B			B			D	
Intersection Summary												
HCM 2000 Control Delay		25.4			HCM 2000 Level of Service			C				
HCM 2000 Volume to Capacity ratio		0.27										
Actuated Cycle Length (s)		33.3			Sum of lost time (s)			14.2				
Intersection Capacity Utilization		31.7%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	110	31	36	62	27	12	40	30	21	33	38
Future Volume (Veh/h)	32	110	31	36	62	27	12	40	30	21	33	38
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	35	120	34	39	67	29	13	43	33	23	36	41
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		280										
pX, platoon unblocked												
vC, conflicting volume	96			154			426	381	137	421	384	82
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	96			154			426	381	137	421	384	82
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			97			97	92	96	95	93	96
cM capacity (veh/h)	1498			1426			471	524	911	472	522	978
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	189	135	89	100								
Volume Left	35	39	13	23								
Volume Right	34	29	33	41								
cSH	1498	1426	610	627								
Volume to Capacity	0.02	0.03	0.15	0.16								
Queue Length 95th (ft)	2	2	13	14								
Control Delay (s)	1.5	2.4	11.9	11.8								
Lane LOS	A	A	B	B								
Approach Delay (s)	1.5	2.4	11.9	11.8								
Approach LOS			B	B								
Intersection Summary												
Average Delay			5.6									
Intersection Capacity Utilization			26.0%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	68	17	10	42	1	14	18	24	6	9	3
Future Volume (vph)	2	68	17	10	42	1	14	18	24	6	9	3
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	74	18	11	46	1	15	20	26	7	10	3
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	94	58	61	20								
Volume Left (vph)	2	11	15	7								
Volume Right (vph)	18	1	26	3								
Hadj (s)	-0.08	0.06	-0.17	0.01								
Departure Headway (s)	4.1	4.2	4.1	4.3								
Degree Utilization, x	0.11	0.07	0.07	0.02								
Capacity (veh/h)	863	828	843	800								
Control Delay (s)	7.5	7.5	7.4	7.4								
Approach Delay (s)	7.5	7.5	7.4	7.4								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				7.5								
Level of Service				A								
Intersection Capacity Utilization				18.2%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	7	108	4	22	49	18	4	49	94	139	9	7
Future Volume (vph)	7	108	4	22	49	18	4	49	94	139	9	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	8	117	4	24	53	20	4	53	102	151	10	8
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	129	97	159	169								
Volume Left (vph)	8	24	4	151								
Volume Right (vph)	4	20	102	8								
Hadj (s)	0.03	-0.04	-0.35	0.18								
Departure Headway (s)	4.8	4.8	4.3	4.8								
Degree Utilization, x	0.17	0.13	0.19	0.23								
Capacity (veh/h)	687	687	779	700								
Control Delay (s)	8.9	8.5	8.4	9.3								
Approach Delay (s)	8.9	8.5	8.4	9.3								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.8								
Level of Service				A								
Intersection Capacity Utilization				38.7%	ICU Level of Service		A					
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	74	38	16	87	75
Future Volume (vph)	0	74	38	16	87	75
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	80	41	17	95	82
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	80	58	177			
Volume Left (vph)	0	0	95			
Volume Right (vph)	80	17	0			
Hadj (s)	-0.57	-0.14	0.14			
Departure Headway (s)	3.9	4.1	4.3			
Degree Utilization, x	0.09	0.07	0.21			
Capacity (veh/h)	880	844	826			
Control Delay (s)	7.2	7.4	8.4			
Approach Delay (s)	7.2	7.4	8.4			
Approach LOS	A	A	A			
Intersection Summary						
Delay			7.9			
Level of Service			A			
Intersection Capacity Utilization			18.8%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	17	130	43	245	53	206	31	215	117	175	304	7
Future Volume (vph)	17	130	43	245	53	206	31	215	117	175	304	7
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	16	16	16
Total Lost time (s)	5.0	5.0	5.0		4.9	4.9	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.95		1.00	1.00	
Flt Protected	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2006	1863	1555		1789	1794	1770	3752		2006	3997	
Flt Permitted	0.95	1.00	1.00		0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	2006	1863	1555		1789	1794	1770	3752		2006	3997	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	18	141	47	266	58	224	34	234	127	190	330	8
RTOR Reduction (vph)	0	0	42	0	0	150	0	85	0	0	2	0
Lane Group Flow (vph)	18	141	5	0	324	74	34	276	0	190	336	0
Confl. Peds. (#/hr)			2	2					5			
Confl. Bikes (#/hr)									4			
Turn Type	Split	NA	Perm	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	7.0	7.0	7.0		16.3	23.0	1.3	20.6		6.7	26.0	
Effective Green, g (s)	7.0	7.0	7.0		16.3	23.0	1.3	20.6		6.7	26.0	
Actuated g/C Ratio	0.10	0.10	0.10		0.23	0.33	0.02	0.30		0.10	0.37	
Clearance Time (s)	5.0	5.0	5.0		4.9		4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	201	187	156		418	591	33	1108		192	1490	
v/s Ratio Prot	0.01	c0.08			c0.18	0.04	0.02	0.07		c0.09	c0.08	
v/s Ratio Perm			0.00									
v/c Ratio	0.09	0.75	0.03		0.78	0.13	1.03	0.25		0.99	0.23	
Uniform Delay, d1	28.5	30.5	28.3		25.0	16.3	34.2	18.7		31.5	15.0	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	14.1	0.0		8.7	0.1	166.0	0.5		61.3	0.4	
Delay (s)	28.5	44.6	28.3		33.7	16.4	200.2	19.2		92.7	15.3	
Level of Service	C	D	C		C	B	F	B		F	B	
Approach Delay (s)		39.5			26.6			34.8			43.2	
Approach LOS		D			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			35.3									
HCM 2000 Volume to Capacity ratio			0.59									
Actuated Cycle Length (s)			69.7									
Intersection Capacity Utilization			62.1%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	349	5	16	521	50	0	0	27	28	0	30
Future Volume (Veh/h)	8	349	5	16	521	50	0	0	27	28	0	30
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	379	5	17	566	54	0	0	29	30	0	33
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			TWLTL							
Median storage (veh)					2							
Upstream signal (ft)		312										
pX, platoon unblocked				0.95			0.95	0.95	0.95	0.95	0.95	
vC, conflicting volume	620			384			1060	1054	382	1056	1029	593
vC1, stage 1 conf vol							400	400		627	627	
vC2, stage 2 conf vol							660	654		428	402	
vCu, unblocked vol	620			323			1035	1029	320	1031	1003	593
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			100	100	96	92	100	93
cM capacity (veh/h)	960			1173			367	395	683	390	406	506
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	393	637	29	63								
Volume Left	9	17	0	30								
Volume Right	5	54	29	33								
cSH	960	1173	683	443								
Volume to Capacity	0.01	0.01	0.04	0.14								
Queue Length 95th (ft)	1	1	3	12								
Control Delay (s)	0.3	0.4	10.5	14.5								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.3	0.4	10.5	14.5								
Approach LOS			B	B								
Intersection Summary												
Average Delay			1.4									
Intersection Capacity Utilization			55.1%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	11	420	10	30	661	28	10	4	66	34	4	17
Future Volume (Veh/h)	11	420	10	30	661	28	10	4	66	34	4	17
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	12	457	11	33	718	30	11	4	72	37	4	18
Pedestrians	1						1					
Lane Width (ft)	12.0						12.0					
Walking Speed (ft/s)	4.0						4.0					
Percent Blockage	0						0					
Right turn flare (veh)												
Median type	TWLTL			TWLTL								
Median storage (veh)	2			2								
Upstream signal (ft)	687											
pX, platoon unblocked												
vC, conflicting volume	748			469			1292	1302	464	1354	1292	734
vC1, stage 1 conf vol							488	488		799	799	
vC2, stage 2 conf vol							805	814		555	493	
vCu, unblocked vol	748			469			1292	1302	464	1354	1292	734
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			97			96	99	88	87	99	96
cM capacity (veh/h)	861			1092			298	325	598	287	330	420
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	12	468	33	748	87	59						
Volume Left	12	0	33	0	11	37						
Volume Right	0	11	0	30	72	18						
cSH	861	1700	1092	1700	513	321						
Volume to Capacity	0.01	0.28	0.03	0.44	0.17	0.18						
Queue Length 95th (ft)	1	0	2	0	15	17						
Control Delay (s)	9.2	0.0	8.4	0.0	13.4	18.7						
Lane LOS	A		A		B	C						
Approach Delay (s)	0.2		0.4		13.4	18.7						
Approach LOS					B	C						
Intersection Summary												
Average Delay				1.9								
Intersection Capacity Utilization				53.0%	ICU Level of Service			A				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	26	600	0	0	774	124	0	0	0	0	0	21
Future Volume (Veh/h)	26	600	0	0	774	124	0	0	0	0	0	21
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	28	652	0	0	841	135	0	0	0	0	0	23
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL				TWLTL							
Median storage veh)	2				2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	976			652			1572	1684	652	1616	1616	908
vC1, stage 1 conf vol							708	708		908	908	
vC2, stage 2 conf vol							864	976		708	708	
vCu, unblocked vol	976			652			1572	1684	652	1616	1616	908
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			100	100	100	100	100	93
cM capacity (veh/h)	707			935			246	253	468	262	281	333
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	28	652	0	976	0	23						
Volume Left	28	0	0	0	0	0						
Volume Right	0	0	0	135	0	23						
cSH	707	1700	1700	1700	1700	333						
Volume to Capacity	0.04	0.38	0.00	0.57	0.00	0.07						
Queue Length 95th (ft)	3	0	0	0	0	6						
Control Delay (s)	10.3	0.0	0.0	0.0	0.0	16.6						
Lane LOS	B				A	C						
Approach Delay (s)	0.4		0.0		0.0	16.6						
Approach LOS					A	C						
Intersection Summary												
Average Delay				0.4								
Intersection Capacity Utilization				58.3%	ICU Level of Service				B			
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	85	0	0	58	36	267	23	40	604	13
Future Volume (Veh/h)	0	0	85	0	0	58	36	267	23	40	604	13
Sign Control	Stop			Stop			Free			Free		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	92	0	0	63	39	290	25	43	657	14
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL		TWLTL			
Median storage veh)							2		2			
Upstream signal (ft)									621			
pX, platoon unblocked												
vC, conflicting volume	1036	1143	664	1216	1138	158	671			315		
vC1, stage 1 conf vol	750	750		380	380							
vC2, stage 2 conf vol	286	393		835	757							
vCu, unblocked vol	1036	1143	664	1216	1138	158	671			315		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	77	100	100	93	96			97		
cM capacity (veh/h)	323	352	403	197	332	860	915			1242		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	92	63	39	193	122	43	671					
Volume Left	0	0	39	0	0	43	0					
Volume Right	92	63	0	0	25	0	14					
cSH	403	860	915	1700	1700	1242	1700					
Volume to Capacity	0.23	0.07	0.04	0.11	0.07	0.03	0.39					
Queue Length 95th (ft)	22	6	3	0	0	3	0					
Control Delay (s)	16.6	9.5	9.1	0.0	0.0	8.0	0.0					
Lane LOS	C	A	A			A						
Approach Delay (s)	16.6	9.5	1.0			0.5						
Approach LOS	C	A										
Intersection Summary												
Average Delay			2.3									
Intersection Capacity Utilization			44.5%	ICU Level of Service				A				
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Michigan Avenue
E/W Street Name	Michigan Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	89	14	38	0	48	16	8	0	23	235	6	0	6	230	28
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	99	16	42	0	53	18	9	0	26	261	7	0	7	255	31
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		157			80			294			293	
Entry Volume veh/h		154			78			288			287	
Circulating Flow (v_c), pc/h	315			386			122			97		
Exiting Flow (v_{ex}), pc/h	30			75			369			350		
Capacity (C_{pce}), pc/h		825			768			1000			1026	
Capacity (c), veh/h		809			753			981			1005	
v/c Ratio (x)		0.19			0.10			0.29			0.29	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		6.4			5.9			6.7			6.4	
Lane LOS		A			A			A			A	
95% Queue, veh		0.7			0.3			1.2			1.2	
Approach Delay, s/veh	6.4			5.9			6.7			6.4		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	6.5						A					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - West
E/W Street Name	West Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	17	10	8	0	14	10	30	0	8	94	14	0	30	94	17
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	19	11	9	0	16	11	33	0	9	104	16	0	33	104	19
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		39			60			129			156	
Entry Volume veh/h		38			59			126			153	
Circulating Flow (v_c), pc/h	153			132			63			36		
Exiting Flow (v_{ex}), pc/h	60			39			156			129		
Capacity (C_{pce}), pc/h		970			990			1061			1090	
Capacity (c), veh/h		951			971			1040			1069	
v/c Ratio (x)		0.04			0.06			0.12			0.14	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		4.1			4.3			4.5			4.6	
Lane LOS		A			A			A			A	
95% Queue, veh		0.1			0.2			0.4			0.5	
Approach Delay, s/veh	4.1			4.3			4.5			4.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	4.5						A					

HCM Unsignalized Intersection Capacity Analysis

47: Coast Hwy & Kelly St

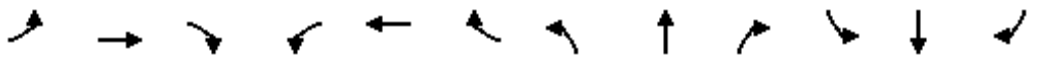
07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	19	26	10	15	21	14	77	10	18	65	24
Future Volume (Veh/h)	9	19	26	10	15	21	14	77	10	18	65	24
Sign Control	Stop				Stop				Free		Free	
Grade	0%				0%				0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	10	21	28	11	16	23	15	84	11	20	71	26
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							737			527		
pX, platoon unblocked												
vC, conflicting volume	227	249	48	234	256	48	97				95	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	227	249	48	234	256	48	97				95	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	99	97	97	98	97	98	99				99	
cM capacity (veh/h)	667	637	1010	653	631	1011	1494				1497	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	59	50	57	53	56	62						
Volume Left	10	11	15	0	20	0						
Volume Right	28	23	0	11	0	26						
cSH	780	770	1494	1700	1497	1700						
Volume to Capacity	0.08	0.06	0.01	0.03	0.01	0.04						
Queue Length 95th (ft)	6	5	1	0	1	0						
Control Delay (s)	10.0	10.0	2.0	0.0	2.7	0.0						
Lane LOS	A	A	A		A							
Approach Delay (s)	10.0	10.0	1.0		1.3							
Approach LOS	A	A										
Intersection Summary												
Average Delay			4.0									
Intersection Capacity Utilization			Err%	ICU Level of Service					H			
Analysis Period (min)			15									

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	149	6	32	7	66	7	22	734	17
Future Volume (veh/h)	0	0	0	149	6	32	7	66	7	22	734	17
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h				167	0	0	8	72	0	24	798	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				1328	0	593	148	1692	527	148	1178	527
Arrive On Green				0.36	0.00	0.00	0.08	0.32	0.00	0.08	0.32	0.00
Sat Flow, veh/h				3690	0	1647	1845	5289	1647	1845	3681	1647
Grp Volume(v), veh/h				167	0	0	8	72	0	24	798	0
Grp Sat Flow(s),veh/h/ln				1845	0	1647	1845	1763	1647	1845	1840	1647
Q Serve(g_s), s				1.5	0.0	0.0	0.2	0.5	0.0	0.6	9.4	0.0
Cycle Q Clear(g_c), s				1.5	0.0	0.0	0.2	0.5	0.0	0.6	9.4	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				1328	0	593	148	1692	527	148	1178	527
V/C Ratio(X)				0.13	0.00	0.00	0.05	0.04	0.00	0.16	0.68	0.00
Avail Cap(c_a), veh/h				1328	0	593	148	1692	527	148	1178	527
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				10.7	0.0	0.0	21.3	11.7	0.0	21.4	14.8	0.0
Incr Delay (d2), s/veh				0.2	0.0	0.0	0.7	0.0	0.0	2.4	3.1	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				0.8	0.0	0.0	0.1	0.2	0.0	0.4	5.3	0.0
LnGrp Delay(d),s/veh				10.9	0.0	0.0	21.9	11.8	0.0	23.8	17.9	0.0
LnGrp LOS				B			C	B		C	B	
Approach Vol, veh/h					167			80			822	
Approach Delay, s/veh					10.9			12.8			18.1	
Approach LOS					B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	8.0	20.0			8.0	20.0		22.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	16.0			4.0	16.0		18.0				
Max Q Clear Time (g_c+I1), s	2.6	2.5			2.2	11.4		3.5				
Green Ext Time (p_c), s	0.0	0.2			0.0	2.2		0.4				
Intersection Summary												
HCM 2010 Ctrl Delay				16.6								
HCM 2010 LOS				B								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↗	↙↙	↑↑					
Traffic Volume (veh/h)	530	191	460	1082	0	0			
Future Volume (veh/h)	530	191	460	1082	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937					
Adj Flow Rate, veh/h	576	208	500	1176					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	1840	823	1074	3313					
Arrive On Green	0.50	0.50	0.30	0.90					
Sat Flow, veh/h	3778	1647	3579	3778					
Grp Volume(v), veh/h	576	208	500	1176					
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840					
Q Serve(g_s), s	3.7	2.9	4.5	1.9					
Cycle Q Clear(g_c), s	3.7	2.9	4.5	1.9					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	1840	823	1074	3313					
V/C Ratio(X)	0.31	0.25	0.47	0.35					
Avail Cap(c_a), veh/h	1840	823	1074	3313					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	5.9	5.7	11.4	0.3					
Incr Delay (d2), s/veh	0.4	0.7	1.5	0.3					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	2.0	1.4	2.4	1.0					
LnGrp Delay(d),s/veh	6.4	6.5	12.8	0.6					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	784			1676					
Approach Delay, s/veh	6.4			4.2					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			16.0	24.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			12.0	20.0				36.0	
Max Q Clear Time (g_c+l1), s			6.5	5.7				3.9	
Green Ext Time (p_c), s			1.0	4.0				10.8	
Intersection Summary									
HCM 2010 Ctrl Delay			4.9						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary 50: I-5 NB On/Off-Ramp & SR-76 ramps

07/02/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↖	↑↑	↖	↗		
Traffic Volume (veh/h)	559	67	750	1720	67	1		
Future Volume (veh/h)	559	67	750	1720	67	1		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	608	73	815	1870	73	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	982	439	954	2208	492	439		
Arrive On Green	0.27	0.27	0.27	0.60	0.27	0.00		
Sat Flow, veh/h	3778	1647	3579	3778	1845	1647		
Grp Volume(v), veh/h	608	73	815	1870	73	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840	1845	1647		
Q Serve(g_s), s	8.7	2.0	13.0	24.8	1.8	0.0		
Cycle Q Clear(g_c), s	8.7	2.0	13.0	24.8	1.8	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	982	439	954	2208	492	439		
V/C Ratio(X)	0.62	0.17	0.85	0.85	0.15	0.00		
Avail Cap(c_a), veh/h	982	439	954	2208	492	439		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	19.3	16.9	20.9	9.8	16.8	0.0		
Incr Delay (d2), s/veh	2.9	0.8	9.6	4.2	0.6	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	4.8	1.0	7.6	13.5	1.0	0.0		
LnGrp Delay(d),s/veh	22.3	17.7	30.5	14.0	17.4	0.0		
LnGrp LOS	C	B	C	B	B			
Approach Vol, veh/h	681			2685	73			
Approach Delay, s/veh	21.8			19.0	17.4			
Approach LOS	C			B	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	20.0	20.0				40.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	16.0	16.0				36.0
Max Q Clear Time (g_c+I1), s		3.8	15.0	10.7				26.8
Green Ext Time (p_c), s		0.1	0.4	2.0				7.6
Intersection Summary								
HCM 2010 Ctrl Delay			19.5					
HCM 2010 LOS			B					

HCM 2010 Signalized Intersection Summary
51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	296	3	94	513	156	10	0	113	20	31	31
Future Volume (veh/h)	0	296	3	94	513	156	10	0	113	20	31	31
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1937	1976	1937	1937	1937	1937	0	1937	1937	1937	1937
Adj Flow Rate, veh/h	0	322	3	102	558	0	11	0	123	22	34	34
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1150	11	284	1982	887	0	0	0	568	596	507
Arrive On Green	0.00	0.31	0.31	0.15	0.54	0.00	0.00	0.00	0.00	0.31	0.31	0.31
Sat Flow, veh/h	0	3834	35	1845	3681	1647		0		1845	1937	1647
Grp Volume(v), veh/h	0	158	167	102	558	0		0.0		22	34	34
Grp Sat Flow(s),veh/h/ln	0	1840	1931	1845	1840	1647				1845	1937	1647
Q Serve(g_s), s	0.0	3.4	3.4	2.6	4.3	0.0				0.4	0.6	0.8
Cycle Q Clear(g_c), s	0.0	3.4	3.4	2.6	4.3	0.0				0.4	0.6	0.8
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	566	594	284	1982	887				568	596	507
V/C Ratio(X)	0.00	0.28	0.28	0.36	0.28	0.00				0.04	0.06	0.07
Avail Cap(c_a), veh/h	0	566	594	284	1982	887				568	596	507
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	13.6	13.6	19.7	6.5	0.0				12.6	12.7	12.7
Incr Delay (d2), s/veh	0.0	1.2	1.2	3.5	0.4	0.0				0.1	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	1.9	2.0	1.6	2.3	0.0				0.2	0.4	0.4
LnGrp Delay(d),s/veh	0.0	14.9	14.8	23.2	6.9	0.0				12.7	12.9	13.0
LnGrp LOS		B	B	C	A					B	B	B
Approach Vol, veh/h		325			660						90	
Approach Delay, s/veh		14.8			9.4						12.9	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			12.0	20.0		20.0		32.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			8.0	16.0		16.0		28.0				
Max Q Clear Time (g_c+I1), s			4.6	5.4		2.8		6.3				
Green Ext Time (p_c), s			0.1	1.3		0.2		3.8				
Intersection Summary												
HCM 2010 Ctrl Delay			11.3									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/13/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	233	492	5	9	647	329	10	10	19	128	2	57
Future Volume (veh/h)	233	492	5	9	647	329	10	10	19	128	2	57
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1976	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	253	535	5	10	703	358	11	11	21	102	54	62
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	158	961	9	105	841	376	216	216	376	422	188	216
Arrive On Green	0.09	0.26	0.26	0.02	0.08	0.08	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	3737	35	1845	3681	1647	945	945	1647	1845	824	946
Grp Volume(v), veh/h	253	263	277	10	703	358	22	0	21	102	0	116
Grp Sat Flow(s),veh/h/ln	1845	1840	1931	1845	1840	1647	1890	0	1647	1845	0	1770
Q Serve(g_s), s	6.0	8.7	8.7	0.4	13.2	15.2	0.6	0.0	0.7	3.2	0.0	3.8
Cycle Q Clear(g_c), s	6.0	8.7	8.7	0.4	13.2	15.2	0.6	0.0	0.7	3.2	0.0	3.8
Prop In Lane	1.00		0.02	1.00		1.00	0.50		1.00	1.00		0.53
Lane Grp Cap(c), veh/h	158	473	497	105	841	376	432	0	376	422	0	405
V/C Ratio(X)	1.60	0.56	0.56	0.09	0.84	0.95	0.05	0.00	0.06	0.24	0.00	0.29
Avail Cap(c_a), veh/h	158	473	497	105	841	376	432	0	376	422	0	405
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	32.0	22.5	22.5	32.6	31.1	32.0	21.1	0.0	21.1	22.0	0.0	22.3
Incr Delay (d2), s/veh	297.5	4.7	4.5	1.8	9.6	35.6	0.2	0.0	0.3	1.4	0.0	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.1	5.0	5.2	0.2	7.9	10.6	0.4	0.0	0.3	1.8	0.0	2.0
LnGrp Delay(d),s/veh	329.5	27.2	27.0	34.3	40.7	67.5	21.3	0.0	21.4	23.4	0.0	24.1
LnGrp LOS	F	C	C	C	D	E	C		C	C		C
Approach Vol, veh/h		793			1071			43			218	
Approach Delay, s/veh		123.6			49.6			21.3			23.8	
Approach LOS		F			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	8.0	22.0		20.0	10.0	20.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	4.0	18.0		16.0	6.0	16.0				
Max Q Clear Time (g_c+I1), s		2.7	2.4	10.7		5.8	8.0	17.2				
Green Ext Time (p_c), s		0.1	0.0	1.9		0.6	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				74.0								
HCM 2010 LOS				E								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	394	290	84	780	168	257	128	80	206	268	184
Future Volume (veh/h)	71	394	290	84	780	168	257	128	80	206	268	184
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	77	428	315	91	848	183	209	237	87	224	291	200
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	105	464	339	132	894	400	448	470	400	422	443	376
Arrive On Green	0.02	0.08	0.08	0.07	0.24	0.24	0.24	0.24	0.24	0.23	0.23	0.23
Sat Flow, veh/h	1845	2031	1485	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	77	388	355	91	848	183	209	237	87	224	291	200
Grp Sat Flow(s),veh/h/ln	1845	1840	1675	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	2.9	14.6	14.8	3.4	15.9	6.6	6.8	7.4	3.0	7.5	9.5	7.5
Cycle Q Clear(g_c), s	2.9	14.6	14.8	3.4	15.9	6.6	6.8	7.4	3.0	7.5	9.5	7.5
Prop In Lane	1.00		0.89	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	105	421	383	132	894	400	448	470	400	422	443	376
V/C Ratio(X)	0.73	0.92	0.93	0.69	0.95	0.46	0.47	0.50	0.22	0.53	0.66	0.53
Avail Cap(c_a), veh/h	105	421	383	132	894	400	448	470	400	422	443	376
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.8	31.7	31.8	31.7	26.1	22.6	22.6	22.9	21.2	23.7	24.5	23.7
Incr Delay (d2), s/veh	35.7	28.0	31.0	25.7	20.0	3.7	3.5	3.8	1.2	4.7	7.4	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	10.7	10.1	2.7	10.5	3.4	3.9	4.4	1.5	4.3	6.0	3.9
LnGrp Delay(d),s/veh	69.5	59.7	62.8	57.5	46.0	26.3	26.1	26.7	22.4	28.4	31.9	29.0
LnGrp LOS	E	E	E	E	D	C	C	C	C	C	C	C
Approach Vol, veh/h		820			1122			533			715	
Approach Delay, s/veh		62.0			43.7			25.8			30.0	
Approach LOS		E			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.0	9.0	20.0		20.0	8.0	21.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	5.0	16.0		16.0	4.0	17.0				
Max Q Clear Time (g_c+I1), s		9.4	5.4	16.8		11.5	4.9	17.9				
Green Ext Time (p_c), s		1.5	0.0	0.0		1.4	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			42.3									
HCM 2010 LOS			D									
Notes												

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	89	7	15	67	40	2	2	5	0	0	0
Future Vol, veh/h	25	89	7	15	67	40	2	2	5	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	27	97	8	16	73	43	2	2	5	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.8	7.6	7.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	22%	21%	12%
Vol Thru, %	22%	74%	55%
Vol Right, %	56%	6%	33%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	9	121	122
LT Vol	2	25	15
Through Vol	2	89	67
RT Vol	5	7	40
Lane Flow Rate	10	132	133
Geometry Grp	1	1	1
Degree of Util (X)	0.011	0.148	0.143
Departure Headway (Hd)	4.198	4.057	3.877
Convergence, Y/N	Yes	Yes	Yes
Cap	858	884	923
Service Time	2.198	2.082	1.907
HCM Lane V/C Ratio	0.012	0.149	0.144
HCM Control Delay	7.2	7.8	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	0.5	0.5

Intersection												
Int Delay, s/veh	2.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑		↑						↑	↑
Traffic Vol, veh/h	0	136	67	44	54	0	0	0	0	16	0	53
Future Vol, veh/h	0	136	67	44	54	0	0	0	0	16	0	53
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	148	73	48	59	0	0	0	0	17	0	58
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	148	0	0				303	303	59
Stage 1	-	-	-	-	-	-				155	155	-
Stage 2	-	-	-	-	-	-				148	148	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1434	-	0				689	610	1007
Stage 1	0	-	-	-	-	0				873	769	-
Stage 2	0	-	-	-	-	0				880	775	-
Platoon blocked, %	-	-	-	-	-	-				-	-	-
Mov Cap-1 Maneuver	-	-	-	1434	-	-				665	0	1007
Mov Cap-2 Maneuver	-	-	-	-	-	-				665	0	-
Stage 1	-	-	-	-	-	-				842	0	-
Stage 2	-	-	-	-	-	-				880	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.4			9.2					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2						
Capacity (veh/h)	-	-	1434	-	665	1007						
HCM Lane V/C Ratio	-	-	0.033	-	0.026	0.057						
HCM Control Delay (s)	-	-	7.6	0	10.6	8.8						
HCM Lane LOS	-	-	A	A	B	A						
HCM 95th %tile Q(veh)	-	-	0.1	-	0.1	0.2						

HCM 2010 Signalized Intersection Summary

56: I-5 SB On/Off-Ramp & Vista Way

07/02/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↗	↖↖	↑	↖	↗↗		
Traffic Volume (veh/h)	392	145	180	931	12	171		
Future Volume (veh/h)	392	145	180	931	12	171		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	426	0	196	1012	13	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1595	714	358	1162	492	773		
Arrive On Green	0.43	0.00	0.10	0.60	0.27	0.00		
Sat Flow, veh/h	3778	1647	3579	1937	1845	2898		
Grp Volume(v), veh/h	426	0	196	1012	13	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1937	1845	1449		
Q Serve(g_s), s	4.5	0.0	3.1	26.3	0.3	0.0		
Cycle Q Clear(g_c), s	4.5	0.0	3.1	26.3	0.3	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1595	714	358	1162	492	773		
V/C Ratio(X)	0.27	0.00	0.55	0.87	0.03	0.00		
Avail Cap(c_a), veh/h	1595	714	358	1162	492	773		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	10.9	0.0	25.7	10.1	16.2	0.0		
Incr Delay (d2), s/veh	0.4	0.0	5.9	9.0	0.1	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	2.3	0.0	1.8	16.7	0.2	0.0		
LnGrp Delay(d),s/veh	11.3	0.0	31.6	19.1	16.3	0.0		
LnGrp LOS	B		C	B	B			
Approach Vol, veh/h	426			1208	13			
Approach Delay, s/veh	11.3			21.1	16.3			
Approach LOS	B			C	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	10.0	30.0				40.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	6.0	26.0				36.0
Max Q Clear Time (g_c+I1), s		2.3	5.1	6.5				28.3
Green Ext Time (p_c), s		0.0	0.1	2.7				4.5
Intersection Summary								
HCM 2010 Ctrl Delay			18.5					
HCM 2010 LOS			B					

HCM Signalized Intersection Capacity Analysis

1: Coast Hwy/I-5 Ramps & Harbor Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	271	107	194	477	305	1669	214	38	179	120	74	78
Future Volume (vph)	271	107	194	477	305	1669	214	38	179	120	74	78
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Lane Util. Factor	1.00	1.00	1.00	1.00	0.91	0.91		1.00	1.00		1.00	1.00
Frt	1.00	1.00	0.85	1.00	0.89	0.85		1.00	0.85		1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (prot)	1770	1863	1583	1770	3018	1441		1787	1583		1807	1583
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00		0.96	1.00		0.97	1.00
Satd. Flow (perm)	1770	1863	1583	1770	3018	1441		1787	1583		1807	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	295	116	211	518	332	1814	233	41	195	130	80	85
RTOR Reduction (vph)	0	0	190	0	495	500	0	0	117	0	0	71
Lane Group Flow (vph)	295	116	21	518	744	407	0	274	78	0	210	14
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Split	NA	Perm	Split	NA	Perm
Protected Phases	7	4		3	8		2	2		6	6	
Permitted Phases			4			8			2			6
Actuated Green, G (s)	16.7	9.8	9.8	33.7	28.4	28.4		21.2	21.2		17.0	17.0
Effective Green, g (s)	16.7	9.8	9.8	33.7	28.4	28.4		21.2	21.2		17.0	17.0
Actuated g/C Ratio	0.17	0.10	0.10	0.34	0.28	0.28		0.21	0.21		0.17	0.17
Clearance Time (s)	4.5	4.6	4.6	4.5	3.0	3.0		4.6	4.6		4.6	4.6
Vehicle Extension (s)	3.0	0.2	0.2	3.0	0.2	0.2		0.2	0.2		0.2	0.2
Lane Grp Cap (vph)	295	182	155	596	857	409		378	335		307	269
v/s Ratio Prot	0.17	0.06		c0.29	0.25			c0.15			c0.12	
v/s Ratio Perm			0.01			c0.28			0.05			0.01
v/c Ratio	1.00	0.64	0.13	0.87	0.98dr	0.99		0.72	0.23		0.68	0.05
Uniform Delay, d1	41.6	43.4	41.2	31.1	34.0	35.7		36.7	32.7		39.0	34.8
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00		1.00	1.00
Incremental Delay, d2	52.4	5.3	0.1	12.8	9.0	42.6		11.5	1.6		11.7	0.4
Delay (s)	94.1	48.7	41.4	43.9	43.0	78.3		48.2	34.3		50.7	35.1
Level of Service	F	D	D	D	D	E		D	C		D	D
Approach Delay (s)		67.7			55.2			42.4			46.2	
Approach LOS		E			E			D			D	

Intersection Summary

HCM 2000 Control Delay	55.0	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.88		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	18.3
Intersection Capacity Utilization	108.7%	ICU Level of Service	G
Analysis Period (min)	15		

dr Defacto Right Lane. Recode with 1 though lane as a right lane.

c Critical Lane Group

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - SR-76 Ramps
E/W Street Name	SR-76 Ramps
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	2	0	0	0	1	0	0	1	1	0
Lane Assignment	LTR				LT				LT				L			
Volume (V), veh/h	0	0	0	0	0	671	0	323	0	0	438	684	0	557	561	0
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	0	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	0	0	0	0	744	0	351	0	0	486	758	0	618	622	0
Right-Turn Bypass	None				Non-Yielding				Non-Yielding				None			
Conflicting Lanes	2				2				2				2			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929		4.6453	4.3276			4.3276		4.6453	4.3276	
Follow-Up Headway (s)		3.1858		2.6667	2.5352			2.5352		2.6667	2.5352	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		0		0	744	351		486	758	618	622	
Entry Volume veh/h		0		0	729	351		476	743	606	610	
Circulating Flow (v_c), pc/h	1984			486			618			744		
Exiting Flow (v_{ex}), pc/h	618			0			486			1366		
Capacity (C_{pce}), pc/h		155		863	939			840		681	754	
Capacity (c), veh/h		152		846	921			823		668	740	
v/c Ratio (x)		0.00		0.00	0.79			0.58		0.91	0.82	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		23.6		4.3	20.9	0.0		13.1	0.0	40.5	27.5	
Lane LOS		C		A	C	A		B	A	E	D	
95% Queue, veh		0.0		0.0	8.4			3.8		11.7	9.0	
Approach Delay, s/veh				14.1			5.1			34.0		
Approach LOS				B			A			D		
Intersection Delay, s/veh LOS	17.9						C					

HCM Unsignalized Intersection Capacity Analysis

3: Pacific St & Surfrider Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	21	11	93	37	161	18	105	97	185	143	12
Future Volume (vph)	0	21	11	93	37	161	18	105	97	185	143	12
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	23	12	101	40	175	20	114	105	201	155	13
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	35	316	239	369								
Volume Left (vph)	0	101	20	201								
Volume Right (vph)	12	175	105	13								
Hadj (s)	-0.17	-0.23	-0.21	0.12								
Departure Headway (s)	6.0	5.4	5.3	5.4								
Degree Utilization, x	0.06	0.47	0.35	0.55								
Capacity (veh/h)	488	624	625	635								
Control Delay (s)	9.4	13.0	11.1	14.9								
Approach Delay (s)	9.4	13.0	11.1	14.9								
Approach LOS	A	B	B	B								
Intersection Summary												
Delay				13.1								
Level of Service				B								
Intersection Capacity Utilization				64.6%	ICU Level of Service		C					
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↰	↱		↰	↱	↰	↱		↰	↱	↱
Traffic Volume (vph)	251	68	105	14	60	34	74	748	22	55	757	181
Future Volume (vph)	251	68	105	14	60	34	74	748	22	55	757	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	1.00		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1792	1583		1772		1770	1855		1770	1863	1583
Flt Permitted		0.72	1.00		0.95		0.13	1.00		0.13	1.00	1.00
Satd. Flow (perm)		1342	1583		1696		242	1855		243	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	273	74	114	15	65	37	80	813	24	60	823	197
RTOR Reduction (vph)	0	0	74	0	24	0	0	2	0	0	0	90
Lane Group Flow (vph)	0	347	40	0	93	0	80	835	0	60	823	107
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		21.3	21.3		21.3		31.5	31.5		32.7	32.7	32.7
Effective Green, g (s)		21.3	21.3		21.3		31.5	31.5		32.7	32.7	32.7
Actuated g/C Ratio		0.36	0.36		0.36		0.52	0.52		0.55	0.55	0.55
Clearance Time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		7.0	7.0	7.0
Lane Grp Cap (vph)		476	561		602		127	973		132	1015	862
v/s Ratio Prot							c0.45				0.44	
v/s Ratio Perm		c0.26	0.03		0.05		0.33			0.25		0.07
v/c Ratio		0.73	0.07		0.15		0.63	0.86		0.45	0.81	0.12
Uniform Delay, d1		16.8	12.8		13.2		10.1	12.3		8.3	11.1	6.7
Progression Factor		1.00	1.00		1.00		0.72	0.76		1.00	1.00	1.00
Incremental Delay, d2		8.6	0.2		0.4		19.0	8.7		10.9	7.0	0.3
Delay (s)		25.5	13.0		13.6		26.4	18.1		19.1	18.2	7.0
Level of Service		C	B		B		C	B		B	B	A
Approach Delay (s)		22.4			13.6			18.8			16.2	
Approach LOS		C			B			B			B	
Intersection Summary												
HCM 2000 Control Delay			18.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.81									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			7.2		
Intersection Capacity Utilization			78.3%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Civic Center Drive
E/W Street Name	Civic Center Drive
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	31	29	28	0	24	34	48	0	23	765	44	0	27	799	26
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (V_{PCE}), pc/h	0	34	32	31	0	27	38	53	0	26	848	49	0	30	886	29
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		97			118			923			945	
Entry Volume veh/h		95			116			905			926	
Circulating Flow (v_c), pc/h	943			908			96			91		
Exiting Flow (v_{ex}), pc/h	111			93			935			944		
Capacity (C_{PCE}), pc/h		440			456			1027			1032	
Capacity (c), veh/h		431			447			1006			1011	
v/c Ratio (x)		0.22			0.26			0.90			0.92	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		11.8			12.1			29.7			31.9	
Lane LOS		B			B			D			D	
95% Queue, veh		0.8			1.0			13.1			14.1	
Approach Delay, s/veh	11.8			12.1			29.7			31.9		
Approach LOS	B			B			D			D		
Intersection Delay, s/veh LOS	28.9						D					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	7/11/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Highway - Pier View Way
E/W Street Name	Pier View Way
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	100	39	109	0	4	39	11	0	83	811	8	0	5	811	189
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	111	43	121	0	4	43	12	0	92	899	9	0	6	899	210
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		275			59			1000			1115	
Entry Volume veh/h		270			58			980			1093	
Circulating Flow (v_c), pc/h	909			1102			160			139		
Exiting Flow (v_{ex}), pc/h	58			345			1022			1024		
Capacity (C_{pce}), pc/h		455			375			963			983	
Capacity (c), veh/h		446			368			944			964	
v/c Ratio (x)		0.60			0.16			1.04			1.13	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		22.6			12.4			60.6			91.9	
Lane LOS		C			B			F			F	
95% Queue, veh		3.9			0.6			21.6			29.9	
Approach Delay, s/veh	22.6			12.4			60.6			91.9		
Approach LOS	C			B			F			F		
Intersection Delay, s/veh LOS	69.4						F					

HCM Unsignalized Intersection Capacity Analysis

7: Horne St & Pier View Way

07/02/2018

																	
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR					
Lane Configurations																	
Sign Control	Stop				Stop			Stop			Stop						
Traffic Volume (vph)	18	11	159	64	11	14	55	399	30	14	359	15					
Future Volume (vph)	18	11	159	64	11	14	55	399	30	14	359	15					
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92					
Hourly flow rate (vph)	20	12	173	70	12	15	60	434	33	15	390	16					
Direction, Lane #	EB 1	EB 2	WB 1	NB 1	NB 2	SB 1	SB 2										
Volume Total (vph)	32	173	97	277	250	210	211										
Volume Left (vph)	20	0	70	60	0	15	0										
Volume Right (vph)	0	173	15	0	33	0	16										
Hadj (s)	0.35	-0.67	0.09	0.14	-0.06	0.07	-0.02										
Departure Headway (s)	7.4	6.4	7.2	6.3	6.1	6.3	6.2										
Degree Utilization, x	0.07	0.31	0.19	0.48	0.42	0.37	0.37										
Capacity (veh/h)	448	520	455	558	574	543	552										
Control Delay (s)	9.7	11.0	11.9	13.8	12.2	11.8	11.6										
Approach Delay (s)	10.8		11.9	13.0		11.7											
Approach LOS	B		B	B		B											
Intersection Summary																	
Delay			12.1														
Level of Service			B														
Intersection Capacity Utilization			46.0%	ICU Level of Service									A				
Analysis Period (min)			15														

HCM Unsignalized Intersection Capacity Analysis

8: Pacific St & Mission Ave

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	296	102	185	206	74	216
Future Volume (vph)	296	102	185	206	74	216
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	322	111	201	224	80	235
Direction, Lane #	WB 1	WB 2	NB 1	SB 1		
Volume Total (vph)	322	111	425	315		
Volume Left (vph)	322	0	0	80		
Volume Right (vph)	0	111	224	0		
Hadj (s)	0.53	-0.67	-0.28	0.08		
Departure Headway (s)	7.1	5.9	5.6	6.1		
Degree Utilization, x	0.63	0.18	0.66	0.53		
Capacity (veh/h)	488	583	622	566		
Control Delay (s)	20.4	9.0	18.5	15.7		
Approach Delay (s)	17.5		18.5	15.7		
Approach LOS	C		C	C		
Intersection Summary						
Delay			17.4			
Level of Service			C			
Intersection Capacity Utilization			64.2%	ICU Level of Service	C	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

9: Cleveland St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	0	333	81	308	84	0	0	0	0	125	93
Future Volume (vph)	44	0	333	81	308	84	0	0	0	0	125	93
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5		4.5	4.5	4.5						4.5	
Lane Util. Factor	1.00		0.88	1.00	0.95						0.95	
Frt	1.00		0.85	1.00	0.97						0.94	
Flt Protected	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (prot)	1770		2787	1770	3426						3313	
Flt Permitted	0.95		1.00	0.95	1.00						1.00	
Satd. Flow (perm)	1770		2787	1770	3426						3313	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	0	362	88	335	91	0	0	0	0	136	101
RTOR Reduction (vph)	0	0	329	45	37	0	0	0	0	0	86	0
Lane Group Flow (vph)	48	0	33	43	389	0	0	0	0	0	151	0
Turn Type	Prot		Prot	Split	NA						NA	
Protected Phases	7		7	8	8						6	
Permitted Phases												
Actuated Green, G (s)	4.5		4.5	24.4	24.4						7.6	
Effective Green, g (s)	4.5		4.5	24.4	24.4						7.6	
Actuated g/C Ratio	0.09		0.09	0.49	0.49						0.15	
Clearance Time (s)	4.5		4.5	4.5	4.5						4.5	
Vehicle Extension (s)	3.0		3.0	3.0	3.0						3.0	
Lane Grp Cap (vph)	159		250	863	1671						503	
v/s Ratio Prot	c0.03		0.01	0.02	c0.11						c0.05	
v/s Ratio Perm												
v/c Ratio	0.30		0.13	0.05	0.23						0.30	
Uniform Delay, d1	21.3		20.9	6.7	7.4						18.8	
Progression Factor	1.00		1.00	1.00	1.00						1.00	
Incremental Delay, d2	1.1		0.2	0.1	0.3						0.3	
Delay (s)	22.4		21.2	6.8	7.7						19.2	
Level of Service	C		C	A	A						B	
Approach Delay (s)		21.3			7.6			0.0			19.2	
Approach LOS		C			A			A			B	
Intersection Summary												
HCM 2000 Control Delay			14.8			HCM 2000 Level of Service					B	
HCM 2000 Volume to Capacity ratio			0.26									
Actuated Cycle Length (s)			50.0			Sum of lost time (s)				13.5		
Intersection Capacity Utilization			33.8%			ICU Level of Service				A		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

10: Coast Hwy & Mission Ave

07/02/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↱	↱	↰	↱			↰	↱
Traffic Volume (vph)	0	0	0	175	403	65	260	728	0	0	590	188
Future Volume (vph)	0	0	0	175	403	65	260	728	0	0	590	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Lane Util. Factor				1.00	0.95	1.00	1.00	1.00			0.95	0.95
Frpb, ped/bikes				1.00	1.00	0.96	1.00	1.00			1.00	0.97
Flpb, ped/bikes				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Frt				1.00	1.00	0.85	1.00	1.00			1.00	0.85
Flt Protected				0.95	1.00	1.00	0.95	1.00			1.00	1.00
Satd. Flow (prot)				1770	3539	1519	1770	1863			1760	1455
Flt Permitted				0.95	1.00	1.00	0.12	1.00			1.00	1.00
Satd. Flow (perm)				1770	3539	1519	219	1863			1760	1455
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	0	0	0	190	438	71	283	791	0	0	641	204
RTOR Reduction (vph)	0	0	0	0	0	54	0	0	0	0	1	59
Lane Group Flow (vph)	0	0	0	190	438	17	283	791	0	0	660	125
Confl. Peds. (#/hr)	10		11	11		10			11			16
Confl. Bikes (#/hr)			1						2			2
Turn Type				Split	NA	Perm	pm+pt	NA			NA	Perm
Protected Phases				8	8		5	2			6	
Permitted Phases						8	2					6
Actuated Green, G (s)				18.0	18.0	18.0	48.0	48.0			29.0	29.0
Effective Green, g (s)				18.0	18.0	18.0	48.0	48.0			29.0	29.0
Actuated g/C Ratio				0.24	0.24	0.24	0.63	0.63			0.38	0.38
Clearance Time (s)				5.0	5.0	5.0	5.0	5.0			5.0	5.0
Vehicle Extension (s)				3.0	3.0	3.0	4.0	4.0			4.0	4.0
Lane Grp Cap (vph)				419	838	359	424	1176			671	555
v/s Ratio Prot				0.11	c0.12		0.12	c0.42			c0.37	
v/s Ratio Perm						0.01	0.30					0.09
v/c Ratio				0.45	0.52	0.05	0.67	0.67			0.98	0.23
Uniform Delay, d1				24.8	25.3	22.4	23.1	9.0			23.3	15.9
Progression Factor				1.00	1.00	1.00	1.00	1.00			1.00	1.00
Incremental Delay, d2				3.5	2.3	0.2	4.3	1.7			30.4	0.3
Delay (s)				28.3	27.6	22.6	27.5	10.6			53.7	16.2
Level of Service				C	C	C	C	B			D	B
Approach Delay (s)		0.0			27.3			15.1			45.5	
Approach LOS		A			C			B			D	
Intersection Summary												
HCM 2000 Control Delay			28.2									HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			76.0								15.0	Sum of lost time (s)
Intersection Capacity Utilization			76.9%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

11: Horne St & Mission Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	19	152	0	143	747	313	16	88	343	436	58	23
Future Volume (vph)	19	152	0	143	747	313	16	88	343	436	58	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Lane Util. Factor	1.00	0.95		1.00	0.95	1.00		1.00	1.00	0.95	0.95	
Frt	1.00	1.00		1.00	1.00	0.85		1.00	0.85	1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00	1.00		0.99	1.00	0.95	0.97	
Satd. Flow (prot)	1770	3539		1770	3539	1583		1849	1583	1681	1688	
Flt Permitted	0.25	1.00		0.65	1.00	1.00		0.94	1.00	0.68	0.72	
Satd. Flow (perm)	459	3539		1206	3539	1583		1755	1583	1211	1264	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	21	165	0	155	812	340	17	96	373	474	63	25
RTOR Reduction (vph)	0	0	0	0	0	216	0	0	201	0	6	0
Lane Group Flow (vph)	21	165	0	155	812	124	0	113	172	275	281	0
Turn Type	Perm	NA		Perm	NA	Perm	Perm	NA	Perm	Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8		8	2		2	6		
Actuated Green, G (s)	20.5	20.5		20.1	20.1	20.1		25.3	25.3	25.3	25.3	
Effective Green, g (s)	20.5	20.5		20.1	20.1	20.1		25.3	25.3	25.3	25.3	
Actuated g/C Ratio	0.37	0.37		0.37	0.37	0.37		0.46	0.46	0.46	0.46	
Clearance Time (s)	4.6	4.6		5.0	5.0	5.0		4.6	4.6	4.6	4.6	
Vehicle Extension (s)	4.0	4.0		3.5	3.5	3.5		4.0	4.0	4.0	4.0	
Lane Grp Cap (vph)	171	1319		440	1293	578		807	728	557	581	
v/s Ratio Prot		0.05			c0.23							
v/s Ratio Perm	0.05			0.13		0.08		0.06	0.11	c0.23	0.22	
v/c Ratio	0.12	0.13		0.35	0.63	0.21		0.14	0.24	0.49	0.48	
Uniform Delay, d1	11.3	11.3		12.7	14.4	12.0		8.6	9.0	10.4	10.3	
Progression Factor	1.00	1.00		1.00	1.00	1.00		1.00	1.00	1.00	1.00	
Incremental Delay, d2	0.4	0.1		0.6	1.0	0.2		0.4	0.8	3.1	2.9	
Delay (s)	11.8	11.4		13.3	15.4	12.2		8.9	9.8	13.5	13.2	
Level of Service	B	B		B	B	B		A	A	B	B	
Approach Delay (s)		11.5			14.3			9.6			13.3	
Approach LOS		B			B			A			B	
Intersection Summary												
HCM 2000 Control Delay			13.0				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			55.0				Sum of lost time (s)			9.6		
Intersection Capacity Utilization			56.8%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

12: Tremont St & Seagaze Dr

07/02/2018

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↰			↱	↰	↱
Traffic Volume (veh/h)	285	15	22	59	23	28
Future Volume (Veh/h)	285	15	22	59	23	28
Sign Control	Free			Free	Stop	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	310	16	24	64	25	30
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type	None			None		
Median storage veh						
Upstream signal (ft)				238		
pX, platoon unblocked						
vC, conflicting volume			326		430	318
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol			326		430	318
tC, single (s)			4.1		6.4	6.2
tC, 2 stage (s)						
tF (s)			2.2		3.5	3.3
p0 queue free %			98		96	96
cM capacity (veh/h)			1234		571	723
Direction, Lane #	EB 1	WB 1	NB 1			
Volume Total	326	88	55			
Volume Left	0	24	25			
Volume Right	16	0	30			
cSH	1700	1234	645			
Volume to Capacity	0.19	0.02	0.09			
Queue Length 95th (ft)	0	1	7			
Control Delay (s)	0.0	2.3	11.1			
Lane LOS		A	B			
Approach Delay (s)	0.0	2.3	11.1			
Approach LOS			B			
Intersection Summary						
Average Delay		1.7				
Intersection Capacity Utilization		32.4%		ICU Level of Service		A
Analysis Period (min)		15				

HCM Signalized Intersection Capacity Analysis

13: Coast Hwy & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	315	199	201	0	0	0	83	496	149	159	426	103
Future Volume (vph)	315	199	201	0	0	0	83	496	149	159	426	103
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Lane Util. Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frpb, ped/bikes	1.00	1.00	0.94				1.00	1.00	0.98	1.00	1.00	0.96
Flpb, ped/bikes	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85				1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00				0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	1770	1863	1493				1770	1863	1552	1770	1863	1516
Flt Permitted	0.95	1.00	1.00				0.50	1.00	1.00	0.21	1.00	1.00
Satd. Flow (perm)	1770	1863	1493				925	1863	1552	392	1863	1516
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	342	216	218	0	0	0	90	539	162	173	463	112
RTOR Reduction (vph)	0	0	144	0	0	0	0	0	87	0	0	55
Lane Group Flow (vph)	342	216	74	0	0	0	90	539	75	173	463	57
Confl. Peds. (#/hr)	13		22	22		13			6			13
Confl. Bikes (#/hr)			1			3			3			2
Turn Type	Split	NA	Perm				Perm	NA	Perm	pm+pt	NA	Perm
Protected Phases	4	4					2	2		1	6	
Permitted Phases			4				2		2	6		6
Actuated Green, G (s)	20.5	20.5	20.5				23.5	23.5	23.5	30.7	30.7	30.7
Effective Green, g (s)	20.5	20.5	20.5				23.5	23.5	23.5	30.7	30.7	30.7
Actuated g/C Ratio	0.34	0.34	0.34				0.39	0.39	0.39	0.51	0.51	0.51
Clearance Time (s)	4.2	4.2	4.2				4.6	4.6	4.6	4.0	4.6	4.6
Vehicle Extension (s)	3.0	3.0	3.0				4.0	4.0	4.0	3.0	4.0	4.0
Lane Grp Cap (vph)	604	636	510				362	729	607	274	953	775
v/s Ratio Prot	c0.19	0.12					c0.29			0.03	c0.25	
v/s Ratio Perm			0.05				0.10		0.05	0.29		0.04
v/c Ratio	0.57	0.34	0.15				0.25	0.74	0.12	0.63	0.49	0.07
Uniform Delay, d1	16.1	14.7	13.7				12.3	15.6	11.7	10.3	9.5	7.4
Progression Factor	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	3.8	1.4	0.6				1.6	6.6	0.4	4.7	1.8	0.2
Delay (s)	19.9	16.2	14.3				13.9	22.3	12.1	15.0	11.3	7.6
Level of Service	B	B	B				B	C	B	B	B	A
Approach Delay (s)		17.3			0.0			19.2			11.6	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay			16.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			12.8		
Intersection Capacity Utilization			63.0%				ICU Level of Service			B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

14: Freeman St & Seagaze Dr

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	556	37	0	0	0	0	9	37	25	26	0
Future Volume (Veh/h)	14	556	37	0	0	0	0	9	37	25	26	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	604	40	0	0	0	0	10	40	27	28	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	218											
pX, platoon unblocked												
vC, conflicting volume	0	644			668			654	322	377	674	0
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	0	644			668			654	322	377	674	0
tC, single (s)	4.1	4.1			7.5			6.5	6.9	7.5	6.5	6.9
tC, 2 stage (s)												
tF (s)	2.2	2.2			3.5			4.0	3.3	3.5	4.0	3.3
p0 queue free %	99	100			100			97	94	95	92	100
cM capacity (veh/h)	1622	937			322			381	674	508	371	1084
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total	317	342	50	55								
Volume Left	15	0	0	27								
Volume Right	0	40	40	0								
cSH	1622	1700	584	428								
Volume to Capacity	0.01	0.20	0.09	0.13								
Queue Length 95th (ft)	1	0	7	11								
Control Delay (s)	0.4	0.0	11.7	14.7								
Lane LOS	A		B	B								
Approach Delay (s)	0.2		11.7	14.7								
Approach LOS			B	B								
Intersection Summary												
Average Delay	2.0											
Intersection Capacity Utilization	33.0%			ICU Level of Service			A					
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	36	1239	25	0	0	0	0	12	32	57	45	0
Future Volume (vph)	36	1239	25	0	0	0	0	12	32	57	45	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	39	1347	27	0	0	0	0	13	35	62	49	0
Direction, Lane #	EB 1	EB 2	NB 1	SB 1								
Volume Total (vph)	713	701	48	111								
Volume Left (vph)	39	0	0	62								
Volume Right (vph)	0	27	35	0								
Hadj (s)	0.06	0.01	-0.40	0.15								
Departure Headway (s)	5.1	5.0	5.6	6.1								
Degree Utilization, x	1.00	0.97	0.08	0.19								
Capacity (veh/h)	704	715	630	586								
Control Delay (s)	54.7	48.0	9.1	10.4								
Approach Delay (s)	51.4		9.1	10.4								
Approach LOS	F		A	B								
Intersection Summary												
Delay			47.2									
Level of Service			E									
Intersection Capacity Utilization			54.9%		ICU Level of Service					A		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

16: Clementine St & Seagaze St

07/02/2018

																				
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR								
Lane Configurations																				
Sign Control	Yield				Stop			Stop			Stop									
Traffic Volume (vph)	286	528	13	43	0	21	0	19	12	0	0	0								
Future Volume (vph)	286	528	13	43	0	21	0	19	12	0	0	0								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92								
Hourly flow rate (vph)	311	574	14	47	0	23	0	21	13	0	0	0								
Direction, Lane #	EB 1	EB 2	WB 1	NB 1																
Volume Total (vph)	311	588	70	34																
Volume Left (vph)	311	0	47	0																
Volume Right (vph)	0	14	23	13																
Hadj (s)	0.53	0.02	-0.03	-0.20																
Departure Headway (s)	5.2	4.7	4.8	5.5																
Degree Utilization, x	0.45	0.76	0.09	0.05																
Capacity (veh/h)	689	759	732	622																
Control Delay (s)	11.1	19.8	8.3	8.7																
Approach Delay (s)	16.8		8.3	8.7																
Approach LOS	C		A	A																
Intersection Summary																				
Delay			16.0																	
Level of Service			C																	
Intersection Capacity Utilization			45.6%	ICU Level of Service						A										
Analysis Period (min)			15																	

HCM Unsignalized Intersection Capacity Analysis

17: Coast Hwy & Missouri Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	43	0	0	31	19	535	45	22	489	20
Future Volume (Veh/h)	0	0	43	0	0	31	19	535	45	22	489	20
Sign Control	Stop			Stop				Free			Free	
Grade	0%			0%				0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	47	0	0	34	21	582	49	24	532	22
Pedestrians	7			7								
Lane Width (ft)	12.0			16.0								
Walking Speed (ft/s)	4.0			4.0								
Percent Blockage	1			1								
Right turn flare (veh)												
Median type							None			None		
Median storage (veh)												
Upstream signal (ft)							1261			455		
pX, platoon unblocked	0.84	0.84	0.84	0.84	0.84		0.84					
vC, conflicting volume	1256	1278	550	1282	1264	614	561				638	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1209	1236	369	1241	1220	614	382				638	
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	92	100	100	93	98				97	
cM capacity (veh/h)	118	139	565	111	142	488	982				938	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	47	34	21	631	24	554						
Volume Left	0	0	21	0	24	0						
Volume Right	47	34	0	49	0	22						
cSH	565	488	982	1700	938	1700						
Volume to Capacity	0.08	0.07	0.02	0.37	0.03	0.33						
Queue Length 95th (ft)	7	6	2	0	2	0						
Control Delay (s)	11.9	12.9	8.7	0.0	8.9	0.0						
Lane LOS	B	B	A		A							
Approach Delay (s)	11.9	12.9	0.3		0.4							
Approach LOS	B	B										
Intersection Summary												
Average Delay			1.1									
Intersection Capacity Utilization			40.9%	ICU Level of Service					A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Washington Avenue
E/W Street Name	Washington Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	13	0	64	0	44	10	12	0	41	510	19	0	24	463	54
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	14	0	71	0	49	11	13	0	45	565	21	0	27	513	60
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		85			73			631			600	
Entry Volume veh/h		83			72			619			588	
Circulating Flow (v_c), pc/h	589			624			41			105		
Exiting Flow (v_{ex}), pc/h	48			116			592			633		
Capacity (C_{pce}), pc/h		627			605			1085			1017	
Capacity (c), veh/h		615			594			1063			997	
v/c Ratio (x)		0.14			0.12			0.58			0.59	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		7.5			7.5			10.9			11.6	
Lane LOS		A			A			B			B	
95% Queue, veh		0.5			0.4			3.9			4.0	
Approach Delay, s/veh	7.5			7.5			10.9			11.6		
Approach LOS	A			A			B			B		
Intersection Delay, s/veh LOS	10.8						B					

HCM Unsignalized Intersection Capacity Analysis

19: Pacific St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	46	73	28	87	6	130	4	264	69	154	163	2
Future Volume (vph)	46	73	28	87	6	130	4	264	69	154	163	2
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	50	79	30	95	7	141	4	287	75	167	177	2
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	159	243	366	346								
Volume Left (vph)	50	95	4	167								
Volume Right (vph)	30	141	75	2								
Hadj (s)	-0.02	-0.24	-0.09	0.13								
Departure Headway (s)	6.6	6.2	5.8	6.1								
Degree Utilization, x	0.29	0.42	0.59	0.58								
Capacity (veh/h)	460	508	579	552								
Control Delay (s)	12.3	13.5	16.9	17.1								
Approach Delay (s)	12.3	13.5	16.9	17.1								
Approach LOS	B	B	C	C								
Intersection Summary												
Delay				15.6								
Level of Service				C								
Intersection Capacity Utilization				64.4%	ICU Level of Service	C						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

20: Tremont St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	314	36	16	218	35	34	55	54	28	73	14
Future Volume (Veh/h)	12	314	36	16	218	35	34	55	54	28	73	14
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	13	341	39	17	237	38	37	60	59	30	79	15
Pedestrians		1						7			14	
Lane Width (ft)		12.0						12.0			12.0	
Walking Speed (ft/s)		4.0						4.0			4.0	
Percent Blockage		0						1			1	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)					265							
pX, platoon unblocked	0.99						0.99	0.99		0.99	0.99	0.99
vC, conflicting volume	289			387			739	716	368	780	717	271
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	271			387			728	705	368	769	705	253
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			86	82	91	87	77	98
cM capacity (veh/h)	1259			1165			259	341	674	237	341	765
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	393	292	156	124								
Volume Left	13	17	37	30								
Volume Right	39	38	59	15								
cSH	1259	1165	384	328								
Volume to Capacity	0.01	0.01	0.41	0.38								
Queue Length 95th (ft)	1	1	48	43								
Control Delay (s)	0.4	0.6	20.7	22.5								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.4	0.6	20.7	22.5								
Approach LOS			C	C								
Intersection Summary												
Average Delay			6.6									
Intersection Capacity Utilization			39.8%	ICU Level of Service				A				
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Wisconsin Avenue
E/W Street Name	Wisconsin Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	99	136	174	0	132	110	23	0	153	480	144	0	25	480	49
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	110	151	193	0	146	122	26	0	170	532	160	0	28	532	54
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		454			294			862			614	
Entry Volume veh/h		445			288			845			602	
Circulating Flow (v_c), pc/h	706			812			289			438		
Exiting Flow (v_{ex}), pc/h	339			346			668			871		
Capacity (C_{pce}), pc/h		558			502			846			729	
Capacity (c), veh/h		547			492			830			715	
v/c Ratio (x)		0.81			0.59			1.02			0.84	

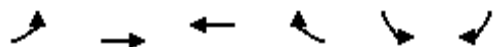
Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		33.3			20.1			58.3			30.0	
Lane LOS		D			C			F			D	
95% Queue, veh		8.0			3.7			18.8			9.5	
Approach Delay, s/veh	33.3			20.1			58.3			30.0		
Approach LOS	D			C			F			D		
Intersection Delay, s/veh LOS	40.3						E					

HCM Unsignalized Intersection Capacity Analysis

22: Wisconsin Ave & Freeman St

07/02/2018



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	8	503	374	23	34	35
Future Volume (Veh/h)	8	503	374	23	34	35
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	9	547	407	25	37	38
Pedestrians		1	1		8	
Lane Width (ft)		12.0	12.0		12.0	
Walking Speed (ft/s)		4.0	4.0		4.0	
Percent Blockage		0	0		1	
Right turn flare (veh)						
Median type		None	None			
Median storage (veh)						
Upstream signal (ft)		266				
pX, platoon unblocked						
vC, conflicting volume	440				994	428
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	440				994	428
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	99				86	94
cM capacity (veh/h)	1112				268	622
Direction, Lane #	EB 1	WB 1	SB 1			
Volume Total	556	432	75			
Volume Left	9	0	37			
Volume Right	0	25	38			
cSH	1112	1700	376			
Volume to Capacity	0.01	0.25	0.20			
Queue Length 95th (ft)	1	0	18			
Control Delay (s)	0.2	0.0	16.9			
Lane LOS	A		C			
Approach Delay (s)	0.2	0.0	16.9			
Approach LOS			C			
Intersection Summary						
Average Delay			1.3			
Intersection Capacity Utilization			43.9%	ICU Level of Service		A
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

23: Ditmar St & Wisconsin Ave

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	29	522	4	2	348	33	2	1	4	49	0	39
Future Volume (Veh/h)	29	522	4	2	348	33	2	1	4	49	0	39
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	32	567	4	2	378	36	2	1	4	53	0	42
Pedestrians		2									2	
Lane Width (ft)		12.0									12.0	
Walking Speed (ft/s)		4.0									4.0	
Percent Blockage		0									0	
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		526										
pX, platoon unblocked												
vC, conflicting volume	416			571			1077	1053	569	1040	1037	400
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	416			571			1077	1053	569	1040	1037	400
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			100			99	100	99	74	100	94
cM capacity (veh/h)	1141			1002			179	219	522	201	224	648
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	603	416	7	95								
Volume Left	32	2	2	53								
Volume Right	4	36	4	42								
cSH	1141	1002	299	289								
Volume to Capacity	0.03	0.00	0.02	0.33								
Queue Length 95th (ft)	2	0	2	35								
Control Delay (s)	0.8	0.1	17.3	23.4								
Lane LOS	A	A	C	C								
Approach Delay (s)	0.8	0.1	17.3	23.4								
Approach LOS			C	C								
Intersection Summary												
Average Delay			2.5									
Intersection Capacity Utilization			64.8%		ICU Level of Service				C			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

24: Wisconsin Ave & Ditmar St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	284	303	84	205	0	180	0	117	0	0	0
Future Volume (vph)	0	284	303	84	205	0	180	0	117	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	309	329	91	223	0	196	0	127	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	638	314	323	0								
Volume Left (vph)	0	91	196	0								
Volume Right (vph)	329	0	127	0								
Hadj (s)	-0.28	0.09	-0.08	0.00								
Departure Headway (s)	5.3	6.1	6.3	7.5								
Degree Utilization, x	0.94	0.53	0.57	0.00								
Capacity (veh/h)	669	576	547	426								
Control Delay (s)	44.0	15.9	17.3	10.5								
Approach Delay (s)	44.0	15.9	17.3	0.0								
Approach LOS	E	C	C	A								
Intersection Summary												
Delay				30.3								
Level of Service				D								
Intersection Capacity Utilization				82.6%	ICU Level of Service	E						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

25: Pacific St & Oceanside Blvd

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	66	134	195	97	97	189
Future Volume (vph)	66	134	195	97	97	189
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	146	212	105	105	205
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	218	317	310			
Volume Left (vph)	72	0	105			
Volume Right (vph)	146	105	0			
Hadj (s)	-0.30	-0.16	0.10			
Departure Headway (s)	5.1	4.7	5.0			
Degree Utilization, x	0.31	0.42	0.43			
Capacity (veh/h)	644	726	688			
Control Delay (s)	10.3	11.1	11.7			
Approach Delay (s)	10.3	11.1	11.7			
Approach LOS	B	B	B			
Intersection Summary						
Delay			11.1			
Level of Service			B			
Intersection Capacity Utilization			53.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

07/02/2018

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (veh/h)	14	365	21	19	302	71	29	42	37	77	26	21		
Future Volume (Veh/h)	14	365	21	19	302	71	29	42	37	77	26	21		
Sign Control		Free			Free			Stop			Stop			
Grade		0%			0%			0%			0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Hourly flow rate (vph)	15	397	23	21	328	77	32	46	40	84	28	23		
Pedestrians		4			8			11			3			
Lane Width (ft)		12.0			12.0			12.0			12.0			
Walking Speed (ft/s)		4.0			4.0			4.0			4.0			
Percent Blockage		0			1			1			0			
Right turn flare (veh)														
Median type		None			None									
Median storage (veh)														
Upstream signal (ft)	213													
pX, platoon unblocked	0.88						0.88	0.88				0.88	0.88	0.88
vC, conflicting volume	408				431			899	900	428	921	872	374	
vC1, stage 1 conf vol														
vC2, stage 2 conf vol														
vCu, unblocked vol	258				431			816	817	428	841	786	218	
tC, single (s)	4.1				4.1			7.1	6.5	6.2	7.1	6.5	6.2	
tC, 2 stage (s)														
tF (s)	2.2				2.2			3.5	4.0	3.3	3.5	4.0	3.3	
p0 queue free %	99				98			86	82	94	57	90	97	
cM capacity (veh/h)	1146				1118			221	262	617	194	273	718	
Direction, Lane #	EB 1	WB 1	NB 1	SB 1										
Volume Total	435	426	118	135										
Volume Left	15	21	32	84										
Volume Right	23	77	40	23										
cSH	1146	1118	306	238										
Volume to Capacity	0.01	0.02	0.39	0.57										
Queue Length 95th (ft)	1	1	44	79										
Control Delay (s)	0.4	0.6	23.9	38.3										
Lane LOS	A	A	C	E										
Approach Delay (s)	0.4	0.6	23.9	38.3										
Approach LOS			C	E										
Intersection Summary														
Average Delay				7.6										
Intersection Capacity Utilization				48.5%	ICU Level of Service				A					
Analysis Period (min)				15										

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↖	↗	↖	↖↗		↖	↗	
Traffic Volume (vph)	53	210	83	205	204	162	87	447	132	167	380	28
Future Volume (vph)	53	210	83	205	204	162	87	447	132	167	380	28
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	10	11	11	16	16	16
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.97	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1844	1537	1681	1762	1794	1652	3290		2006	2090	
Flt Permitted		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1844	1537	1681	1762	1794	1652	3290		2006	2090	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	228	90	223	222	176	95	486	143	182	413	30
RTOR Reduction (vph)	0	0	72	0	0	143	0	35	0	0	3	0
Lane Group Flow (vph)	0	286	18	201	244	33	95	594	0	182	440	0
Confl. Peds. (#/hr)			10	10					3			
Confl. Bikes (#/hr)			4						3			
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		15.6	15.6	15.1	15.1	15.1	6.7	22.4		8.1	23.8	
Effective Green, g (s)		15.6	15.6	15.1	15.1	15.1	6.7	22.4		8.1	23.8	
Actuated g/C Ratio		0.19	0.19	0.19	0.19	0.19	0.08	0.28		0.10	0.30	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		359	299	317	332	338	138	921		203	621	
v/s Ratio Prot		c0.16		0.12	c0.14		0.06	0.18		c0.09	c0.21	
v/s Ratio Perm			0.01			0.02						
v/c Ratio		0.80	0.06	0.63	0.73	0.10	0.69	0.65		0.90	0.71	
Uniform Delay, d1		30.7	26.2	29.9	30.6	26.8	35.6	25.3		35.5	25.0	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		10.9	0.0	4.3	8.5	0.2	10.8	3.5		35.8	6.7	
Delay (s)		41.6	26.3	34.2	39.0	27.0	46.4	28.8		71.3	31.7	
Level of Service		D	C	C	D	C	D	C		E	C	
Approach Delay (s)		37.9			34.0			31.1			43.3	
Approach LOS		D			C			C			D	
Intersection Summary												
HCM 2000 Control Delay			36.2									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.78									
Actuated Cycle Length (s)			80.0							18.8		
Intersection Capacity Utilization			67.5%									ICU Level of Service C
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

28: Ditmar St & Oceanside Blvd

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↶↷		↰	↶↷			↶↷			↶↷	↰
Traffic Volume (vph)	53	620	6	24	689	231	9	20	61	433	16	106
Future Volume (vph)	53	620	6	24	689	231	9	20	61	433	16	106
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Lane Util. Factor	1.00	0.95		1.00	0.95			0.95			1.00	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00			0.99			1.00	0.96
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Frt	1.00	1.00		1.00	0.96			0.90			1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00			0.99			0.95	1.00
Satd. Flow (prot)	1770	3532		1761	3394			3135			1776	1524
Flt Permitted	0.19	1.00		0.30	1.00			0.91			0.66	1.00
Satd. Flow (perm)	353	3532		549	3394			2879			1228	1524
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	674	7	26	749	251	10	22	66	471	17	115
RTOR Reduction (vph)	0	1	0	0	58	0	0	34	0	0	0	43
Lane Group Flow (vph)	58	680	0	26	942	0	0	64	0	0	488	72
Confl. Peds. (#/hr)			11	11			30		1	1		30
Confl. Bikes (#/hr)			4			4						1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		6
Actuated Green, G (s)	21.1	21.1		21.1	21.1			29.4			29.4	29.4
Effective Green, g (s)	21.1	21.1		21.1	21.1			29.4			29.4	29.4
Actuated g/C Ratio	0.35	0.35		0.35	0.35			0.49			0.49	0.49
Clearance Time (s)	4.5	4.5		4.5	4.5			5.0			5.0	5.0
Vehicle Extension (s)	3.0	3.0		3.0	3.0			4.0			4.0	4.0
Lane Grp Cap (vph)	124	1242		193	1193			1410			601	746
v/s Ratio Prot		0.19			c0.28							
v/s Ratio Perm	0.16			0.05				0.02			c0.40	0.05
v/c Ratio	0.47	0.55		0.13	0.79			0.05			0.81	0.10
Uniform Delay, d1	15.1	15.6		13.2	17.5			8.0			13.0	8.2
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	1.00
Incremental Delay, d2	2.8	0.5		0.3	3.6			0.1			11.4	0.3
Delay (s)	17.9	16.1		13.6	21.0			8.0			24.4	8.4
Level of Service	B	B		B	C			A			C	A
Approach Delay (s)		16.2			20.8			8.0			21.3	
Approach LOS		B			C			A			C	
Intersection Summary												
HCM 2000 Control Delay			19.1				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			9.5		
Intersection Capacity Utilization			73.8%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	19	15	69	19	237	20	525	127	303	547	19
Future Volume (vph)	43	19	15	69	19	237	20	525	127	303	547	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	10	11	16
Total Lost time (s)		4.6				4.6	4.6	4.2	4.9		4.2	4.9
Lane Util. Factor		1.00				1.00	1.00	1.00	0.95		1.00	0.95
Frpb, ped/bikes		1.00				1.00	1.00	1.00	0.99		1.00	1.00
Flpb, ped/bikes		1.00				1.00	1.00	1.00	1.00		1.00	1.00
Frt		0.97				1.00	0.85	1.00	0.97		1.00	0.99
Flt Protected		0.97				0.96	1.00	0.95	1.00		0.95	1.00
Satd. Flow (prot)		1760				1789	1794	1770	3873		1652	3404
Flt Permitted		0.77				0.80	1.00	0.95	1.00		0.95	1.00
Satd. Flow (perm)		1399				1484	1794	1770	3873		1652	3404
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	47	21	16	75	21	258	22	571	138	329	595	21
RTOR Reduction (vph)	0	13	0	0	0	219	0	27	0	0	2	0
Lane Group Flow (vph)	0	71	0	0	96	39	22	682	0	329	614	0
Confl. Peds. (#/hr)			4	4					3			
Confl. Bikes (#/hr)			1						2			
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		9.0			9.0	9.0	0.6	22.2		14.1	35.7	
Effective Green, g (s)		9.0			9.0	9.0	0.6	22.2		14.1	35.7	
Actuated g/C Ratio		0.15			0.15	0.15	0.01	0.38		0.24	0.61	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		213			226	273	18	1457		394	2059	
v/s Ratio Prot							0.01	c0.18		c0.20	0.18	
v/s Ratio Perm		0.05			c0.06	0.02						
v/c Ratio		0.33			0.42	0.14	1.22	0.47		0.84	0.30	
Uniform Delay, d1		22.3			22.7	21.7	29.2	13.9		21.3	5.6	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			0.5	0.1	289.8	0.2		14.1	0.1	
Delay (s)		22.7			23.1	21.8	319.0	14.2		35.5	5.7	
Level of Service		C			C	C	F	B		D	A	
Approach Delay (s)		22.7			22.1			23.3			16.1	
Approach LOS		C			C			C			B	
Intersection Summary												
HCM 2000 Control Delay			19.9		HCM 2000 Level of Service					B		
HCM 2000 Volume to Capacity ratio			0.57									
Actuated Cycle Length (s)			59.0		Sum of lost time (s)					13.7		
Intersection Capacity Utilization			58.8%		ICU Level of Service					B		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	387	63	68	235	0	139	0	118	0	0	0
Future Volume (Veh/h)	0	387	63	68	235	0	139	0	118	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	421	68	74	255	0	151	0	128	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		252										
pX, platoon unblocked												
vC, conflicting volume	255			489			858	858	455	986	892	255
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	255			489			858	858	455	986	892	255
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			93			42	100	79	100	100	100
cM capacity (veh/h)	1310			1074			262	274	605	169	262	784
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	489	329	279	0								
Volume Left	0	74	151	0								
Volume Right	68	0	128	0								
cSH	1310	1074	355	1700								
Volume to Capacity	0.00	0.07	0.79	0.00								
Queue Length 95th (ft)	0	6	164	0								
Control Delay (s)	0.0	2.5	44.0	0.0								
Lane LOS		A	E	A								
Approach Delay (s)	0.0	2.5	44.0	0.0								
Approach LOS			E	A								
Intersection Summary												
Average Delay			11.9									
Intersection Capacity Utilization			65.3%		ICU Level of Service				C			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

31: Ditmar St & Morse St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	211	54	0	82	0	54	2	16	0	0	0
Future Volume (Veh/h)	0	211	54	0	82	0	54	2	16	0	0	0
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	229	59	0	89	0	59	2	17	0	0	0
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		643										
pX, platoon unblocked												
vC, conflicting volume	89			288			348	348	258	366	377	89
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	89			288			348	348	258	366	377	89
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			100			90	100	98	100	100	100
cM capacity (veh/h)	1506			1274			607	576	780	576	555	969
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	288	89	78	0								
Volume Left	0	0	59	0								
Volume Right	59	0	17	0								
cSH	1506	1274	637	1700								
Volume to Capacity	0.00	0.00	0.12	0.00								
Queue Length 95th (ft)	0	0	10	0								
Control Delay (s)	0.0	0.0	11.4	0.0								
Lane LOS			B	A								
Approach Delay (s)	0.0	0.0	11.4	0.0								
Approach LOS			B	A								
Intersection Summary												
Average Delay			2.0									
Intersection Capacity Utilization			25.1%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

32: Pacific St & Cassidy St

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Stop		Stop			Stop
Traffic Volume (vph)	66	261	21	38	311	21
Future Volume (vph)	66	261	21	38	311	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	72	284	23	41	338	23
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	356	64	361			
Volume Left (vph)	72	0	338			
Volume Right (vph)	284	41	0			
Hadj (s)	-0.40	-0.35	0.22			
Departure Headway (s)	4.6	4.9	5.1			
Degree Utilization, x	0.45	0.09	0.51			
Capacity (veh/h)	737	658	674			
Control Delay (s)	11.4	8.4	13.3			
Approach Delay (s)	11.4	8.4	13.3			
Approach LOS	B	A	B			
Intersection Summary						
Delay			12.0			
Level of Service			B			
Intersection Capacity Utilization			51.4%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Unsignalized Intersection Capacity Analysis

33: Broadway St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	13	165	160	21	129	22	217	28	28	6	20	34
Future Volume (Veh/h)	13	165	160	21	129	22	217	28	28	6	20	34
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	14	179	174	23	140	24	236	30	30	7	22	37
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			None								
Median storage (veh)												
Upstream signal (ft)	576											
pX, platoon unblocked												
vC, conflicting volume	164			353			540	504	266	537	579	152
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	164			353			540	504	266	537	579	152
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			98			42	93	96	98	95	96
cM capacity (veh/h)	1414			1206			407	457	773	406	414	894
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	367	187	296	66								
Volume Left	14	23	236	7								
Volume Right	174	24	30	37								
cSH	1414	1206	433	591								
Volume to Capacity	0.01	0.02	0.68	0.11								
Queue Length 95th (ft)	1	1	126	9								
Control Delay (s)	0.4	1.1	29.5	11.9								
Lane LOS	A	A	D	B								
Approach Delay (s)	0.4	1.1	29.5	11.9								
Approach LOS			D	B								
Intersection Summary												
Average Delay			10.8									
Intersection Capacity Utilization			49.5%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

34: Tremont St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	110	14	42	92	15	8	12	39	7	5	2
Future Volume (Veh/h)	2	110	14	42	92	15	8	12	39	7	5	2
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	2	120	15	46	100	16	9	13	42	8	5	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None				None							
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	116			135			336	340	128	380	339	108
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	116			135			336	340	128	380	339	108
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	100			97			98	98	95	98	99	100
cM capacity (veh/h)	1473			1449			597	563	923	528	563	946
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	137	162	64	15								
Volume Left	2	46	9	8								
Volume Right	15	16	42	2								
cSH	1473	1449	765	574								
Volume to Capacity	0.00	0.03	0.08	0.03								
Queue Length 95th (ft)	0	2	7	2								
Control Delay (s)	0.1	2.3	10.1	11.4								
Lane LOS	A	A	B	B								
Approach Delay (s)	0.1	2.3	10.1	11.4								
Approach LOS			B	B								
Intersection Summary												
Average Delay												
Intersection Capacity Utilization												
Analysis Period (min)												
ICU Level of Service												
A												

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	83	80	56	94	46	19	62	413	61	77	327	22
Future Volume (vph)	83	80	56	94	46	19	62	413	61	77	327	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.6			5.0			4.2	5.0		4.0	5.0
Lane Util. Factor		1.00			1.00			1.00	0.95		1.00	0.95
Frt		0.97			0.98			1.00	0.98		1.00	0.99
Flt Protected		0.98			0.97			0.95	1.00		0.95	1.00
Satd. Flow (prot)		1765			1780			1770	3471		1770	3506
Flt Permitted		0.84			0.70			0.95	1.00		0.95	1.00
Satd. Flow (perm)		1513			1290			1770	3471		1770	3506
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	90	87	61	102	50	21	67	449	66	84	355	24
RTOR Reduction (vph)	0	19	0	0	8	0	0	17	0	0	6	0
Lane Group Flow (vph)	0	219	0	0	165	0	67	498	0	84	373	0
Turn Type	Perm	NA		Perm		NA		Prot		NA		
Protected Phases		4				8		5		2		
Permitted Phases	4				8							
Actuated Green, G (s)		10.3				9.9		5.4		17.6		
Effective Green, g (s)		10.3				9.9		5.4		17.6		
Actuated g/C Ratio		0.23				0.22		0.12		0.39		
Clearance Time (s)		4.6				5.0		4.2		5.0		
Vehicle Extension (s)		3.0				3.5		2.0		3.0		
Lane Grp Cap (vph)		344				281		210		1348		
v/s Ratio Prot								0.04		c0.14		
v/s Ratio Perm		c0.14				0.13						
v/c Ratio		0.64				0.59		0.32		0.37		
Uniform Delay, d1		15.8				15.9		18.3		9.9		
Progression Factor		1.00				1.00		1.00		1.00		
Incremental Delay, d2		3.8				3.3		0.3		0.2		
Delay (s)		19.6				19.2		18.6		10.1		
Level of Service		B				B		B		B		
Approach Delay (s)		19.6				19.2		11.0				
Approach LOS		B				B		B		B		
Intersection Summary												
HCM 2000 Control Delay			14.2		HCM 2000 Level of Service				B			
HCM 2000 Volume to Capacity ratio			0.49									
Actuated Cycle Length (s)			45.3		Sum of lost time (s)				14.2			
Intersection Capacity Utilization			43.3%		ICU Level of Service				A			
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	211	80	79	95	27	92	119	36	42	46	48
Future Volume (Veh/h)	48	211	80	79	95	27	92	119	36	42	46	48
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	52	229	87	86	103	29	100	129	39	46	50	52
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type		None			None							
Median storage (veh)												
Upstream signal (ft)		280										
pX, platoon unblocked												
vC, conflicting volume	132			316			743	680	272	770	710	118
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	132			316			743	680	272	770	710	118
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			93			61	61	95	76	84	94
cM capacity (veh/h)	1453			1244			254	335	766	196	322	934
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	368	218	268	148								
Volume Left	52	86	100	46								
Volume Right	87	29	39	52								
cSH	1453	1244	323	332								
Volume to Capacity	0.04	0.07	0.83	0.45								
Queue Length 95th (ft)	3	6	179	55								
Control Delay (s)	1.4	3.6	52.8	24.3								
Lane LOS	A	A	F	C								
Approach Delay (s)	1.4	3.6	52.8	24.3								
Approach LOS			F	C								
Intersection Summary												
Average Delay			19.0									
Intersection Capacity Utilization			50.3%		ICU Level of Service				A			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis

37: Dittmar St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	10	113	31	37	53	3	41	52	37	4	22	7
Future Volume (vph)	10	113	31	37	53	3	41	52	37	4	22	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	11	123	34	40	58	3	45	57	40	4	24	8
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	168	101	142	36								
Volume Left (vph)	11	40	45	4								
Volume Right (vph)	34	3	40	8								
Hadj (s)	-0.07	0.10	-0.07	-0.08								
Departure Headway (s)	4.4	4.6	4.5	4.6								
Degree Utilization, x	0.20	0.13	0.18	0.05								
Capacity (veh/h)	789	736	754	717								
Control Delay (s)	8.5	8.3	8.5	7.8								
Approach Delay (s)	8.5	8.3	8.5	7.8								
Approach LOS	A	A	A	A								
Intersection Summary												
Delay				8.4								
Level of Service				A								
Intersection Capacity Utilization				37.3%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

38: Stewart St & Cassidy St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	22	167	14	73	72	49	14	119	164	94	25	5
Future Volume (vph)	22	167	14	73	72	49	14	119	164	94	25	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	24	182	15	79	78	53	15	129	178	102	27	5
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	221	210	322	134								
Volume Left (vph)	24	79	15	102								
Volume Right (vph)	15	53	178	5								
Hadj (s)	0.01	-0.04	-0.29	0.16								
Departure Headway (s)	5.5	5.5	5.1	5.8								
Degree Utilization, x	0.34	0.32	0.45	0.22								
Capacity (veh/h)	596	598	658	552								
Control Delay (s)	11.3	11.1	12.2	10.4								
Approach Delay (s)	11.3	11.1	12.2	10.4								
Approach LOS	B	B	B	B								
Intersection Summary												
Delay				11.4								
Level of Service				B								
Intersection Capacity Utilization				58.9%	ICU Level of Service	B						
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

39: Broadway St & Vista Way

07/02/2018

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Sign Control	Yield		Stop			Yield
Traffic Volume (vph)	0	168	156	11	111	59
Future Volume (vph)	0	168	156	11	111	59
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	183	170	12	121	64
Direction, Lane #	WB 1	NB 1	SB 1			
Volume Total (vph)	183	182	185			
Volume Left (vph)	0	0	121			
Volume Right (vph)	183	12	0			
Hadj (s)	-0.57	-0.01	0.16			
Departure Headway (s)	4.2	4.5	4.7			
Degree Utilization, x	0.21	0.23	0.24			
Capacity (veh/h)	792	757	729			
Control Delay (s)	8.3	8.9	9.2			
Approach Delay (s)	8.3	8.9	9.2			
Approach LOS	A	A	A			
Intersection Summary						
Delay			8.8			
Level of Service			A			
Intersection Capacity Utilization			25.9%	ICU Level of Service	A	
Analysis Period (min)			15			

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	25	165	55	228	131	390	61	751	302	326	631	30
Future Volume (vph)	25	165	55	228	131	390	61	751	302	326	631	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	16	16	16
Total Lost time (s)	5.0	5.0	5.0		4.9	4.9	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	0.95	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2006	1863	1556		1805	1794	1770	3793		2006	3983	
Flt Permitted	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	2006	1863	1556		1805	1794	1770	3793		2006	3983	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	27	179	60	248	142	424	66	816	328	354	686	33
RTOR Reduction (vph)	0	0	53	0	0	189	0	39	0	0	3	0
Lane Group Flow (vph)	27	179	7	0	390	235	66	1105	0	354	716	0
Confl. Peds. (#/hr)			2	2					5			
Confl. Bikes (#/hr)									4			
Turn Type	Split	NA	Perm	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	12.6	12.6	12.6		24.1	43.9	7.0	31.0		19.8	43.8	
Effective Green, g (s)	12.6	12.6	12.6		24.1	43.9	7.0	31.0		19.8	43.8	
Actuated g/C Ratio	0.12	0.12	0.12		0.23	0.41	0.07	0.29		0.19	0.41	
Clearance Time (s)	5.0	5.0	5.0		4.9		4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	237	220	183		408	738	116	1103		372	1636	
v/s Ratio Prot	0.01	c0.10			c0.22	0.13	0.04	c0.29		c0.18	0.18	
v/s Ratio Perm			0.00									
v/c Ratio	0.11	0.81	0.04		0.96	0.32	0.57	1.00		0.95	0.44	
Uniform Delay, d1	42.0	45.9	41.6		40.7	21.2	48.3	37.8		42.9	22.6	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	19.1	0.0		33.0	0.2	3.8	27.5		34.1	0.9	
Delay (s)	42.1	65.0	41.7		73.7	21.5	52.1	65.3		77.0	23.4	
Level of Service	D	E	D		E	C	D	E		E	C	
Approach Delay (s)		57.4			46.5			64.6			41.1	
Approach LOS		E			D			E			D	
Intersection Summary												
HCM 2000 Control Delay			52.2									
HCM 2000 Volume to Capacity ratio			0.95									
Actuated Cycle Length (s)			106.6									
Intersection Capacity Utilization			92.7%									
Analysis Period (min)			15									
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

41: Freeman St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	14	720	33	44	692	78	22	0	44	36	15	82
Future Volume (Veh/h)	14	720	33	44	692	78	22	0	44	36	15	82
Sign Control	Free				Free				Stop		Stop	
Grade	0%				0%				0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	783	36	48	752	85	24	0	48	39	16	89
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	None			TWLTL								
Median storage veh				2								
Upstream signal (ft)	312											
pX, platoon unblocked				0.91				0.91	0.91	0.91	0.91	0.91
vC, conflicting volume	837				819				1818	1764	801	1770
vC1, stage 1 conf vol								831	831			890
vC2, stage 2 conf vol								988	933			879
vCu, unblocked vol	837				751				1850	1790	732	1796
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1
tC, 2 stage (s)								6.1	5.5			6.1
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5
p0 queue free %	98				94				85	100	87	80
cM capacity (veh/h)	797				781				165	239	383	191
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total	834	885	72	144								
Volume Left	15	48	24	39								
Volume Right	36	85	48	89								
cSH	797	781	266	287								
Volume to Capacity	0.02	0.06	0.27	0.50								
Queue Length 95th (ft)	1	5	27	66								
Control Delay (s)	0.5	1.7	23.5	29.5								
Lane LOS	A	A	C	D								
Approach Delay (s)	0.5	1.7	23.5	29.5								
Approach LOS				C	D							
Intersection Summary												
Average Delay				4.1								
Intersection Capacity Utilization				81.4%	ICU Level of Service			D				
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

07/02/2018

																		
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR						
Lane Configurations																		
Traffic Volume (veh/h)	14	974	25	61	958	93	5	4	96	37	4	23						
Future Volume (Veh/h)	14	974	25	61	958	93	5	4	96	37	4	23						
Sign Control	Free			Free			Stop			Stop								
Grade	0%			0%			0%			0%								
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92						
Hourly flow rate (vph)	15	1059	27	66	1041	101	5	4	104	40	4	25						
Pedestrians	1						1											
Lane Width (ft)	12.0						12.0											
Walking Speed (ft/s)	4.0						4.0											
Percent Blockage	0						0											
Right turn flare (veh)																		
Median type	TWLTL			TWLTL														
Median storage veh	2			2														
Upstream signal (ft)	687																	
pX, platoon unblocked				0.93				0.93	0.93	0.93	0.93	0.93						
vC, conflicting volume	1142				1087				2304	2378	1074	2418	2340	1092				
vC1, stage 1 conf vol							1104	1104				1224	1224					
vC2, stage 2 conf vol							1201	1274				1195	1117					
vCu, unblocked vol	1142				1055				2366	2445	1041	2489	2405	1092				
tC, single (s)	4.1				4.1				7.1	6.5	6.2	7.1	6.5	6.2				
tC, 2 stage (s)							6.1	5.5				6.1	5.5					
tF (s)	2.2				2.2				3.5	4.0	3.3	3.5	4.0	3.3				
p0 queue free %	98				89				96	97	60	28	97	90				
cM capacity (veh/h)	612				612				131	155	259	55	145	260				
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1												
Volume Total	15	1086	66	1142	113	69												
Volume Left	15	0	66	0	5	40												
Volume Right	0	27	0	101	104	25												
cSH	612	1700	612	1700	243	82												
Volume to Capacity	0.02	0.64	0.11	0.67	0.47	0.85												
Queue Length 95th (ft)	2	0	9	0	57	109												
Control Delay (s)	11.0	0.0	11.6	0.0	32.1	148.8												
Lane LOS	B		B		D	F												
Approach Delay (s)	0.2		0.6		32.1	148.8												
Approach LOS					D	F												
Intersection Summary																		
Average Delay				6.0														
Intersection Capacity Utilization				73.1%	ICU Level of Service				D									
Analysis Period (min)				15														

HCM Unsignalized Intersection Capacity Analysis

43: Stewart St & Vista Way

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	1123	0	0	1155	387	0	0	0	0	0	26
Future Volume (Veh/h)	15	1123	0	0	1155	387	0	0	0	0	0	26
Sign Control	Free			Free			Stop			Stop		
Grade	0%			0%			0%			0%		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	1221	0	0	1255	421	0	0	0	0	0	28
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type	TWLTL				TWLTL							
Median storage veh	2				2							
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1676			1221			2536	2929	1221	2718	2718	1466
vC1, stage 1 conf vol							1253	1253		1466	1466	
vC2, stage 2 conf vol							1283	1676		1253	1253	
vCu, unblocked vol	1676			1221			2536	2929	1221	2718	2718	1466
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)							6.1	5.5		6.1	5.5	
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			100			100	100	100	100	100	82
cM capacity (veh/h)	382			571			116	113	219	120	143	157
Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1						
Volume Total	16	1221	0	1676	0	28						
Volume Left	16	0	0	0	0	0						
Volume Right	0	0	0	421	0	28						
cSH	382	1700	1700	1700	1700	157						
Volume to Capacity	0.04	0.72	0.00	0.99	0.00	0.18						
Queue Length 95th (ft)	3	0	0	0	0	16						
Control Delay (s)	14.8	0.0	0.0	0.0	0.0	32.8						
Lane LOS	B				A	D						
Approach Delay (s)	0.2		0.0		0.0	32.8						
Approach LOS					A	D						
Intersection Summary												
Average Delay	0.4											
Intersection Capacity Utilization	94.3%			ICU Level of Service					F			
Analysis Period (min)	15											

HCM Unsignalized Intersection Capacity Analysis

44: Coast Hwy & Eaton St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	106	0	0	104	111	867	23	104	695	10
Future Volume (Veh/h)	0	0	106	0	0	104	111	867	23	104	695	10
Sign Control	Stop				Stop				Free			
Grade	0%				0%				0%			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	0	115	0	0	113	121	942	25	113	755	11
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							TWLTL			TWLTL		
Median storage veh							2			2		
Upstream signal (ft)										621		
pX, platoon unblocked												
vC, conflicting volume	1812	2196	760	2292	2188	484	766				967	
vC1, stage 1 conf vol	986	986		1196	1196							
vC2, stage 2 conf vol	826	1209		1096	992							
vCu, unblocked vol	1812	2196	760	2292	2188	484	766				967	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)	6.5	5.5		6.5	5.5							
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	100	100	67	100	100	79	86				84	
cM capacity (veh/h)	100	97	348	11	124	529	843				708	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	SB 1	SB 2					
Volume Total	115	113	121	628	339	113	766					
Volume Left	0	0	121	0	0	113	0					
Volume Right	115	113	0	0	25	0	11					
cSH	348	529	843	1700	1700	708	1700					
Volume to Capacity	0.33	0.21	0.14	0.37	0.20	0.16	0.45					
Queue Length 95th (ft)	35	20	12	0	0	14	0					
Control Delay (s)	20.4	13.6	10.0	0.0	0.0	11.0	0.0					
Lane LOS	C	B	A			B						
Approach Delay (s)	20.4	13.6	1.1			1.4						
Approach LOS	C	B										
Intersection Summary												
Average Delay			2.9									
Intersection Capacity Utilization			50.4%		ICU Level of Service				A			
Analysis Period (min)			15									

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - Michigan Avenue
E/W Street Name	Michigan Avenue
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	199	92	83	0	53	12	26	0	27	538	45	0	19	538	50
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	221	102	92	0	59	13	29	0	30	596	50	0	21	596	55
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		415			101			676			672	
Entry Volume veh/h		407			99			663			659	
Circulating Flow (v_c), pc/h	676			847			344			102		
Exiting Flow (v_{ex}), pc/h	173			98			846			747		
Capacity (C_{pce}), pc/h		575			484			801			1020	
Capacity (c), veh/h		564			475			785			1000	
v/c Ratio (x)		0.72			0.21			0.84			0.66	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		24.8			10.6			28.2			13.5	
Lane LOS		C			B			D			B	
95% Queue, veh		6.0			0.8			9.9			5.2	
Approach Delay, s/veh	24.8			10.6			28.2			13.5		
Approach LOS	C			B			D			B		
Intersection Delay, s/veh LOS	21.2						C					

HCS7 Roundabouts Report

General Information

Analyst	
Agency or Co.	IBI Group
Date Performed	05/23/2016
Analysis Year	2016
Time Analyzed	AM Peak Hour
Project Description	35130 - Coast Highway

Site Information

Intersection	Coast Hwy - West
E/W Street Name	West Street
N/S Street Name	Coast Highway
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.92
Jurisdiction	

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment	LTR				LTR				LTR				LTR			
Volume (V), veh/h	0	33	20	16	0	28	20	61	0	16	191	28	0	61	191	33
Percent Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Flow Rate (v_{pce}), pc/h	0	37	22	18	0	31	22	68	0	18	212	31	0	68	212	37
Right-Turn Bypass	None				None				None				None			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		5.1929			5.1929			5.1929			5.1929	
Follow-Up Headway (s)		3.1858			3.1858			3.1858			3.1858	

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		77			121			261			317	
Entry Volume veh/h		75			119			256			311	
Circulating Flow (v_c), pc/h	311			267			127			71		
Exiting Flow (v_{ex}), pc/h	121			77			317			261		
Capacity (C_{pce}), pc/h		828			865			995			1053	
Capacity (c), veh/h		812			848			976			1032	
v/c Ratio (x)		0.09			0.14			0.26			0.30	

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.4			5.6			6.3			6.5	
Lane LOS		A			A			A			A	
95% Queue, veh		0.3			0.5			1.1			1.3	
Approach Delay, s/veh	5.4			5.6			6.3			6.5		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh LOS	6.2						A					

HCM Unsignalized Intersection Capacity Analysis

47: Coast Hwy & Kelly St

07/02/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	38	51	21	31	44	28	156	21	37	132	48
Future Volume (Veh/h)	17	38	51	21	31	44	28	156	21	37	132	48
Sign Control	Stop				Stop				Free		Free	
Grade	0%				0%				0%		0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	18	41	55	23	34	48	30	170	23	40	143	52
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type							None			None		
Median storage veh												
Upstream signal (ft)							737			527		
pX, platoon unblocked												
vC, conflicting volume	459	502	98	468	516	96	195				193	
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	459	502	98	468	516	96	195				193	
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1				4.1	
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2				2.2	
p0 queue free %	96	91	94	94	92	95	98				97	
cM capacity (veh/h)	417	446	940	402	438	941	1375				1378	
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2						
Volume Total	114	105	115	108	112	124						
Volume Left	18	23	30	0	40	0						
Volume Right	55	48	0	23	0	52						
cSH	589	565	1375	1700	1378	1700						
Volume to Capacity	0.19	0.19	0.02	0.06	0.03	0.07						
Queue Length 95th (ft)	18	17	2	0	2	0						
Control Delay (s)	12.6	12.8	2.1	0.0	2.9	0.0						
Lane LOS	B	B	A	A								
Approach Delay (s)	12.6	12.8	1.1	1.4								
Approach LOS	B	B										
Intersection Summary												
Average Delay			4.9									
Intersection Capacity Utilization			Err%	ICU Level of Service				H				
Analysis Period (min)			15									

HCM 2010 Signalized Intersection Summary

48: Harbor Dr/Vandergrift Blvd & I-5 NB On-Ramp/San Rafael Dr

07/02/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	0	0	102	0	14	13	1056	13	24	2206	16
Future Volume (veh/h)	0	0	0	102	0	14	13	1056	13	24	2206	16
Number				3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln				1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h				111	0	0	14	1148	0	26	2398	0
Adj No. of Lanes				2	0	1	1	3	1	1	2	1
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	2	2	2	2
Cap, veh/h				738	0	329	92	3173	988	92	2208	988
Arrive On Green				0.20	0.00	0.00	0.05	0.60	0.00	0.05	0.60	0.00
Sat Flow, veh/h				3690	0	1647	1845	5289	1647	1845	3681	1647
Grp Volume(v), veh/h				111	0	0	14	1148	0	26	2398	0
Grp Sat Flow(s),veh/h/ln				1845	0	1647	1845	1763	1647	1845	1840	1647
Q Serve(g_s), s				2.0	0.0	0.0	0.6	8.9	0.0	1.1	48.0	0.0
Cycle Q Clear(g_c), s				2.0	0.0	0.0	0.6	8.9	0.0	1.1	48.0	0.0
Prop In Lane				1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h				738	0	329	92	3173	988	92	2208	988
V/C Ratio(X)				0.15	0.00	0.00	0.15	0.36	0.00	0.28	1.09	0.00
Avail Cap(c_a), veh/h				738	0	329	92	3173	988	92	2208	988
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh				26.4	0.0	0.0	36.4	8.2	0.0	36.6	16.0	0.0
Incr Delay (d2), s/veh				0.4	0.0	0.0	3.5	0.3	0.0	7.5	47.1	0.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				1.0	0.0	0.0	0.4	4.3	0.0	0.7	38.4	0.0
LnGrp Delay(d),s/veh				26.8	0.0	0.0	39.8	8.5	0.0	44.1	63.1	0.0
LnGrp LOS				C			D	A		D	F	
Approach Vol, veh/h					111			1162			2424	
Approach Delay, s/veh					26.8			8.9			62.9	
Approach LOS					C			A			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2			5	6		8				
Phs Duration (G+Y+Rc), s	8.0	52.0			8.0	52.0		20.0				
Change Period (Y+Rc), s	4.0	4.0			4.0	4.0		4.0				
Max Green Setting (Gmax), s	4.0	48.0			4.0	48.0		16.0				
Max Q Clear Time (g_c+I1), s	3.1	10.9			2.6	50.0		4.0				
Green Ext Time (p_c), s	0.0	10.5			0.0	0.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				44.8								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

49: I-5 SB On-Ramp & SR-76 ramps

02/11/2019

									
Movement	EBT	EBR	WBL	WBT	NBL	NBR			
Lane Configurations	↑↑	↗	↖↖	↑↑					
Traffic Volume (veh/h)	1122	212	304	1286	0	0			
Future Volume (veh/h)	1122	212	304	1286	0	0			
Number	4	14	3	8					
Initial Q (Qb), veh	0	0	0	0					
Ped-Bike Adj(A_pbT)		1.00	1.00						
Parking Bus, Adj	1.00	1.00	1.00	1.00					
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937					
Adj Flow Rate, veh/h	1220	230	330	1398					
Adj No. of Lanes	2	1	2	2					
Peak Hour Factor	0.92	0.92	0.92	0.92					
Percent Heavy Veh, %	2	2	2	2					
Cap, veh/h	2116	947	805	3313					
Arrive On Green	0.57	0.57	0.22	0.90					
Sat Flow, veh/h	3778	1647	3579	3778					
Grp Volume(v), veh/h	1220	230	330	1398					
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840					
Q Serve(g_s), s	8.4	2.8	3.1	2.4					
Cycle Q Clear(g_c), s	8.4	2.8	3.1	2.4					
Prop In Lane		1.00	1.00						
Lane Grp Cap(c), veh/h	2116	947	805	3313					
V/C Ratio(X)	0.58	0.24	0.41	0.42					
Avail Cap(c_a), veh/h	2116	947	805	3313					
HCM Platoon Ratio	1.00	1.00	1.00	1.00					
Upstream Filter(I)	1.00	1.00	1.00	1.00					
Uniform Delay (d), s/veh	5.4	4.2	13.2	0.3					
Incr Delay (d2), s/veh	1.2	0.6	1.5	0.4					
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0					
%ile BackOfQ(50%),veh/ln	4.4	1.4	1.7	1.2					
LnGrp Delay(d),s/veh	6.6	4.8	14.8	0.7					
LnGrp LOS	A	A	B	A					
Approach Vol, veh/h	1450			1728					
Approach Delay, s/veh	6.3			3.4					
Approach LOS	A			A					
Timer	1	2	3	4	5	6	7	8	
Assigned Phs			3	4				8	
Phs Duration (G+Y+Rc), s			13.0	27.0				40.0	
Change Period (Y+Rc), s			4.0	4.0				4.0	
Max Green Setting (Gmax), s			9.0	23.0				36.0	
Max Q Clear Time (g_c+I1), s			5.1	10.4				4.4	
Green Ext Time (p_c), s			0.4	7.5				13.7	
Intersection Summary									
HCM 2010 Ctrl Delay			4.7						
HCM 2010 LOS			A						

HCM 2010 Signalized Intersection Summary 50: I-5 NB On/Off-Ramp & SR-76 ramps

07/02/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↑↑	↑↑	↑	↑		
Traffic Volume (veh/h)	1520	97	283	1157	155	0		
Future Volume (veh/h)	1520	97	283	1157	155	0		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	1652	105	308	1258	168	0		
Adj No. of Lanes	2	1	2	2	1	1		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1595	714	298	2147	523	467		
Arrive On Green	0.43	0.43	0.08	0.58	0.28	0.00		
Sat Flow, veh/h	3778	1647	3579	3778	1845	1647		
Grp Volume(v), veh/h	1652	105	308	1258	168	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1840	1845	1647		
Q Serve(g_s), s	26.0	2.3	5.0	13.0	4.3	0.0		
Cycle Q Clear(g_c), s	26.0	2.3	5.0	13.0	4.3	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1595	714	298	2147	523	467		
V/C Ratio(X)	1.04	0.15	1.03	0.59	0.32	0.00		
Avail Cap(c_a), veh/h	1595	714	298	2147	523	467		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	17.0	10.3	27.5	7.9	17.0	0.0		
Incr Delay (d2), s/veh	32.3	0.4	60.8	1.2	1.6	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	20.2	1.1	5.0	6.8	2.4	0.0		
LnGrp Delay(d),s/veh	49.3	10.7	88.3	9.1	18.6	0.0		
LnGrp LOS	F	B	F	A	B			
Approach Vol, veh/h	1757			1566	168			
Approach Delay, s/veh	47.0			24.7	18.6			
Approach LOS	D			C	B			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		21.0	9.0	30.0				39.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		17.0	5.0	26.0				35.0
Max Q Clear Time (g_c+I1), s		6.3	7.0	28.0				15.0
Green Ext Time (p_c), s		0.3	0.0	0.0				9.6
Intersection Summary								
HCM 2010 Ctrl Delay			35.6					
HCM 2010 LOS			D					

HCM 2010 Signalized Intersection Summary

51: Pirates Cove Way/I-5 SB Off-Ramp & Mission Ave

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	644	6	84	599	98	5	0	32	70	8	48
Future Volume (veh/h)	0	644	6	84	599	98	5	0	32	70	8	48
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1937	1976	1937	1937	1937	1937	0	1937	1937	1937	1937
Adj Flow Rate, veh/h	0	700	7	91	651	0	5	0	35	82	0	52
Adj No. of Lanes	0	2	0	1	2	1	1	0	1	2	0	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	0	2	2	2	2
Cap, veh/h	0	1245	12	217	1949	872	0	0	0	1158	0	517
Arrive On Green	0.00	0.33	0.33	0.12	0.53	0.00	0.00	0.00	0.00	0.31	0.00	0.31
Sat Flow, veh/h	0	3831	37	1845	3681	1647		0		3690	0	1647
Grp Volume(v), veh/h	0	345	362	91	651	0		0.0		82	0	52
Grp Sat Flow(s),veh/h/ln	0	1840	1931	1845	1840	1647				1845	0	1647
Q Serve(g_s), s	0.0	7.8	7.8	2.3	5.2	0.0				0.8	0.0	1.1
Cycle Q Clear(g_c), s	0.0	7.8	7.8	2.3	5.2	0.0				0.8	0.0	1.1
Prop In Lane	0.00		0.02	1.00		1.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	613	644	217	1949	872				1158	0	517
V/C Ratio(X)	0.00	0.56	0.56	0.42	0.33	0.00				0.07	0.00	0.10
Avail Cap(c_a), veh/h	0	613	644	217	1949	872				1158	0	517
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	13.9	13.9	20.9	6.9	0.0				12.3	0.0	12.4
Incr Delay (d2), s/veh	0.0	3.7	3.5	5.9	0.5	0.0				0.1	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	4.6	4.8	1.5	2.7	0.0				0.4	0.0	0.6
LnGrp Delay(d),s/veh	0.0	17.6	17.5	26.7	7.3	0.0				12.4	0.0	12.8
LnGrp LOS		B	B	C	A					B		B
Approach Vol, veh/h		707			742						134	
Approach Delay, s/veh		17.6			9.7						12.6	
Approach LOS		B			A						B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			10.0	21.0		20.0		31.0				
Change Period (Y+Rc), s			4.0	4.0		4.0		4.0				
Max Green Setting (Gmax), s			6.0	17.0		16.0		27.0				
Max Q Clear Time (g_c+I1), s			4.3	9.8		3.1		7.2				
Green Ext Time (p_c), s			0.0	2.5		0.3		4.4				
Intersection Summary												
HCM 2010 Ctrl Delay			13.5									
HCM 2010 LOS			B									
Notes												

HCM 2010 Signalized Intersection Summary

52: Oceanside Blvd & I-5 SB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	181	731	10	28	1073	277	9	2	15	271	6	74
Future Volume (veh/h)	181	731	10	28	1073	277	9	2	15	271	6	74
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1976	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	197	795	11	30	1166	301	10	2	16	191	153	80
Adj No. of Lanes	1	2	0	1	2	1	0	1	1	1	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	185	1255	17	115	1104	494	310	62	329	369	240	125
Arrive On Green	0.10	0.34	0.34	0.06	0.30	0.30	0.20	0.20	0.20	0.20	0.20	0.20
Sat Flow, veh/h	1845	3717	51	1845	3681	1647	1550	310	1647	1845	1199	627
Grp Volume(v), veh/h	197	394	412	30	1166	301	12	0	16	191	0	233
Grp Sat Flow(s),veh/h/ln	1845	1840	1928	1845	1840	1647	1860	0	1647	1845	0	1827
Q Serve(g_s), s	8.0	14.4	14.4	1.2	24.0	12.5	0.4	0.0	0.6	7.4	0.0	9.4
Cycle Q Clear(g_c), s	8.0	14.4	14.4	1.2	24.0	12.5	0.4	0.0	0.6	7.4	0.0	9.4
Prop In Lane	1.00		0.03	1.00		1.00	0.83		1.00	1.00		0.34
Lane Grp Cap(c), veh/h	185	621	651	115	1104	494	372	0	329	369	0	365
V/C Ratio(X)	1.07	0.63	0.63	0.26	1.06	0.61	0.03	0.00	0.05	0.52	0.00	0.64
Avail Cap(c_a), veh/h	185	621	651	115	1104	494	372	0	329	369	0	365
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.0	22.3	22.3	35.7	28.0	24.0	25.8	0.0	25.9	28.6	0.0	29.3
Incr Delay (d2), s/veh	85.4	4.9	4.7	5.4	43.1	5.5	0.2	0.0	0.3	5.1	0.0	8.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	8.2	8.5	0.8	18.7	6.4	0.2	0.0	0.3	4.3	0.0	5.6
LnGrp Delay(d),s/veh	121.4	27.2	27.0	41.1	71.1	29.5	25.9	0.0	26.1	33.7	0.0	37.6
LnGrp LOS	F	C	C	D	F	C	C		C	C		D
Approach Vol, veh/h		1003			1497			28			424	
Approach Delay, s/veh		45.6			62.2			26.0			35.8	
Approach LOS		D			E			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	9.0	31.0		20.0	12.0	28.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	5.0	27.0		16.0	8.0	24.0				
Max Q Clear Time (g_c+I1), s		2.6	3.2	16.4		11.4	10.0	26.0				
Green Ext Time (p_c), s		0.0	0.0	3.7		0.9	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				52.4								
HCM 2010 LOS				D								
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/11/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	870	282	87	766	169	359	97	140	400	235	371
Future Volume (veh/h)	58	870	282	87	766	169	359	97	140	400	235	371
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1976	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	63	946	307	95	833	184	248	304	152	345	381	403
Adj No. of Lanes	1	2	0	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	115	890	287	92	1150	515	415	436	370	369	387	329
Arrive On Green	0.06	0.32	0.32	0.05	0.31	0.31	0.22	0.22	0.22	0.20	0.20	0.20
Sat Flow, veh/h	1845	2737	884	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	63	635	618	95	833	184	248	304	152	345	381	403
Grp Sat Flow(s),veh/h/ln	1845	1840	1781	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	2.7	26.0	26.0	4.0	16.1	6.9	9.6	11.5	6.3	14.7	15.7	16.0
Cycle Q Clear(g_c), s	2.7	26.0	26.0	4.0	16.1	6.9	9.6	11.5	6.3	14.7	15.7	16.0
Prop In Lane	1.00		0.50	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	115	598	579	92	1150	515	415	436	371	369	387	329
V/C Ratio(X)	0.55	1.06	1.07	1.03	0.72	0.36	0.60	0.70	0.41	0.93	0.98	1.22
Avail Cap(c_a), veh/h	115	598	579	92	1150	515	415	436	371	369	387	329
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.4	27.0	27.0	38.0	24.4	21.3	27.8	28.5	26.5	31.5	31.9	32.0
Incr Delay (d2), s/veh	17.3	54.1	56.9	102.0	4.0	1.9	6.2	8.9	3.3	33.0	41.7	124.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	22.1	21.9	4.6	8.7	3.4	5.6	7.2	3.2	10.9	12.9	18.6
LnGrp Delay(d),s/veh	53.7	81.1	83.9	140.5	28.4	23.2	34.0	37.4	29.8	64.5	73.6	156.8
LnGrp LOS	D	F	F	F	C	C	C	D	C	E	E	F
Approach Vol, veh/h	1316				1112				704			
Approach Delay, s/veh	81.1				37.1				34.6			
Approach LOS	F				D				C			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6			7	8			
Phs Duration (G+Y+Rc), s	22.0		8.0	30.0	20.0			9.0	29.0			
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0			4.0	4.0			
Max Green Setting (Gmax), s	18.0		4.0	26.0	16.0			5.0	25.0			
Max Q Clear Time (g_c+I1), s	13.5		6.0	28.0	18.0			4.7	18.1			
Green Ext Time (p_c), s	1.4		0.0	0.0	0.0			0.0	3.5			
Intersection Summary												
HCM 2010 Ctrl Delay	67.1											
HCM 2010 LOS	E											
Notes												

Intersection

Intersection Delay, s/veh 7.6

Intersection LOS A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	24	81	6	6	89	9	4	2	7	0	0	0
Future Vol, veh/h	24	81	6	6	89	9	4	2	7	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	26	88	7	7	97	10	4	2	8	0	0	0
Number of Lanes	0	1	0	0	1	0	0	1	0	0	0	0

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	1	1	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	1	1
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	1	0	1
HCM Control Delay	7.7	7.6	7.2
HCM LOS	A	A	A

Lane	NBLn1	EBLn1	WBLn1
Vol Left, %	31%	22%	6%
Vol Thru, %	15%	73%	86%
Vol Right, %	54%	5%	9%
Sign Control	Stop	Stop	Stop
Traffic Vol by Lane	13	111	104
LT Vol	4	24	6
Through Vol	2	81	89
RT Vol	7	6	9
Lane Flow Rate	14	121	113
Geometry Grp	1	1	1
Degree of Util (X)	0.016	0.136	0.126
Departure Headway (Hd)	4.172	4.054	4.009
Convergence, Y/N	Yes	Yes	Yes
Cap	863	883	893
Service Time	2.172	2.082	2.039
HCM Lane V/C Ratio	0.016	0.137	0.127
HCM Control Delay	7.2	7.7	7.6
HCM Lane LOS	A	A	A
HCM 95th-tile Q	0	0.5	0.4

Intersection												
Int Delay, s/veh	2.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↖						↖	↗
Traffic Vol, veh/h	0	179	54	28	32	0	0	0	0	26	0	44
Future Vol, veh/h	0	179	54	28	32	0	0	0	0	26	0	44
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop
RT Channelized	-	-	Yield	-	-	None	-	-	None	-	-	Yield
Storage Length	-	-	200	-	-	-	-	-	-	-	-	85
Veh in Median Storage, #	-	0	-	-	0	-	-	-	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	195	59	30	35	0	0	0	0	28	0	48
Major/Minor	Major1			Major2			Minor2					
Conflicting Flow All	-	0	0	195	0	0				290	290	35
Stage 1	-	-	-	-	-	-				95	95	-
Stage 2	-	-	-	-	-	-				195	195	-
Critical Hdwy	-	-	-	4.12	-	-				6.42	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-				5.42	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-				5.42	5.52	-
Follow-up Hdwy	-	-	-	2.218	-	-				3.518	4.018	3.318
Pot Cap-1 Maneuver	0	-	-	1378	-	0				701	620	1038
Stage 1	0	-	-	-	-	0				929	816	-
Stage 2	0	-	-	-	-	0				838	739	-
Platoon blocked, %	-	-	-	-	-	-				-	-	-
Mov Cap-1 Maneuver	-	-	-	1378	-	-				686	0	1038
Mov Cap-2 Maneuver	-	-	-	-	-	-				686	0	-
Stage 1	-	-	-	-	-	-				909	0	-
Stage 2	-	-	-	-	-	-				838	0	-
Approach	EB			WB			SB					
HCM Control Delay, s	0			3.6			9.3					
HCM LOS							A					
Minor Lane/Major Mvmt	EBT	EBR	WBL	WBT	SBLn1	SBLn2						
Capacity (veh/h)	-	-	1378	-	686	1038						
HCM Lane V/C Ratio	-	-	0.022	-	0.041	0.046						
HCM Control Delay (s)	-	-	7.7	0	10.5	8.6						
HCM Lane LOS	-	-	A	A	B	A						
HCM 95th %tile Q(veh)	-	-	0.1	-	0.1	0.1						

HCM 2010 Signalized Intersection Summary

56: I-5 SB On/Off-Ramp & Vista Way

07/02/2018

								
Movement	EBT	EBR	WBL	WBT	NBL	NBR		
Lane Configurations	↑↑	↑	↰	↑	↰	↰		
Traffic Volume (veh/h)	716	99	165	1236	40	252		
Future Volume (veh/h)	716	99	165	1236	40	252		
Number	4	14	3	8	5	12		
Initial Q (Qb), veh	0	0	0	0	0	0		
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00		
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937		
Adj Flow Rate, veh/h	778	0	179	1343	43	0		
Adj No. of Lanes	2	1	2	1	1	2		
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2	2	2		
Cap, veh/h	1963	878	334	1317	394	618		
Arrive On Green	0.53	0.00	0.09	0.68	0.21	0.00		
Sat Flow, veh/h	3778	1647	3579	1937	1845	2898		
Grp Volume(v), veh/h	778	0	179	1343	43	0		
Grp Sat Flow(s),veh/h/ln	1840	1647	1790	1937	1845	1449		
Q Serve(g_s), s	9.4	0.0	3.6	51.0	1.4	0.0		
Cycle Q Clear(g_c), s	9.4	0.0	3.6	51.0	1.4	0.0		
Prop In Lane		1.00	1.00		1.00	1.00		
Lane Grp Cap(c), veh/h	1963	878	334	1317	394	618		
V/C Ratio(X)	0.40	0.00	0.54	1.02	0.11	0.00		
Avail Cap(c_a), veh/h	1963	878	334	1317	394	618		
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	0.00		
Uniform Delay (d), s/veh	10.4	0.0	32.4	12.0	23.8	0.0		
Incr Delay (d2), s/veh	0.6	0.0	6.0	29.8	0.6	0.0		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	4.9	0.0	2.0	37.3	0.8	0.0		
LnGrp Delay(d),s/veh	11.0	0.0	38.5	41.8	24.3	0.0		
LnGrp LOS	B		D	F	C			
Approach Vol, veh/h	778			1522	43			
Approach Delay, s/veh	11.0			41.4	24.3			
Approach LOS	B			D	C			
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2	3	4				8
Phs Duration (G+Y+Rc), s		20.0	11.0	44.0				55.0
Change Period (Y+Rc), s		4.0	4.0	4.0				4.0
Max Green Setting (Gmax), s		16.0	7.0	40.0				51.0
Max Q Clear Time (g_c+I1), s		3.4	5.6	11.4				53.0
Green Ext Time (p_c), s		0.0	0.1	6.1				0.0
Intersection Summary								
HCM 2010 Ctrl Delay			31.0					
HCM 2010 LOS			C					

Appendix N – Analysis Output Sheets (Mitigation - Existing)

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

2/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↖	↗	↖	↖↗		↖	↗	
Traffic Volume (vph)	40	160	60	263	155	235	63	618	169	242	525	21
Future Volume (vph)	40	160	60	263	155	235	63	618	169	242	525	21
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.97	1.00	1.00	0.93	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.99	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1844	1532	1681	1746	1478	1770	3412		1770	1847	
Flt Permitted		0.99	1.00	0.95	0.99	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1844	1532	1681	1746	1478	1770	3412		1770	1847	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	174	65	286	168	255	68	672	184	263	571	23
RTOR Reduction (vph)	0	0	55	0	0	210	0	27	0	0	2	0
Lane Group Flow (vph)	0	217	10	223	231	45	68	829	0	263	592	0
Confl. Peds. (#/hr)	14		10	10		14			3			15
Confl. Bikes (#/hr)			4			5			3			3
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		14.4	14.4	15.9	15.9	15.9	5.8	25.2		15.7	35.1	
Effective Green, g (s)		14.4	14.4	15.9	15.9	15.9	5.8	25.2		15.7	35.1	
Actuated g/C Ratio		0.16	0.16	0.18	0.18	0.18	0.06	0.28		0.17	0.39	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.5		2.0	3.5	
Lane Grp Cap (vph)		295	245	296	308	261	114	955		308	720	
v/s Ratio Prot		c0.12		c0.13	0.13		0.04	0.24		c0.15	c0.32	
v/s Ratio Perm			0.01			0.03						
v/c Ratio		0.74	0.04	0.75	0.75	0.17	0.60	0.87		0.85	0.82	
Uniform Delay, d1		36.0	32.0	35.2	35.2	31.5	41.0	30.8		36.0	24.7	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		8.0	0.0	10.7	10.1	0.4	5.5	10.6		19.3	10.3	
Delay (s)		43.9	32.0	45.9	45.3	31.8	46.4	41.4		55.3	34.9	
Level of Service		D	C	D	D	C	D	D		E	C	
Approach Delay (s)		41.2			40.6			41.8			41.2	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			41.2									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			90.0									Sum of lost time (s) 18.8
Intersection Capacity Utilization			75.9%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

9/8/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	53	118	106	51	68	23	117	696	74	92	552	41
Future Volume (vph)	53	118	106	51	68	23	117	696	74	92	552	41
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.95			0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.99			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1750			1790		1770	1836		1770	1843	
Flt Permitted		0.92			0.71		0.95	1.00		0.29	1.00	
Satd. Flow (perm)		1625			1295		1770	1836		532	1843	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	58	128	115	55	74	25	127	757	80	100	600	45
RTOR Reduction (vph)	0	27	0	0	8	0	0	5	0	0	3	0
Lane Group Flow (vph)	0	274	0	0	146	0	127	832	0	100	642	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Perm	NA	
Protected Phases		4			8		5	2			6	
Permitted Phases	4			8						6		
Actuated Green, G (s)		15.5			15.1		7.5	39.2		27.5	27.5	
Effective Green, g (s)		15.5			15.1		7.5	39.2		27.5	27.5	
Actuated g/C Ratio		0.24			0.23		0.12	0.61		0.43	0.43	
Clearance Time (s)		4.6			5.0		4.2	5.0		5.0	5.0	
Vehicle Extension (s)		3.0			3.5		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		391			304		206	1119		227	788	
v/s Ratio Prot							0.07	c0.45			c0.35	
v/s Ratio Perm		c0.17			0.11					0.19		
v/c Ratio		0.70			0.48		0.62	0.74		0.44	0.81	
Uniform Delay, d1		22.3			21.2		27.0	9.0		13.0	16.2	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		5.4			1.4		3.8	2.7		1.4	6.5	
Delay (s)		27.7			22.6		30.9	11.7		14.3	22.7	
Level of Service		C			C		C	B		B	C	
Approach Delay (s)		27.7			22.6			14.2			21.5	
Approach LOS		C			C			B			C	
Intersection Summary												
HCM 2000 Control Delay			19.2									
HCM 2000 Volume to Capacity ratio			0.80									
Actuated Cycle Length (s)			64.3									
Intersection Capacity Utilization			79.1%									
Analysis Period (min)			15									
c Critical Lane Group												

Appendix O.1 – Analysis Output Sheets (Mitigation - Future with Project Build Out SR-78)

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

9/8/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	251	80	104	17	70	42	73	731	26	67	739	181
Future Volume (vph)	251	80	104	17	70	42	73	731	26	67	739	181
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	1.00	1.00
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	0.85
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	1.00
Satd. Flow (prot)		1795	1583		1769		1770	1853		1770	1863	1583
Flt Permitted		0.70	1.00		0.95		0.14	1.00		0.13	1.00	1.00
Satd. Flow (perm)		1304	1583		1685		256	1853		249	1863	1583
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	273	87	113	18	76	46	79	795	28	73	803	197
RTOR Reduction (vph)	0	0	72	0	29	0	0	2	0	0	0	91
Lane Group Flow (vph)	0	360	41	0	111	0	79	821	0	73	803	106
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm
Protected Phases		4			8			2			6	
Permitted Phases	4		4	8			2			6		6
Actuated Green, G (s)		21.7	21.7		21.7		31.1	31.1		32.3	32.3	32.3
Effective Green, g (s)		21.7	21.7		21.7		31.1	31.1		32.3	32.3	32.3
Actuated g/C Ratio		0.36	0.36		0.36		0.52	0.52		0.54	0.54	0.54
Clearance Time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		7.0	7.0	7.0
Lane Grp Cap (vph)		471	572		609		132	960		134	1002	852
v/s Ratio Prot							c0.44				0.43	
v/s Ratio Perm		c0.28	0.03		0.07		0.31			0.29		0.07
v/c Ratio		0.76	0.07		0.18		0.60	0.86		0.54	0.80	0.12
Uniform Delay, d1		16.9	12.5		13.1		10.1	12.5		9.0	11.2	6.9
Progression Factor		1.00	1.00		1.00		1.03	0.95		1.00	1.00	1.00
Incremental Delay, d2		10.0	0.2		0.5		16.4	8.6		15.0	6.7	0.3
Delay (s)		26.9	12.7		13.6		26.7	20.4		24.0	18.0	7.2
Level of Service		C	B		B		C	C		C	B	A
Approach Delay (s)		23.5			13.6			21.0			16.4	
Approach LOS		C			B			C			B	
Intersection Summary												
HCM 2000 Control Delay			19.2				HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio			0.82									
Actuated Cycle Length (s)			60.0				Sum of lost time (s)			7.2		
Intersection Capacity Utilization			78.7%				ICU Level of Service			D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

9/8/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	1277	26	0	0	0	0	13	33	59	48	0
Future Volume (vph)	39	1277	26	0	0	0	0	13	33	59	48	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		1.00						0.90			1.00	
Flt Protected		1.00						1.00			0.97	
Satd. Flow (prot)		3524						1682			1813	
Flt Permitted		1.00						1.00			0.84	
Satd. Flow (perm)		3524						1682			1569	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	1388	28	0	0	0	0	14	36	64	52	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	19	0	0	0	0
Lane Group Flow (vph)	0	1455	0	0	0	0	0	31	0	0	116	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		25.5						16.5			16.5	
Effective Green, g (s)		25.5						16.5			16.5	
Actuated g/C Ratio		0.51						0.33			0.33	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		1797						555			517	
v/s Ratio Prot								0.02				
v/s Ratio Perm		0.41									c0.07	
v/c Ratio		0.81						0.06			0.22	
Uniform Delay, d1		10.2						11.4			12.1	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		2.8						0.2			1.0	
Delay (s)		13.0						11.6			13.1	
Level of Service		B						B			B	
Approach Delay (s)		13.0			0.0			11.6			13.1	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		13.0										
HCM 2000 Volume to Capacity ratio		0.58										
Actuated Cycle Length (s)		50.0										
Intersection Capacity Utilization		56.4%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

9/8/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	14	375	22	20	310	69	30	42	40	75	26	21
Future Volume (vph)	14	375	22	20	310	69	30	42	40	75	26	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	408	24	22	337	75	33	46	43	82	28	23
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	447	434	122	133								
Volume Left (vph)	15	22	33	82								
Volume Right (vph)	24	75	43	23								
Hadj (s)	0.01	-0.06	-0.12	0.05								
Departure Headway (s)	5.5	5.4	6.5	6.6								
Degree Utilization, x	0.68	0.65	0.22	0.24								
Capacity (veh/h)	447	635	459	453								
Control Delay (s)	19.2	18.0	11.3	11.7								
Approach Delay (s)	19.2	18.0	11.3	11.7								
Approach LOS	C	C	B	B								
Intersection Summary												
Delay			17.0									
Level of Service			C									
Intersection Capacity Utilization			49.3%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

27: Coast Hwy & Oceanside Blvd

2/21/2017

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	58	230	90	252	223	211	94	577	162	217	490	30
Future Volume (vph)	58	230	90	252	223	211	94	577	162	217	490	30
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	10	11	11	16	16	16
Total Lost time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Lane Util. Factor		1.00	1.00	0.95	0.95	1.00	1.00	0.95		1.00	1.00	
Frpb, ped/bikes		1.00	0.97	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Frt		1.00	0.85	1.00	1.00	0.85	1.00	0.97		1.00	0.99	
Flt Protected		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1844	1534	1681	1761	1794	1652	3295		2006	2093	
Flt Permitted		0.99	1.00	0.95	1.00	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1844	1534	1681	1761	1794	1652	3295		2006	2093	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	63	250	98	274	242	229	102	627	176	236	533	33
RTOR Reduction (vph)	0	0	79	0	0	187	0	28	0	0	3	0
Lane Group Flow (vph)	0	313	19	247	269	42	102	775	0	236	563	0
Confl. Peds. (#/hr)			10	10					3			
Confl. Bikes (#/hr)			4						3			
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4			8						
Actuated Green, G (s)		17.4	17.4	16.4	16.4	16.4	6.8	25.6		11.8	30.6	
Effective Green, g (s)		17.4	17.4	16.4	16.4	16.4	6.8	25.6		11.8	30.6	
Actuated g/C Ratio		0.19	0.19	0.18	0.18	0.18	0.08	0.28		0.13	0.34	
Clearance Time (s)		4.6	4.6	5.0	5.0	5.0	4.2	5.0		4.2	5.0	
Vehicle Extension (s)		2.0	2.0	3.5	3.5	3.5	2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		356	296	306	320	326	124	937		263	711	
v/s Ratio Prot		c0.17		0.15	c0.15		0.06	c0.24		0.12	c0.27	
v/s Ratio Perm			0.01			0.02						
v/c Ratio		0.88	0.06	0.81	0.84	0.13	0.82	0.83		0.90	0.79	
Uniform Delay, d1		35.3	29.6	35.3	35.5	30.8	41.0	30.1		38.5	26.8	
Progression Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		20.5	0.0	14.7	18.1	0.2	32.4	8.3		29.9	8.8	
Delay (s)		55.8	29.7	50.0	53.6	31.0	73.4	38.4		68.4	35.7	
Level of Service		E	C	D	D	C	E	D		E	D	
Approach Delay (s)		49.5			45.5			42.4			45.3	
Approach LOS		D			D			D			D	
Intersection Summary												
HCM 2000 Control Delay			45.0									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.86									
Actuated Cycle Length (s)			90.0							18.8		
Intersection Capacity Utilization			77.0%									ICU Level of Service D
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

9/8/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	40	15	15	50	15	167	20	737	91	213	768	18
Future Volume (vph)	40	15	15	50	15	167	20	737	91	213	768	18
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	10	11	16
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1747			1785	1794	1770	2070		1652	1794	
Flt Permitted		0.78			0.80	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1408			1478	1794	1770	2070		1652	1794	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	43	16	16	54	16	182	22	801	99	232	835	20
RTOR Reduction (vph)	0	12	0	0	0	161	0	4	0	0	1	0
Lane Group Flow (vph)	0	63	0	0	70	21	22	896	0	232	854	0
Confl. Peds. (#/hr)			4	4					3			
Confl. Bikes (#/hr)			1						2			
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		8.7			8.7	8.7	1.4	41.7		12.9	53.2	
Effective Green, g (s)		8.7			8.7	8.7	1.4	41.7		12.9	53.2	
Actuated g/C Ratio		0.11			0.11	0.11	0.02	0.54		0.17	0.69	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		159			166	202	32	1121		276	1239	
v/s Ratio Prot							0.01	c0.43		c0.14	0.48	
v/s Ratio Perm		0.04			c0.05	0.01						
v/c Ratio		0.39			0.42	0.10	0.69	0.80		0.84	0.69	
Uniform Delay, d1		31.7			31.8	30.6	37.6	14.3		31.1	7.0	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.6			0.6	0.1	47.1	4.1		20.0	1.6	
Delay (s)		32.3			32.4	30.7	84.7	18.3		51.1	8.6	
Level of Service		C			C	C	F	B		D	A	
Approach Delay (s)		32.3			31.2			19.9			17.7	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay		20.5										
HCM 2000 Volume to Capacity ratio		0.75										
Actuated Cycle Length (s)		77.0										
Intersection Capacity Utilization		79.2%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

9/1/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	116	133	122	68	76	24	134	719	78	97	571	47
Future Volume (vph)	116	133	122	68	76	24	134	719	78	97	571	47
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.6			5.0		4.2	5.0		4.0	5.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.98		1.00	0.99		1.00	0.99	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1753			1791		1770	1835		1770	1842	
Flt Permitted		0.81			0.63		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1443			1159		1770	1835		1770	1842	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	126	145	133	74	83	26	146	782	85	105	621	51
RTOR Reduction (vph)	0	20	0	0	7	0	0	4	0	0	3	0
Lane Group Flow (vph)	0	384	0	0	176	0	146	863	0	105	669	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		24.4			24.0		18.8	46.0		6.0	33.0	
Effective Green, g (s)		24.4			24.0		18.8	46.0		6.0	33.0	
Actuated g/C Ratio		0.27			0.27		0.21	0.51		0.07	0.37	
Clearance Time (s)		4.6			5.0		4.2	5.0		4.0	5.0	
Vehicle Extension (s)		3.0			3.5		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		391			309		369	937		118	675	
v/s Ratio Prot							0.08	c0.47		0.06	c0.36	
v/s Ratio Perm		c0.27			0.15							
v/c Ratio		0.98			0.57		0.40	0.92		0.89	0.99	
Uniform Delay, d1		32.6			28.5		30.7	20.3		41.7	28.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		40.7			2.7		0.3	15.5		49.7	32.5	
Delay (s)		73.3			31.3		31.0	35.8		91.4	60.8	
Level of Service		E			C		C	D		F	E	
Approach Delay (s)		73.3			31.3			35.1			65.0	
Approach LOS		E			C			D			E	
Intersection Summary												
HCM 2000 Control Delay		51.1			HCM 2000 Level of Service			D				
HCM 2000 Volume to Capacity ratio		1.00										
Actuated Cycle Length (s)		90.0			Sum of lost time (s)			14.2				
Intersection Capacity Utilization		84.1%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

40: Coast Hwy & Vista Way

9/8/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	22	147	48	216	117	369	54	691	286	309	581	26
Future Volume (vph)	22	147	48	216	117	369	54	691	286	309	581	26
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	16	16	16
Total Lost time (s)	5.0	5.0	5.0		4.9	4.9	4.2	5.0		4.2	5.0	
Lane Util. Factor	1.00	1.00	1.00		1.00	1.00	1.00	0.95		1.00	1.00	
Frpb, ped/bikes	1.00	1.00	0.98		1.00	1.00	1.00	0.99		1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Frt	1.00	1.00	0.85		1.00	0.85	1.00	0.96		1.00	0.99	
Flt Protected	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2006	1863	1557		1804	1794	1770	3792		2006	2098	
Flt Permitted	0.95	1.00	1.00		0.97	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)	2006	1863	1557		1804	1794	1770	3792		2006	2098	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	24	160	52	235	127	401	59	751	311	336	632	28
RTOR Reduction (vph)	0	0	46	0	0	242	0	49	0	0	2	0
Lane Group Flow (vph)	24	160	6	0	362	159	59	1013	0	336	658	0
Confl. Peds. (#/hr)			2	2					5			
Confl. Bikes (#/hr)									4			
Turn Type	Split	NA	Perm	Split	NA	pt+ov	Prot	NA		Prot	NA	
Protected Phases	4	4		8	8	8 1	5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	10.0	10.0	10.0		19.2	33.0	3.0	21.2		13.8	32.0	
Effective Green, g (s)	10.0	10.0	10.0		19.2	33.0	3.0	21.2		13.8	32.0	
Actuated g/C Ratio	0.12	0.12	0.12		0.23	0.40	0.04	0.25		0.17	0.38	
Clearance Time (s)	5.0	5.0	5.0		4.9		4.2	5.0		4.2	5.0	
Vehicle Extension (s)	0.5	0.5	0.5		3.0		2.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	240	223	186		415	710	63	965		332	805	
v/s Ratio Prot	0.01	c0.09			c0.20	0.09	0.03	c0.27		c0.17	0.31	
v/s Ratio Perm			0.00									
v/c Ratio	0.10	0.72	0.03		0.87	0.22	0.94	1.05		1.01	0.82	
Uniform Delay, d1	32.6	35.3	32.4		30.9	16.7	40.1	31.0		34.8	23.0	
Progression Factor	1.00	1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2	0.1	8.8	0.0		17.9	0.2	89.3	42.8		52.5	6.5	
Delay (s)	32.7	44.1	32.4		48.8	16.8	129.3	73.9		87.2	29.5	
Level of Service	C	D	C		D	B	F	E		F	C	
Approach Delay (s)		40.4			32.0			76.8			49.0	
Approach LOS		D			C			E			D	
Intersection Summary												
HCM 2000 Control Delay			54.2									HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio			0.94									
Actuated Cycle Length (s)			83.3									Sum of lost time (s) 19.1
Intersection Capacity Utilization			87.3%									ICU Level of Service E
Analysis Period (min)			15									
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

12/21/2016



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	1116	26	61	1097	61	5	4	97	24	4	15
Future Volume (vph)	9	1116	26	61	1097	61	5	4	97	24	4	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.88			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.97	
Satd. Flow (prot)	1770	1856		1770	1848			1627			1726	
Flt Permitted	0.10	1.00		0.11	1.00			0.99			0.71	
Satd. Flow (perm)	188	1856		203	1848			1608			1267	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	1213	28	66	1192	66	5	4	105	26	4	16
RTOR Reduction (vph)	0	1	0	0	2	0	0	94	0	0	14	0
Lane Group Flow (vph)	10	1240	0	66	1256	0	0	20	0	0	32	0
Confl. Peds. (#/hr)			1	1			1					
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	55.4	55.4		55.4	55.4			7.4			7.4	
Effective Green, g (s)	55.4	55.4		55.4	55.4			7.4			7.4	
Actuated g/C Ratio	0.78	0.78		0.78	0.78			0.10			0.10	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	147	1452		158	1446			168			132	
v/s Ratio Prot		0.67			c0.68							
v/s Ratio Perm	0.05			0.32				0.01			c0.03	
v/c Ratio	0.07	0.85		0.42	0.87			0.12			0.24	
Uniform Delay, d1	1.8	5.1		2.5	5.2			28.7			29.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	5.1		1.8	5.8			0.3			0.9	
Delay (s)	2.0	10.2		4.3	11.1			29.1			30.1	
Level of Service	A	B		A	B			C			C	
Approach Delay (s)		10.1			10.7			29.1			30.1	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay		11.5			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.79										
Actuated Cycle Length (s)		70.8			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		77.2%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/25/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Future Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	82	427	316	91	846	199	210	238	87	246	297	211
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	894	400	132	894	400	422	443	376	422	443	376
Arrive On Green	0.07	0.24	0.24	0.07	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	3681	1647	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	82	427	316	91	846	199	210	238	87	246	297	211
Grp Sat Flow(s),veh/h/ln	1845	1840	1647	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	3.0	7.0	12.6	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Cycle Q Clear(g_c), s	3.0	7.0	12.6	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	132	894	400	132	894	400	422	443	376	422	443	376
V/C Ratio(X)	0.62	0.48	0.79	0.69	0.95	0.50	0.50	0.54	0.23	0.58	0.67	0.56
Avail Cap(c_a), veh/h	132	894	400	132	894	400	422	443	376	422	443	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.6	22.7	24.8	31.7	26.1	22.8	23.5	23.7	22.0	24.0	24.6	23.9
Incr Delay (d2), s/veh	20.1	1.8	14.7	25.7	19.6	4.4	4.2	4.6	1.4	5.8	7.9	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	3.7	7.3	2.7	10.4	3.8	4.0	4.6	1.5	4.9	6.2	4.2
LnGrp Delay(d),s/veh	51.7	24.5	39.5	57.5	45.7	27.2	27.7	28.4	23.4	29.8	32.5	29.8
LnGrp LOS	D	C	D	E	D	C	C	C	C	C	C	C
Approach Vol, veh/h		825			1136			535			754	
Approach Delay, s/veh		33.0			43.4			27.3			30.9	
Approach LOS		C			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	9.0	21.0		20.0	9.0	21.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	5.0	17.0		16.0	5.0	17.0				
Max Q Clear Time (g_c+I1), s		9.6	5.4	14.6		11.8	5.0	17.8				
Green Ext Time (p_c), s		1.3	0.0	1.0		1.4	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			35.2									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd

02/22/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	916	284	88	807	170	361	96	141	403	234	374
Future Volume (veh/h)	58	916	284	88	807	170	361	96	141	403	234	374
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	63	996	309	96	877	185	248	306	153	346	383	407
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	105	946	423	105	946	423	422	443	376	422	443	376
Arrive On Green	0.06	0.26	0.26	0.06	0.26	0.26	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	3681	1647	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	63	996	309	96	877	185	248	306	153	346	383	407
Grp Sat Flow(s),veh/h/ln	1845	1840	1647	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	2.3	18.0	12.0	3.6	16.3	6.6	8.4	10.1	5.5	12.5	13.3	16.0
Cycle Q Clear(g_c), s	2.3	18.0	12.0	3.6	16.3	6.6	8.4	10.1	5.5	12.5	13.3	16.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	105	946	423	105	946	423	422	443	376	422	443	376
V/C Ratio(X)	0.60	1.05	0.73	0.91	0.93	0.44	0.59	0.69	0.41	0.82	0.86	1.08
Avail Cap(c_a), veh/h	105	946	423	105	946	423	422	443	376	422	443	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	26.0	23.8	32.8	25.4	21.8	24.1	24.7	23.0	25.6	26.0	27.0
Incr Delay (d2), s/veh	22.5	44.0	10.6	65.9	16.1	3.3	5.9	8.6	3.2	16.2	19.7	69.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	14.9	6.6	3.8	10.3	3.4	5.0	6.4	2.8	8.2	9.5	14.5
LnGrp Delay(d),s/veh	54.8	70.0	34.3	98.7	41.5	25.0	30.0	33.3	26.2	41.9	45.6	96.9
LnGrp LOS	D	F	C	F	D	C	C	C	C	D	D	F
Approach Vol, veh/h	1368				1158				707			
Approach Delay, s/veh	61.2				43.6				30.6			
Approach LOS	E				D				C			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	20.0		8.0	22.0	20.0		8.0	22.0				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	16.0		4.0	18.0	16.0		4.0	18.0				
Max Q Clear Time (g_c+I1), s	12.1		5.6	20.0	18.0		4.3	18.3				
Green Ext Time (p_c), s	1.2		0.0	0.0	0.0		0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	52.0											
HCM 2010 LOS	D											
Notes												

Appendix O.2 – Analysis Output Sheets (Mitigation - Future with Project Existing SR-78)

HCM Signalized Intersection Capacity Analysis

4: Coast Hwy & Surfrider Way

07/03/2018

														
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR		
Lane Configurations														
Traffic Volume (vph)	245	81	102	17	71	43	72	721	27	69	729	177		
Future Volume (vph)	245	81	102	17	71	43	72	721	27	69	729	177		
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900		
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12		
Total Lost time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0		
Lane Util. Factor		1.00	1.00		1.00		1.00	1.00		1.00	0.95	0.95		
Frt		1.00	0.85		0.96		1.00	0.99		1.00	1.00	0.85		
Flt Protected		0.96	1.00		0.99		0.95	1.00		0.95	1.00	1.00		
Satd. Flow (prot)		1795	1583		1768		1770	1853		1770	1763	1504		
Flt Permitted		0.70	1.00		0.95		0.13	1.00		0.14	1.00	1.00		
Satd. Flow (perm)		1302	1583		1686		239	1853		266	1763	1504		
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92		
Adj. Flow (vph)	266	88	111	18	77	47	78	784	29	75	792	192		
RTOR Reduction (vph)	0	0	71	0	30	0	0	2	0	0	1	80		
Lane Group Flow (vph)	0	354	40	0	112	0	78	811	0	75	810	93		
Turn Type	Perm	NA	Perm	Perm	NA		Perm	NA		Perm	NA	Perm		
Protected Phases		4			8			2			6			
Permitted Phases	4		4	8			2			6		6		
Actuated Green, G (s)		21.6	21.6		21.6		31.2	31.2		32.4	32.4	32.4		
Effective Green, g (s)		21.6	21.6		21.6		31.2	31.2		32.4	32.4	32.4		
Actuated g/C Ratio		0.36	0.36		0.36		0.52	0.52		0.54	0.54	0.54		
Clearance Time (s)		3.0	3.0		3.0		4.2	4.2		3.0	3.0	3.0		
Vehicle Extension (s)		7.0	7.0		7.0		3.0	3.0		7.0	7.0	7.0		
Lane Grp Cap (vph)		468	569		606		124	963		143	952	812		
v/s Ratio Prot								0.44			c0.46			
v/s Ratio Perm		c0.27	0.03		0.07		0.33			0.28		0.06		
v/c Ratio		0.76	0.07		0.18		0.63	0.84		0.52	0.85	0.12		
Uniform Delay, d1		16.9	12.6		13.2		10.3	12.3		8.9	11.7	6.8		
Progression Factor		1.00	1.00		1.00		0.89	0.85		1.00	1.00	1.00		
Incremental Delay, d2		9.8	0.2		0.5		19.5	7.9		13.1	9.4	0.3		
Delay (s)		26.6	12.8		13.7		28.6	18.4		21.9	21.2	7.1		
Level of Service		C	B		B		C	B		C	C	A		
Approach Delay (s)		23.3			13.7			19.3			18.9			
Approach LOS		C			B			B			B			
Intersection Summary														
HCM 2000 Control Delay			19.6									HCM 2000 Level of Service	B	
HCM 2000 Volume to Capacity ratio			0.83											
Actuated Cycle Length (s)			60.0							7.2				
Intersection Capacity Utilization			80.6%										ICU Level of Service	D
Analysis Period (min)			15											
c Critical Lane Group														

HCM Signalized Intersection Capacity Analysis

6: Coast Hwy & Pier View Way

07/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	27	79	4	27	10	60	810	9	5	810	136
Future Volume (vph)	72	27	79	4	27	10	60	810	9	5	810	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	16	12	12	16	16	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.97		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.97	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.96		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	1810		1770	2024		1770	1860		2006	1812	
Flt Permitted	0.73	1.00		0.68	1.00		0.18	1.00		0.25	1.00	
Satd. Flow (perm)	1323	1810		1272	2024		336	1860		522	1812	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	78	29	86	4	29	11	65	880	10	5	880	148
RTOR Reduction (vph)	0	75	0	0	10	0	0	1	0	0	7	0
Lane Group Flow (vph)	78	40	0	4	30	0	65	889	0	5	1021	0
Confl. Peds. (#/hr)	16		11				10					10
Confl. Bikes (#/hr)			2									1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.8	7.8		7.8	7.8		44.2	44.2		44.2	44.2	
Effective Green, g (s)	7.8	7.8		7.8	7.8		44.2	44.2		44.2	44.2	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.74	0.74		0.74	0.74	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	171	235		165	263		247	1370		384	1334	
v/s Ratio Prot		0.02			0.02			0.48			c0.56	
v/s Ratio Perm	c0.06			0.00			0.19			0.01		
v/c Ratio	0.46	0.17		0.02	0.12		0.26	0.65		0.01	0.77	
Uniform Delay, d1	24.1	23.2		22.8	23.1		2.6	4.0		2.1	4.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.83	0.73	
Incremental Delay, d2	1.9	0.3		0.1	0.2		2.6	2.4		0.1	3.9	
Delay (s)	26.1	23.6		22.8	23.3		5.2	6.4		1.8	7.4	
Level of Service	C	C		C	C		A	A		A	A	
Approach Delay (s)		24.6			23.2			6.3			7.3	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		8.7					HCM 2000 Level of Service		A			
HCM 2000 Volume to Capacity ratio		0.72										
Actuated Cycle Length (s)		60.0					Sum of lost time (s)		8.0			
Intersection Capacity Utilization		69.2%					ICU Level of Service		C			
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

07/03/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	1148	24	0	0	0	0	13	31	56	49	0
Future Volume (vph)	37	1148	24	0	0	0	0	13	31	56	49	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		1.00						0.90			1.00	
Flt Protected		1.00						1.00			0.97	
Satd. Flow (prot)		3523						1685			1814	
Flt Permitted		1.00						1.00			0.85	
Satd. Flow (perm)		3523						1685			1589	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	1248	26	0	0	0	0	14	34	61	53	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	18	0	0	0	0
Lane Group Flow (vph)	0	1311	0	0	0	0	0	30	0	0	114	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		20.7						16.3			16.3	
Effective Green, g (s)		20.7						16.3			16.3	
Actuated g/C Ratio		0.46						0.36			0.36	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		1620						610			575	
v/s Ratio Prot								0.02				
v/s Ratio Perm		0.37									c0.07	
v/c Ratio		0.81						0.05			0.20	
Uniform Delay, d1		10.5						9.3			9.9	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		3.1						0.1			0.8	
Delay (s)		13.5						9.5			10.6	
Level of Service		B						A			B	
Approach Delay (s)		13.5			0.0			9.5			10.6	
Approach LOS		B			A			A			B	
Intersection Summary												
HCM 2000 Control Delay		13.2										
HCM 2000 Volume to Capacity ratio		0.54										
Actuated Cycle Length (s)		45.0										
Intersection Capacity Utilization		52.6%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

07/03/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	15	358	21	20	296	77	29	46	38	84	28	23
Future Volume (vph)	15	358	21	20	296	77	29	46	38	84	28	23
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	16	389	23	22	322	84	32	50	41	91	30	25
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	428	428	123	146								
Volume Left (vph)	16	22	32	91								
Volume Right (vph)	23	84	41	25								
Hadj (s)	0.01	-0.07	-0.11	0.06								
Departure Headway (s)	5.5	5.4	6.5	6.6								
Degree Utilization, x	0.65	0.65	0.22	0.27								
Capacity (veh/h)	625	636	460	459								
Control Delay (s)	18.3	17.8	11.3	11.9								
Approach Delay (s)	18.3	17.8	11.3	11.9								
Approach LOS	C	C	B	B								
Intersection Summary												
Delay				16.5								
Level of Service				C								
Intersection Capacity Utilization				49.3%	ICU Level of Service	A						
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

29: Coast Hwy & Morse St

07/03/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	42	16	15	56	16	190	20	846	103	243	881	19
Future Volume (vph)	42	16	15	56	16	190	20	846	103	243	881	19
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	10	11	16
Total Lost time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frpb, ped/bikes		0.99			1.00	1.00	1.00	1.00		1.00	1.00	
Flpb, ped/bikes		1.00			0.99	1.00	1.00	1.00		1.00	1.00	
Frt		0.97			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1749			1783	1794	1770	2070		1652	1795	
Flt Permitted		0.78			0.76	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1398			1411	1794	1770	2070		1652	1795	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	46	17	16	61	17	207	22	920	112	264	958	21
RTOR Reduction (vph)	0	11	0	0	0	185	0	4	0	0	1	0
Lane Group Flow (vph)	0	68	0	0	78	22	22	1028	0	264	978	0
Confl. Peds. (#/hr)			4	4					3			
Confl. Bikes (#/hr)			1						2			
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		9.5			9.5	9.5	1.5	51.1		15.8	65.4	
Effective Green, g (s)		9.5			9.5	9.5	1.5	51.1		15.8	65.4	
Actuated g/C Ratio		0.11			0.11	0.11	0.02	0.57		0.18	0.73	
Clearance Time (s)		4.6			4.6	4.6	4.2	4.9		4.2	4.9	
Vehicle Extension (s)		2.0			2.0	2.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		147			148	189	29	1173		289	1302	
v/s Ratio Prot							0.01	c0.50		c0.16	0.55	
v/s Ratio Perm		0.05			c0.06	0.01						
v/c Ratio		0.46			0.53	0.12	0.76	0.88		0.91	0.75	
Uniform Delay, d1		37.9			38.2	36.5	44.1	16.8		36.5	7.4	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.8			1.6	0.1	71.7	7.6		31.2	2.5	
Delay (s)		38.8			39.7	36.6	115.8	24.4		67.7	9.9	
Level of Service		D			D	D	F	C		E	A	
Approach Delay (s)		38.8			37.5			26.3			22.2	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay		25.9										
HCM 2000 Volume to Capacity ratio		0.84										
Actuated Cycle Length (s)		90.1								13.7		
Intersection Capacity Utilization		87.5%								E		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

35: Coast Hwy & Cassidy St

07/05/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔		↖	↗		↖	↗	
Traffic Volume (vph)	135	152	129	125	88	31	142	817	99	123	648	50
Future Volume (vph)	135	152	129	125	88	31	142	817	99	123	648	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Frt		0.96			0.98		1.00	0.98		1.00	0.99	
Flt Protected		0.98			0.98		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1756			1785		1770	1832		1770	1843	
Flt Permitted		0.78			0.53		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1392			978		1770	1832		1770	1843	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	147	165	140	136	96	34	154	888	108	134	704	54
RTOR Reduction (vph)	0	13	0	0	4	0	0	4	0	0	3	0
Lane Group Flow (vph)	0	439	0	0	262	0	154	992	0	134	755	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8								
Actuated Green, G (s)		35.0			35.0		13.3	64.0		9.0	59.7	
Effective Green, g (s)		35.0			35.0		13.3	64.0		9.0	59.7	
Actuated g/C Ratio		0.29			0.29		0.11	0.53		0.08	0.50	
Clearance Time (s)		4.0			4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		406			285		196	977		132	916	
v/s Ratio Prot							c0.09	c0.54		c0.08	0.41	
v/s Ratio Perm		c0.31			0.27							
v/c Ratio		1.08			0.92		0.79	1.02		1.02	0.82	
Uniform Delay, d1		42.5			41.1		52.0	28.0		55.5	25.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		67.8			32.4		18.4	32.7		82.4	6.1	
Delay (s)		110.3			73.5		70.4	60.7		137.9	31.8	
Level of Service		F			E		E	E		F	C	
Approach Delay (s)		110.3			73.5			62.0			47.7	
Approach LOS		F			E			E			D	
Intersection Summary												
HCM 2000 Control Delay		66.4			HCM 2000 Level of Service			E				
HCM 2000 Volume to Capacity ratio		1.04										
Actuated Cycle Length (s)		120.0			Sum of lost time (s)			12.0				
Intersection Capacity Utilization		91.5%			ICU Level of Service			F				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

07/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1249	30	72	1228	92	6	5	114	36	5	22
Future Volume (vph)	14	1249	30	72	1228	92	6	5	114	36	5	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.88			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.97	
Satd. Flow (prot)	1770	1855		1770	1843			1629			1725	
Flt Permitted	0.06	1.00		0.08	1.00			0.99			0.38	
Satd. Flow (perm)	104	1855		148	1843			1611			671	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	1358	33	78	1335	100	7	5	124	39	5	24
RTOR Reduction (vph)	0	1	0	0	2	0	0	104	0	0	17	0
Lane Group Flow (vph)	15	1390	0	78	1433	0	0	32	0	0	51	0
Confl. Peds. (#/hr)			1	1			1					
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	96.1	96.1		96.1	96.1			10.6			10.6	
Effective Green, g (s)	96.1	96.1		96.1	96.1			10.6			10.6	
Actuated g/C Ratio	0.84	0.84		0.84	0.84			0.09			0.09	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	87	1554		124	1544			148			62	
v/s Ratio Prot		0.75			c0.78							
v/s Ratio Perm	0.14			0.53				0.02			c0.08	
v/c Ratio	0.17	0.89		0.63	0.93			0.21			0.82	
Uniform Delay, d1	1.8	6.0		3.2	6.8			48.2			51.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.9	7.1		9.6	10.0			0.7			54.6	
Delay (s)	2.7	13.1		12.8	16.8			48.9			105.7	
Level of Service	A	B		B	B			D			F	
Approach Delay (s)		13.0			16.6			48.9			105.7	
Approach LOS		B			B			D			F	
Intersection Summary												
HCM 2000 Control Delay		18.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.92										
Actuated Cycle Length (s)		114.7			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		87.1%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/22/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Future Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	82	427	316	91	846	199	210	238	87	246	297	211
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	894	400	132	894	400	422	443	376	422	443	376
Arrive On Green	0.07	0.24	0.24	0.07	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	3681	1647	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	82	427	316	91	846	199	210	238	87	246	297	211
Grp Sat Flow(s),veh/h/ln	1845	1840	1647	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	3.0	7.0	12.6	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Cycle Q Clear(g_c), s	3.0	7.0	12.6	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	132	894	400	132	894	400	422	443	376	422	443	376
V/C Ratio(X)	0.62	0.48	0.79	0.69	0.95	0.50	0.50	0.54	0.23	0.58	0.67	0.56
Avail Cap(c_a), veh/h	132	894	400	132	894	400	422	443	376	422	443	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.6	22.7	24.8	31.7	26.1	22.8	23.5	23.7	22.0	24.0	24.6	23.9
Incr Delay (d2), s/veh	20.1	1.8	14.7	25.7	19.6	4.4	4.2	4.6	1.4	5.8	7.9	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	3.7	7.3	2.7	10.4	3.8	4.0	4.6	1.5	4.9	6.2	4.2
LnGrp Delay(d),s/veh	51.7	24.5	39.5	57.5	45.7	27.2	27.7	28.4	23.4	29.8	32.5	29.8
LnGrp LOS	D	C	D	E	D	C	C	C	C	C	C	C
Approach Vol, veh/h		825			1136			535			754	
Approach Delay, s/veh		33.0			43.4			27.3			30.9	
Approach LOS		C			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	9.0	21.0		20.0	9.0	21.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	5.0	17.0		16.0	5.0	17.0				
Max Q Clear Time (g_c+I1), s		9.6	5.4	14.6		11.8	5.0	17.8				
Green Ext Time (p_c), s		1.3	0.0	1.0		1.4	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			35.2									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/22/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	868	283	88	765	185	360	99	141	437	240	390
Future Volume (veh/h)	61	868	283	88	765	185	360	99	141	437	240	390
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	66	943	308	96	832	201	250	306	153	368	411	424
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	105	894	400	105	894	400	448	470	400	422	443	376
Arrive On Green	0.06	0.24	0.24	0.06	0.24	0.24	0.24	0.24	0.24	0.23	0.23	0.23
Sat Flow, veh/h	1845	3681	1647	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	66	943	308	96	832	201	250	306	153	368	411	424
Grp Sat Flow(s),veh/h/ln	1845	1840	1647	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	2.4	17.0	12.2	3.6	15.5	7.4	8.3	9.9	5.4	13.5	14.5	16.0
Cycle Q Clear(g_c), s	2.4	17.0	12.2	3.6	15.5	7.4	8.3	9.9	5.4	13.5	14.5	16.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	105	894	400	105	894	400	448	470	400	422	443	376
V/C Ratio(X)	0.63	1.05	0.77	0.91	0.93	0.50	0.56	0.65	0.38	0.87	0.93	1.13
Avail Cap(c_a), veh/h	105	894	400	105	894	400	448	470	400	422	443	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.3	26.5	24.7	32.8	25.9	22.9	23.2	23.8	22.1	26.0	26.4	27.0
Incr Delay (d2), s/veh	24.9	45.7	13.4	65.9	17.4	4.5	4.9	6.8	2.8	21.3	28.1	85.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	14.2	7.0	3.8	10.0	3.8	4.9	6.2	2.8	9.3	11.2	16.1
LnGrp Delay(d),s/veh	57.2	72.2	38.0	98.7	43.3	27.3	28.2	30.7	24.9	47.3	54.5	112.3
LnGrp LOS	E	F	D	F	D	C	C	C	C	D	D	F
Approach Vol, veh/h	1317				1129				709		1203	
Approach Delay, s/veh	63.4				45.2				28.5		72.7	
Approach LOS	E				D				C		E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	21.0		8.0	21.0	20.0		8.0	21.0				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	17.0		4.0	17.0	16.0		4.0	17.0				
Max Q Clear Time (g_c+I1), s	11.9		5.6	19.0	18.0		4.4	17.5				
Green Ext Time (p_c), s	1.5		0.0	0.0	0.0		0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	55.6											
HCM 2010 LOS	E											
Notes												

Appendix P.1 – Analysis Output Sheets (Mitigation - Future with Project Sub- Alternative Build Out SR-78)

HCM Signalized Intersection Capacity Analysis

5: Coast Hwy & Civic Center Dr

08/01/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	40	34	37	66	143	28	732	101	73	764	31
Future Volume (vph)	37	40	34	37	66	143	28	732	101	73	764	31
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	16	12	12	12	12	16	12	16	12	16	16	16
Total Lost time (s)	4.2	4.2		4.2	4.2		4.6	4.6		4.6	4.6	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.93		1.00	0.90		1.00	0.98		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	2006	1734		1770	1672		1770	2073		2006	2099	
Flt Permitted	0.45	1.00		0.70	1.00		0.25	1.00		0.23	1.00	
Satd. Flow (perm)	960	1734		1313	1672		462	2073		478	2099	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	43	37	40	72	155	30	796	110	79	830	34
RTOR Reduction (vph)	0	32	0	0	132	0	0	5	0	0	1	0
Lane Group Flow (vph)	40	48	0	40	95	0	30	901	0	79	863	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.8	8.8		8.8	8.8		42.4	42.4		42.4	42.4	
Effective Green, g (s)	8.8	8.8		8.8	8.8		42.4	42.4		42.4	42.4	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.71	0.71		0.71	0.71	
Clearance Time (s)	4.2	4.2		4.2	4.2		4.6	4.6		4.6	4.6	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		4.0	4.0		3.0	3.0	
Lane Grp Cap (vph)	140	254		192	245		326	1464		337	1483	
v/s Ratio Prot		0.03			c0.06			c0.43			0.41	
v/s Ratio Perm	0.04			0.03			0.06			0.17		
v/c Ratio	0.29	0.19		0.21	0.39		0.09	0.62		0.23	0.58	
Uniform Delay, d1	22.8	22.5		22.5	23.2		2.8	4.6		3.1	4.4	
Progression Factor	1.00	1.00		1.00	1.00		0.73	0.56		0.48	0.35	
Incremental Delay, d2	1.1	0.4		0.5	1.0		0.5	1.7		1.1	1.2	
Delay (s)	23.9	22.8		23.1	24.2		2.5	4.3		2.6	2.7	
Level of Service	C	C		C	C		A	A		A	A	
Approach Delay (s)		23.2			24.0			4.2			2.7	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		6.9			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.58										
Actuated Cycle Length (s)		60.0			Sum of lost time (s)			8.8				
Intersection Capacity Utilization		83.2%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

08/01/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	49	1277	26	0	0	0	0	13	33	59	48	0
Future Volume (vph)	49	1277	26	0	0	0	0	13	33	59	48	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		1.00						0.90			1.00	
Flt Protected		1.00						1.00			0.97	
Satd. Flow (prot)		3523						1682			1813	
Flt Permitted		1.00						1.00			0.81	
Satd. Flow (perm)		3523						1682			1500	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	53	1388	28	0	0	0	0	14	36	64	52	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	23	0	0	0	0
Lane Group Flow (vph)	0	1467	0	0	0	0	0	27	0	0	116	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		23.9						8.4			8.4	
Effective Green, g (s)		23.9						8.4			8.4	
Actuated g/C Ratio		0.59						0.21			0.21	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		2089						350			312	
v/s Ratio Prot								0.02				
v/s Ratio Perm		0.42									c0.08	
v/c Ratio		0.70						0.08			0.37	
Uniform Delay, d1		5.7						12.8			13.7	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		1.1						0.1			0.7	
Delay (s)		6.8						12.9			14.4	
Level of Service		A						B			B	
Approach Delay (s)		6.8			0.0			12.9			14.4	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		7.5						HCM 2000 Level of Service		A		
HCM 2000 Volume to Capacity ratio		0.62										
Actuated Cycle Length (s)		40.3						Sum of lost time (s)		8.0		
Intersection Capacity Utilization		56.7%						ICU Level of Service		B		
Analysis Period (min)		15										
c Critical Lane Group												

Appendix P.2 – Analysis Output Sheets (Mitigation - Future with Project Sub- Alternative Existing SR-78)

HCM Signalized Intersection Capacity Analysis

6: Coast Hwy & Pier View Way

08/01/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	86	0	93	0	0	0	60	813	0	0	810	136
Future Volume (vph)	86	0	93	0	0	0	60	813	0	0	810	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	16	12	12	16	16	12	12
Total Lost time (s)	4.0	4.0					4.0	4.0			4.0	
Lane Util. Factor	1.00	1.00					1.00	1.00			1.00	
Frpb, ped/bikes	1.00	0.95					1.00	1.00			0.99	
Flpb, ped/bikes	0.97	1.00					1.00	1.00			1.00	
Frt	1.00	0.85					1.00	1.00			0.98	
Flt Protected	0.95	1.00					0.95	1.00			1.00	
Satd. Flow (prot)	1717	1713					1770	1863			1812	
Flt Permitted	0.76	1.00					0.17	1.00			1.00	
Satd. Flow (perm)	1368	1713					325	1863			1812	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	93	0	101	0	0	0	65	884	0	0	880	148
RTOR Reduction (vph)	0	87	0	0	0	0	0	0	0	0	7	0
Lane Group Flow (vph)	93	14	0	0	0	0	65	884	0	0	1021	0
Confl. Peds. (#/hr)	16		11				10					10
Confl. Bikes (#/hr)			2									1
Turn Type	Perm	NA		Perm			Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	8.3	8.3					43.7	43.7			43.7	
Effective Green, g (s)	8.3	8.3					43.7	43.7			43.7	
Actuated g/C Ratio	0.14	0.14					0.73	0.73			0.73	
Clearance Time (s)	4.0	4.0					4.0	4.0			4.0	
Vehicle Extension (s)	3.0	3.0					3.0	3.0			3.0	
Lane Grp Cap (vph)	189	236					236	1356			1319	
v/s Ratio Prot		0.01						0.47			c0.56	
v/s Ratio Perm	c0.07						0.20					
v/c Ratio	0.49	0.06					0.28	0.65			0.77	
Uniform Delay, d1	23.9	22.5					2.8	4.2			5.1	
Progression Factor	1.00	1.00					1.00	1.00			0.29	
Incremental Delay, d2	2.0	0.1					2.9	2.4			4.1	
Delay (s)	25.9	22.6					5.6	6.7			5.6	
Level of Service	C	C					A	A			A	
Approach Delay (s)		24.2			0.0			6.6			5.6	
Approach LOS		C			A			A			A	
Intersection Summary												
HCM 2000 Control Delay		7.7			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.73										
Actuated Cycle Length (s)		60.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		66.6%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

08/01/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	44	1148	24	0	0	0	0	13	31	56	49	0
Future Volume (vph)	44	1148	24	0	0	0	0	13	31	56	49	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		1.00						0.90			1.00	
Flt Protected		1.00						1.00			0.97	
Satd. Flow (prot)		3522						1685			1814	
Flt Permitted		1.00						1.00			0.81	
Satd. Flow (perm)		3522						1685			1515	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	48	1248	26	0	0	0	0	14	34	61	53	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	23	0	0	0	0
Lane Group Flow (vph)	0	1319	0	0	0	0	0	25	0	0	114	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		19.7						8.0			8.0	
Effective Green, g (s)		19.7						8.0			8.0	
Actuated g/C Ratio		0.55						0.22			0.22	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		1943						377			339	
v/s Ratio Prot								0.02				
v/s Ratio Perm		0.37									c0.08	
v/c Ratio		0.68						0.07			0.34	
Uniform Delay, d1		5.7						10.9			11.6	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		1.0						0.1			0.6	
Delay (s)		6.7						11.0			12.2	
Level of Service		A						B			B	
Approach Delay (s)		6.7			0.0			11.0			12.2	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		7.3										
HCM 2000 Volume to Capacity ratio		0.58										
Actuated Cycle Length (s)		35.7										
Intersection Capacity Utilization		52.8%										
Analysis Period (min)		15										
c Critical Lane Group												

Appendix Q.1 – Analysis Output Sheets (Mitigation - Future with Project Alternative 1 Build Out SR-78)

HCM Signalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

9/8/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	1277	26	0	0	0	0	13	33	59	48	0
Future Volume (vph)	39	1277	26	0	0	0	0	13	33	59	48	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		1.00						0.90			1.00	
Flt Protected		1.00						1.00			0.97	
Satd. Flow (prot)		3524						1682			1813	
Flt Permitted		1.00						1.00			0.84	
Satd. Flow (perm)		3524						1682			1569	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	1388	28	0	0	0	0	14	36	64	52	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	19	0	0	0	0
Lane Group Flow (vph)	0	1455	0	0	0	0	0	31	0	0	116	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		25.5						16.5			16.5	
Effective Green, g (s)		25.5						16.5			16.5	
Actuated g/C Ratio		0.51						0.33			0.33	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		1797						555			517	
v/s Ratio Prot								0.02				
v/s Ratio Perm		0.41									c0.07	
v/c Ratio		0.81						0.06			0.22	
Uniform Delay, d1		10.2						11.4			12.1	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		2.8						0.2			1.0	
Delay (s)		13.0						11.6			13.1	
Level of Service		B						B			B	
Approach Delay (s)		13.0			0.0			11.6			13.1	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		13.0										
HCM 2000 Volume to Capacity ratio		0.58										
Actuated Cycle Length (s)		50.0										
Intersection Capacity Utilization		56.4%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

9/8/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	14	375	22	20	310	69	30	42	40	75	26	21
Future Volume (vph)	14	375	22	20	310	69	30	42	40	75	26	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	408	24	22	337	75	33	46	43	82	28	23
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	447	434	122	133								
Volume Left (vph)	15	22	33	82								
Volume Right (vph)	24	75	43	23								
Hadj (s)	0.01	-0.06	-0.12	0.05								
Departure Headway (s)	5.5	5.4	6.5	6.6								
Degree Utilization, x	0.68	0.65	0.22	0.24								
Capacity (veh/h)	447	635	459	453								
Control Delay (s)	19.2	18.0	11.3	11.7								
Approach Delay (s)	19.2	18.0	11.3	11.7								
Approach LOS	C	C	B	B								
Intersection Summary												
Delay				17.0								
Level of Service				C								
Intersection Capacity Utilization				49.3%	ICU Level of Service		A					
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

12/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	1116	26	61	1097	61	5	4	97	24	4	15
Future Volume (vph)	9	1116	26	61	1097	61	5	4	97	24	4	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.88			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.97	
Satd. Flow (prot)	1770	1856		1770	1848			1627			1726	
Flt Permitted	0.10	1.00		0.11	1.00			0.99			0.71	
Satd. Flow (perm)	188	1856		203	1848			1608			1267	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	1213	28	66	1192	66	5	4	105	26	4	16
RTOR Reduction (vph)	0	1	0	0	2	0	0	94	0	0	14	0
Lane Group Flow (vph)	10	1240	0	66	1256	0	0	20	0	0	32	0
Confl. Peds. (#/hr)			1	1			1					
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	55.4	55.4		55.4	55.4			7.4			7.4	
Effective Green, g (s)	55.4	55.4		55.4	55.4			7.4			7.4	
Actuated g/C Ratio	0.78	0.78		0.78	0.78			0.10			0.10	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	147	1452		158	1446			168			132	
v/s Ratio Prot		0.67			c0.68							
v/s Ratio Perm	0.05			0.32				0.01			c0.03	
v/c Ratio	0.07	0.85		0.42	0.87			0.12			0.24	
Uniform Delay, d1	1.8	5.1		2.5	5.2			28.7			29.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	5.1		1.8	5.8			0.3			0.9	
Delay (s)	2.0	10.2		4.3	11.1			29.1			30.1	
Level of Service	A	B		A	B			C			C	
Approach Delay (s)		10.1			10.7			29.1			30.1	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay		11.5			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.79										
Actuated Cycle Length (s)		70.8			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		77.2%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/25/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Future Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	82	427	316	91	846	199	210	238	87	246	297	211
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	894	400	132	894	400	422	443	376	422	443	376
Arrive On Green	0.02	0.08	0.08	0.07	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	3681	1647	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	82	427	316	91	846	199	210	238	87	246	297	211
Grp Sat Flow(s),veh/h/ln	1845	1840	1647	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	3.1	7.8	13.2	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Cycle Q Clear(g_c), s	3.1	7.8	13.2	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	132	894	400	132	894	400	422	443	376	422	443	376
V/C Ratio(X)	0.62	0.48	0.79	0.69	0.95	0.50	0.50	0.54	0.23	0.58	0.67	0.56
Avail Cap(c_a), veh/h	132	894	400	132	894	400	422	443	376	422	443	376
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	27.9	30.4	31.7	26.1	22.8	23.5	23.7	22.0	24.0	24.6	23.9
Incr Delay (d2), s/veh	20.1	1.8	14.7	25.7	19.6	4.4	4.2	4.6	1.4	5.8	7.9	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	4.2	7.7	2.7	10.4	3.8	4.0	4.6	1.5	4.9	6.2	4.2
LnGrp Delay(d),s/veh	53.4	29.8	45.1	57.5	45.7	27.2	27.7	28.4	23.4	29.8	32.5	29.8
LnGrp LOS	D	C	D	E	D	C	C	C	C	C	C	C
Approach Vol, veh/h		825			1136			535			754	
Approach Delay, s/veh		38.0			43.4			27.3			30.9	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	9.0	21.0		20.0	9.0	21.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	5.0	17.0		16.0	5.0	17.0				
Max Q Clear Time (g_c+I1), s		9.6	5.4	15.2		11.8	5.1	17.8				
Green Ext Time (p_c), s		1.3	0.0	0.8		1.4	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			36.5									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd

02/22/2019

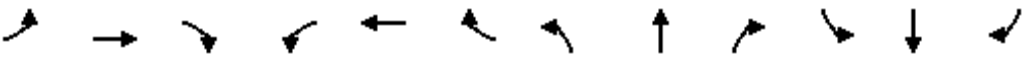
												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	916	284	88	807	170	361	96	141	403	234	374
Future Volume (veh/h)	58	916	284	88	807	170	361	96	141	403	234	374
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	63	996	309	96	877	185	248	306	153	346	383	407
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	105	946	423	105	946	423	422	443	376	422	443	376
Arrive On Green	0.06	0.26	0.26	0.06	0.26	0.26	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	3681	1647	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	63	996	309	96	877	185	248	306	153	346	383	407
Grp Sat Flow(s),veh/h/ln	1845	1840	1647	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	2.3	18.0	12.0	3.6	16.3	6.6	8.4	10.1	5.5	12.5	13.3	16.0
Cycle Q Clear(g_c), s	2.3	18.0	12.0	3.6	16.3	6.6	8.4	10.1	5.5	12.5	13.3	16.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	105	946	423	105	946	423	422	443	376	422	443	376
V/C Ratio(X)	0.60	1.05	0.73	0.91	0.93	0.44	0.59	0.69	0.41	0.82	0.86	1.08
Avail Cap(c_a), veh/h	105	946	423	105	946	423	422	443	376	422	443	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	26.0	23.8	32.8	25.4	21.8	24.1	24.7	23.0	25.6	26.0	27.0
Incr Delay (d2), s/veh	22.5	44.0	10.6	65.9	16.1	3.3	5.9	8.6	3.2	16.2	19.7	69.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	14.9	6.6	3.8	10.3	3.4	5.0	6.4	2.8	8.2	9.5	14.5
LnGrp Delay(d),s/veh	54.8	70.0	34.3	98.7	41.5	25.0	30.0	33.3	26.2	41.9	45.6	96.9
LnGrp LOS	D	F	C	F	D	C	C	C	C	D	D	F
Approach Vol, veh/h	1368				1158				707			
Approach Delay, s/veh	61.2				43.6				30.6			
Approach LOS	E				D				C			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	20.0		8.0	22.0	20.0		8.0	22.0				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	16.0		4.0	18.0	16.0		4.0	18.0				
Max Q Clear Time (g_c+I1), s	12.1		5.6	20.0	18.0		4.3	18.3				
Green Ext Time (p_c), s	1.2		0.0	0.0	0.0		0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	52.0											
HCM 2010 LOS	D											
Notes												

Appendix Q.2 – Analysis Output Sheets (Mitigation - Future with Project Alternative 1 Existing SR-78)

HCM Signalized Intersection Capacity Analysis

6: Coast Hwy & Pier View Way

07/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	27	79	4	27	10	60	810	9	5	810	136
Future Volume (vph)	72	27	79	4	27	10	60	810	9	5	810	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	16	12	12	16	16	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.97		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.97	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.96		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	1810		1770	2024		1770	1860		2006	1812	
Flt Permitted	0.73	1.00		0.68	1.00		0.18	1.00		0.25	1.00	
Satd. Flow (perm)	1323	1810		1272	2024		336	1860		522	1812	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	78	29	86	4	29	11	65	880	10	5	880	148
RTOR Reduction (vph)	0	75	0	0	10	0	0	1	0	0	7	0
Lane Group Flow (vph)	78	40	0	4	30	0	65	889	0	5	1021	0
Confl. Peds. (#/hr)	16		11				10					10
Confl. Bikes (#/hr)			2									1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.8	7.8		7.8	7.8		44.2	44.2		44.2	44.2	
Effective Green, g (s)	7.8	7.8		7.8	7.8		44.2	44.2		44.2	44.2	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.74	0.74		0.74	0.74	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	171	235		165	263		247	1370		384	1334	
v/s Ratio Prot		0.02			0.02			0.48			c0.56	
v/s Ratio Perm	c0.06			0.00			0.19			0.01		
v/c Ratio	0.46	0.17		0.02	0.12		0.26	0.65		0.01	0.77	
Uniform Delay, d1	24.1	23.2		22.8	23.1		2.6	4.0		2.1	4.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.83	0.73	
Incremental Delay, d2	1.9	0.3		0.1	0.2		2.6	2.4		0.1	3.9	
Delay (s)	26.1	23.6		22.8	23.3		5.2	6.4		1.8	7.4	
Level of Service	C	C		C	C		A	A		A	A	
Approach Delay (s)		24.6			23.2			6.3			7.3	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		8.7			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.72										
Actuated Cycle Length (s)		60.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		69.2%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

07/03/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	1148	24	0	0	0	0	13	31	56	49	0
Future Volume (vph)	37	1148	24	0	0	0	0	13	31	56	49	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		1.00						0.90			1.00	
Flt Protected		1.00						1.00			0.97	
Satd. Flow (prot)		3523						1685			1814	
Flt Permitted		1.00						1.00			0.85	
Satd. Flow (perm)		3523						1685			1589	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	1248	26	0	0	0	0	14	34	61	53	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	18	0	0	0	0
Lane Group Flow (vph)	0	1311	0	0	0	0	0	30	0	0	114	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		20.7						16.3			16.3	
Effective Green, g (s)		20.7						16.3			16.3	
Actuated g/C Ratio		0.46						0.36			0.36	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		1620						610			575	
v/s Ratio Prot								0.02				
v/s Ratio Perm		0.37									c0.07	
v/c Ratio		0.81						0.05			0.20	
Uniform Delay, d1		10.5						9.3			9.9	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		3.1						0.1			0.8	
Delay (s)		13.5						9.5			10.6	
Level of Service		B						A			B	
Approach Delay (s)		13.5			0.0			9.5			10.6	
Approach LOS		B			A			A			B	
Intersection Summary												
HCM 2000 Control Delay		13.2										
HCM 2000 Volume to Capacity ratio		0.54										
Actuated Cycle Length (s)		45.0										
Intersection Capacity Utilization		52.6%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

07/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1249	30	72	1228	92	6	5	114	36	5	22
Future Volume (vph)	14	1249	30	72	1228	92	6	5	114	36	5	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.88			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.97	
Satd. Flow (prot)	1770	1855		1770	1843			1629			1725	
Flt Permitted	0.06	1.00		0.08	1.00			0.99			0.38	
Satd. Flow (perm)	104	1855		148	1843			1611			671	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	1358	33	78	1335	100	7	5	124	39	5	24
RTOR Reduction (vph)	0	1	0	0	2	0	0	104	0	0	17	0
Lane Group Flow (vph)	15	1390	0	78	1433	0	0	32	0	0	51	0
Confl. Peds. (#/hr)			1	1			1					
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	96.1	96.1		96.1	96.1			10.6			10.6	
Effective Green, g (s)	96.1	96.1		96.1	96.1			10.6			10.6	
Actuated g/C Ratio	0.84	0.84		0.84	0.84			0.09			0.09	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	87	1554		124	1544			148			62	
v/s Ratio Prot		0.75			c0.78							
v/s Ratio Perm	0.14			0.53				0.02			c0.08	
v/c Ratio	0.17	0.89		0.63	0.93			0.21			0.82	
Uniform Delay, d1	1.8	6.0		3.2	6.8			48.2			51.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.9	7.1		9.6	10.0			0.7			54.6	
Delay (s)	2.7	13.1		12.8	16.8			48.9			105.7	
Level of Service	A	B		B	B			D			F	
Approach Delay (s)		13.0			16.6			48.9			105.7	
Approach LOS		B			B			D			F	
Intersection Summary												
HCM 2000 Control Delay		18.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.92										
Actuated Cycle Length (s)		114.7			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		87.1%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

47: Coast Hwy & Kelly St

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	43	27	31	26	197	10	317	30	180	300	62
Future Volume (vph)	28	43	27	31	26	197	10	317	30	180	300	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.96			0.90			0.99			0.98	
Flt Protected		0.99			0.99			1.00			0.98	
Satd. Flow (prot)		2005			1879			3954			3878	
Flt Permitted		0.87			0.94			0.94			0.73	
Satd. Flow (perm)		1778			1777			3714			2884	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	47	29	34	28	214	11	345	33	196	326	67
RTOR Reduction (vph)	0	23	0	0	167	0	0	15	0	0	21	0
Lane Group Flow (vph)	0	83	0	0	109	0	0	374	0	0	568	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		6.2			6.2			14.0			14.0	
Effective Green, g (s)		6.2			6.2			14.0			14.0	
Actuated g/C Ratio		0.22			0.22			0.50			0.50	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		390			390			1843			1431	
v/s Ratio Prot												
v/s Ratio Perm		0.05			0.06			0.10			0.20	
v/c Ratio		0.21			0.28			0.20			0.40	
Uniform Delay, d1		9.0			9.1			4.0			4.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.3			0.4			0.1			0.2	
Delay (s)		9.3			9.5			4.0			4.6	
Level of Service		A			A			A			A	
Approach Delay (s)		9.3			9.5			4.0			4.6	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay		5.8			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.36										
Actuated Cycle Length (s)		28.2			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		52.3%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/22/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Future Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	82	427	316	91	846	199	210	238	87	246	297	211
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	894	400	132	894	400	422	443	376	422	443	376
Arrive On Green	0.02	0.08	0.08	0.07	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	3681	1647	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	82	427	316	91	846	199	210	238	87	246	297	211
Grp Sat Flow(s),veh/h/ln	1845	1840	1647	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	3.1	7.8	13.2	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Cycle Q Clear(g_c), s	3.1	7.8	13.2	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	132	894	400	132	894	400	422	443	376	422	443	376
V/C Ratio(X)	0.62	0.48	0.79	0.69	0.95	0.50	0.50	0.54	0.23	0.58	0.67	0.56
Avail Cap(c_a), veh/h	132	894	400	132	894	400	422	443	376	422	443	376
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	27.9	30.4	31.7	26.1	22.8	23.5	23.7	22.0	24.0	24.6	23.9
Incr Delay (d2), s/veh	20.1	1.8	14.7	25.7	19.6	4.4	4.2	4.6	1.4	5.8	7.9	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	4.2	7.7	2.7	10.4	3.8	4.0	4.6	1.5	4.9	6.2	4.2
LnGrp Delay(d),s/veh	53.4	29.8	45.1	57.5	45.7	27.2	27.7	28.4	23.4	29.8	32.5	29.8
LnGrp LOS	D	C	D	E	D	C	C	C	C	C	C	C
Approach Vol, veh/h		825			1136			535			754	
Approach Delay, s/veh		38.0			43.4			27.3			30.9	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	9.0	21.0		20.0	9.0	21.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	5.0	17.0		16.0	5.0	17.0				
Max Q Clear Time (g_c+I1), s		9.6	5.4	15.2		11.8	5.1	17.8				
Green Ext Time (p_c), s		1.3	0.0	0.8		1.4	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			36.5									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/22/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 						 	
Traffic Volume (veh/h)	61	868	283	88	765	185	360	99	141	437	240	390
Future Volume (veh/h)	61	868	283	88	765	185	360	99	141	437	240	390
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	66	943	308	96	832	201	250	306	153	368	411	424
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	105	894	400	105	894	400	448	470	400	422	443	376
Arrive On Green	0.06	0.24	0.24	0.06	0.24	0.24	0.24	0.24	0.24	0.23	0.23	0.23
Sat Flow, veh/h	1845	3681	1647	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	66	943	308	96	832	201	250	306	153	368	411	424
Grp Sat Flow(s),veh/h/ln	1845	1840	1647	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	2.4	17.0	12.2	3.6	15.5	7.4	8.3	9.9	5.4	13.5	14.5	16.0
Cycle Q Clear(g_c), s	2.4	17.0	12.2	3.6	15.5	7.4	8.3	9.9	5.4	13.5	14.5	16.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	105	894	400	105	894	400	448	470	400	422	443	376
V/C Ratio(X)	0.63	1.05	0.77	0.91	0.93	0.50	0.56	0.65	0.38	0.87	0.93	1.13
Avail Cap(c_a), veh/h	105	894	400	105	894	400	448	470	400	422	443	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.3	26.5	24.7	32.8	25.9	22.9	23.2	23.8	22.1	26.0	26.4	27.0
Incr Delay (d2), s/veh	24.9	45.7	13.4	65.9	17.4	4.5	4.9	6.8	2.8	21.3	28.1	85.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	14.2	7.0	3.8	10.0	3.8	4.9	6.2	2.8	9.3	11.2	16.1
LnGrp Delay(d),s/veh	57.2	72.2	38.0	98.7	43.3	27.3	28.2	30.7	24.9	47.3	54.5	112.3
LnGrp LOS	E	F	D	F	D	C	C	C	C	D	D	F
Approach Vol, veh/h	1317				1129				709		1203	
Approach Delay, s/veh	63.4				45.2				28.5		72.7	
Approach LOS	E				D				C		E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	21.0		8.0	21.0	20.0		8.0	21.0				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	17.0		4.0	17.0	16.0		4.0	17.0				
Max Q Clear Time (g_c+I1), s	11.9		5.6	19.0	18.0		4.4	17.5				
Green Ext Time (p_c), s	1.5		0.0	0.0	0.0		0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	55.6											
HCM 2010 LOS	E											
Notes												

Appendix R.1 – Analysis Output Sheets (Mitigation - Future with Project Alternative 2 Build Out SR-78)

HCM Signalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

9/8/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	39	1277	26	0	0	0	0	13	33	59	48	0
Future Volume (vph)	39	1277	26	0	0	0	0	13	33	59	48	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		1.00						0.90			1.00	
Flt Protected		1.00						1.00			0.97	
Satd. Flow (prot)		3524						1682			1813	
Flt Permitted		1.00						1.00			0.84	
Satd. Flow (perm)		3524						1682			1569	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	42	1388	28	0	0	0	0	14	36	64	52	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	19	0	0	0	0
Lane Group Flow (vph)	0	1455	0	0	0	0	0	31	0	0	116	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		25.5						16.5			16.5	
Effective Green, g (s)		25.5						16.5			16.5	
Actuated g/C Ratio		0.51						0.33			0.33	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		1797						555			517	
v/s Ratio Prot								0.02				
v/s Ratio Perm		0.41									c0.07	
v/c Ratio		0.81						0.06			0.22	
Uniform Delay, d1		10.2						11.4			12.1	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		2.8						0.2			1.0	
Delay (s)		13.0						11.6			13.1	
Level of Service		B						B			B	
Approach Delay (s)		13.0			0.0			11.6			13.1	
Approach LOS		B			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		13.0										
HCM 2000 Volume to Capacity ratio		0.58										
Actuated Cycle Length (s)		50.0										
Intersection Capacity Utilization		56.4%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

9/8/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	14	375	22	20	310	69	30	42	40	75	26	21
Future Volume (vph)	14	375	22	20	310	69	30	42	40	75	26	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	408	24	22	337	75	33	46	43	82	28	23
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	447	434	122	133								
Volume Left (vph)	15	22	33	82								
Volume Right (vph)	24	75	43	23								
Hadj (s)	0.01	-0.06	-0.12	0.05								
Departure Headway (s)	5.5	5.4	6.5	6.6								
Degree Utilization, x	0.68	0.65	0.22	0.24								
Capacity (veh/h)	447	635	459	453								
Control Delay (s)	19.2	18.0	11.3	11.7								
Approach Delay (s)	19.2	18.0	11.3	11.7								
Approach LOS	C	C	B	B								
Intersection Summary												
Delay			17.0									
Level of Service			C									
Intersection Capacity Utilization			49.3%	ICU Level of Service					A			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

12/21/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	9	1116	26	61	1097	61	5	4	97	24	4	15
Future Volume (vph)	9	1116	26	61	1097	61	5	4	97	24	4	15
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.88			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.97	
Satd. Flow (prot)	1770	1856		1770	1848			1627			1726	
Flt Permitted	0.10	1.00		0.11	1.00			0.99			0.71	
Satd. Flow (perm)	188	1856		203	1848			1608			1267	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	10	1213	28	66	1192	66	5	4	105	26	4	16
RTOR Reduction (vph)	0	1	0	0	2	0	0	94	0	0	14	0
Lane Group Flow (vph)	10	1240	0	66	1256	0	0	20	0	0	32	0
Confl. Peds. (#/hr)			1	1			1					
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	55.4	55.4		55.4	55.4			7.4			7.4	
Effective Green, g (s)	55.4	55.4		55.4	55.4			7.4			7.4	
Actuated g/C Ratio	0.78	0.78		0.78	0.78			0.10			0.10	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	147	1452		158	1446			168			132	
v/s Ratio Prot		0.67			c0.68							
v/s Ratio Perm	0.05			0.32				0.01			c0.03	
v/c Ratio	0.07	0.85		0.42	0.87			0.12			0.24	
Uniform Delay, d1	1.8	5.1		2.5	5.2			28.7			29.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.2	5.1		1.8	5.8			0.3			0.9	
Delay (s)	2.0	10.2		4.3	11.1			29.1			30.1	
Level of Service	A	B		A	B			C			C	
Approach Delay (s)		10.1			10.7			29.1			30.1	
Approach LOS		B			B			C			C	
Intersection Summary												
HCM 2000 Control Delay		11.5			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.79										
Actuated Cycle Length (s)		70.8			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		77.2%			ICU Level of Service			D				
Analysis Period (min)		15										
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/25/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Future Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	82	427	316	91	846	199	210	238	87	246	297	211
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	894	400	132	894	400	422	443	376	422	443	376
Arrive On Green	0.02	0.08	0.08	0.07	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	3681	1647	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	82	427	316	91	846	199	210	238	87	246	297	211
Grp Sat Flow(s),veh/h/ln	1845	1840	1647	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	3.1	7.8	13.2	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Cycle Q Clear(g_c), s	3.1	7.8	13.2	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	132	894	400	132	894	400	422	443	376	422	443	376
V/C Ratio(X)	0.62	0.48	0.79	0.69	0.95	0.50	0.50	0.54	0.23	0.58	0.67	0.56
Avail Cap(c_a), veh/h	132	894	400	132	894	400	422	443	376	422	443	376
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	27.9	30.4	31.7	26.1	22.8	23.5	23.7	22.0	24.0	24.6	23.9
Incr Delay (d2), s/veh	20.1	1.8	14.7	25.7	19.6	4.4	4.2	4.6	1.4	5.8	7.9	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	4.2	7.7	2.7	10.4	3.8	4.0	4.6	1.5	4.9	6.2	4.2
LnGrp Delay(d),s/veh	53.4	29.8	45.1	57.5	45.7	27.2	27.7	28.4	23.4	29.8	32.5	29.8
LnGrp LOS	D	C	D	E	D	C	C	C	C	C	C	C
Approach Vol, veh/h		825			1136			535			754	
Approach Delay, s/veh		38.0			43.4			27.3			30.9	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		20.0	9.0	21.0		20.0	9.0	21.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		16.0	5.0	17.0		16.0	5.0	17.0				
Max Q Clear Time (g_c+I1), s		9.6	5.4	15.2		11.8	5.1	17.8				
Green Ext Time (p_c), s		1.3	0.0	0.8		1.4	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			36.5									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd

02/22/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	916	284	88	807	170	361	96	141	403	234	374
Future Volume (veh/h)	58	916	284	88	807	170	361	96	141	403	234	374
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	63	996	309	96	877	185	248	306	153	346	383	407
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	105	946	423	105	946	423	422	443	376	422	443	376
Arrive On Green	0.06	0.26	0.26	0.06	0.26	0.26	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	3681	1647	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	63	996	309	96	877	185	248	306	153	346	383	407
Grp Sat Flow(s),veh/h/ln	1845	1840	1647	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	2.3	18.0	12.0	3.6	16.3	6.6	8.4	10.1	5.5	12.5	13.3	16.0
Cycle Q Clear(g_c), s	2.3	18.0	12.0	3.6	16.3	6.6	8.4	10.1	5.5	12.5	13.3	16.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	105	946	423	105	946	423	422	443	376	422	443	376
V/C Ratio(X)	0.60	1.05	0.73	0.91	0.93	0.44	0.59	0.69	0.41	0.82	0.86	1.08
Avail Cap(c_a), veh/h	105	946	423	105	946	423	422	443	376	422	443	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	26.0	23.8	32.8	25.4	21.8	24.1	24.7	23.0	25.6	26.0	27.0
Incr Delay (d2), s/veh	22.5	44.0	10.6	65.9	16.1	3.3	5.9	8.6	3.2	16.2	19.7	69.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	14.9	6.6	3.8	10.3	3.4	5.0	6.4	2.8	8.2	9.5	14.5
LnGrp Delay(d),s/veh	54.8	70.0	34.3	98.7	41.5	25.0	30.0	33.3	26.2	41.9	45.6	96.9
LnGrp LOS	D	F	C	F	D	C	C	C	C	D	D	F
Approach Vol, veh/h	1368				1158				707			
Approach Delay, s/veh	61.2				43.6				30.6			
Approach LOS	E				D				C			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	20.0		8.0	22.0	20.0		8.0	22.0				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	16.0		4.0	18.0	16.0		4.0	18.0				
Max Q Clear Time (g_c+I1), s	12.1		5.6	20.0	18.0		4.3	18.3				
Green Ext Time (p_c), s	1.2		0.0	0.0	0.0		0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	52.0											
HCM 2010 LOS	D											
Notes												

Appendix R.2 – Analysis Output Sheets (Mitigation - Future with Project Alternative 2 Existing SR-78)

HCM Signalized Intersection Capacity Analysis

6: Coast Hwy & Pier View Way

07/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	72	27	79	4	27	10	60	810	9	5	810	136
Future Volume (vph)	72	27	79	4	27	10	60	810	9	5	810	136
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	16	12	12	16	16	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.97		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.97	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.96		1.00	1.00		1.00	0.98	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1719	1810		1770	2024		1770	1860		2006	1812	
Flt Permitted	0.73	1.00		0.68	1.00		0.18	1.00		0.25	1.00	
Satd. Flow (perm)	1323	1810		1272	2024		336	1860		522	1812	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	78	29	86	4	29	11	65	880	10	5	880	148
RTOR Reduction (vph)	0	75	0	0	10	0	0	1	0	0	7	0
Lane Group Flow (vph)	78	40	0	4	30	0	65	889	0	5	1021	0
Confl. Peds. (#/hr)	16		11				10					10
Confl. Bikes (#/hr)			2									1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	7.8	7.8		7.8	7.8		44.2	44.2		44.2	44.2	
Effective Green, g (s)	7.8	7.8		7.8	7.8		44.2	44.2		44.2	44.2	
Actuated g/C Ratio	0.13	0.13		0.13	0.13		0.74	0.74		0.74	0.74	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	171	235		165	263		247	1370		384	1334	
v/s Ratio Prot		0.02			0.02			0.48			c0.56	
v/s Ratio Perm	c0.06			0.00			0.19			0.01		
v/c Ratio	0.46	0.17		0.02	0.12		0.26	0.65		0.01	0.77	
Uniform Delay, d1	24.1	23.2		22.8	23.1		2.6	4.0		2.1	4.8	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		0.83	0.73	
Incremental Delay, d2	1.9	0.3		0.1	0.2		2.6	2.4		0.1	3.9	
Delay (s)	26.1	23.6		22.8	23.3		5.2	6.4		1.8	7.4	
Level of Service	C	C		C	C		A	A		A	A	
Approach Delay (s)		24.6			23.2			6.3			7.3	
Approach LOS		C			C			A			A	
Intersection Summary												
HCM 2000 Control Delay		8.7			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.72										
Actuated Cycle Length (s)		60.0			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		69.2%			ICU Level of Service			C				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

07/03/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	37	1148	24	0	0	0	0	13	31	56	49	0
Future Volume (vph)	37	1148	24	0	0	0	0	13	31	56	49	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		1.00						0.90			1.00	
Flt Protected		1.00						1.00			0.97	
Satd. Flow (prot)		3523						1685			1814	
Flt Permitted		1.00						1.00			0.85	
Satd. Flow (perm)		3523						1685			1589	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	40	1248	26	0	0	0	0	14	34	61	53	0
RTOR Reduction (vph)	0	3	0	0	0	0	0	18	0	0	0	0
Lane Group Flow (vph)	0	1311	0	0	0	0	0	30	0	0	114	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		20.7						16.3			16.3	
Effective Green, g (s)		20.7						16.3			16.3	
Actuated g/C Ratio		0.46						0.36			0.36	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		1620						610			575	
v/s Ratio Prot								0.02				
v/s Ratio Perm		0.37									c0.07	
v/c Ratio		0.81						0.05			0.20	
Uniform Delay, d1		10.5						9.3			9.9	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		3.1						0.1			0.8	
Delay (s)		13.5						9.5			10.6	
Level of Service		B						A			B	
Approach Delay (s)		13.5			0.0			9.5			10.6	
Approach LOS		B			A			A			B	
Intersection Summary												
HCM 2000 Control Delay		13.2										
HCM 2000 Volume to Capacity ratio		0.54										
Actuated Cycle Length (s)		45.0										
Intersection Capacity Utilization		52.6%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

07/05/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	14	1249	30	72	1228	92	6	5	114	36	5	22
Future Volume (vph)	14	1249	30	72	1228	92	6	5	114	36	5	22
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.88			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.97	
Satd. Flow (prot)	1770	1855		1770	1843			1629			1725	
Flt Permitted	0.06	1.00		0.08	1.00			0.99			0.38	
Satd. Flow (perm)	104	1855		148	1843			1611			671	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	15	1358	33	78	1335	100	7	5	124	39	5	24
RTOR Reduction (vph)	0	1	0	0	2	0	0	104	0	0	17	0
Lane Group Flow (vph)	15	1390	0	78	1433	0	0	32	0	0	51	0
Confl. Peds. (#/hr)			1	1			1					
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	96.1	96.1		96.1	96.1			10.6			10.6	
Effective Green, g (s)	96.1	96.1		96.1	96.1			10.6			10.6	
Actuated g/C Ratio	0.84	0.84		0.84	0.84			0.09			0.09	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	87	1554		124	1544			148			62	
v/s Ratio Prot		0.75			c0.78							
v/s Ratio Perm	0.14			0.53				0.02			c0.08	
v/c Ratio	0.17	0.89		0.63	0.93			0.21			0.82	
Uniform Delay, d1	1.8	6.0		3.2	6.8			48.2			51.1	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.9	7.1		9.6	10.0			0.7			54.6	
Delay (s)	2.7	13.1		12.8	16.8			48.9			105.7	
Level of Service	A	B		B	B			D			F	
Approach Delay (s)		13.0			16.6			48.9			105.7	
Approach LOS		B			B			D			F	
Intersection Summary												
HCM 2000 Control Delay		18.3			HCM 2000 Level of Service			B				
HCM 2000 Volume to Capacity ratio		0.92										
Actuated Cycle Length (s)		114.7			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		87.1%			ICU Level of Service			E				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

47: Coast Hwy & Kelly St

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	28	43	27	31	26	197	10	317	30	180	300	62
Future Volume (vph)	28	43	27	31	26	197	10	317	30	180	300	62
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			0.95			0.95	
Frt		0.96			0.90			0.99			0.98	
Flt Protected		0.99			0.99			1.00			0.98	
Satd. Flow (prot)		2005			1879			3954			3878	
Flt Permitted		0.87			0.94			0.94			0.73	
Satd. Flow (perm)		1778			1777			3714			2884	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	30	47	29	34	28	214	11	345	33	196	326	67
RTOR Reduction (vph)	0	23	0	0	167	0	0	15	0	0	21	0
Lane Group Flow (vph)	0	83	0	0	109	0	0	374	0	0	568	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		6.2			6.2			14.0			14.0	
Effective Green, g (s)		6.2			6.2			14.0			14.0	
Actuated g/C Ratio		0.22			0.22			0.50			0.50	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		390			390			1843			1431	
v/s Ratio Prot												
v/s Ratio Perm		0.05			0.06			0.10			0.20	
v/c Ratio		0.21			0.28			0.20			0.40	
Uniform Delay, d1		9.0			9.1			4.0			4.5	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		0.3			0.4			0.1			0.2	
Delay (s)		9.3			9.5			4.0			4.6	
Level of Service		A			A			A			A	
Approach Delay (s)		9.3			9.5			4.0			4.6	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay		5.8			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.36										
Actuated Cycle Length (s)		28.2			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		52.3%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/22/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Future Volume (veh/h)	75	393	291	84	778	183	258	130	80	226	273	194
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	82	427	316	91	846	199	210	238	87	246	297	211
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	894	400	132	894	400	422	443	376	422	443	376
Arrive On Green	0.02	0.08	0.08	0.07	0.24	0.24	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	3681	1647	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	82	427	316	91	846	199	210	238	87	246	297	211
Grp Sat Flow(s),veh/h/ln	1845	1840	1647	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	3.1	7.8	13.2	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Cycle Q Clear(g_c), s	3.1	7.8	13.2	3.4	15.8	7.3	6.9	7.6	3.0	8.3	9.8	7.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	132	894	400	132	894	400	422	443	376	422	443	376
V/C Ratio(X)	0.62	0.48	0.79	0.69	0.95	0.50	0.50	0.54	0.23	0.58	0.67	0.56
Avail Cap(c_a), veh/h	132	894	400	132	894	400	422	443	376	422	443	376
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	27.9	30.4	31.7	26.1	22.8	23.5	23.7	22.0	24.0	24.6	23.9
Incr Delay (d2), s/veh	20.1	1.8	14.7	25.7	19.6	4.4	4.2	4.6	1.4	5.8	7.9	5.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	4.2	7.7	2.7	10.4	3.8	4.0	4.6	1.5	4.9	6.2	4.2
LnGrp Delay(d),s/veh	53.4	29.8	45.1	57.5	45.7	27.2	27.7	28.4	23.4	29.8	32.5	29.8
LnGrp LOS	D	C	D	E	D	C	C	C	C	C	C	C
Approach Vol, veh/h	825				1136				535			
Approach Delay, s/veh	38.0				43.4				27.3			
Approach LOS	D				D				C			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	20.0		9.0	21.0	20.0		9.0	21.0				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	16.0		5.0	17.0	16.0		5.0	17.0				
Max Q Clear Time (g_c+I1), s	9.6		5.4	15.2	11.8		5.1	17.8				
Green Ext Time (p_c), s	1.3		0.0	0.8	1.4		0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	36.5											
HCM 2010 LOS	D											
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/22/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	868	283	88	765	185	360	99	141	437	240	390
Future Volume (veh/h)	61	868	283	88	765	185	360	99	141	437	240	390
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	66	943	308	96	832	201	250	306	153	368	411	424
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	105	894	400	105	894	400	448	470	400	422	443	376
Arrive On Green	0.06	0.24	0.24	0.06	0.24	0.24	0.24	0.24	0.24	0.23	0.23	0.23
Sat Flow, veh/h	1845	3681	1647	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	66	943	308	96	832	201	250	306	153	368	411	424
Grp Sat Flow(s),veh/h/ln	1845	1840	1647	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	2.4	17.0	12.2	3.6	15.5	7.4	8.3	9.9	5.4	13.5	14.5	16.0
Cycle Q Clear(g_c), s	2.4	17.0	12.2	3.6	15.5	7.4	8.3	9.9	5.4	13.5	14.5	16.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	105	894	400	105	894	400	448	470	400	422	443	376
V/C Ratio(X)	0.63	1.05	0.77	0.91	0.93	0.50	0.56	0.65	0.38	0.87	0.93	1.13
Avail Cap(c_a), veh/h	105	894	400	105	894	400	448	470	400	422	443	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.3	26.5	24.7	32.8	25.9	22.9	23.2	23.8	22.1	26.0	26.4	27.0
Incr Delay (d2), s/veh	24.9	45.7	13.4	65.9	17.4	4.5	4.9	6.8	2.8	21.3	28.1	85.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	14.2	7.0	3.8	10.0	3.8	4.9	6.2	2.8	9.3	11.2	16.1
LnGrp Delay(d),s/veh	57.2	72.2	38.0	98.7	43.3	27.3	28.2	30.7	24.9	47.3	54.5	112.3
LnGrp LOS	E	F	D	F	D	C	C	C	C	D	D	F
Approach Vol, veh/h	1317				1129				709		1203	
Approach Delay, s/veh	63.4				45.2				28.5		72.7	
Approach LOS	E				D				C		E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	21.0		8.0	21.0	20.0		8.0	21.0				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	17.0		4.0	17.0	16.0		4.0	17.0				
Max Q Clear Time (g_c+I1), s	11.9		5.6	19.0	18.0		4.4	17.5				
Green Ext Time (p_c), s	1.5		0.0	0.0	0.0		0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	55.6											
HCM 2010 LOS	E											
Notes												

Appendix S.1 – Analysis Output Sheets (Mitigation - Future with Project Alternative 3 Build Out SR-78)

HCM Signalized Intersection Capacity Analysis

6: Coast Hwy & Pier View Way

07/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	99	39	109	4	39	10	83	804	8	5	804	188
Future Volume (vph)	99	39	109	4	39	10	83	804	8	5	804	188
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	16	12	12	16	16	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.96		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.97	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.97		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1712	1811		1770	2045		1770	1860		2006	1796	
Flt Permitted	0.72	1.00		0.55	1.00		0.15	1.00		0.24	1.00	
Satd. Flow (perm)	1302	1811		1029	2045		270	1860		509	1796	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	108	42	118	4	42	11	90	874	9	5	874	204
RTOR Reduction (vph)	0	99	0	0	9	0	0	1	0	0	10	0
Lane Group Flow (vph)	108	61	0	4	44	0	90	882	0	5	1068	0
Confl. Peds. (#/hr)	16		11				10					10
Confl. Bikes (#/hr)			2									1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.1	11.1		11.1	11.1		50.9	50.9		50.9	50.9	
Effective Green, g (s)	11.1	11.1		11.1	11.1		50.9	50.9		50.9	50.9	
Actuated g/C Ratio	0.16	0.16		0.16	0.16		0.73	0.73		0.73	0.73	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	206	287		163	324		196	1352		370	1305	
v/s Ratio Prot		0.03			0.02			0.47			c0.60	
v/s Ratio Perm	c0.08			0.00			0.33			0.01		
v/c Ratio	0.52	0.21		0.02	0.14		0.46	0.65		0.01	0.82	
Uniform Delay, d1	27.0	25.6		24.9	25.3		3.9	5.0		2.6	6.4	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	2.4	0.4		0.1	0.2		7.6	2.5		0.1	5.8	
Delay (s)	29.4	26.0		24.9	25.5		11.5	7.4		2.7	12.3	
Level of Service	C	C		C	C		B	A		A	B	
Approach Delay (s)		27.4			25.5			7.8			12.2	
Approach LOS		C			C			A			B	
Intersection Summary												
HCM 2000 Control Delay		12.4					HCM 2000 Level of Service			B		
HCM 2000 Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		70.0					Sum of lost time (s)			8.0		
Intersection Capacity Utilization		81.0%					ICU Level of Service			D		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

07/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	1249	26	0	0	0	0	12	33	57	45	0
Future Volume (vph)	36	1249	26	0	0	0	0	12	33	57	45	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		1.00						0.90			1.00	
Flt Protected		1.00						1.00			0.97	
Satd. Flow (prot)		3524						1678			1812	
Flt Permitted		1.00						1.00			0.80	
Satd. Flow (perm)		3524						1678			1497	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	1358	28	0	0	0	0	13	36	62	49	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	25	0	0	0	0
Lane Group Flow (vph)	0	1423	0	0	0	0	0	24	0	0	111	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		23.5						8.2			8.2	
Effective Green, g (s)		23.5						8.2			8.2	
Actuated g/C Ratio		0.59						0.21			0.21	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		2085						346			309	
v/s Ratio Prot								0.01				
v/s Ratio Perm		0.40									c0.07	
v/c Ratio		0.68						0.07			0.36	
Uniform Delay, d1		5.5						12.7			13.5	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.9						0.1			0.7	
Delay (s)		6.5						12.8			14.2	
Level of Service		A						B			B	
Approach Delay (s)		6.5			0.0			12.8			14.2	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		7.2						HCM 2000 Level of Service		A		
HCM 2000 Volume to Capacity ratio		0.60										
Actuated Cycle Length (s)		39.7						Sum of lost time (s)		8.0		
Intersection Capacity Utilization		55.3%						ICU Level of Service		B		
Analysis Period (min)		15										
c Critical Lane Group												

HCM Unsignalized Intersection Capacity Analysis

26: Tremont St & Oceanside Blvd

07/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	14	366	21	19	302	70	29	42	38	77	26	21
Future Volume (vph)	14	366	21	19	302	70	29	42	38	77	26	21
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	15	398	23	21	328	76	32	46	41	84	28	23
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	436	425	119	135								
Volume Left (vph)	15	21	32	84								
Volume Right (vph)	23	76	41	23								
Hadj (s)	0.01	-0.06	-0.12	0.06								
Departure Headway (s)	5.4	5.4	6.4	6.5								
Degree Utilization, x	0.66	0.63	0.21	0.25								
Capacity (veh/h)	635	642	465	459								
Control Delay (s)	18.2	17.2	11.1	11.7								
Approach Delay (s)	18.2	17.2	11.1	11.7								
Approach LOS	C	C	B	B								
Intersection Summary												
Delay				16.3								
Level of Service				C								
Intersection Capacity Utilization				48.5%	ICU Level of Service		A					
Analysis Period (min)				15								

HCM Unsignalized Intersection Capacity Analysis

30: Freeman St & Morse St

07/19/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	0	380	65	70	231	0	143	0	121	0	0	0
Future Volume (vph)	0	380	65	70	231	0	143	0	121	0	0	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	0	413	71	76	251	0	155	0	132	0	0	0
Direction, Lane #	EB 1	WB 1	NB 1	SB 1								
Volume Total (vph)	484	327	287	0								
Volume Left (vph)	0	76	155	0								
Volume Right (vph)	71	0	132	0								
Hadj (s)	-0.05	0.08	-0.13	0.00								
Departure Headway (s)	5.3	5.6	5.9	6.8								
Degree Utilization, x	0.71	0.51	0.47	0.00								
Capacity (veh/h)	657	610	563	436								
Control Delay (s)	20.1	14.3	13.9	9.8								
Approach Delay (s)	20.1	14.3	13.9	0.0								
Approach LOS	C	B	B	A								
Intersection Summary												
Delay				16.8								
Level of Service				C								
Intersection Capacity Utilization				65.3%	ICU Level of Service	C						
Analysis Period (min)				15								

HCM Signalized Intersection Capacity Analysis

36: Freeman St & Cassidy St

07/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	50	204	75	75	92	28	87	119	34	44	46	50
Future Volume (vph)	50	204	75	75	92	28	87	119	34	44	46	50
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0			4.0			4.0			4.0	
Lane Util. Factor		1.00			1.00			1.00			1.00	
Frt		0.97			0.98			0.98			0.95	
Flt Protected		0.99			0.98			0.98			0.98	
Satd. Flow (prot)		1792			1792			1794			1746	
Flt Permitted		0.92			0.81			0.84			0.85	
Satd. Flow (perm)		1668			1486			1532			1506	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	54	222	82	82	100	30	95	129	37	48	50	54
RTOR Reduction (vph)	0	29	0	0	16	0	0	16	0	0	34	0
Lane Group Flow (vph)	0	329	0	0	196	0	0	245	0	0	118	0
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)		10.7			10.7			11.1			11.1	
Effective Green, g (s)		10.7			10.7			11.1			11.1	
Actuated g/C Ratio		0.36			0.36			0.37			0.37	
Clearance Time (s)		4.0			4.0			4.0			4.0	
Vehicle Extension (s)		3.0			3.0			3.0			3.0	
Lane Grp Cap (vph)		598			533			570			560	
v/s Ratio Prot												
v/s Ratio Perm		c0.20			0.13			c0.16			0.08	
v/c Ratio		0.55			0.37			0.43			0.21	
Uniform Delay, d1		7.6			7.1			7.0			6.4	
Progression Factor		1.00			1.00			1.00			1.00	
Incremental Delay, d2		1.1			0.4			0.5			0.2	
Delay (s)		8.7			7.5			7.5			6.6	
Level of Service		A			A			A			A	
Approach Delay (s)		8.7			7.5			7.5			6.6	
Approach LOS		A			A			A			A	
Intersection Summary												
HCM 2000 Control Delay		7.8			HCM 2000 Level of Service			A				
HCM 2000 Volume to Capacity ratio		0.49										
Actuated Cycle Length (s)		29.8			Sum of lost time (s)			8.0				
Intersection Capacity Utilization		47.4%			ICU Level of Service			A				
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

42: Ditmar St & Vista Way

07/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	15	976	25	61	960	97	5	4	97	38	4	23
Future Volume (vph)	15	976	25	61	960	97	5	4	97	38	4	23
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00			1.00			1.00	
Frt	1.00	1.00		1.00	0.99			0.88			0.95	
Flt Protected	0.95	1.00		0.95	1.00			1.00			0.97	
Satd. Flow (prot)	1770	1855		1770	1837			1627			1722	
Flt Permitted	0.12	1.00		0.15	1.00			0.99			0.77	
Satd. Flow (perm)	218	1855		275	1837			1608			1373	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	16	1061	27	66	1043	105	5	4	105	41	4	25
RTOR Reduction (vph)	0	1	0	0	4	0	0	91	0	0	22	0
Lane Group Flow (vph)	16	1087	0	66	1144	0	0	23	0	0	48	0
Confl. Peds. (#/hr)			1	1			1					
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	43.1	43.1		43.1	43.1			7.8			7.8	
Effective Green, g (s)	43.1	43.1		43.1	43.1			7.8			7.8	
Actuated g/C Ratio	0.73	0.73		0.73	0.73			0.13			0.13	
Clearance Time (s)	4.0	4.0		4.0	4.0			4.0			4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0			3.0			3.0	
Lane Grp Cap (vph)	159	1357		201	1344			212			181	
v/s Ratio Prot		0.59			c0.62							
v/s Ratio Perm	0.07			0.24				0.01			c0.04	
v/c Ratio	0.10	0.80		0.33	0.85			0.11			0.27	
Uniform Delay, d1	2.3	5.1		2.8	5.6			22.5			23.0	
Progression Factor	1.00	1.00		1.00	1.00			1.00			1.00	
Incremental Delay, d2	0.3	3.5		1.0	5.4			0.2			0.8	
Delay (s)	2.6	8.6		3.7	11.0			22.7			23.8	
Level of Service	A	A		A	B			C			C	
Approach Delay (s)		8.5			10.6			22.7			23.8	
Approach LOS		A			B			C			C	
Intersection Summary												
HCM 2000 Control Delay			10.6			HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.76									
Actuated Cycle Length (s)			58.9			Sum of lost time (s)				8.0		
Intersection Capacity Utilization			73.5%			ICU Level of Service				D		
Analysis Period (min)			15									
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/22/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	73	412	293	84	815	172	260	128	80	212	269	189
Future Volume (veh/h)	73	412	293	84	815	172	260	128	80	212	269	189
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1976
Adj Flow Rate, veh/h	79	448	318	91	886	187	211	240	87	230	292	205
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	105	841	376	132	894	400	448	470	400	422	491	335
Arrive On Green	0.06	0.23	0.23	0.07	0.24	0.24	0.24	0.24	0.24	0.23	0.23	0.23
Sat Flow, veh/h	1845	3681	1647	1845	3681	1647	1845	1937	1647	1845	2150	1466
Grp Volume(v), veh/h	79	448	318	91	886	187	211	240	87	230	262	235
Grp Sat Flow(s),veh/h/ln	1845	1840	1647	1845	1840	1647	1845	1937	1647	1845	1937	1679
Q Serve(g_s), s	3.0	7.5	12.9	3.4	16.8	6.8	6.8	7.5	3.0	7.7	8.5	8.8
Cycle Q Clear(g_c), s	3.0	7.5	12.9	3.4	16.8	6.8	6.8	7.5	3.0	7.7	8.5	8.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.87
Lane Grp Cap(c), veh/h	105	841	376	132	894	400	448	470	400	422	443	384
V/C Ratio(X)	0.75	0.53	0.84	0.69	0.99	0.47	0.47	0.51	0.22	0.55	0.59	0.61
Avail Cap(c_a), veh/h	105	841	376	132	894	400	448	470	400	422	443	384
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.5	23.7	25.8	31.7	26.4	22.6	22.7	22.9	21.2	23.8	24.1	24.2
Incr Delay (d2), s/veh	38.1	2.4	20.2	25.7	28.0	3.9	3.5	3.9	1.2	5.0	5.7	7.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	4.1	7.9	2.7	12.0	3.5	3.9	4.5	1.5	4.5	5.2	4.8
LnGrp Delay(d),s/veh	70.6	26.1	46.0	57.5	54.5	26.5	26.2	26.8	22.4	28.8	29.8	31.3
LnGrp LOS	E	C	D	E	D	C	C	C	C	C	C	C
Approach Vol, veh/h		845			1164			538			727	
Approach Delay, s/veh		37.8			50.2			25.9			30.0	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.0	9.0	20.0		20.0	8.0	21.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	5.0	16.0		16.0	4.0	17.0				
Max Q Clear Time (g_c+I1), s		9.5	5.4	14.9		10.8	5.0	18.8				
Green Ext Time (p_c), s		1.5	0.0	0.5		1.8	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			38.5									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/22/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	908	285	88	800	174	363	97	141	410	236	381
Future Volume (veh/h)	59	908	285	88	800	174	363	97	141	410	236	381
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	64	987	310	96	870	189	250	308	153	352	389	414
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	105	946	423	105	946	423	422	443	376	422	443	376
Arrive On Green	0.06	0.26	0.26	0.06	0.26	0.26	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	3681	1647	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	64	987	310	96	870	189	250	308	153	352	389	414
Grp Sat Flow(s),veh/h/ln	1845	1840	1647	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	2.4	18.0	12.1	3.6	16.1	6.7	8.5	10.2	5.5	12.7	13.6	16.0
Cycle Q Clear(g_c), s	2.4	18.0	12.1	3.6	16.1	6.7	8.5	10.2	5.5	12.7	13.6	16.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	105	946	423	105	946	423	422	443	376	422	443	376
V/C Ratio(X)	0.61	1.04	0.73	0.91	0.92	0.45	0.59	0.70	0.41	0.83	0.88	1.10
Avail Cap(c_a), veh/h	105	946	423	105	946	423	422	443	376	422	443	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	26.0	23.8	32.8	25.3	21.8	24.1	24.8	23.0	25.7	26.1	27.0
Incr Delay (d2), s/veh	23.3	41.0	10.7	65.9	15.2	3.4	6.0	8.7	3.2	17.5	21.2	76.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	14.5	6.7	3.8	10.1	3.4	5.0	6.5	2.8	8.5	9.8	15.2
LnGrp Delay(d),s/veh	55.5	67.0	34.5	98.7	40.5	25.2	30.1	33.5	26.2	43.2	47.2	103.1
LnGrp LOS	E	F	C	F	D	C	C	C	C	D	D	F
Approach Vol, veh/h	1361				1155				711			
Approach Delay, s/veh	59.1				42.9				30.7			
Approach LOS	E				D				C			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	20.0		8.0	22.0	20.0		8.0	22.0				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	16.0		4.0	18.0	16.0		4.0	18.0				
Max Q Clear Time (g_c+I1), s	12.2		5.6	20.0	18.0		4.4	18.1				
Green Ext Time (p_c), s	1.2		0.0	0.0	0.0		0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay	52.0											
HCM 2010 LOS	D											
Notes												

Appendix S.2 – Analysis Output Sheets (Mitigation - Future with Project Alternative 3 Existing SR-78)

HCM Signalized Intersection Capacity Analysis

6: Coast Hwy & Pier View Way

07/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	100	39	109	4	39	11	83	811	8	5	811	189
Future Volume (vph)	100	39	109	4	39	11	83	811	8	5	811	189
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	16	12	12	16	16	12	12	16	16	12	12
Total Lost time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	0.96		1.00	1.00		1.00	1.00		1.00	0.99	
Flpb, ped/bikes	0.97	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.89		1.00	0.97		1.00	1.00		1.00	0.97	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1708	1808		1770	2041		1770	1860		2006	1795	
Flt Permitted	0.72	1.00		0.53	1.00		0.15	1.00		0.24	1.00	
Satd. Flow (perm)	1298	1808		985	2041		279	1860		514	1795	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	109	42	118	4	42	12	90	882	9	5	882	205
RTOR Reduction (vph)	0	100	0	0	10	0	0	1	0	0	9	0
Lane Group Flow (vph)	109	60	0	4	44	0	90	890	0	5	1078	0
Confl. Peds. (#/hr)	16		11				10					10
Confl. Bikes (#/hr)			2									1
Turn Type	Perm	NA		Perm	NA		Perm	NA		Perm	NA	
Protected Phases		4			8			2			6	
Permitted Phases	4			8			2			6		
Actuated Green, G (s)	11.4	11.4		11.4	11.4		55.6	55.6		55.6	55.6	
Effective Green, g (s)	11.4	11.4		11.4	11.4		55.6	55.6		55.6	55.6	
Actuated g/C Ratio	0.15	0.15		0.15	0.15		0.74	0.74		0.74	0.74	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	197	274		149	310		206	1378		381	1330	
v/s Ratio Prot		0.03			0.02			0.48			c0.60	
v/s Ratio Perm	c0.08			0.00			0.32			0.01		
v/c Ratio	0.55	0.22		0.03	0.14		0.44	0.65		0.01	0.81	
Uniform Delay, d1	29.4	27.9		27.1	27.6		3.7	4.8		2.5	6.3	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	3.3	0.4		0.1	0.2		6.6	2.4		0.1	5.4	
Delay (s)	32.8	28.3		27.2	27.8		10.3	7.2		2.6	11.7	
Level of Service	C	C		C	C		B	A		A	B	
Approach Delay (s)		30.1			27.7			7.5			11.7	
Approach LOS		C			C			A			B	
Intersection Summary												
HCM 2000 Control Delay		12.4										
HCM 2000 Volume to Capacity ratio		0.77										
Actuated Cycle Length (s)		75.0										
Intersection Capacity Utilization		81.5%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM Signalized Intersection Capacity Analysis

15: Ditmar/Ditmar St & Seagaze Dr/Seagaze St

07/06/2018

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	36	1239	25	0	0	0	0	12	32	57	45	0
Future Volume (vph)	36	1239	25	0	0	0	0	12	32	57	45	0
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Lane Width	12	12	12	12	12	12	12	12	12	12	12	12
Total Lost time (s)		4.0						4.0			4.0	
Lane Util. Factor		0.95						1.00			1.00	
Frt		1.00						0.90			1.00	
Flt Protected		1.00						1.00			0.97	
Satd. Flow (prot)		3524						1679			1812	
Flt Permitted		1.00						1.00			0.80	
Satd. Flow (perm)		3524						1679			1498	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	39	1347	27	0	0	0	0	13	35	62	49	0
RTOR Reduction (vph)	0	2	0	0	0	0	0	26	0	0	0	0
Lane Group Flow (vph)	0	1411	0	0	0	0	0	22	0	0	111	0
Turn Type	Perm	NA						NA		Perm	NA	
Protected Phases		4						2			6	
Permitted Phases	4									6		
Actuated Green, G (s)		23.5						8.2			8.2	
Effective Green, g (s)		23.5						8.2			8.2	
Actuated g/C Ratio		0.59						0.21			0.21	
Clearance Time (s)		4.0						4.0			4.0	
Vehicle Extension (s)		3.0						3.0			3.0	
Lane Grp Cap (vph)		2085						346			309	
v/s Ratio Prot								0.01				
v/s Ratio Perm		0.40									c0.07	
v/c Ratio		0.68						0.06			0.36	
Uniform Delay, d1		5.5						12.7			13.5	
Progression Factor		1.00						1.00			1.00	
Incremental Delay, d2		0.9						0.1			0.7	
Delay (s)		6.4						12.7			14.2	
Level of Service		A						B			B	
Approach Delay (s)		6.4			0.0			12.7			14.2	
Approach LOS		A			A			B			B	
Intersection Summary												
HCM 2000 Control Delay		7.1										
HCM 2000 Volume to Capacity ratio		0.59										
Actuated Cycle Length (s)		39.7										
Intersection Capacity Utilization		54.9%										
Analysis Period (min)		15										
c Critical Lane Group												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/22/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	71	394	290	84	780	168	257	128	80	206	268	184
Future Volume (veh/h)	71	394	290	84	780	168	257	128	80	206	268	184
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	77	428	315	91	848	183	209	237	87	224	291	200
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	105	841	376	132	894	400	448	470	400	422	443	376
Arrive On Green	0.02	0.08	0.08	0.07	0.24	0.24	0.24	0.24	0.24	0.23	0.23	0.23
Sat Flow, veh/h	1845	3681	1647	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	77	428	315	91	848	183	209	237	87	224	291	200
Grp Sat Flow(s),veh/h/ln	1845	1840	1647	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	2.9	7.8	13.2	3.4	15.9	6.6	6.8	7.4	3.0	7.5	9.5	7.5
Cycle Q Clear(g_c), s	2.9	7.8	13.2	3.4	15.9	6.6	6.8	7.4	3.0	7.5	9.5	7.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	105	841	376	132	894	400	448	470	400	422	443	376
V/C Ratio(X)	0.73	0.51	0.84	0.69	0.95	0.46	0.47	0.50	0.22	0.53	0.66	0.53
Avail Cap(c_a), veh/h	105	841	376	132	894	400	448	470	400	422	443	376
HCM Platoon Ratio	0.33	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.8	28.6	31.1	31.7	26.1	22.6	22.6	22.9	21.2	23.7	24.5	23.7
Incr Delay (d2), s/veh	35.7	2.2	19.4	25.7	20.0	3.7	3.5	3.8	1.2	4.7	7.4	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	4.2	8.1	2.7	10.5	3.4	3.9	4.4	1.5	4.3	6.0	3.9
LnGrp Delay(d),s/veh	69.5	30.8	50.5	57.5	46.0	26.3	26.1	26.7	22.4	28.4	31.9	29.0
LnGrp LOS	E	C	D	E	D	C	C	C	C	C	C	C
Approach Vol, veh/h		820			1122			533			715	
Approach Delay, s/veh		42.0			43.7			25.8			30.0	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		21.0	9.0	20.0		20.0	8.0	21.0				
Change Period (Y+Rc), s		4.0	4.0	4.0		4.0	4.0	4.0				
Max Green Setting (Gmax), s		17.0	5.0	16.0		16.0	4.0	17.0				
Max Q Clear Time (g_c+I1), s		9.4	5.4	15.2		11.5	4.9	17.9				
Green Ext Time (p_c), s		1.5	0.0	0.4		1.4	0.0	0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			37.2									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

53: Oceanside Blvd & I-5 NB On/Off-Ramp

02/22/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	58	870	282	87	766	169	359	97	140	400	235	371
Future Volume (veh/h)	58	870	282	87	766	169	359	97	140	400	235	371
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937	1937
Adj Flow Rate, veh/h	63	946	307	95	833	184	248	304	152	345	381	403
Adj No. of Lanes	1	2	1	1	2	1	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	105	946	423	105	946	423	422	443	376	422	443	376
Arrive On Green	0.06	0.26	0.26	0.06	0.26	0.26	0.23	0.23	0.23	0.23	0.23	0.23
Sat Flow, veh/h	1845	3681	1647	1845	3681	1647	1845	1937	1647	1845	1937	1647
Grp Volume(v), veh/h	63	946	307	95	833	184	248	304	152	345	381	403
Grp Sat Flow(s),veh/h/ln	1845	1840	1647	1845	1840	1647	1845	1937	1647	1845	1937	1647
Q Serve(g_s), s	2.3	18.0	11.9	3.6	15.2	6.5	8.4	10.1	5.5	12.4	13.2	16.0
Cycle Q Clear(g_c), s	2.3	18.0	11.9	3.6	15.2	6.5	8.4	10.1	5.5	12.4	13.2	16.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	105	946	423	105	946	423	422	443	376	422	443	376
V/C Ratio(X)	0.60	1.00	0.73	0.90	0.88	0.43	0.59	0.69	0.40	0.82	0.86	1.07
Avail Cap(c_a), veh/h	105	946	423	105	946	423	422	443	376	422	443	376
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.2	26.0	23.7	32.8	25.0	21.7	24.1	24.7	22.9	25.6	25.9	27.0
Incr Delay (d2), s/veh	22.5	29.1	10.3	63.9	11.5	3.2	5.9	8.4	3.2	16.0	19.2	66.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	12.9	6.6	3.7	9.1	3.3	5.0	6.4	2.8	8.2	9.3	14.2
LnGrp Delay(d),s/veh	54.8	55.1	34.1	96.7	36.5	25.0	30.0	33.1	26.1	41.7	45.1	93.5
LnGrp LOS	D	E	C	F	D	C	C	C	C	D	D	F
Approach Vol, veh/h	1316				1112				704			
Approach Delay, s/veh	50.2				39.7				30.5			
Approach LOS	D				D				C			
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		3	4	6		7	8				
Phs Duration (G+Y+Rc), s	20.0		8.0	22.0	20.0		8.0	22.0				
Change Period (Y+Rc), s	4.0		4.0	4.0	4.0		4.0	4.0				
Max Green Setting (Gmax), s	16.0		4.0	18.0	16.0		4.0	18.0				
Max Q Clear Time (g_c+I1), s	12.1		5.6	20.0	18.0		4.3	17.2				
Green Ext Time (p_c), s	1.3		0.0	0.0	0.0		0.0	0.5				
Intersection Summary												
HCM 2010 Ctrl Delay	47.2											
HCM 2010 LOS	D											
Notes												