

Memo

To: Tim Duff, Steve McGrath
From: Lisa Wise Consulting and Central Coast Transportation Consulting
Date: February 10, 2014
Re: Harbor Terrace January 21, 2014 Traffic Scoping Meeting Summary

The following memo summarizes topics discussed during the January 21, 2014 Traffic Scoping Meeting regarding the Harbor Terrace project. The memo concludes with a list of action-items as determined during the meeting.

ATTENDEES:

- San Luis Obispo County (County):
 - Robert Fitzroy (Planning)
 - Ryan Hostetter (Planning)
 - Frank Honeycutt (Public Works)
 - Jeremy Ghent (Public Works)
- State Coastal Conservancy (SCC):
 - Tim Duff
- Port San Luis Harbor District (PSLHD):
 - Steve McGrath
- Central Coast Transportation Consulting (CCTC):
 - Joe Fernandez
- Lisa Wise Consulting (LWC):
 - Menka Sethi

MEETING OBJECTIVES:

- Seek County feedback on proposed study intersections, roadway segments, required analysis time period, and cumulative forecasting approach.
- Coordinate Harbor Terrace traffic analysis with County's Avila Circulation Study update.

MEETING SUMMARY:

1. Project Timeline & Summary

- Project History: PSLHD introduced project history as a partnership between SCC and PSLHD. SCC is funding entitlements for the project.
- Net RV Count: California Coastal Commission has expressed support for the project for a key reason that it will relocate RV's from Avila Beach Drive up to the Harbor Terrace site. Project analyses should incorporate findings for RV counts net of the 67 RV's that currently use the Harbor Terrace site and that will be relocated from Avila Beach Drive.
- Public Parking: San Luis Bay Area plan specifies project is to provide approx. 48,000 sq. ft of public parking across the site.
- Expected Timeline: LWC and PSLHD outlined project background and timeline:

- Feb. 12, 2014: Public outreach meeting and special PSLHD Harbor Commission meeting
- Early March, 2014: Project re-submittal to County
- March 3, 2014: Notice of Preparation
- Week of March 17, 2014: Public Scoping Meeting
- Fall 2014: Draft EIR

2. Study Intersections and Roadway Segments

- Primary Study Intersections: CCTC presented two study intersections:
 - Avila Beach Drive & San Luis Bay Drive
 - First Street & Avila Beach Drive
- Alternative Study Intersection: CCTC presented third possible study intersection of San Miguel and Avila Beach Drive. County relayed it saw little benefit in studying the intersection, and would like to review trip generation estimates to determine if any intersections require study. County suggested that intersection analysis may not be necessary because project has already been analyzed as a part of Avila Circulation Study. County also mentioned Babe Lane as potential study location.
- Project Exit/Entry Patterns: Proximity of the northern curb-cut (along the site Avila Beach Drive frontage) to Diablo Canyon Road is of concern to the County. Consider a project layout that results in primary visitor entry/exit from Babe Lane. Avoid queuing. Perform a corresponding auto-turn analysis.

3. Analysis Time Period

- May Traffic Counts: San Luis Bay Area Plan stipulates traffic counts are to be taken in May during the mid-week evening timeframe. County agreed to May mid-week evening timeframe.
- Peak Hour: County proposed the Harbor Terrace project traffic study also analyze summer peak hour trips, and relayed the community may also be interested in the summer peak-hour analysis. CCTC suggested a “factor” analysis to study the summer peak-hour.
- Diablo Canyon Shift Change: County recommended the project traffic study incorporate the shift change at Diablo Canyon. PSLHD recounted shift changes occur at non-peak hours relative to anticipated post-build out Harbor Terrace use.
- Realistic Traffic Patterns: Analyze traffic patterns that are representative of anticipated traffic patterns that would result from project build out. Define well the commissary component of the project. May mid-week evening timeframe may not represent such patterns even though this timeframe is required of the San Luis Bay Area Plan.

4. Cumulative Forecasting Approach

- Current Model Assumptions: County model incorporates Harbor Terrace build out as put forth in the San Luis Bay Area plan. County model incorporates most major projects currently in discussion for the area, except the Chevron Tank Farm Road project (as it will require a General Plan amendment.)
- Forecasting Approach: County recommends using current model for cumulative forecasting. Model will be updated in the coming year, but current model is appropriate for use given the project’s location.

5. Plans for Class I Bike/Pedestrian Path Planned Along Project Frontage

- Pedestrian Crossing: County put forth the project should provide a pedestrian crossing that connects the site to the beach. CCTC will perform sight-line checks. County standard for the crossing is in-pavement mid-block flashing lights if pedestrian demand warrants improved design.
- Class I Bike/Pedestrian Path Timing: Assume the path will be implemented beyond the project horizon.

6. Coordinating Traffic Counts with Other Studies

- County Avila Circulation Study Update Timing: County anticipates update will be adopted in December 2014 and will go into effect 60 days thereafter. Project traffic study will be done under old model. Project EIR likely adopted when new model is in effect. New and old models should produce nearly identical results for the project portion of Avila Beach Drive.
- Avila Circulation Study Update Traffic Count Coordination: Harbor Terrace project will be studying two intersections that will also be studied in the County's Avila Circulation Study update. County proposed it would contract out for the traffic counts, and the project could reimburse it for a pro rata share of the cost. County will share data with project team immediately after counts are taken in May 2014.

ACTION ITEMS:

COUNTY:

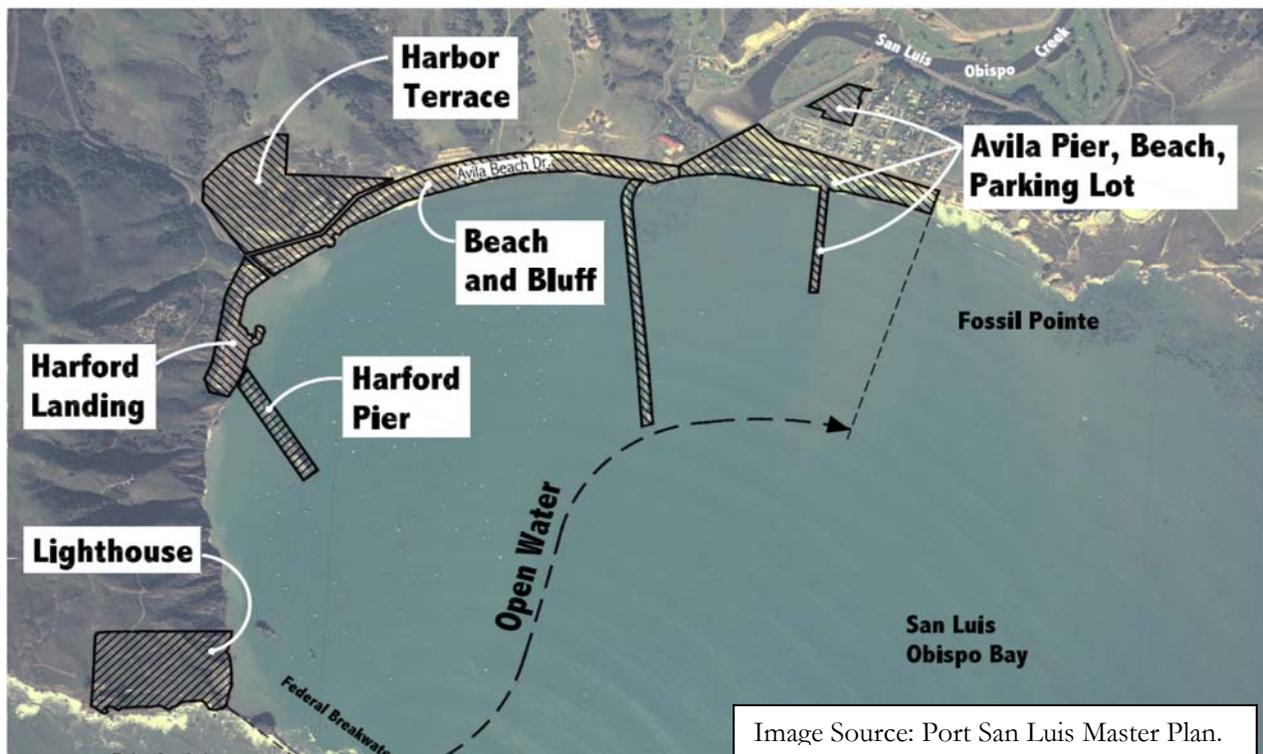
1. Confirm traffic county arrangement whereby Harbor Terrace will reimburse County for cost of Avila Beach Drive / San Luis Bay Drive and First Street / Avila Beach Drive traffic counts.

CCTC

1. Send trip generation estimates to County. – Pending program refinement per email message of Jan. 28, 2014 from Joe Fernandez to Jeremy Ghent.

Port San Luis Harbor Terrace

Transportation Impact Study



Central Coast Transportation Consulting

895 Napa Avenue, Suite A-3

Morro Bay, CA 93442

(805) 316-0101

August 2014



Executive Summary

This study evaluates the potential transportation impacts of the proposed Harbor Terrace project located in the Port San Luis Harbor District. The project would develop a campground, office space for Port administration, and would provide public parking consistent with the San Luis Bay Coastal Area Plan. The project would generate an estimated 1,215 new daily trips and 126 new trips during the weekday PM peak hour.

This study focused on two study intersections on Avila Beach Drive: Babe Lane and First Street. Three roadway segments were studied: Avila Beach Drive near San Luis Bay Drive, and segments of US Highway 101 to the north and south.

The impacts of the project were evaluated under existing and future (cumulative) conditions. All of the study locations within Avila Beach are expected to operate acceptably under all studied scenarios. The segments of southbound US Highway 101 currently operate unacceptably at LOS E, and would continue to operate unacceptably in the future both with and without the project.

The results of this study are consistent with those of the Avila Circulation Study which was the basis for the transportation section of the Port San Luis Program EIR (2003). No new impacts or mitigation measures have been identified in this study.

The proposed pedestrian crossings of Avila Beach Drive will require the implementation of no parking zones and vegetation maintenance, and may require minor grading to ensure adequate sight distance is provided. The forecast inbound left turning volumes are on the cusp of warranting a dedicated left turn lane. These volumes should be monitored and the addition of a left turn lane or bypass lane considered if justified by conditions in the field.



Contents

Executive Summary	1
Contents	2
Introduction	3
Analysis Methods.....	6
Existing Conditions.....	7
Existing Plus Project Conditions	10
Cumulative Conditions	15
References.....	16
Figure 1: Project and Study Locations	4
Figure 2: Site Plan.....	5
Figure 3: Traffic Volume Summary.....	9
Appendix A: Traffic Counts	
Appendix B: LOS/Queue Calculation Sheets	

Introduction

This study evaluates the potential transportation impacts of the proposed Harbor Terrace project located on Avila Beach Drive in the Port San Luis Harbor District. The project includes the development of a campground with associated uses, office space intended for the Port Administration offices, and public parking as required by the San Luis Bay Coastal Area Plan (LCP). The project's components are described in detail in Table 5.

The project's location and study intersections are shown on **Figure 1**, and **Figure 2** shows the site plan. The following intersections were evaluated during the weekday evening (4-6 PM) time period:

1. Avila Beach Drive/Babe Lane (project driveway)
2. Avila Beach Drive/First Street

The following roadway segments were evaluated using PM peak hour volumes:

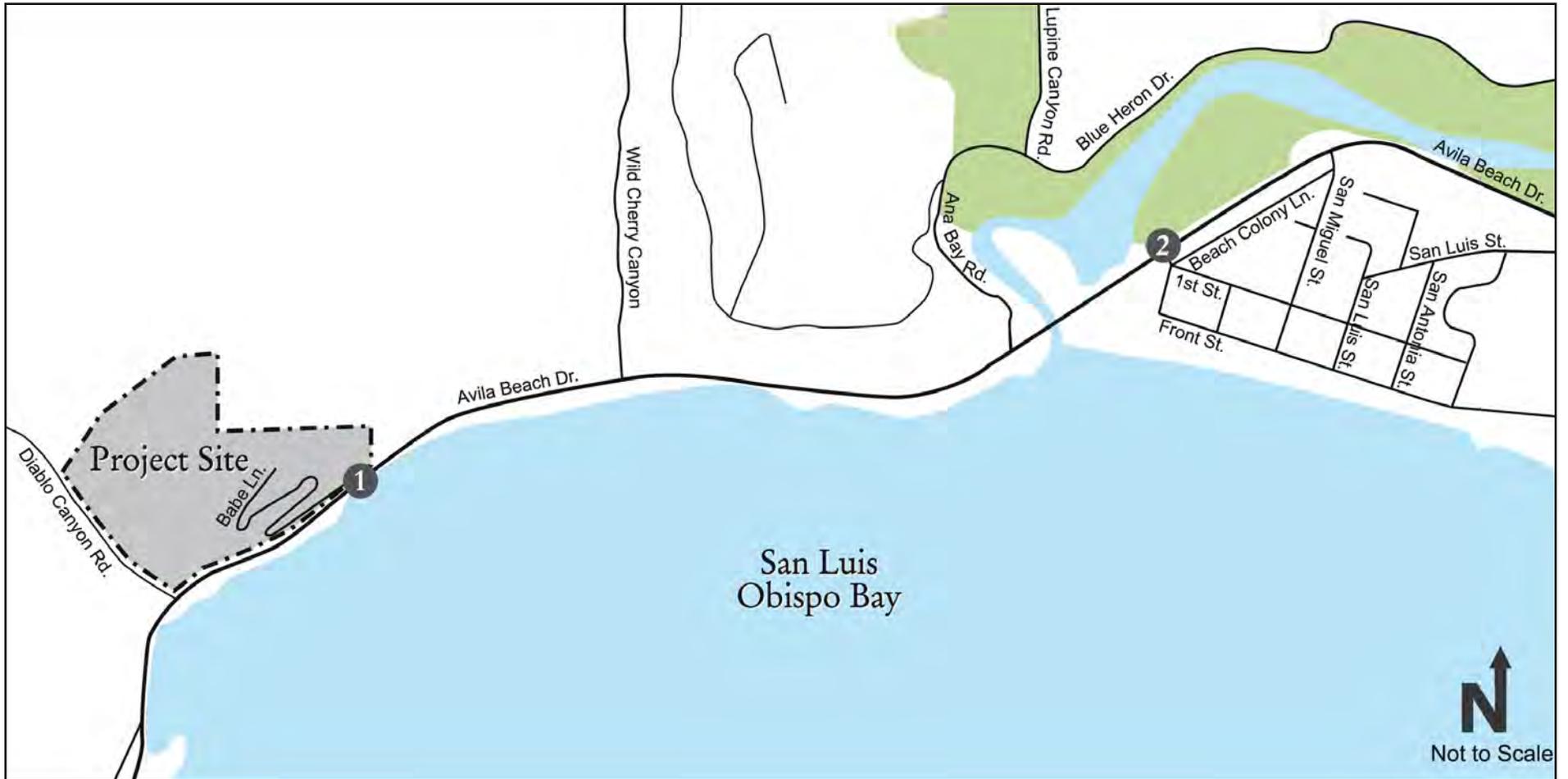
- Avila Beach Drive west of San Luis Bay Drive
- US Highway 101 north of San Luis Bay Drive
- US Highway 101 south of Avila Beach Drive

The study intersections were evaluated under these analysis scenarios:

1. **Existing Conditions** reflect recently collected traffic counts and the existing transportation network.
2. **Existing Plus Project Conditions** add project generated traffic to Existing Conditions volumes.
3. **Cumulative Conditions** reflect future traffic conditions reflective of buildout of the Avila Beach area, developed using the Avila Traffic Model.
4. **Cumulative Plus Project Conditions** add project traffic to Cumulative Conditions volumes.

A description of the analysis approach follows Figures 1 and 2.

Figure 1: Project and Study Locations



August 2014

Legend:

- Project Site
- Study Intersection

Port San Luis Harbor Terrace

Figure 2: Site Plan



Source: Lisa Wise Consulting



August 2014

Port San Luis Harbor Terrace

Analysis Methods

The analysis approach was developed based on the County of San Luis Obispo and Caltrans standards.

County Facilities

The County’s Traffic Impact Study policies provide guidelines for identifying transportation impacts. The study intersections are located within the Avila Beach Urban Reserve Line, where Level of Service (LOS) D is acceptable but LOS E is not. The San Luis Bay Coastal Area Plan (LCP Section B2) provides further guidance that Avila Beach Drive shall not be subject to traffic levels exceeding LOS C during the PM peak hour based on counts conducted on a weekday in May.

Caltrans Facilities

Caltrans controls US Highway 101 and relies on LOS to identify impacts. Caltrans strives to maintain operations at the LOS C/D threshold on state-operated facilities, where LOS C is acceptable but LOS D is not. If an existing State Highway facility is operating at LOS D, E, or F the existing service level should be maintained.

Level of Service Thresholds

The level of service thresholds for intersections based on the 2010 Highway Capacity Manual (HCM) are presented in Table 1. The study intersections were analyzed with the Synchro 8 software package applying the 2010 HCM methods.

Table 1: Intersection Level of Service Thresholds			
Signalized Intersections ¹		Stop Sign Controlled Intersections ²	
Control Delay (seconds/vehicle)	Level of Service	Control Delay (seconds/vehicle)	Level of Service
≤ 10	A	≤ 10	A
> 10 - 20	B	> 10 - 15	B
> 20 - 35	C	> 15 - 25	C
> 35 - 55	D	> 25 - 35	D
> 55 - 80	E	> 35 - 50	E
> 80	F	> 50	F

1. Source: Exhibit 18-4 of the 2010 *Highway Capacity Manual*.
2. Source: Exhibits 19-1 and 20-2 of the 2010 *Highway Capacity Manual*.

Roadway segment thresholds are summarized in Table 2. The study roadway segment on Avila Beach Drive was evaluated using generalized daily volume thresholds based on the LCP, and the mainline segments of Highway 101 were evaluated using a vehicle density calculation consistent with the 2010 HCM.

Table 2: Segment Level of Service Thresholds			
Freeway Segments ¹		Avila Beach Drive (2-lane undivided arterial) ²	
Density (passenger car/mile/lane)	Level of Service	Peak Hour Two-Way Volume	Level of Service
≤ 11	A	≤ 1,180	A
> 11 - 18	B	> 1,180 - 1,380	B
> 18 - 26	C	> 1,380 - 1,580	C
> 26 - 35	D	> 1,580 - 1,780	D
> 35 - 45	E	> 1,780 - 2,000	E
> 45 (demand exceeds capacity)	F	> 2,000	F

1. Source: Exhibit 11-5 of the 2010 *Highway Capacity Manual*.
2. Source: 2007 Avila Valley Circulation Study, which derived capacities by blending 1992 and 1997 HCM approaches.

Existing Conditions

This section describes the existing transportation system and current operating conditions in the study area.

EXISTING ROADWAY NETWORK

US Highway 101 is a north-south facility connecting Los Angeles to San Francisco. In the vicinity of the project it is a four-lane freeway with full access interchanges at Avila Beach Drive and San Luis Bay Drive. There is an auxiliary lane serving southbound traffic roughly between the San Luis Bay Drive and Spyglass Drive interchanges.

Avila Beach Drive is an east-west arterial connecting US Highway 101 with Port San Luis. Along the project frontage it consists of two lanes and is posted with a speed limit of 40 miles per hour (mph).

San Luis Bay Drive is an arterial roadway connecting US Highway 101 to Avila Beach Drive, generally used for local trips and trips to and from the north on US Highway 101.

First Street is a collector roadway serving the downtown area of Avila Beach. The signalized intersection of First Street and Avila Beach Drive serves high volumes of pedestrians and cyclists and provides a controlled crossing location with dedicated pedestrian and bicycle phases.

Babe Lane is a local road serving the project site. It is stop controlled where it intersects with Avila Beach Drive.

EXISTING PEDESTRIAN AND BICYCLE FACILITIES

Pedestrian facilities include sidewalks, crosswalks, multi-use paths, and pedestrian signals at signalized intersections. The First Street/Avila Beach Drive intersection provides pedestrian crosswalks and a pedestrian scramble phase.

Bicycle facilities consist of multi-use paths separate from the roadway (Class I), on-street striped bike lanes (Class II), and signed bike routes (Class III). The Bob Jones City-to-the-Sea Trail is mostly a Class I multi-use path within Avila Beach. Avila Beach Drive is a Class III route east of San Luis Bay Drive, and is identified as a recreational route west of San Luis Bay Drive. San Luis Bay Drive is a Class III bike route.

EXISTING TRANSIT SERVICE

The Avila Beach Trolley provides free fixed route service between Pismo Beach and Avila Beach on Friday evenings, Saturdays, and Sundays during the summer. Weekend service is provided hourly between 10 AM and 6 PM. The Trolley connects to the South County Transit network which serves the Five Cities area with four routes.

The San Luis Obispo Regional Transit Authority (RTA) provides regional fixed-route and dial-a-ride services to San Luis Obispo County. Route 10 serves the South County, with a stop in Pismo Beach.

EXISTING TRAFFIC CONDITIONS

Traffic counts for weekday PM peak hour conditions were collected at the study locations in May 2014 as set forth in the San Luis Bay Area Plan. Traffic counts on US Highway 101 were obtained from SLOCOG's Highway 101 Mobility Study data. The intersection turning volumes at Avila Beach Drive/Babe Lane were derived from a nearby roadway segment count. The traffic count sheets are included in Appendix A.

Figure 3 shows the existing peak hour traffic volumes. Table 3 presents the LOS for the study intersections based on the thresholds shown in Tables 1 and 2, with detailed calculation sheets included in Appendix B.

Table 3: Existing PM Peak Hour LOS		
Intersections		
	Delay (sec/veh) ¹	LOS
1. Avila Beach Drive/Babe Lane	0.4 (12.3)	A (B)
2. Avila Beach Drive/First Street	6.7	A
Segments		
	Two-way Volume	LOS
Avila Beach Drive west of San Luis Bay Drive	1,328	B
	Density (pc/mi/ln) ²	LOS
US Highway 101 north of San Luis Bay Drive		
Northbound	13.6	B
Southbound	37.5	E
US Highway 101 south of Avila Beach Drive		
Northbound	15.3	B
Southbound	41.8	E
1. HCM average control delay in seconds per vehicle. Delay for side street stop controlled intersection reported as average delay followed by worst approach delay in parenthesis.		
2. Passenger cars per mile per lane.		
Unacceptable operations shown in bold italics .		

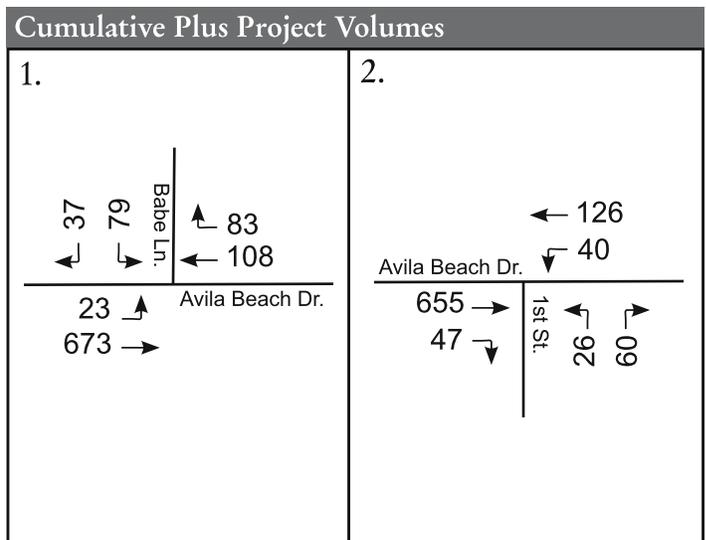
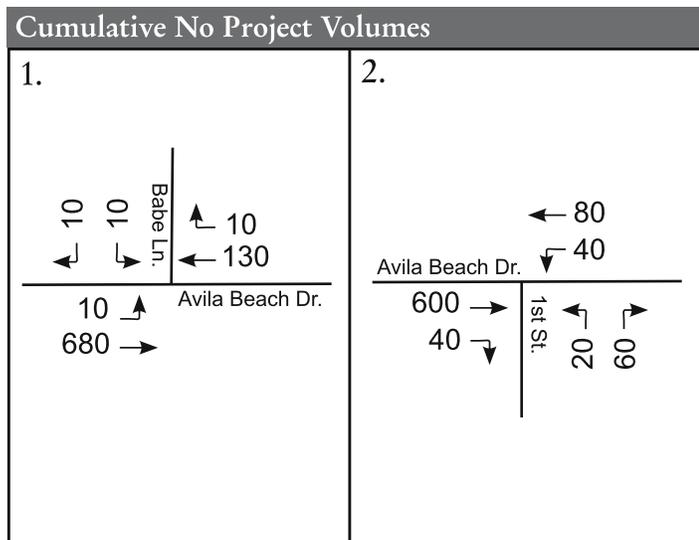
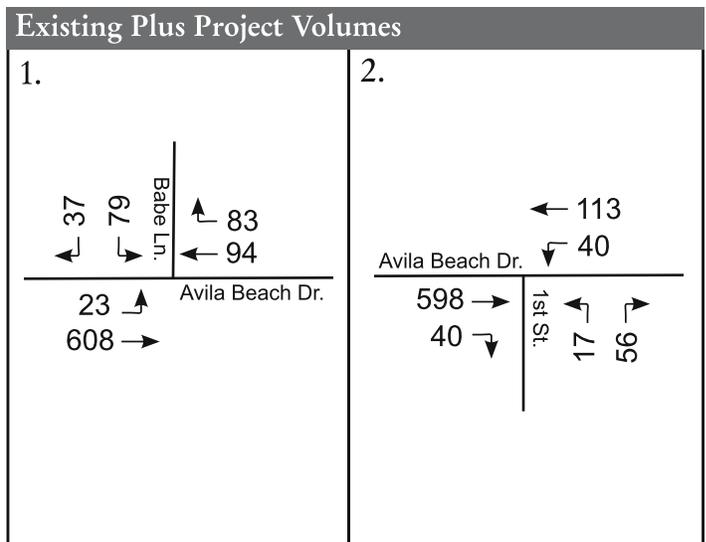
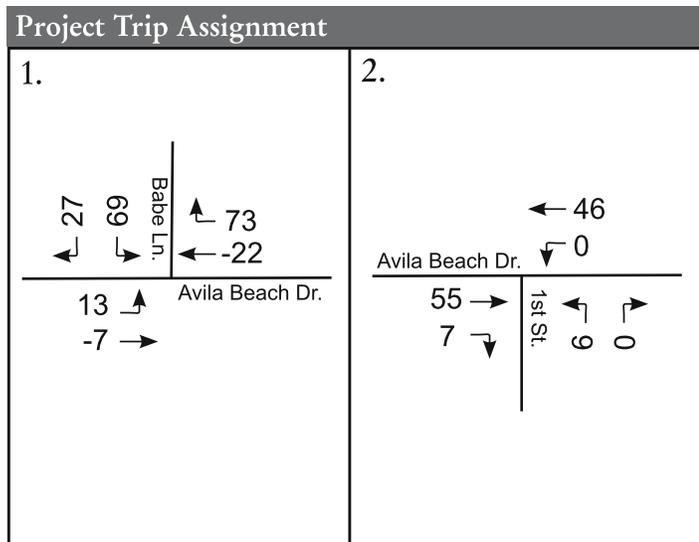
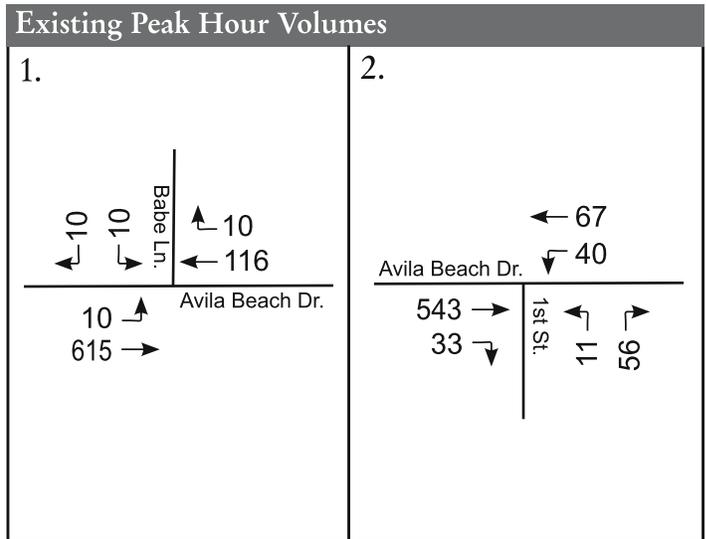
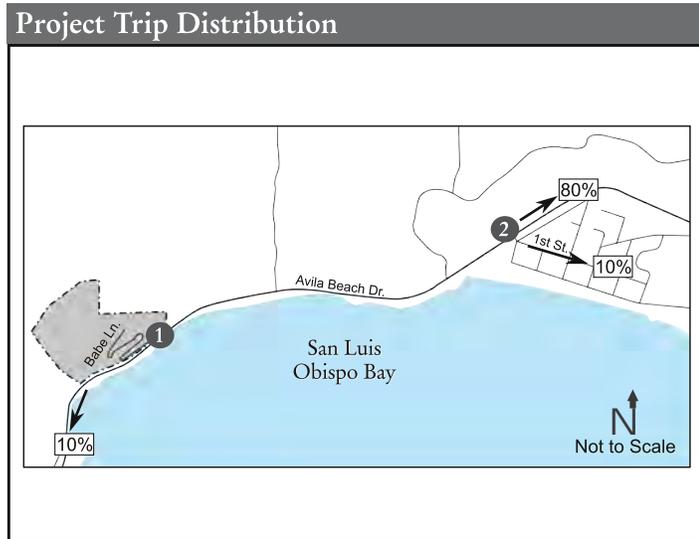
All of the study locations within Avila Beach operate at LOS B or better during the weekday PM peak hour. Both study segments of southbound Highway 101 operates at LOS E during the weekday PM peak hour, which is below Caltrans' desired LOS C service level.

Table 4 summarizes the 95th percentile queues for the study intersections.

Table 4: Existing PM Peak Hour 95th Percentile Queues ¹			
Intersection	Movement	Storage Length	Existing Queue Length (ft)
1. Avila Beach Drive/Babe Lane	Southbound Shared Lane	> 300 ft	3
2. Avile Beach Drive/First Street	Eastbound Through	> 300 ft	220
	Northbound Right	60 ft	47
1. Queue length that would not be exceeded 95 percent of the time. Queues are reported only for critical movements.			

The longest field observed queues occurred on the eastbound approach to the Avila Beach Drive/First Street intersection, which coincides with commuters departing from Diablo Canyon. The queue did not extend to the bridge during field observations and cleared in one signal cycle. The queues shown in Table 4 are consistent with field observations.

Figure 3: Traffic Volume Summary



Legend:
7 - Study Intersection xx - PM Peak Hour Traffic Volumes

Existing Plus Project Conditions

This section evaluates the impacts of the proposed project on the surrounding transportation network. Existing Plus Project conditions reflect existing traffic levels plus the estimated traffic generated by the proposed project.

PROJECT TRAFFIC ESTIMATES

The amount of project traffic affecting the study intersections is estimated in three steps: trip generation, trip distribution, and trip assignment. Trip generation refers to the total number of new trips generated by the site. Trip distribution identifies the general origins and destination of these trips, and trip assignment specifies the routes taken to reach these origins and destinations.

Trip Generation

The project's trip generation estimates, summarized in Table 5, were developed using rates in the Institute of Transportation Engineers' *Trip Generation Manual*.

Use	ITE Land Use (Code) ²	Size	Daily	PM Peak Hour		
				In	Out	Total
Meeting/Conference/ Office/Reception	General Office (710)	15,800 s.f.	174	4	20	24
Restaurant	Sit-Down Restaurant (932)	3,000 s.f.	381	18	12	30
			<i>Pass-By Trips</i> -164	-8	-5	-13
Market	Convenience Market (852)	2,000 s.f.	690	34	35	69
			<i>Pass-By Trips</i> -421	-21	-21	-42
Park/Open Space	County Park (412)	1 acre	2	1	1	2
RV Sites (95), Tent Sites (56) ¹	Campground/RV Park (416)	96 units	260	17	9	26
Cabins	Hotel (310)	31 units	253	10	9	19
Harbor Expansion Area	General Light Industrial (110)	10,000 s.f.	30	1	9	10
Manager's Residence	Single Family Residential (210)	1 unit	10	1	0	1
Total Driveway Trips			1,800	86	95	181
<i>Pass-By Trips</i>			-585	-29	-26	-55
Net New Trips			1,215	57	69	126

1. Net new RV sites- reflects removal of 55 RV spaces from Avila Beach Drive as a part of the project.
 2. Pass-By Trip reductions based on average of surveyed data in ITE manual (43% for restaurant, 61% for market).
 Campground and market daily trips estimated as 10 times PM peak hour.
 Source: ITE *Trip Generation Manual*, 9th Edition, 2012; CCTC, 2014.

The project trips are categorized as new trips and pass-by trips. Pass-by trips are made by drivers already passing by the site who stop at the project before continuing to their original destination. Pass-by trips increase the number of trips at the project driveways, but do not change the volume approaching and departing the project on Avila Beach Drive. New trips are from drivers whose primary destination is located on the project site. These new trips increase traffic along Avila Beach Drive and the project driveways. Pass-by trip reductions were applied to the restaurant and convenience market components of the project, since typically a large portion of traffic from these uses are trips already on the adjacent roadway network.

This is a conservative estimate of the project's most intense traffic generating uses, and typical operations are expected to generate fewer trips. The Campground/Recreational Vehicle Park (ITE Land Use #416) survey data includes trips generated by a variety of on-site facilities, including

recreational facilities such as swimming pools, convenience stores, and laundry facilities. The estimate in Table 5 adds trips for the convenience market to the campground sites, potentially overstating the number of trips generated. Furthermore, the trip generation assumes 100% occupancy of the campground sites and cabins. Typical weekday occupancy would be lower.

Finally, project trips were assigned exclusively to the Babe Lane entry to show a worst case operational scenario. The second access driveway would serve a portion of the project traffic, spreading the traffic flow.

The project trip generation estimate shows 1,215 new daily trips and 126 new PM peak hour trips.

Trip Distribution and Assignment

The directions of approach and departure for project trips were estimated based on existing trip patterns and the locations of complementary land uses. Project trips were assigned to individual intersections based on the trip distribution percentages, and were then added to the existing traffic volumes for Existing Plus Project Conditions. **Figure 3** shows the trip distribution percentages, project trip assignment, and Existing Plus Project volumes.

IMPACT ANALYSIS

Table 6 summarizes the automobile operating conditions under Existing and Existing Plus Project conditions.

Table 6: Existing and Existing Plus Project Peak Hour LOS					
Intersections					
	Existing PM		Existing Plus Project PM		
	Delay (sec/veh) ¹	LOS	Delay (sec/veh) ¹	LOS	
1. Avila Beach Drive/Babe Lane	0.4 (12.3)	A (B)	2.4 (17.3)	A (C)	
2. Avila Beach Drive/First Street	6.7	A	7.6	A	
Segments					
	Existing PM		Existing Plus Project PM		
	Two-way Volume	LOS	Two-way Volume	LOS	
Avila Beach Drive west of San Luis Bay Drive	1,328	B	1,429	C	
US Highway 101 north of San Luis Bay Drive	Density (pc/mi/ln) ²	LOS	Density (pc/mi/ln) ²	LOS	
	Northbound	13.6	B	13.8	B
Southbound	37.5	E	37.7	E	
US Highway 101 south of Avila Beach Drive	Northbound	15.3	B	15.5	B
	Southbound	41.8	E	42.1	E
1. HCM average control delay in seconds per vehicle. Delay for side street stop controlled intersection reported as average delay followed by worst approach delay in parenthesis.					
2. Passenger cars per mile per lane.					
Unacceptable operations shown in bold italics .					

All of the study locations within Avila Beach operate acceptably at LOS C or better with the addition of project traffic. Vehicle queues at all study locations were acceptable.

The southbound segments of US Highway 101 would continue to operate unacceptably, but the service level would not change and the project would increase the vehicle density on the highway by less than one percent.

Bicycles

Bicycle deficiencies would occur if the project disrupts existing or planned bicycle facilities or is otherwise incongruent with the County's Bikeways Plan. There is a multi-use path planned parallel to Avila Beach Drive along the project frontage. The project would not conflict with this or any other planned bicycle facility.

Pedestrians

Pedestrian deficiencies would occur if the project fails to provide safe and accessible pedestrian connections between the project and nearby destinations.

The project proposes two pedestrian crosswalks across Avila Beach Drive, one adjacent to each project entrance as shown on Figure 2. These crosswalks would also serve visitors parking on the project site, and would connect the project site to the multi-use path planned along the ocean side of Avila Beach Drive as well as the nearby beaches.

Pedestrian volumes crossing Avila Beach Drive should be monitored to determine the need, if any, of enhanced crossing treatments such as in-pavement flashers. Detailed site designs should be reviewed once they are available to ensure that pedestrian facilities are continuous and connect to likely destinations to the maximum extent possible. Sight distance related to the crosswalks is discussed in the Site Access section later in this chapter.

Transit

Transit deficiencies would occur if the project disrupts existing or planned transit facilities or services or conflicts with County plans, guidelines, policies, or standards.

The nearest transit stop to the project is served the seasonal Avila Trolley, which stops in front of Fat Cats restaurant approximately ¼ mile southwest of the project. The Port San Luis Master Plan calls for a new trolley stop at one of the proposed project crosswalks. The project would not result in any transit deficiencies.

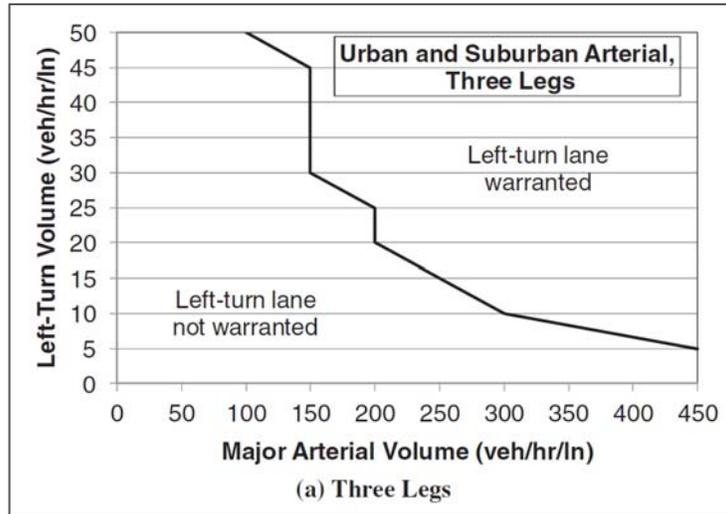
Site Access and On-Site Circulation

On-site circulation deficiencies would occur if project designs fail to meet appropriate standards, fail to provide adequate truck access, or would result in hazardous or unsafe conditions.

The proposed site plan is shown on **Figure 2**. Primary project access will be provided via Babe Lane, where there would be a short term parking facility and payment kiosks. Secondary project access will be provided via a second entry located approximately 150 feet east of Diablo Canyon Road. Both project access points currently exist. While additional spacing would be desirable between the second entry and Diablo Canyon Road, site topography and the need for secondary emergency access preclude other alternatives.

No turn lanes are provided on Avila Beach Drive at the project access points. The need for left turn lanes was evaluated based on the approach recommended in NCHRP Report 745, *Left-Turn Accommodations at Unsignalized Intersections*. This document provides recommended thresholds for determining if a left turn lane is warranted. The warrants are an important element of the decision making process, but must be considered with other factors such as design consistency within a corridor. The project would generate relatively few left turns into the project site, since most campground users would come from the east. However, some traffic would arrive from the Harford Landing area to the west. The project trip estimates show 13 inbound left turns during the peak hour, which would be split between the two driveways. The existing volume on Avila Beach Drive is 365 vehicles per hour per

lane. Based on Figure 4 from NCHRP 745, shown below, a left turn lane would be warranted with a minimum volume of roughly eight left turns. We recommend monitoring traffic levels at the project driveways and making a determination of the need for left turn lanes based on field observed conditions after project occupancy.

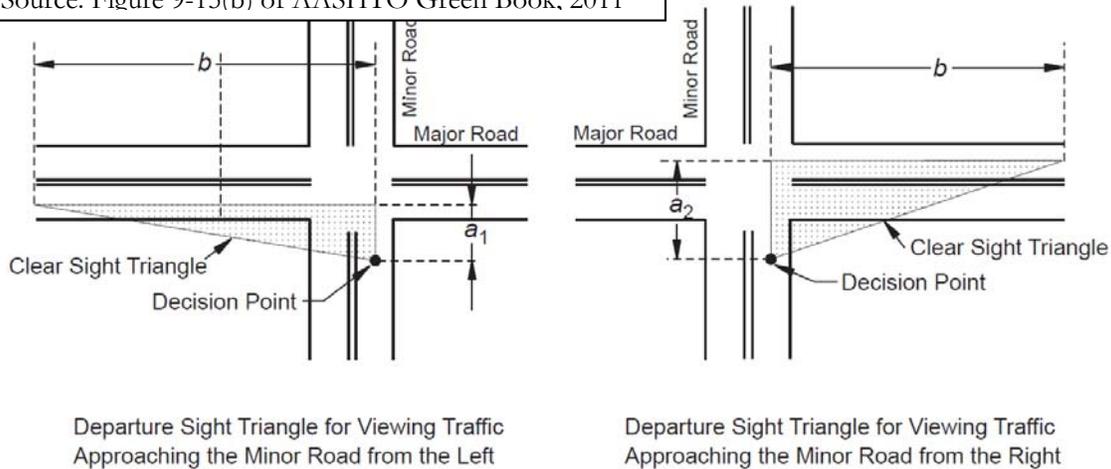


Source: Figure 4 of NCHRP Report 745, 2013.

Two types of sight distance are relevant for the project entries and crosswalks: intersection sight distance and stopping sight distance. Intersection sight distance allows a driver on a minor road to depart from the intersection and enter or cross the main road without causing undue delay to the major road traffic. Intersection sight distance requires a clear sight triangle free of visual obstructions, as illustrated in the figure below.

The recommended dimensions 'a' and 'b' of the clear sight triangle are primarily a function of the design vehicle, design speed, and roadway widths. The 'b' dimension is 440 feet per Table 405.1 of the Caltrans Highway Design Manual (HDM). The intent of the intersection sight distance criteria is to allow the intersection to operate smoothly, with minimal effect on major street traffic flow. Values below the recommended minimum would require major street traffic to slow or stop as minor street vehicles enter the traffic stream. The values for intersection sight distance are longer than the stopping sight distance, discussed below.

Source: Figure 9-15(b) of AASHTO Green Book, 2011



Stopping sight distance is the sum of two values: 1) the distance traveled by the vehicle from the instant the driver sees an object until the brakes are applied plus 2) the distance needed to stop the vehicle. This is the minimum length of clear roadway that must be visible for a motorist to stop for a pedestrian, vehicle, or object in the road. The HDM allows for the use of stopping sight distance in lieu of intersection sight distance at locations where restrictive conditions (such as excessive costs or immitigable environmental impacts) exist. The minimum stopping sight distance for a 40 mph design speed is 300 feet per the HDM.

At a minimum, the project should maintain a clear sight triangle providing at least 300 feet of stopping sight distance for the project driveways and crosswalks. This will require parking restrictions along portions of both sides of Avila Beach Drive near the project entrances and may require vegetation removal/maintenance. The provision of 440 feet of intersection sight distance is desirable, and would minimize the disruption of flow on Avila Beach Drive caused by vehicles exiting the project.

Cumulative Conditions

Cumulative conditions represent build-out of the Avila Beach area.

CUMULATIVE ROADWAY NETWORK

While several capacity expansions are planned in the area, particularly in the vicinity of the US Highway 101 interchanges, no changes are planned to the study locations. Therefore the roadway geometrics have not been changed from Existing conditions. The project would be required to contribute traffic impact fees which would apply towards future improvements in the area.

CUMULATIVE TRAFFIC FORECASTS

The Avila Traffic Model was developed to forecast future travel patterns in the Avila Beach area. The model incorporates future land uses to produce future year traffic forecasts. The most recent version of the model was calibrated and validated to year 2006 data, and the future year scenario was developed to represent build-out conditions in the area, nominally year 2020.

The model was applied to develop Cumulative forecasts using the difference method, where the model’s projected growth of future year volumes over base year volumes was added to the recently collected traffic counts. Project traffic was added to Cumulative conditions volumes to yield Cumulative Plus Project conditions as shown in **Figure 3**.

CUMULATIVE TRAFFIC CONDITIONS

Table 7 summarizes Cumulative traffic conditions with and without the project.

Table 7: Cumulative and Cumulative Plus Project Peak Hour LOS					
Intersections					
	Cumulative PM		Cumulative + Project PM		
	Delay (sec/veh) ¹	LOS	Delay (sec/veh) ¹	LOS	
1. Avila Beach Drive/Babe Lane	0.4 (13.1)	A (B)	2.4 (19.2)	A (C)	
2. Avila Beach Drive/First Street	7.9	A	7.9	A (C)	
Segments					
	Cumulative PM		Cumulative + Project PM		
	Two-way Volume	LOS	Two-way Volume	LOS	
Avila Beach Drive west of San Luis Bay Drive	1,425	C	1,526	C	
US Highway 101 north of San Luis Bay Drive	Density (pc/mi/ln) ²	LOS	Density (pc/mi/ln) ²	LOS	
	Northbound	16.5	B	16.7	B
Southbound	40.8	E	41.1	E	
US Highway 101 south of Avila Beach Drive	Northbound	18.1	C	18.3	C
	Southbound	45.1	F	45.4	F
1. HCM average control delay in seconds per vehicle. Delay for side street stop controlled intersection reported as average delay followed by worst approach delay in parenthesis. 2. Passenger cars per mile per lane. Unacceptable operations shown in bold italics .					

The study locations within Avila Beach would operate acceptably at LOS C or better. No queuing issues are expected. The southbound segments of US Highway 101 would operate at LOS E and F both with and without the project. The addition of project traffic would not change the service level on US Highway 101, and would increase the density of mainline flow by less than one percent.

References

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- County of San Luis Obispo. 2009. San Luis Bay Area Plan (Coastal). _____. 2007. Traffic Impact Study Policies.
- Crawford Multari & Clark Associates. 2003. Final Program Environmental Impact Report for the Port San Luis Harbor District 2003 Port Master Plan SCH#2003081007.
- National Cooperative Highway Research Program (NCHRP) Report 745. 2013. Left-Turn Accommodations at Unsignalized Intersections.
- Port San Luis Harbor District. 2004. Part San Luis Harbor District Port Master Plan.
- TPG Consulting. 2007. Avila Valley Circulation Study Update.
- Transportation Research Board. 2010. Highway Capacity Manual.

Appendix A: Traffic Count Sheets



Metro Traffic Data Inc.
 310 N. Irwin Street - Suite 20
 Hanford, CA 93230
 800-975-6938 Phone/Fax
 www.metrotrafficdata.com

Turning Movement Report

Prepared For:

County of San Luis Obispo
 1087 Santa Rosa Street
 San Luis Obispo, CA 93408

LOCATION Avila Beach Drive @ 1st Street

LATITUDE 35.180491°

COUNTY San Luis Obispo

LONGITUDE -120.735933°

COLLECTION DATE Tuesday, May 20, 2014

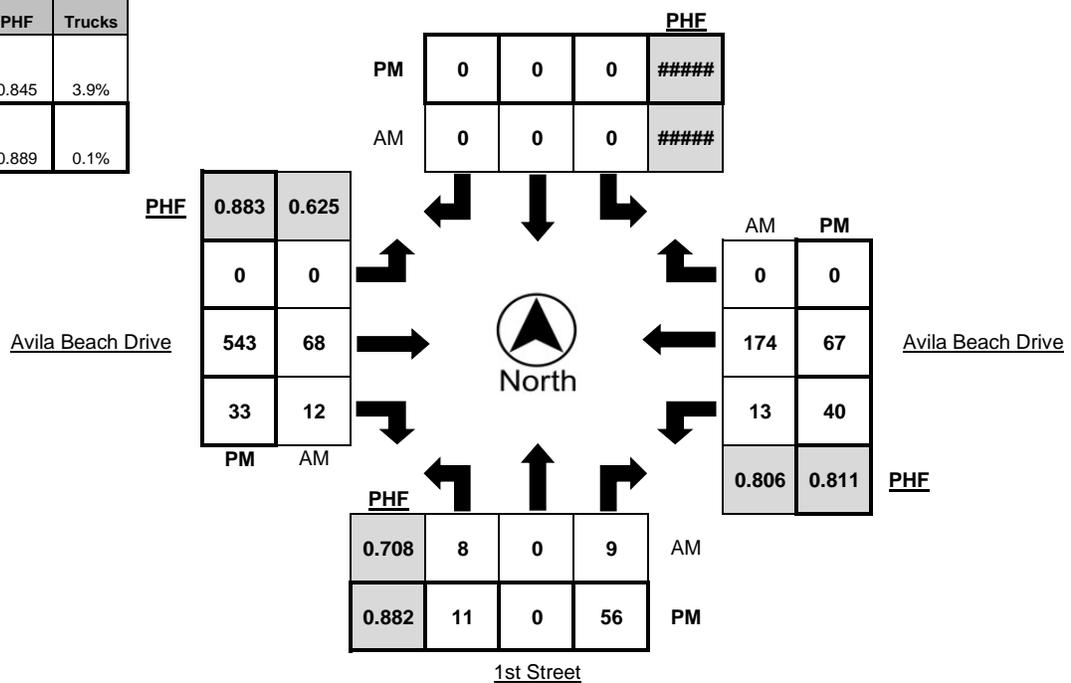
WEATHER Sunny and Clear

Time	Northbound				Southbound				Eastbound				Westbound			
	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:00 AM - 7:15 AM	2	0	4	0	0	0	0	0	0	26	6	1	3	40	0	0
7:15 AM - 7:30 AM	0	0	2	0	0	0	0	0	0	24	3	2	4	51	0	0
7:30 AM - 7:45 AM	2	0	1	0	0	0	0	0	0	14	0	1	3	55	0	2
7:45 AM - 8:00 AM	4	0	2	0	0	0	0	0	0	4	3	1	3	28	0	4
8:00 AM - 8:15 AM	2	0	1	0	0	0	0	0	0	8	3	1	4	32	0	0
8:15 AM - 8:30 AM	2	0	2	0	0	0	0	0	0	10	1	1	9	19	0	1
8:30 AM - 8:45 AM	2	0	1	1	0	0	0	0	0	7	2	2	6	25	0	1
8:45 AM - 9:00 AM	2	0	6	0	0	0	0	0	0	12	1	0	12	23	0	0
TOTAL	16	0	19	1	0	0	0	0	0	105	19	9	44	273	0	8

Time	Northbound				Southbound				Eastbound				Westbound			
	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
4:00 PM - 4:15 PM	2	0	18	0	0	0	0	0	0	59	3	0	11	33	0	0
4:15 PM - 4:30 PM	6	0	4	0	0	0	0	0	0	88	7	1	9	33	0	1
4:30 PM - 4:45 PM	4	0	15	0	0	0	0	0	0	104	7	1	10	12	0	0
4:45 PM - 5:00 PM	4	0	11	0	0	0	0	0	0	153	10	0	12	21	0	0
5:00 PM - 5:15 PM	2	0	15	0	0	0	0	0	0	147	10	0	10	20	0	0
5:15 PM - 5:30 PM	1	0	15	0	0	0	0	0	0	139	6	0	8	14	0	0
5:30 PM - 5:45 PM	3	0	17	0	0	0	0	0	0	81	7	1	12	17	0	0
5:45 PM - 6:00 PM	4	0	2	0	0	0	0	0	0	54	4	0	11	19	0	0
TOTAL	26	0	97	0	0	0	0	0	0	825	54	3	83	169	0	1

PEAK HOUR	Northbound				Southbound				Eastbound				Westbound			
	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks	Left	Thru	Right	Trucks
7:00 AM - 8:00 AM	8	0	9	0	0	0	0	0	0	68	12	5	13	174	0	6
4:30 PM - 5:30 PM	11	0	56	0	0	0	0	0	0	543	33	1	40	67	0	0

	PHF	Trucks
AM	0.845	3.9%
PM	0.889	0.1%





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Report Prepared For:

County of San Luis Obispo
1087 Santa Rosa Street
San Luis Obispo, CA 93408

(805) 781-5200

7 Day Volume Count Report

Location No. **128**

Road Name Avila Beach Drive

Nearest Cross St West of San Luis Bay Drive

Survey Date 5/11/14 thru 5/17/14

Latitude 35.188323

Longitude -120.72161

Peak Day Friday

Number of Lanes 2

Comments

Hour	Eastbound					Westbound					Hourly Totals
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	
12:00 AM	13	23	12	12	60	10	7	5	7	29	89
1:00 AM	16	5	4	6	31	3	3	7	10	23	54
2:00 AM	9	3	5	3	20	1	3	0	1	5	25
3:00 AM	7	0	2	2	11	1	0	1	1	3	14
4:00 AM	1	0	0	0	1	1	7	5	8	21	22
5:00 AM	2	2	5	5	14	6	8	24	29	67	81
6:00 AM	3	6	9	22	40	15	25	19	29	88	128
7:00 AM	37	25	20	21	103	16	24	43	66	149	252
8:00 AM	27	24	36	49	136	58	75	85	88	306	442
9:00 AM	40	52	54	72	218	75	96	116	117	404	622
10:00 AM	73	83	100	109	365	137	119	133	139	528	893
11:00 AM	102	106	87	97	392	173	184	171	163	691	1083
12:00 PM	122	136	118	142	518	188	167	196	201	752	1270
1:00 PM	135	181	146	152	614	228	193	217	193	831	1445
2:00 PM	152	171	165	214	702	184	172	170	150	676	1378
3:00 PM	228	207	211	166	812	121	140	131	121	513	1325
4:00 PM	190	165	160	180	695	104	117	90	89	400	1095
5:00 PM	188	147	142	134	611	79	92	84	75	330	941
6:00 PM	123	126	109	123	481	81	69	60	53	263	744
7:00 PM	118	82	93	88	381	42	45	33	34	154	535
8:00 PM	84	60	81	35	260	22	18	20	25	85	345
9:00 PM	27	47	13	19	106	16	17	22	30	85	191
10:00 PM	35	18	7	18	78	10	11	6	8	35	113
11:00 PM	34	12	7	2	55	3	6	6	4	19	74
Total	6704										6457

AM Peak Hr 11:00 am to 12:00 pm **1083** AM PHF **0.934**
PM Peak Hr 1:00 pm to 2:00 pm **1445** PM PHF **0.966**

Hour	Eastbound					Westbound					Hourly Totals
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	
12:00 AM	7	6	3	4	20	4	1	3	2	10	30
1:00 AM	1	1	3	3	8	4	2	2	4	12	20
2:00 AM	5	3	3	6	17	4	2	3	1	10	27
3:00 AM	2	0	3	1	6	2	4	4	9	19	25
4:00 AM	1	4	1	0	6	8	13	16	35	72	78
5:00 AM	4	4	5	8	21	68	120	125	186	499	520
6:00 AM	12	12	15	15	54	140	86	84	66	376	430
7:00 AM	49	30	24	36	139	51	66	44	54	215	354
8:00 AM	28	36	21	34	119	38	50	42	56	186	305
9:00 AM	35	37	53	40	165	53	82	77	81	293	458
10:00 AM	52	49	53	60	214	60	60	84	98	302	516
11:00 AM	84	73	65	74	296	74	76	87	112	349	645
12:00 PM	60	77	60	68	265	93	109	81	80	363	628
1:00 PM	84	96	78	97	355	85	103	101	96	385	740
2:00 PM	107	95	107	129	438	99	102	84	79	364	802
3:00 PM	141	122	127	120	510	73	79	77	82	311	821
4:00 PM	122	125	200	190	637	78	81	79	78	316	953
5:00 PM	211	174	153	100	638	84	79	61	57	281	919
6:00 PM	103	70	77	72	322	62	60	61	51	234	556
7:00 PM	91	72	57	66	286	56	32	48	33	169	455
8:00 PM	69	63	53	26	211	22	12	19	17	70	281
9:00 PM	28	34	27	23	112	16	19	16	33	84	196
10:00 PM	32	14	17	17	80	18	11	11	9	49	129
11:00 PM	30	8	10	7	55	3	8	3	0	14	69
Total	4974										4983

AM Peak Hr 11:00 am to 12:00 pm **645** AM PHF **0.867**
PM Peak Hr 4:30 pm to 5:30 pm **1095** PM PHF **0.928**

Hour	Eastbound					Westbound					Hourly Totals
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	
12:00 AM	6	5	4	3	18	2	0	2	6	10	28
1:00 AM	3	6	2	2	13	1	3	3	4	11	24
2:00 AM	1	8	0	4	13	1	3	1	2	7	20
3:00 AM	6	0	1	0	7	0	3	6	5	14	21
4:00 AM	2	1	3	2	8	12	15	22	31	80	88
5:00 AM	1	2	6	6	15	80	120	162	191	553	568
6:00 AM	9	14	20	23	66	138	115	89	66	408	474
7:00 AM	31	41	32	26	130	61	60	50	74	245	375
8:00 AM	42	32	36	43	153	65	71	91	83	310	463
9:00 AM	41	42	36	50	169	65	84	61	78	288	457
10:00 AM	54	57	64	95	270	77	70	97	103	347	617
11:00 AM	68	75	64	82	289	95	93	96	117	401	690
12:00 PM	73	99	93	83	348	114	100	102	118	434	782
1:00 PM	84	101	96	105	386	125	107	125	93	450	836
2:00 PM	118	121	124	144	507	91	80	97	88	356	863
3:00 PM	132	137	135	123	527	111	103	104	111	429	956
4:00 PM	108	171	198	220	697	93	97	98	97	385	1082
5:00 PM	268	234	158	135	795	77	87	106	83	353	1148
6:00 PM	110	129	95	103	437	96	71	65	69	301	738
7:00 PM	115	108	76	93	392	51	53	48	38	190	582
8:00 PM	97	60	71	59	287	33	32	33	31	129	416
9:00 PM	53	35	30	31	149	26	26	26	16	94	243
10:00 PM	23	21	24	25	93	12	9	7	9	37	130
11:00 PM	18	10	10	16	54	2	7	4	2	15	69
Total	5823										5847

AM Peak Hr 11:00 am to 12:00 pm **690** AM PHF **0.867**
PM Peak Hr 4:30 pm to 5:30 pm **1279** PM PHF **0.927**

Hour	Eastbound					Westbound					Hourly Totals
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	
12:00 AM	11	4	7	7	29	6	5	0	4	15	44
1:00 AM	8	6	4	1	19	3	0	5	6	14	33
2:00 AM	6	4	1	3	14	2	2	1	1	6	20
3:00 AM	6	1	2	0	9	5	1	6	7	19	28
4:00 AM	2	1	6	1	10	10	11	16	41	78	88
5:00 AM	5	4	7	7	23	86	133	143	206	568	591
6:00 AM	13	14	28	17	72	151	118	102	77	448	520
7:00 AM	30	46	37	30	143	71	89	64	71	295	438
8:00 AM	35	32	34	43	144	55	55	76	95	281	425
9:00 AM	39	41	52	61	193	71	85	72	86	314	507
10:00 AM	43	59	55	76	233	100	78	71	104	353	586
11:00 AM	84	70	74	75	303	89	101	103	124	417	720
12:00 PM	72	86	107	87	352	126	96	104	113	439	791
1:00 PM	104	104	109	117	434	123	142	132	115	512	946
2:00 PM	136	108	124	140	508	126	88	115	109	438	946
3:00 PM	149	147	152	161	609	105	107	112	112	436	1045
4:00 PM	148	171	223	254	796	121	112	124	96	453	1249
5:00 PM	239	228	184	183	834	118	120	94	99	431	1265
6:00 PM	128	134	146	130	538	95	105	99	105	404	942
7:00 PM	128	131	104	128	491	82	57	67	43	249	740
8:00 PM	98	97	86	96	377	42	30	38	39	149	526
9:00 PM	77	56	31	54	218	33	32	34	25	124	342
10:00 PM	51	35	25	22	133	25	17	25	26	93	226
11:00 PM	39	19	13	21	92	6	14	9	2	31	123
Total	6574										6567

AM Peak Hr 11:00 am to 12:00 pm **720** AM PHF **0.905**
PM Peak Hr 4:30 pm to 5:30 pm **1402** PM PHF **0.982**

Hour	Eastbound					Westbound					Hourly Totals
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	
12:00 AM	15	14	10	5	44	6	8	4	1	19	63
1:00 AM	13	4	7	6	30	2	2	3	7	14	44
2:00 AM	9	3	4	4	20	4	2	4	3	13	33
3:00 AM	9	5	2	1	17	1	2	5	12	20	37
4:00 AM	1	2	4	4	11	11	15	29	34	89	100
5:00 AM	4	6	9	10	29	84	123	136	181	524	553
6:00 AM	6	7	15	11	39	146	108	90	77	421	460
7:00 AM	47	45	40	41	173	71	62	75	55	263	436
8:00 AM	24	42	43	50	159	58	58	68	93	277	436
9:00 AM	33	59	43	54	189	71	110	93	83	357	546
10:00 AM	56	73	66	78	273	79	92	99	102	372	645
11:00 AM	78	87	77	81	323	117	96	120	112	445	768
12:00 PM	85	97	94	97	373	123	116	110	143	4	



Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
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County of San Luis Obispo
1087 Santa Rosa Street
San Luis Obispo, CA 93408

(805) 781-5200

7 Day Volume Count Report

Location No. 151

Road Name Avila Beach Dr

Nearest Cross St West of Babe Lane

Survey Date 5/11/14 thru 5/17/14

Latitude 35.518518

Longitude -120.522463

Peak Day Wednesday

Number of Lanes 2

Comments

Monday, May 12, 2014												
Hour	Eastbound					Westbound					Hourly Totals	
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total		
12:00 AM	3	1	1	0	5	0	1	0	0	1	6	
1:00 AM	1	0	1	0	2	0	2	2	2	6	8	
2:00 AM	3	0	1	4	8	3	2	1	1	7	15	
3:00 AM	2	1	3	0	6	3	3	3	11	20	26	
4:00 AM	0	3	1	1	5	7	12	17	26	62	67	
5:00 AM	1	0	2	5	8	66	94	127	166	453	461	
6:00 AM	4	9	8	9	30	152	89	78	56	375	405	
7:00 AM	37	10	7	12	66	32	46	27	17	122	188	
8:00 AM	8	10	9	4	31	8	17	17	15	57	88	
9:00 AM	12	7	16	24	59	19	13	31	35	98	157	
10:00 AM	25	23	15	42	105	26	23	17	26	92	197	
11:00 AM	30	36	25	24	115	24	32	26	23	105	220	
12:00 PM	35	23	29	26	113	24	31	32	25	112	225	
1:00 PM	38	38	33	28	137	25	41	38	26	130	267	
2:00 PM	40	42	44	76	202	32	33	30	23	118	320	
3:00 PM	54	33	63	44	194	19	27	24	21	91	285	
4:00 PM	57	69	137	111	374	18	20	23	30	91	465	
5:00 PM	172	106	78	53	409	18	27	15	14	74	483	
6:00 PM	43	37	25	27	132	23	22	15	16	76	208	
7:00 PM	30	28	19	18	95	8	14	7	8	37	132	
8:00 PM	10	9	7	4	30	8	4	6	3	21	51	
9:00 PM	8	9	3	9	29	4	5	8	16	33	62	
10:00 PM	4	2	7	14	27	9	1	2	4	16	43	
11:00 PM	20	7	3	6	36	0	3	3	0	6	42	
Total					4421					2203		
AM Peak Hr 5:30 am to 6:30 am					AM Peak	554	AM PHF					0.810
PM Peak Hr 4:30 pm to 5:30 pm					PM Peak	624	PM PHF					0.821

Thursday, May 15, 2014												
Hour	Eastbound					Westbound					Hourly Totals	
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total		
12:00 AM	12	1	4	3	20	0	3	1	0	4	24	
1:00 AM	6	3	3	2	14	0	1	2	6	9	23	
2:00 AM	8	1	1	5	15	5	0	3	3	11	26	
3:00 AM	6	6	1	1	14	0	2	4	9	15	29	
4:00 AM	1	0	1	1	3	13	10	29	31	83	86	
5:00 AM	2	0	3	6	11	70	116	124	159	469	480	
6:00 AM	1	6	6	11	24	172	105	76	49	402	426	
7:00 AM	22	20	17	14	73	46	39	39	28	152	225	
8:00 AM	11	15	7	12	45	22	14	31	35	102	147	
9:00 AM	26	21	19	18	84	32	33	38	34	137	221	
10:00 AM	30	27	27	30	114	22	27	30	29	108	222	
11:00 AM	39	38	38	34	149	37	31	49	32	149	298	
12:00 PM	56	23	40	35	154	30	32	28	45	135	289	
1:00 PM	40	68	51	45	204	40	47	31	37	155	359	
2:00 PM	40	48	45	83	216	34	32	35	22	123	339	
3:00 PM	66	53	60	67	246	38	30	35	32	135	381	
4:00 PM	75	86	140	126	427	29	24	44	20	117	544	
5:00 PM	156	101	80	84	421	36	19	20	32	107	528	
6:00 PM	60	51	51	44	206	28	31	23	26	108	314	
7:00 PM	38	34	23	28	123	18	31	18	15	82	205	
8:00 PM	22	15	9	19	65	6	11	9	7	33	98	
9:00 PM	20	4	6	4	34	6	12	12	16	46	80	
10:00 PM	14	6	8	19	47	8	6	3	2	19	66	
11:00 PM	19	2	3	5	29	1	2	1	3	7	36	
Total					2738					2708		
AM Peak Hr 5:15 am to 6:15 am					AM Peak	581	AM PHF					0.840
PM Peak Hr 4:30 pm to 5:30 pm					PM Peak	642	PM PHF					0.836

Tuesday, May 13, 2014												
Hour	Eastbound					Westbound					Hourly Totals	
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total		
12:00 AM	4	4	0	3	11	0	1	1	2	4	15	
1:00 AM	5	3	1	1	10	2	3	3	2	10	20	
2:00 AM	2	5	0	7	14	3	0	0	2	5	19	
3:00 AM	2	1	0	0	3	1	0	6	8	15	18	
4:00 AM	2	0	0	1	3	9	15	23	30	77	80	
5:00 AM	0	1	3	2	6	70	92	163	179	504	510	
6:00 AM	3	15	8	9	35	146	126	95	43	410	445	
7:00 AM	21	16	11	8	56	39	39	29	21	128	184	
8:00 AM	11	6	9	15	41	23	23	17	29	92	133	
9:00 AM	19	13	14	21	67	24	17	27	24	92	159	
10:00 AM	15	18	22	39	94	29	31	27	28	115	209	
11:00 AM	33	35	30	29	127	25	37	33	34	129	256	
12:00 PM	34	36	34	28	132	23	32	37	31	123	255	
1:00 PM	39	38	36	39	152	32	42	35	46	155	307	
2:00 PM	46	41	47	63	197	22	30	27	20	99	296	
3:00 PM	59	53	39	54	205	40	18	27	22	107	312	
4:00 PM	66	86	157	124	433	24	31	25	22	102	535	
5:00 PM	180	114	90	67	451	24	19	25	20	88	539	
6:00 PM	56	61	37	38	192	30	24	23	16	93	285	
7:00 PM	41	28	11	43	123	13	10	19	11	53	176	
8:00 PM	19	15	15	18	67	6	10	13	8	37	104	
9:00 PM	10	8	10	6	34	4	7	7	11	29	63	
10:00 PM	6	9	6	7	28	9	1	3	2	15	43	
11:00 PM	18	3	2	9	32	1	1	3	1	6	38	
Total					2513					2488		
AM Peak Hr 5:30 am to 6:30 am					AM Peak	637	AM PHF					0.880
PM Peak Hr 4:30 pm to 5:30 pm					PM Peak	665	PM PHF					0.815

Friday, May 16, 2014												
Hour	Eastbound					Westbound					Hourly Totals	
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total		
12:00 AM	12	4	3	1	20	2	1	1	2	6	26	
1:00 AM	3	1	1	2	7	2	2	2	1	7	14	
2:00 AM	7	1	1	1	10	4	0	0	2	6	16	
3:00 AM	3	0	0	0	3	0	1	1	3	5	8	
4:00 AM	1	1	0	2	4	8	5	4	18	35	39	
5:00 AM	1	2	4	2	9	19	36	40	68	163	172	
6:00 AM	2	6	11	13	32	73	60	46	29	208	240	
7:00 AM	32	19	14	4	69	34	40	32	20	126	195	
8:00 AM	12	9	14	12	47	15	19	23	23	80	127	
9:00 AM	12	18	33	39	102	27	40	23	32	122	224	
10:00 AM	32	33	25	33	123	34	25	25	32	116	239	
11:00 AM	36	34	42	34	146	27	25	33	34	119	265	
12:00 PM	38	33	43	45	159	29	25	25	42	121	280	
1:00 PM	50	48	40	43	181	31	33	37	39	140	321	
2:00 PM	41	41	50	48	180	33	30	22	25	110	290	
3:00 PM	72	62	55	35	224	35	25	31	24	115	339	
4:00 PM	36	38	46	57	177	29	29	28	30	116	293	
5:00 PM	55	39	45	26	165	23	22	34	20	99	264	
6:00 PM	30	28	32	38	128	30	31	46	29	136	264	
7:00 PM	28	32	20	18	98	26	23	22	20	91	189	
8:00 PM	25	33	22	22	102	18	18	26	10	72	174	
9:00 PM	19	13	13	9	54	17	16	11	19	63	117	
10:00 PM	22	17	15	21	75	12	10	7	4	33	108	
11:00 PM	14	7	6	5	32	3	4	2	2	11	43	
Total					2147					2100		
AM Peak Hr 11:00 am to 12:00 pm					AM Peak	265	AM PHF					0.883
PM Peak Hr 2:45 pm to 3:45 pm					PM Peak	353	PM PHF					0.825

Sunday, May 11, 2014											
Hour	Eastbound					Westbound					Hourly Totals
	1st	2nd	3rd	4th	Total	1st	2nd	3rd	4th	Total	
12:00 AM	1	7	1	5	14	1	0	1	2	4	18
1:00 AM	0	0	2	1	3	0	0	5	7	12	15
2:00 AM	2	0	1	4	7	1	1	0	1	3	10
3:00 AM	3	0	2	0	5	0	0	0	1	1	6
4:00 AM	0	0	0	0	0	2	4	5	5	16	16
5:00 AM	1	1	3	1	6	6	8	17	27	58	64
6:00 AM	0	5	9	12	26	15	10	12	12	49	75
7:00 AM	24	23	7	8	62	8	11	7	17	43	105
8:00 AM	13	7	12	12	44	14	16	25	30	85	129
9:00 AM	11	24	19	29	83	24	31	30	43	128	211
10:00 AM	38	42	41	39	160	44	54	46	45	189	349
11:00 AM	36	48	40	50	174	40	68	68	52	228	402
12:00 PM	63	61	57	63	244	54	53	72	62	241	485
1:00 PM	82	62	68	62	274	77	84	77	81	319	593
2:00 PM	69	89</									

Appendix B: LOS/Queue Calculation Sheets

1: Avila Beach Drive & Babe Lane

Existing PM
HCM 2010 TWSC

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	10	615	116	10	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	647	122	11	11	11
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	133	0	-	0	795	127
Stage 1	-	-	-	-	127	-
Stage 2	-	-	-	-	668	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1452	-	-	-	357	923
Stage 1	-	-	-	-	899	-
Stage 2	-	-	-	-	510	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1452	-	-	-	353	923
Mov Cap-2 Maneuver	-	-	-	-	353	-
Stage 1	-	-	-	-	899	-
Stage 2	-	-	-	-	504	-
Approach	EB		WB		SB	
HCM Control Delay, s	0.1		0		12.3	
HCM LOS	A		B		B	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1452	-	-	-	511	
HCM Lane V/C Ratio	0.007	-	-	-	0.041	
HCM Control Delay (s)	7.5	0	-	-	12.3	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

2: First Street & Avila Beach Drive

Existing PM
Queues



Lane Group	EBT	EBR	WBL	WBT	NBT	NBR
Lane Group Flow (vph)	610	37	45	75	12	63
v/c Ratio	0.46	0.03	0.08	0.05	0.04	0.22
Control Delay	8.7	6.3	3.3	3.0	18.8	20.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	8.7	6.3	3.3	3.0	18.8	20.6
Queue Length 50th (ft)	113	5	3	5	3	17
Queue Length 95th (ft)	220	16	12	17	15	47
Internal Link Dist (ft)	573		373		447	
Turn Bay Length (ft)	50		150		50	
Base Capacity (vph)	1759	1449	549	1848	687	653
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.35	0.03	0.08	0.04	0.02	0.10
Intersection Summary						

2: First Street & Avila Beach Drive

Existing PM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗	↖	↗			↖	↗		↖	↗
Volume (vph)	0	543	33	40	67	0	11	0	56	0	0	0
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	4.0			
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	1.00			
Frpb, ped/bikes	1.00	0.98	1.00	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	0.85	1.00	1.00	1.00			1.00	0.85			
Flt Protected	1.00	1.00	0.95	1.00	1.00			0.95	1.00			
Satd. Flow (prot)	1863	1544	1769	1863	1863			1770	1534			
Flt Permitted	1.00	1.00	0.31	1.00	1.00			0.87	1.00			
Satd. Flow (perm)	1863	1544	573	1863	1863			1620	1534			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	610	37	45	75	0	12	0	63	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	610	37	45	75	0	0	12	63	0	0	0
Confl. Peds. (#/hr)			3	2								
Confl. Bikes (#/hr)			1			2			3			
Turn Type		NA	Perm	pm+pt	NA		Perm	NA	Perm			
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		28.8	28.8	34.8	34.8			4.6	4.6			
Effective Green, g (s)		28.8	28.8	34.8	34.8			4.6	4.6			
Actuated g/C Ratio		0.61	0.61	0.73	0.73			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)	1131	938	471	1367				157	148			
v/s Ratio Prot	c0.33		c0.00	0.04								
v/s Ratio Perm			0.02	0.07				0.01	c0.04			
v/c Ratio		0.54	0.04	0.10	0.05			0.08	0.43			
Uniform Delay, d1		5.4	3.7	2.7	1.7			19.5	20.2			
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.5	0.0	0.1	0.0			0.2	2.0			
Delay (s)		5.9	3.8	2.8	1.8			19.7	22.1			
Level of Service		A	A	A	A			B	C			
Approach Delay (s)		5.8			2.2			21.7			0.0	
Approach LOS		A			A			C			A	
Intersection Summary												
HCM 2000 Control Delay		6.7										
HCM 2000 Volume to Capacity ratio		0.56										
Actuated Cycle Length (s)		47.4			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		43.2%			ICU Level of Service			A				
Analysis Period (min)		15										
c	Critical Lane Group											

1: Avila Beach Drive & Babe Lane

Existing+Project PM
HCM 2010 TWSC

Intersection												
Int Delay, s/veh	2.4											
Movement												
	EBL	EBT	WBT	WBR	SBL	SBR						
Vol, veh/h	23	608	94	83	79	37						
Conflicting Peds, #/hr	0	0	0	0	0	0						
Sign Control	Free	Free	Free	Free	Stop	Stop						
RT Channelized	-	None	-	None	-	None						
Storage Length	-	-	-	-	0	-						
Veh in Median Storage, #	-	0	0	-	0	-						
Grade, %	-	0	0	-	0	-						
Peak Hour Factor	95	95	95	95	95	95						
Heavy Vehicles, %	2	2	2	2	2	2						
Mvmt Flow	24	640	99	87	83	39						
Major/Minor												
	Major1			Major2			Minor2					
Conflicting Flow All	186	0	-	0	-	831	143					
Stage 1	-	-	-	-	-	143	-					
Stage 2	-	-	-	-	-	688	-					
Critical Hdwy	4.12	-	-	-	-	6.42	6.22					
Critical Hdwy Stg 1	-	-	-	-	-	5.42	-					
Critical Hdwy Stg 2	-	-	-	-	-	5.42	-					
Follow-up Hdwy	2.218	-	-	-	-	3.518	3.318					
Pot Cap-1 Maneuver	1388	-	-	-	-	340	905					
Stage 1	-	-	-	-	-	884	-					
Stage 2	-	-	-	-	-	499	-					
Platoon blocked, %	-	-	-	-	-	-	-					
Mov Cap-1 Maneuver	1388	-	-	-	-	331	905					
Mov Cap-2 Maneuver	-	-	-	-	-	331	-					
Stage 1	-	-	-	-	-	884	-					
Stage 2	-	-	-	-	-	486	-					
Approach												
	EB				WB				SB			
HCM Control Delay, s	0.3				0				17.3			
HCM LOS									C			
Minor Lane/Major Mvmt												
	EBL	EBT	WBT	WBR	SBLn1							
Capacity (veh/h)	1388	-	-	-	415							
HCM Lane V/C Ratio	0.017	-	-	-	0.294							
HCM Control Delay (s)	7.6	0	-	-	17.3							
HCM Lane LOS	A	A	-	-	C							
HCM 95th %tile Q(veh)	0.1	-	-	-	1.2							

2: First Street & Avila Beach Drive

Existing+Project PM
Queues

	→	↘	↙	←	↑	↗
Lane Group	EBT	EBR	WBL	WBT	NBT	NBR
Lane Group Flow (vph)	672	45	45	127	19	63
v/c Ratio	0.55	0.04	0.10	0.09	0.08	0.24
Control Delay	9.9	6.1	3.3	3.2	21.2	23.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.9	6.1	3.3	3.2	21.2	23.0
Queue Length 50th (ft)	133	6	3	10	5	17
Queue Length 95th (ft)	249	18	11	25	22	51
Internal Link Dist (ft)	573			373	447	
Turn Bay Length (ft)		50	150			50
Base Capacity (vph)	1706	1406	467	1820	539	589
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.39	0.03	0.10	0.07	0.04	0.11
Intersection Summary						

2: First Street & Avila Beach Drive

Existing+Project PM
HCM Signalized Intersection Capacity Analysis

	↘	→	↙	↘	←	↙	↘	↑	↗	↘	↓	↗
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↘	↘	↘	↘			↘	↘		↘	
Volume (vph)	0	598	40	40	113	0	17	0	56	0	0	0
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			1.00	1.00			
Frpb, ped/bikes		1.00	0.97	1.00	1.00			1.00	0.97			
Flpb, ped/bikes		1.00	1.00	1.00	1.00			1.00	1.00			
Frt		1.00	0.85	1.00	1.00			1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00			0.95	1.00			
Satd. Flow (prot)		1863	1543	1769	1863			1770	1538			
Flt Permitted		1.00	1.00	0.26	1.00			0.76	1.00			
Satd. Flow (perm)		1863	1543	492	1863			1410	1538			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	672	45	45	127	0	19	0	63	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	672	45	45	127	0	0	19	63	0	0	0
Confl. Peds. (#/hr)			3	2								
Confl. Bikes (#/hr)			1			2			3			
Turn Type		NA	Perm	pm+pt	NA		Perm	NA	Perm			
Protected Phases		4		3	8			2		2		6
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		30.4	30.4	36.5	36.5			6.4	6.4			
Effective Green, g (s)		30.4	30.4	36.5	36.5			6.4	6.4			
Actuated g/C Ratio		0.60	0.60	0.72	0.72			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)	1112	921	405	1335				177	193			
v/s Ratio Prot		c0.36		0.00	c0.07							
v/s Ratio Perm			0.03	0.08				0.01	c0.04			
v/c Ratio		0.60	0.05	0.11	0.10			0.11	0.33			
Uniform Delay, d1		6.5	4.3	3.6	2.2			19.7	20.3			
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.9	0.0	0.1	0.0			0.3	1.0			
Delay (s)		7.4	4.3	3.8	2.2			20.0	21.3			
Level of Service		A	A	A	A			B	C			
Approach Delay (s)		7.2			2.6			21.0				0.0
Approach LOS		A			A			C				A
Intersection Summary												
HCM 2000 Control Delay			7.6									A
HCM 2000 Volume to Capacity ratio			0.60									
Actuated Cycle Length (s)			50.9						16.0			
Intersection Capacity Utilization			43.2%									A
Analysis Period (min)			15									
c Critical Lane Group												

1: Avila Beach Drive & Babe Lane

Cumulative PM
HCM 2010 TWSC

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	10	680	130	10	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	716	137	11	11	11
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	147	0	-	0	879	142
Stage 1	-	-	-	-	142	-
Stage 2	-	-	-	-	737	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1435	-	-	-	318	906
Stage 1	-	-	-	-	885	-
Stage 2	-	-	-	-	473	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1435	-	-	-	314	906
Mov Cap-2 Maneuver	-	-	-	-	314	-
Stage 1	-	-	-	-	885	-
Stage 2	-	-	-	-	467	-
Approach	EB		WB		SB	
HCM Control Delay, s	0.1		0		13.1	
HCM LOS	B		B		B	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1435	-	-	-	466	
HCM Lane V/C Ratio	0.007	-	-	-	0.045	
HCM Control Delay (s)	7.5	0	-	-	13.1	
HCM Lane LOS	A	A	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.1	

2: First Street & Avila Beach Drive

Cumulative PM
Queues

Lane Group	EBT	EBR	WBL	WBT	NBT	NBR
Lane Group Flow (vph)	674	45	45	90	22	67
v/c Ratio	0.55	0.04	0.10	0.06	0.09	0.25
Control Delay	10.0	6.2	3.4	3.1	21.4	23.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.0	6.2	3.4	3.1	21.4	23.2
Queue Length 50th (ft)	135	6	3	7	6	19
Queue Length 95th (ft)	252	18	11	19	24	54
Internal Link Dist (ft)	573		373		447	
Turn Bay Length (ft)	50		150		50	
Base Capacity (vph)	1697	1398	464	1816	535	585
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.40	0.03	0.10	0.05	0.04	0.11

Intersection Summary

2: First Street & Avila Beach Drive

Cumulative PM
HCM Signalized Intersection Capacity Analysis

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔	↔	↔	↔		↔	↔	↔		↔	↔
Volume (vph)	0	600	40	40	80	0	20	0	60	0	0	0
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	4.0			
Lane Util. Factor		1.00	1.00	1.00	1.00			1.00	1.00			
Flpb. ped/bikes	1.00	0.97	1.00	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	0.85	1.00	1.00	1.00			1.00	0.85			
Flt Protected	1.00	1.00	0.95	1.00	1.00			0.95	1.00			
Satd. Flow (prot)	1863	1543	1769	1863	1863			1770	1538			
Flt Permitted	1.00	1.00	0.26	1.00	1.00			0.76	1.00			
Satd. Flow (perm)	1863	1543	489	1863	1863			1410	1538			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	674	45	45	90	0	22	0	67	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	674	45	45	90	0	0	22	67	0	0	0
Confl. Peds. (#/hr)			3	2								
Confl. Bikes (#/hr)		1				2			3			
Turn Type		NA	Perm	pm+pt	NA		Perm	NA	Perm			
Protected Phases		4		3	8			2			6	
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		30.7	30.7	36.8	36.8			6.6	6.6			
Effective Green, g (s)		30.7	30.7	36.8	36.8			6.6	6.6			
Actuated g/C Ratio		0.60	0.60	0.72	0.72			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)	1112	921	402	1333				181	197			
v/s Ratio Prot	c0.36		c0.00	0.05								
v/s Ratio Perm			0.03	0.08				0.02	c0.04			
v/c Ratio		0.61	0.05	0.11	0.07			0.12	0.34			
Uniform Delay, d1		6.5	4.3	3.7	2.2			19.8	20.4			
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00			
Incremental Delay, d2		0.9	0.0	0.1	0.0			0.3	1.0			
Delay (s)		7.5	4.3	3.8	2.2			20.1	21.4			
Level of Service		A	A	A	A			C	C			
Approach Delay (s)		7.3			2.7			21.1			0.0	
Approach LOS		A			A			C			A	
Intersection Summary												
HCM 2000 Control Delay		7.9										
HCM 2000 Volume to Capacity ratio		0.60										
Actuated Cycle Length (s)		51.4			Sum of lost time (s)			16.0				
Intersection Capacity Utilization		43.2%			ICU Level of Service			A				
Analysis Period (min)		15										
c	Critical Lane Group											

1: Avila Beach Drive & Babe Lane

Cumulative Plus Project PM
HCM 2010 TWSC

Intersection						
Int Delay, s/veh	2.4					
Movement						
	EBL	EBT	WBT	WBR	SBL	SBR
Vol, veh/h	23	673	108	83	79	37
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	708	114	87	83	39
Major/Minor						
	Major1		Major2		Minor2	
Conflicting Flow All	201	0	-	0	914	157
Stage 1	-	-	-	-	157	-
Stage 2	-	-	-	-	757	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1371	-	-	-	303	889
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	463	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1371	-	-	-	294	889
Mov Cap-2 Maneuver	-	-	-	-	294	-
Stage 1	-	-	-	-	871	-
Stage 2	-	-	-	-	450	-
Approach						
	EB			WB		SB
HCM Control Delay, s	0.3			0		19.2
HCM LOS						C
Minor Lane/Major Mvmt						
	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1371	-	-	-	374	
HCM Lane V/C Ratio	0.018	-	-	-	0.326	
HCM Control Delay (s)	7.7	0	-	-	19.2	
HCM Lane LOS	A	A	-	-	C	
HCM 95th %tile Q(veh)	0.1	-	-	-	1.4	

2: First Street & Avila Beach Drive

Cumulative Plus Project PM
Queues

	→	↘	↙	←	↑	↗
Lane Group	EBT	EBR	WBL	WBT	NBT	NBR
Lane Group Flow (vph)	736	53	45	142	29	67
v/c Ratio	0.58	0.05	0.10	0.10	0.13	0.27
Control Delay	9.9	5.7	3.2	3.0	24.3	26.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.9	5.7	3.2	3.0	24.3	26.1
Queue Length 50th (ft)	157	7	3	11	8	20
Queue Length 95th (ft)	285	20	11	27	32	58
Internal Link Dist (ft)	573			373	447	
Turn Bay Length (ft)		50	150			50
Base Capacity (vph)	1617	1332	440	1767	492	538
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.04	0.10	0.08	0.06	0.12
Intersection Summary						

2: First Street & Avila Beach Drive

Cumulative Plus Project PM
HCM Signalized Intersection Capacity Analysis

	↘	→	↙	↘	←	↙	↘	↑	↗	↘	↓	↗
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↘	↘	↘	↘			↘	↘		↘	
Volume (vph)	0	655	47	40	126	0	26	0	60	0	0	0
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			1.00	1.00			
Frpb, ped/bikes		1.00	0.97	1.00	1.00			1.00	0.97			
Flpb, ped/bikes		1.00	1.00	1.00	1.00			1.00	1.00			
Frt		1.00	0.85	1.00	1.00			1.00	0.85			
Flt Protected		1.00	1.00	0.95	1.00			0.95	1.00			
Satd. Flow (prot)		1863	1543	1769	1863			1770	1537			
Flt Permitted		1.00	1.00	0.24	1.00			0.76	1.00			
Satd. Flow (perm)		1863	1543	451	1863			1410	1537			
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	0	736	53	45	142	0	29	0	67	0	0	0
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	0	736	53	45	142	0	0	29	67	0	0	0
Confl. Peds. (#/hr)			3	2								
Confl. Bikes (#/hr)			1			2			3			
Turn Type		NA	Perm	pm+pt	NA		Perm	NA	Perm			
Protected Phases		4		3	8			2		2		6
Permitted Phases	4		4	8			2		2	6		
Actuated Green, G (s)		34.7	34.7	40.8	40.8			6.7	6.7			
Effective Green, g (s)		34.7	34.7	40.8	40.8			6.7	6.7			
Actuated g/C Ratio		0.63	0.63	0.74	0.74			0.12	0.12			
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)	1164	964	381	1369				170	185			
v/s Ratio Prot		c0.40		0.00	c0.08							
v/s Ratio Perm			0.03	0.08				0.02	c0.04			
v/c Ratio		0.63	0.05	0.12	0.10			0.17	0.36			
Uniform Delay, d1		6.4	4.0	4.0	2.1			21.9	22.4			
Progression Factor		1.00	1.00	1.00	1.00			1.00	1.00			
Incremental Delay, d2		1.1	0.0	0.1	0.0			0.5	1.2			
Delay (s)		7.6	4.1	4.1	2.1			22.4	23.6			
Level of Service		A	A	A	A			C	C			
Approach Delay (s)		7.3			2.6			23.3			0.0	
Approach LOS		A			A			C			A	
Intersection Summary												
HCM 2000 Control Delay			7.9								A	
HCM 2000 Volume to Capacity ratio			0.63									
Actuated Cycle Length (s)			55.5			Sum of lost time (s)			16.0			
Intersection Capacity Utilization			44.9%			ICU Level of Service			A			
Analysis Period (min)			15									
c Critical Lane Group												