516 La Costa Development

Traffic Study

Prepared for:
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1650 N Coast Highway 101
Encinitas, CA 92024

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1 INTRODUCTION

This traffic study evaluates the traffic conditions associated with the proposed 516 La Costa development (herein referred to as "the project") located at 516 La Costa Avenue in the City of Encinitas, CA.

Figure 1-1 illustrates the location of the project site in the region.

1.1 Project Description

The project proposes to construct a 17-room boutique hotel spread across nine detached bungalow structures and will include a full service public restaurant. The restaurant will service the guests of the hotel and members of the public. The project is located on the north side of La Costa Avenue and just west of I-5 at 516 La Costa Avenue (APN #216-030-10-00).

Access will be provided by a single driveway off La Costa Avenue. The driveway will be unsignalized with stop controls on the approach to La Costa Avenue. **Figure 1-2** illustrates the project site plan.

1.2 Study Area

This traffic study addresses potential operational impacts that could result from the addition of the project traffic to the local circulation system. The criteria outlined in the *SANTEC/ITE Guidelines for Traffic Impact Studies in the San Diego Region* states that a traffic study is required when the project generates more than 50 peak-hour trips. Based on the project trip assignment (see Section 4.3 for more details), none of the study area intersections or driveway meet the criteria. However, due to the project site's proximity to the I-5 freeway and for consistency with other projects in the immediate study area, the following list summarizes the locations included in the study area:

Intersections

1. N Coast Highway 101 & La Costa Avenue (signal)
2. N Vulcan Avenue & La Costa Avenue (stop controlled)
3. Project Driveway & La Costa Avenue (stop controlled)
4. I-5 Southbound Ramps & La Costa Avenue (signal)
5. I-5 Northbound Ramps & La Costa Avenue (signal)

Roadway Segments

1. La Costa Avenue between N Coast Highway 101 and N Vulcan Avenue
2. La Costa Avenue between N Vulcan Avenue and Sheridan Road
3. La Costa Avenue between Sheridan Road and Project Driveway
4. La Costa Avenue between Project Driveway and I-5 Southbound Ramps

Freeway Segments

1. I-5 from Poinsettia Lane to La Costa Avenue
2. I-5 from La Costa Avenue to Leucadia Boulevard

Ramp Meters

1. I-5 Northbound On-Ramp from La Costa Avenue
2. I-5 Southbound On-Ramp from La Costa Avenue

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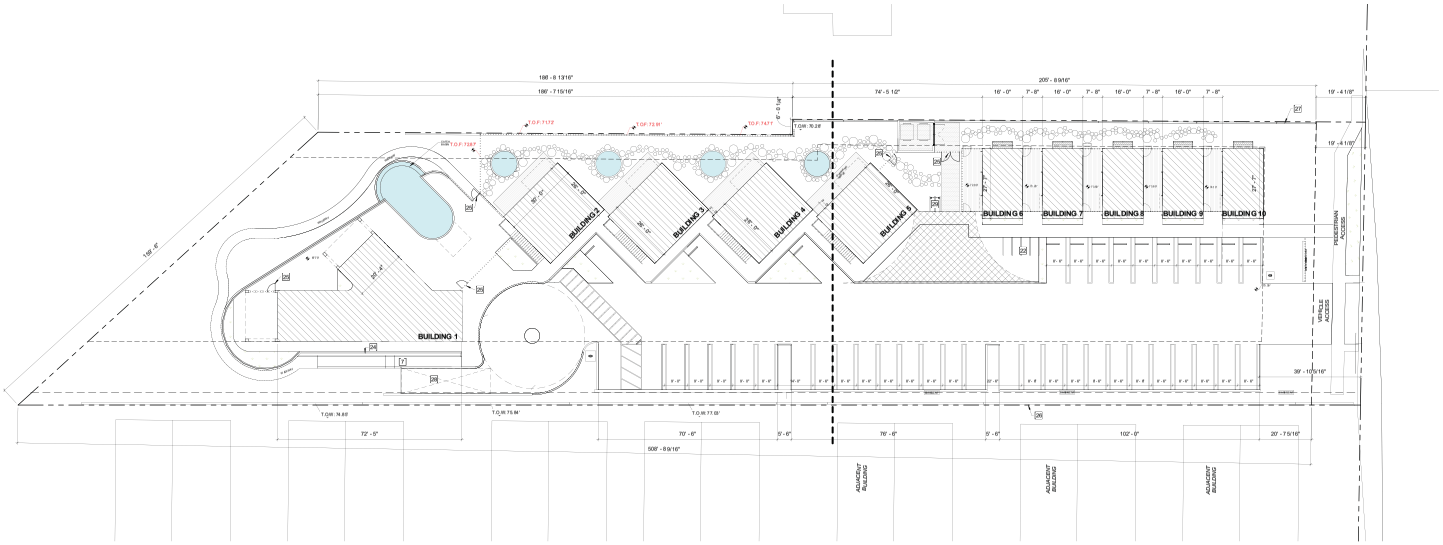
Figure 1-1
Project Study Area



1 PROPOSED SITE PLAN
1/16" = 1'-0"

KEYNOTES

1	BMP
2	SOUND WALL
4	OUTDOOR LOUNGE
5	WALKING PATH
6	TRASH ENCLOSURE
7	ADA RAMP
8	LOUNGE SEATING AREA
9	QUONSET HUT (3 UNITS)
10	FIRE TRUCK TURNAROUND
11	SPA
12	BUNGALOW UNITS
13	KIDS POOL
14	HOTEL PLUNGE POOL
15	6' FENCE
16	SCREENED MECHANICAL EQUIPMENT
17	STEPSTONE WALKWAY
18	MONUMENT SIGN
19	MOTOR COURT
20	OUTDOOR DINING
21	UNDERGROUND SPA EQUIPMENT
22	MOTORCYCLE PARKING
23	SCREENED MECHANICAL EQUIPMENT UNDER STAIRS
24	RAISED PLANTER
25	GATE AT FENCE (KEY ACCESS)
26	CMU FENCE
27	WOOD FENCE 6'
28	LOADING SPACE
29	BICYCLE PARKING

NOTES

CASE NO.	18-188 DR/MUP/CDP
PROJECT NO.	
DRAWN BY:	Designer
CHECKED BY:	Checker
DATE:	06/28/19
REVISIONS:	

THE BROWN STUDIO INC.
1144 N Coast Hwy 101
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516 LA COSTA

Case No. 18-188 DR/MUP/CDP

PROJECT NO. CASE NO. 18-188 DR/MUP/CDP
DRAWINGS PREPARED BY:
LINDSAY BROWN

SHEET TITLE
SITE PLAN (FULL)

SHEET NUMBER
A0.03

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Figure 1-2
Site Plan

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2 ANALYSIS APPROACH AND METHODOLOGY

This section summarizes the analysis approach and methodology used to evaluate the study intersections/project driveway, roadway segments, freeway segments, and freeway on-ramps associated with the project.

2.1 Analysis Scenarios

The following scenarios were evaluated in this traffic study:

- Existing Conditions (2019): This scenario reflects the conditions on the ground at the time the traffic volume data was obtained (May 2019).
- Existing Plus Project: This scenario reflects existing conditions with the addition of project traffic.
- Existing Plus Cumulative: This scenario accounts for the addition of cumulative traffic onto Existing Conditions.
- Existing Plus Cumulative Plus Project: This scenario accounts for the addition of project traffic onto Existing Plus Cumulative traffic.

The traditional weekday peak-hour coinciding with the highest volume of traffic between 7:00 and 9:00 AM and between 4:00 and 6:00 PM was analyzed for each analysis scenario.

2.2 Methodology

2.2.1 Intersection Delay Analysis

Signalized and unsignalized intersection operations were analyzed with Synchro 10 software (Trafficware), using the methodologies outlined in the *2010 Highway Capacity Manual (HCM)*. The HCM methodology calculates delay, which corresponds to a particular LOS, to describe the overall operation of an intersection. Delay is a measure of driver and/or passenger discomfort, frustration, fuel consumption and lost travel time.

Signal timing data and parameters such as cycle lengths, splits, clearance intervals, etc. were based on existing Caltrans timing plans that are currently implemented in the field and were calibrated into the Synchro model. The LOS for unsignalized intersections is determined by the computed or measured control delay and is defined for each minor movement. At a one-way or two-way stop control intersection, the delay reported represents the worst movement, which is typically the left-turns from the minor street approach. The criteria for the LOS grade designations are provided in **Table 2-1**.

Within the City of Encinitas, the threshold for acceptable operating conditions for signalized and unsignalized intersections is LOS D or better.

Table 2-1
LOS Criteria for Intersections

LOS	LOS Criteria (sec/veh)		Description
	Signalized Intersections	Unsignalized Intersections	
A	≤10	≤10	EXCELLENT. Operations with very low delay and most vehicles do not stop.
B	>10 and ≤20	>10 and ≤15	VERY GOOD. Operations with good progression but with some restricted movements.
C	>20 and ≤35	>15 and ≤25	GOOD. Operations where a significant number of vehicles are stopping with some backup and light congestion.
D	>35 and ≤55	>25 and ≤35	FAIR. Operations where congestion is noticeable, longer delays occur, and many vehicles stop. The proportion of vehicles not stopping declines.
E	>55 and ≤80	>35 and ≤50	POOR. Operations where there is significant delay, extensive queuing, and poor progression.
F	>80	>50	FAILURE. Operations that are unacceptable to most drivers, when the arrival rates exceed the capacity of the intersection.

Source: *2010 Highway Capacity Manual*

2.2.2 Roadway Segment Analysis

Roadway segment LOS standards and thresholds provide the basis for analysis of arterial roadway segment performance. This analysis is based on the functional classification of the roadway, the maximum capacity, roadway geometrics, and the daily traffic volumes.

Table 2-2 summarizes the capacities for the various roadway classifications with the City of Encinitas for each respective LOS.

Table 2-2
LOS Criteria for Roadway Segments

Facility Type	Number of Lanes	ADT Capacity		
		LOS C	LOS D	LOS E
Prime Arterial	6	‹ 46,000	‹ 51,200	‹ 57,000
Prime Arterial – Augmented	6	‹ 53,000	‹ 60,000	‹ 66,000
Major Roadway	4	‹ 28,200	‹ 31,600	‹ 35,200
Major Roadway – Augmented	4+	‹ 36,300	‹ 41,000	‹ 45,400
Collector Roadway	4	‹ 26,000	‹ 29,200	‹ 32,400
Local Roadway - Augmented	2+	‹ 16,000	‹ 18,000	‹ 20,000
Local Roadway	2	‹ 11,200	‹ 12,600	‹ 14,000

Source: *City of Encinitas Public Road Standards, April 1991*

2.2.3 Freeway Segment Analysis

The freeway segments were analyzed during the AM and PM peak-hours based on the volume to capacity (v/c) ratio. The freeway LOS operations are based on the *Caltrans Guide for the Preparation of Traffic Impact Studies, December 2002*, which assumes a maximum service flow rate of 2,350 passenger cars per hour per lane to estimate the capacity for the freeway segments. The most recent published data released by Caltrans was used for the analyses. **Appendix A** contains excerpts of the freeway data used for the analysis.

Table 2-3 summarizes the freeway segment criteria based on the respective v/c ratio thresholds.

Table 2-3
LOS Criteria for Freeway Segments

Measure of Effectiveness	LOS A	LOS B	LOS C	LOS D	LOS E
Volume/Capacity (v/c) Ratio	‹ 0.30	0.30 – 0.50	0.51 – 0.71	0.72 – 0.89	0.90 – 1.00

Source: *Caltrans Guide for the Preparation of Traffic Impact Studies, December 2002*

2.2.4 Freeway Ramp Meters

Ramp metering is a means of controlling the volume of traffic entering the freeway with the goal of improving the safety, traffic operations, and flow on the freeway main lanes. Freeway ramp meter analysis estimates the peak hour queues and delays at freeway ramps by comparing existing volumes to the meter rate at the given location. Meter rates were provided by Caltrans and include a range between the least and most restrictive rates. Since many of the freeways currently operate at or above its capacity during the peak hours, the most restrictive rate was used for the analysis.

The excess demand at a freeway ramp forms the basis for calculating the maximum queues and maximum delays anticipated at each location. Substantial queues and delays can form where demand significantly exceeds the meter rate. This approach assumes a static rate throughout the course of the peak hour; however, Caltrans has indicated that the meter rates operate in a traffic responsive mode and based on the level of traffic using the on-ramp. To the extent possible, the meter rate in the field is set such that the

queue length does not exceed the available storage, smooth flows on the freeway mainline are maintained, and there is no interference to arterial traffic.

The following list contains the assumptions used for the ramp meter analyses based on field observations:

- Storage length measured from recent aerials of the area
- The usage split between the High Occupancy Vehicle (HOV) and Single Occupancy Vehicle (SOV) lanes was calculated from actual observations in the field.
- 29-foot vehicle length

Appendix B contains excerpts of the ramp metering data used for the analysis.

2.2.5 Queuing Analysis

The 50th percentile and 95th percentile queue lengths were calculated using the Synchro 10 software. The 50th percentile queues are those that would occur on a typical signal cycle. Thus, half of the queue lengths would be longer than this number and half would be shorter. The 95th percentile queues are those that would be exceeded by only five percent of the time. The 95th percentile queue length is generally used to design the storage bays for turn pockets.

2.3 Significance Criteria

To determine the project impacts to roadway segments and intersections, the *SANTEC/ITE Guidelines for Traffic Impact Studies in the San Diego Region* has developed thresholds based on allowable increases in delay at intersections, volume to capacity ratios (v/c Ratio) for roadway and freeway segments, and delay at ramp meters. **Table 2-4** summarizes the significance criteria.

Table 2-4
Significance Thresholds

Facility	Measurement of Effectiveness (MOE)	Significance Threshold
Intersections	Seconds of delay	At LOS E or F, › 2.0 seconds of delay
Roadway Segments	v/c Ratio	At LOS E or F, › 0.02 v/c Ratio
Freeway Segments	v/c Ratio	At LOS E or F, › 0.01 v/c Ratio
Ramp Metering	Delay (min)	› 2 minutes of delay when total delay › 15 minutes

Source: *SANTEC/ITE Guidelines for Traffic Impact Studies in the San Diego Region*, March 2, 2000

3 EXISTING CONDITIONS

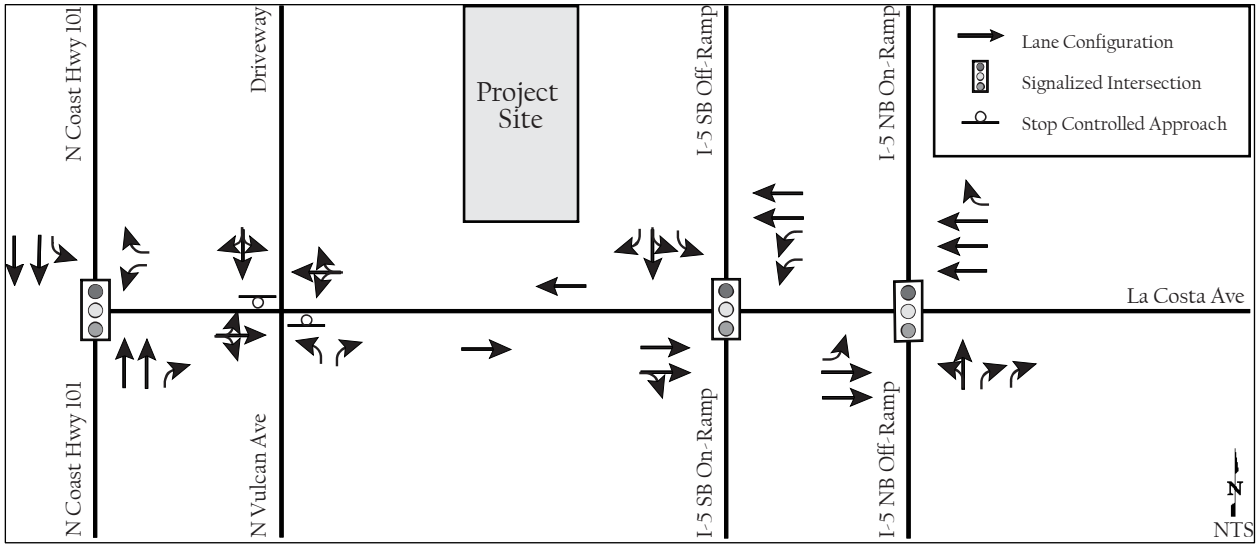
This section describes the existing roadway network, peak hour traffic volumes, and operations at the facilities within the study area.

3.1 Roadway Network

La Costa Avenue is classified as a 4-lane collector from N Highway 101 to the I-5 Southbound Ramps, but functions as a 2-lane local collector between N Coast Highway 101 and Sheridan Road and as a 2-lane local augmented collector between Sheridan Road and the I-5 Southbound Ramps. On-street parking is prohibited on both sides of the roadway. Curb and gutters are provided on both sides of the roadway, but a sidewalk is only provided on the north side and ending just to the west of the project site. A Class 2 bicycle lane is provided in both directions. The posted speed limit is 35 miles per hour.

Figure 3-1 illustrates the existing geometrics at the intersections and number of travel lanes within the study area.

Figure 3-1 Existing Intersection and Roadway Geometrics



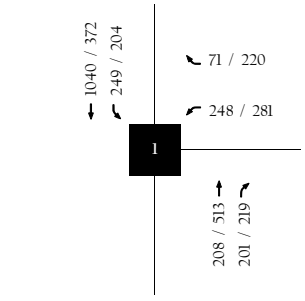
3.2 Traffic Volumes

Traffic volumes at the study area intersections and roadway segments were obtained on May 16, 2019. Traffic volumes for the I-5 segments were obtained in 2017 and referenced from the *Caltrans 2017 Traffic Volumes on California State Highways.* The 2017 freeway volumes represent the most current published data. **Figure 3-2** illustrates the study area traffic volumes.

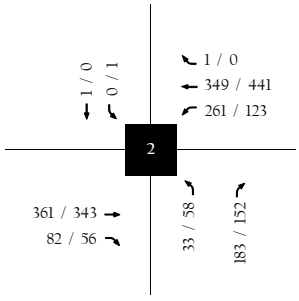
Appendix C contains a copy of the traffic volume data sheets.

xx / yy = AM / PM Peak-Hour Turning Movement Volumes
The naming convention for intersections is North / South & East / West

N Coast Hwy 101 & La Costa Ave



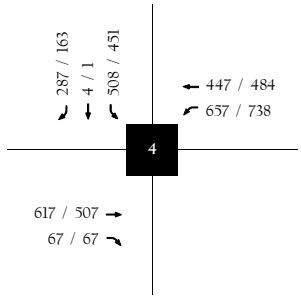
Vulcan Ave & La Costa Ave



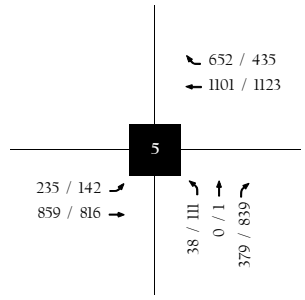
Proj Dwy & La Costa Ave

Intersection does not exist

I-5 SB Ramps & La Costa Ave



I-5 NB Ramps & La Costa Ave



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Existing Conditions Traffic Volumes

Figure 3-2

3.3 Intersection Analysis

Table 3-1 displays the LOS analysis results for the study area intersections under Existing Conditions.

Table 3-1
Existing Peak Hour Intersection LOS Summary

#	Intersection	Traffic Control	Peak Hour	Existing Conditions	
				Delay[1]	LOS[2]
1	N Coast Hwy & La Costa Ave	Signal	AM	10.1	B
			PM	14.4	B
2	N Vulcan Ave & La Costa Ave	OWSC	AM	**41.0**	**E**
			PM	**43.8**	**E**
3	Proj Dwy & La Costa Ave	OWSC	AM	DNE	
			PM		
4	I-5 SB Ramps & La Costa Ave	Signal	AM	35.3	D
			PM	28.7	C
5	I-5 NB Ramps & La Costa Ave	Signal	AM	21.3	C
			PM	**63.4**	**E**

Notes:
DNE: Does not exist
Signal: Traffic signal, OWSC: One-Way Stopped Control
Bold values indicate intersections operating at LOS E or F.

1. Delays are reported as the average control delay for the entire intersection at signalized intersections and the worst approach at unsignalized intersections.
2. LOS calculations are based on the methodology outlined in the *2010 Highway Capacity Manual* (HCM) and performed using Synchro 10.

As shown in the table, all intersections operate at LOS D or better during the weekday peak-hours except for the following intersections:

- N Vulcan Avenue & La Costa Avenue (LOS E – AM and PM peak-hour)
- I-5 NB Ramps & La Costa Avenue (LOS E – PM peak-hour)

Appendix D contains the intersection LOS worksheets.

3.4 Roadway Segment Analysis

Table 3-2 displays the LOS analysis for La Costa Avenue roadway segments under Existing Conditions. As shown in the table, all segments along La Costa Avenue function at LOS C except for the segment between Vulcan Avenue and Sheridan Road, which functions at LOS F.

Table 3-2
Existing Roadway LOS Summary

Roadway Segment	Functional Classification[1]	Capacity (LOS E)	ADT	v/c Ratio	LOS
La Costa Ave					
N Coast Hwy 101 to Vulcan Ave	2-Lane Local Roadway	14,000	10,466	0.748	C
Vulcan Ave to Sheridan Rd	2-Lane Local Roadway	14,000	14,033	1.002	**F**
Sheridan Rd to Proj Dwy	2-Lane Local Roadway - Augmented	20,000	15,303	0.765	C
Proj Dwy to I-5 SB Ramps	2-Lane Local Roadway - Augmented	20,000	15,361	0.768	C

Notes:
Bold values indicate roadway segments operating at LOS E or F.
1. The segments are classified as a 4-lane collector per the City's Circulation Plan. However, the segments currently function as a 2-lane roadway or 2-lane augmented 2-lane roadway with bicycle lanes in each direction.

3.5 Freeway Segment Analysis

Table 3-3 displays the LOS analysis for the two I-5 freeway segments between Poinsettia Lane and Leucadia Boulevard under Existing Conditions. As shown in the table, all freeway segments operate at LOS D or better, except for the following:

- I-5 Northbound between Poinsettia Lane and La Costa Avenue (LOS F – AM & PM Peak)
- I-5 Southbound between La Costa Avenue and Leucadia Boulevard (LOS E – AM Peak)

Table 3-3
Existing Freeway Segment LOS Summary

Freeway Segment		Dir	Number of Lanes	Peak-Hour Volume[1]		Capacity[2]	v/c Ratio		LOS	
				AM	PM		AM	PM	AM	PM
I-5	Poinsettia Ln to La Costa Ave	NB	4	12,718	10,484	9,400	1.35	1.12	**F**	**F**
		SB	4	4,590	5,260	9,400	0.49	0.56	B	C
	La Costa Ave to Leucadia Blvd	NB	4	7,180	8,164	9,400	0.76	0.87	D	D
		SB	4	8,726	7,333	9,400	0.93	0.78	**E**	D

Notes:
Bold values indicate freeway segments operating at LOS E or F.
1. Peak-hour volumes were estimated by applying the K and D factors and truck percentages published by Caltrans in 2017.
2. A capacity of 2,350 pcphpl was used based on the *Caltrans Guide for the Preparation of Traffic Impact Studies, December 2002.*

3.6 Ramp Metering Analysis

Table 3-4 displays the ramp metering analysis for the two I-5 freeway segments between Poinsettia Lane and Leucadia Boulevard under Existing Conditions. As shown in the table, both ramp meters have volumes that do not exceed the meter rate and results in no delays.

Table 3-4
Existing Ramp Metering Summary

On-Ramp	Peak Hour	Number of Lanes		Storage Length (ft)		Meter Rate (veh/hr/ln)[1]	Ramp Volume (per lane)[2]			Delay (min)[3]	
		GP	HOV	GP	HOV		Total	GP	HOV	GP	HOV
I-5 NB & La Costa Ave	AM	1	1	410	410	n/a	772	710	62		
	PM					492	540	432	108	0	0
I-5 SB & La Costa Ave	AM	2	1	670	670	346	599	255	90	0	0
	PM					346	788	343	102	0	0

Notes:
1. The ramp meter rate represents the most restrictive rate obtained from Caltrans. Cells containing a "n/a" indicate that the meter was not turned on.
2. The split between SOV and HOV is based on actual count data.
3. Delays exceeding 15-minutes are shown in **bold** font.

3.7 Queuing Analysis

Table 3-5 displays the queueing analysis of the eastbound approach at the I-5 Southbound Ramps & La Costa Avenue intersection. Queue lengths are rounded up to the nearest 25 feet to represent the length of a typical vehicle. The main movement of concern is the eastbound movement at the I-5 Southbound Ramps. Excessive queue lengths from this movement could extend back to or past the project driveway and affect the operations for vehicles turning onto La Costa Avenue. There is approximately 400 feet between the stop bar at the I-5 Southbound Ramps to the location of the proposed project driveway.

Table 3-5
Existing Peak-Hour Queuing Summary

Intersection	Peak Hour	Movement	Storage Length (ft)	Queue Length (ft)[1]	
				50th %	95th %
I-5 SB Ramps & La Costa Ave	AM	EB	400	200	250
	PM			150	225

Notes:
Values shown in **bold** indicate movements where the queue length exceeds the available storage length.
1. Queue lengths were rounded up to the nearest 25 feet to represent the length of a typical vehicle.

As shown in the table, the queuing analysis for the eastbound movement along La Costa Avenue indicates that all queue lengths in both peak-hours do not exceed the available storage length. **Appendix E** contains the queueing worksheets.

4 PROJECT TRAFFIC

This section describes the proposed project, estimated trip generation, trip distribution, and assignment of trips to the adjacent roadway network.

4.1 Project Trip Generation

Trip generation rates for the project were developed utilizing *SANDAG Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region, April 2002.* The trip rates for the hotel and quality restaurant land uses are the most applicable for the proposed project. A hotel use is described as the following:

"A hotel is a place of lodging that provides sleeping accommodations and supporting facilities such as restaurants, cocktail lounges, meeting and banquet rooms or convention facilities, limited recreational facilities (pool, fitness room), and/or other retail and service shops."

Since the project will only have a few supporting facilities such as a pool and a restaurant and not include large trip generators associated with a meeting/banquet room or convention facilities, the estimated trip generation utilizing the hotel trip generation rate would typically cover any trips associated with the small restaurant. However, as a conservative estimate, trips associated with the restaurant use have been included for the total trip generation. It should be noted that a passby reduction could be applied for the restaurant use, but was excluded as a conservative estimate.

The proposed restaurant would consist of a total of 1,165 sf of indoor and outdoor dining space. The indoor dining would consist of 820 sf and located on the ground level near the check-in lobby. The indoor dining space would also include 11 tables with 51 seats. A full menu food service would be provided daily from 6:00 AM to 2:00 AM. There also is an outdoor dining area that is 345 sf and would include 6 tables with 23 seats. Food service would be provided daily from 6:00 AM to 10:00 PM.

Table 4-1 summarizes the weekday trip generation rates and calculations.

Table 4-1
Weekday Trip Generation Summary

TRIP GENERATION RATES[1]						
		AM PEAK		PM PEAK		
Land Use	Weekday Daily	% ADT	In:Out Ratio	% ADT	In:Out Ratio	
Hotel	10 trips / rm	6%	0.60 : 0.40	8%	0.60 : 0.40	
Quality Restaurant	100 trips / ksf	1%	0.60 : 0.40	8%	0.70 : 0.30	

TRIP GENERATION CALCULATIONS								
			AM PEAK			PM PEAK		
Land Use	Amount	ADT	In	Out	Total	In	Out	Total
Proposed Uses								
Hotel	17 rm	170	7	4	11	9	5	14
Quality Restaurant	1.165 ksf[2]	117	2	0	2	7	3	10
DRIVEWAY TRIPS		**287**	**9**	**4**	**13**	**16**	**8**	**24**

Notes:
ksf: 1,000 square feet, rm: rooms
1. The trip rates are based on *SANDAG's Brief Guide of Vehicular Trip Generation Rates for the San Diego Region, April 2002.*
2. Includes the inside and outside areas of the restaurant.

As shown in the table, the project is forecasted to generate a total of 287 daily trips with 13 AM peak-hour trips and 24 PM peak-hour trips at the project driveway.

4.2 Project Trip Distribution

Based on existing travel patterns and approved trip distributions for similar land uses of approved projects in the study area and logical connections to regional facilities, the following list shows the assumed project trip distribution for the proposed project:

Hotel Use
- 20 percent to/from the north via I-5
- 35 percent to/from the south via I-5
- 20 percent to/from the east via La Costa Avenue
- 25 percent to/from the west via La Costa Avenue

Restaurant Use
- 5 percent to/from the north via I-5
- 5 percent to/from the south via I-5
- 45 percent to/from the east via La Costa Avenue
- 45 percent to/from the west via La Costa Avenue

Figures 4-1 and 4-2 display the assumed project trip distribution through the study intersections and project driveway for the hotel and restaurant land uses, respectively.

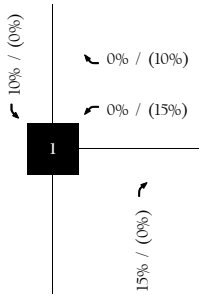
4.3 Project Trip Assignment

Based on the project trip generation and distribution, the project trips were assigned to the intersections and project driveway. **Figures 4-3** and **4-4** illustrate the weekday project trip assignment for the hotel and restaurant land uses, respectively. **Figure 4-5** illustrates the total weekday project trip assignment.

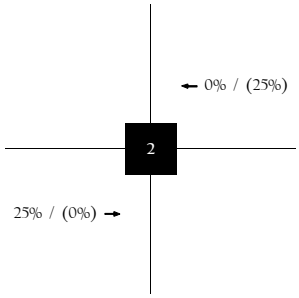
xx% / (yy%) - Enter % / (Exit %)
The naming convention for intersections is North / South & East / West

xx% Trip Distribution Percentage

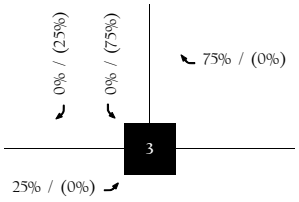
N Coast Hwy 101 & La Costa Ave



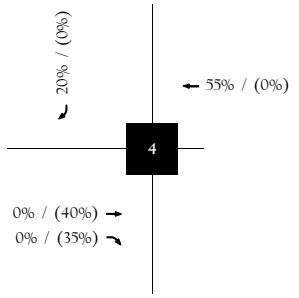
Vulcan Ave & La Costa Ave



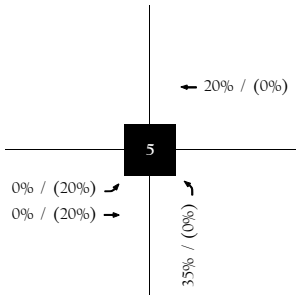
Proj Dwy & La Costa Ave



I-5 SB Ramps & La Costa Ave



I-5 NB Ramps & La Costa Ave



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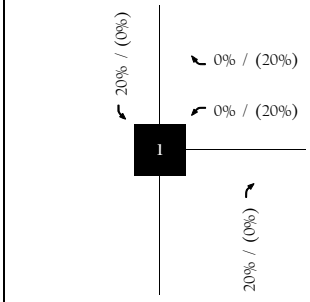
Project Trip Distribution - Hotel

Figure 4-1

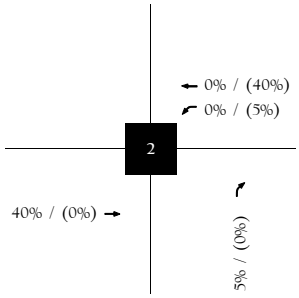
xx% / (yy%) - Enter % / (Exit %)
The naming convention for intersections is North / South & East / West

xx% Trip Distribution Percentage

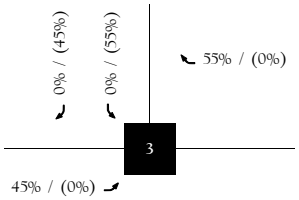
N Coast Hwy 101 & La Costa Ave



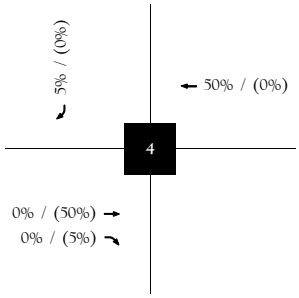
Vulcan Ave & La Costa Ave



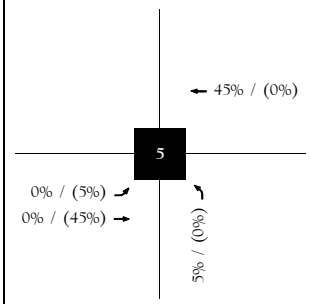
Proj Dwy & La Costa Ave



I-5 SB Ramps & La Costa Ave



I-5 NB Ramps & La Costa Ave



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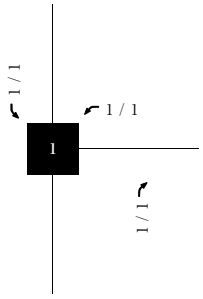
Project Trip Distribution - Restaurant

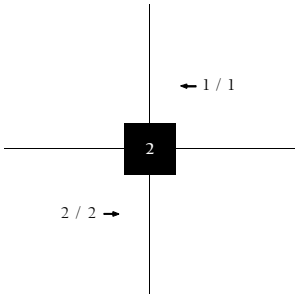
Figure 4-2

xx / yy = AM / PM Peak-Hour Turning Movement Volumes
The naming convention for intersections is North / South & East / West

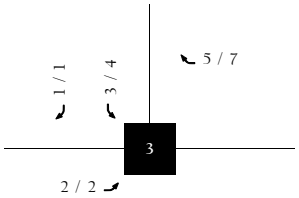
N Coast Hwy 101 & La Costa Ave



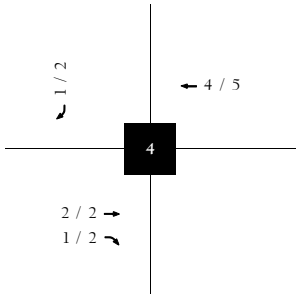
Vulcan Ave & La Costa Ave



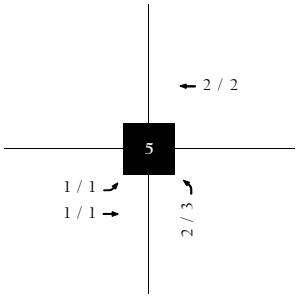
Proj Dwy & La Costa Ave



I-5 SB Ramps & La Costa Ave



I-5 NB Ramps & La Costa Ave



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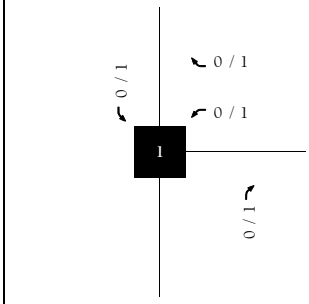
Project Trip Assignment - Hotel

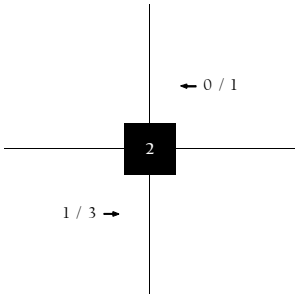
Figure 4-3

xx / yy = AM / PM Peak-Hour Turning Movement Volumes
The naming convention for intersections is North / South & East / West

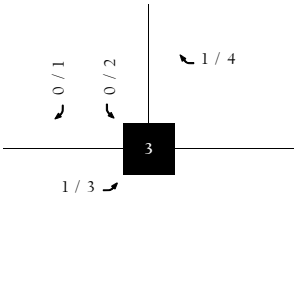
N Coast Hwy 101 & La Costa Ave



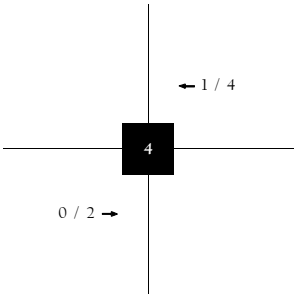
Vulcan Ave & La Costa Ave



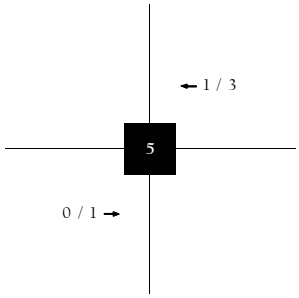
Proj Dwy & La Costa Ave



I-5 SB Ramps & La Costa Ave



I-5 NB Ramps & La Costa Ave



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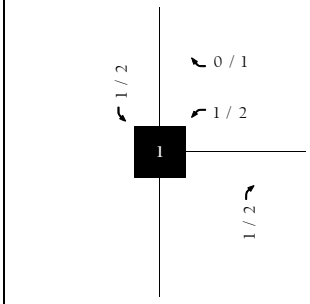
Project Trip Assignment - Restaurant

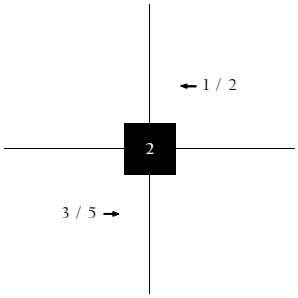
Figure 4-4

xx / yy = AM / PM Peak-Hour Turning Movement Volumes
The naming convention for intersections is North / South & East / West

N Coast Hwy 101 & La Costa Ave

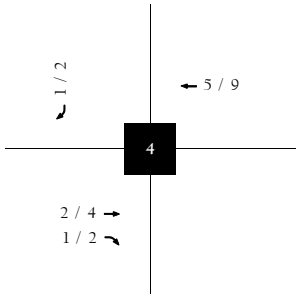


Vulcan Ave & La Costa Ave

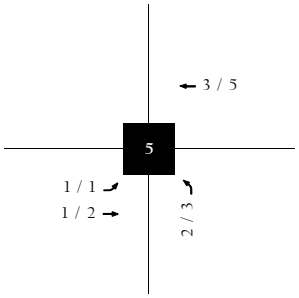


Proj Dwy & La Costa Ave

I-5 SB Ramps & La Costa Ave



I-5 NB Ramps & La Costa Ave



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516 La Costa Development

Project Trip Assigment

Figure 4-5

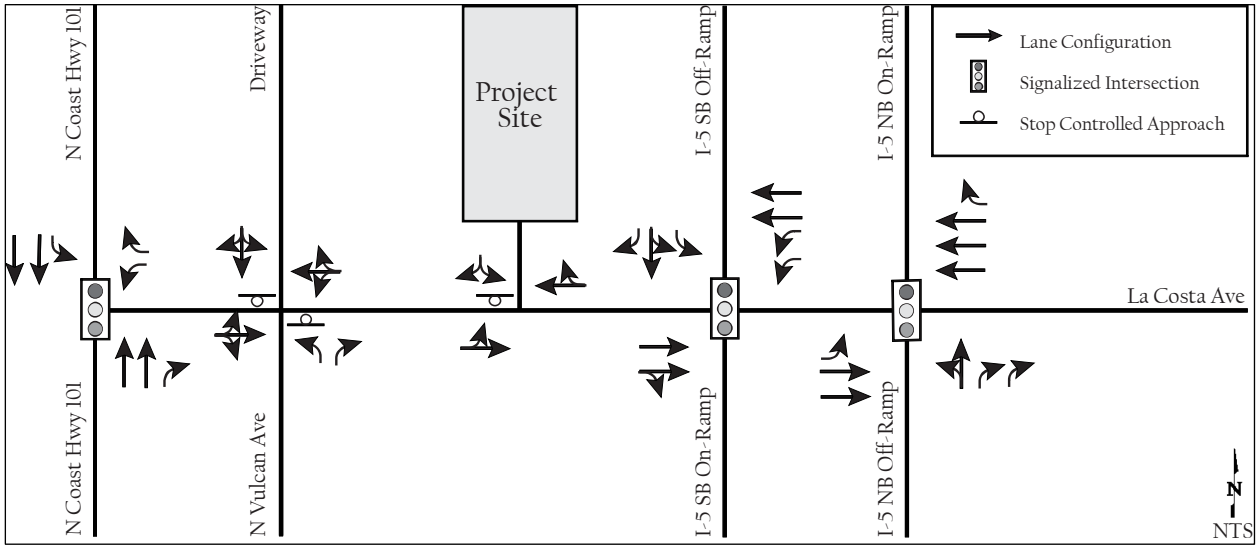
5 EXISTING PLUS PROJECT

This section provides a summary of operations at the facilities within the study area with the addition of the project.

5.1 Roadway Network

No changes to the existing roadway network will occur with the addition of the project except for the construction of the project driveway along La Costa Avenue. The project driveway will be unsignalized with stop-controls on the project driveway approach. **Figure 5-1** illustrates the intersection geometrics of all study area intersections, including the project driveway.

Figure 5-1 Existing Plus Project Intersection Geometrics

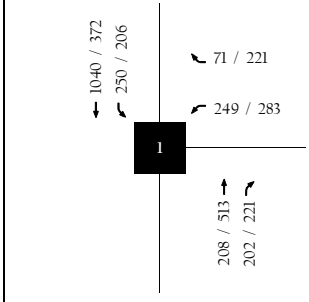


5.2 Traffic Volumes

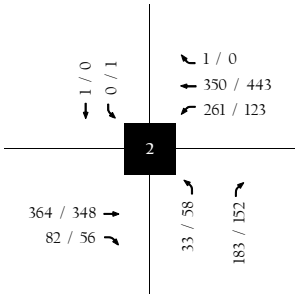
The project trips were added to the existing traffic volumes. **Figure 5-2** illustrates the Existing Plus Project traffic volumes in the study area.

xx / yy = AM / PM Peak-Hour Turning Movement Volumes
The naming convention for intersections is North / South & East / West

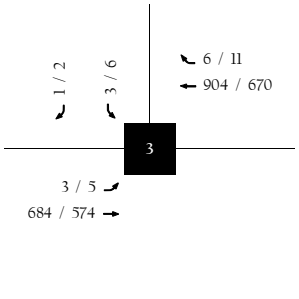
N Coast Hwy 101 & La Costa Ave



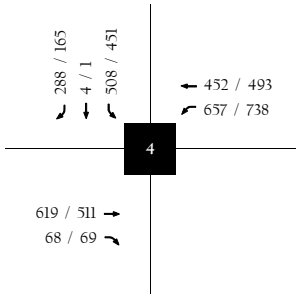
Vulcan Ave & La Costa Ave



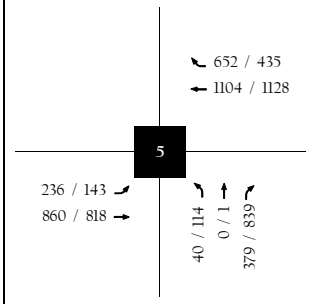
Proj Dwy & La Costa Ave



I-5 SB Ramps & La Costa Ave



I-5 NB Ramps & La Costa Ave



516 La Costa Development

Existing Plus Project Traffic Volumes

Figure 5-2

5.3 Intersection Analysis

Table 5-1 displays the LOS analysis results for the study intersections under the Existing Plus Project scenario.

Table 5-1
Existing Plus Project Peak Hour Intersection LOS Summary

#	Intersection	Traffic Control	Peak Hour	Existing Conditions		Existing Plus Project		Δ in Delay	Sig?
				Delay[1]	LOS[2]	Delay[1]	LOS[2]		
1	N Coast Hwy & La Costa Ave	Signal	AM	10.1	B	10.2	B	0.1	No
			PM	14.4	B	14.5	B	0.1	No
2	N Vulcan Ave & La Costa Ave	OWSC	AM	**41.0**	**E**	**41.4**	**E**	0.4	No
			PM	**43.8**	**E**	**44.2**	**E**	0.4	No
3	Proj Dwy & La Costa Ave	OWSC	AM	DNE		34.3	D	34.3	No
			PM			25.9	D	25.9	No
4	I-5 SB Ramps & La Costa Ave	Signal	AM	35.3	D	35.4	D	0.1	No
			PM	28.7	C	28.8	C	0.1	No
5	I-5 NB Ramps & La Costa Ave	Signal	AM	21.3	C	21.3	C	0.0	No
			PM	**63.4**	**E**	**64.0**	**E**	0.6	No

Notes:
DNE: Does not exist
OWSC: One-Way Stopped Control, Signal: Traffic Signal
Bold values indicate intersections operating at LOS E or F.
1. Delays are reported as the average control delay for the entire intersection at signalized intersections and the worst approach at unsignalized intersections.
2. LOS calculations are based on the methodology outlined in the *2010 Highway Capacity Manual* (HCM) and performed using Synchro 10.

As shown in the table, all intersections, including the project driveways, are expected to operate at LOS D or better with the addition of the project traffic except for the following intersections:

- N Vulcan Avenue & La Costa Avenue (LOS E – AM and PM peak-hours)
- I-5 NB Ramps & La Costa Avenue (LOS E – PM peak-hour)

Although the two intersections above operate at LOS E with the project, the increase in delay does not exceed the significance threshold and would not result in any significant impacts.

Appendix D contains the intersection LOS worksheets.

5.4 Roadway Segment Analysis

Table 5-2 displays the LOS analysis for La Costa Avenue roadway segments under the Existing Plus Project scenario.

Table 5-2
Existing Plus Project Roadway LOS Summary

Roadway Segment	Existing			Existing + Proj			Δ in V/C	Sig?
	ADT	v/c Ratio	LOS	ADT	v/c Ratio	LOS		
La Costa Ave								
N Coast Hwy 101 to Vulcan Ave	10,466	0.748	C	10,562	0.754	C	0.006	No
Vulcan Ave to Sheridan Rd	14,033	1.002	**F**	14,129	1.009	**F**	0.007	No
Sheridan Rd to Proj Dwy	15,303	0.765	C	15,399	0.770	C	0.005	No
Proj Dwy to I-5 SB Ramps	15,361	0.768	C	15,553	0.778	C	0.010	No

Notes:
Bold values indicate roadway segments operating at LOS E or F. **Bold and shaded** values indicate a project significant impact

As shown in the table, all La Costa Avenue segments would function at LOS C with the addition of the project traffic except for the following:

- La Costa Avenue between Vulcan Avenue and Sheridan Road (LOS F)

Although this segment would function at LOS F, the increase in the v/c Ratio would not exceed the significance threshold and would not result in a significant impact.

5.5 Freeway Segment Analysis

Table 5-3 displays the LOS analysis for the two I-5 freeway segments between Poinsettia Lane and Leucadia Boulevard under the Existing Plus Project scenario. As shown in the table, all freeway segments would continue to operate at LOS D or better, except for the following:

- I-5 Northbound between Poinsettia Lane and La Costa Avenue (LOS F – AM & PM Peak)
- I-5 Southbound between La Costa Avenue and Leucadia Boulevard (LOS E – AM Peak)

Although the freeway segments above would operate at LOS E/F, the increase in the v/c Ratio would not exceed the significance threshold and would not result in a significant impact.

5.6 Ramp Metering Analysis

Table 5-4 displays the ramp metering analysis for the two I-5 freeway segments between Poinsettia Lane and Leucadia Boulevard under the Existing Plus Project scenario. As shown in the table, both ramp meters have volumes that would not exceed the meter rate and results in no delays. As a result, the project is not considered to have an impact at both ramp meters in the study area.

Table 5-3
Existing Plus Project Freeway Segment LOS Summary

Freeway Segment		Dir	Existing						Existing Plus Proj						Δ in v/c		Sig?
			Peak-Hour Volume		v/c Ratio		LOS		Peak-Hour Volume[1]		v/c Ratio		LOS				
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
I-5	Poinsettia Ln to La Costa Ave	NB	12,718	10,484	1.35	1.12	F	F	12,719	10,485	1.35	1.12	F	F	0.00	0.00	No
		SB	4,590	5,260	0.49	0.56	B	C	4,591	5,262	0.49	0.56	B	C	0.00	0.00	No
	La Costa Ave to Leucadia Blvd	NB	7,180	8,164	0.76	0.87	D	D	7,182	8,167	0.76	0.87	D	D	0.00	0.00	No
		SB	8,726	7,333	0.93	0.78	E	D	8,727	7,335	0.93	0.78	E	D	0.00	0.00	No

Notes:
Bold values indicate freeway segments operating at LOS E or F. **Bold and shaded** values indicate a significant project impact.
1. The project traffic for each respective freeway segment was added to the peak-hour volumes.

Table 5-4
Existing Plus Project Ramp Metering Summary

On-Ramp	Peak Hour	Meter Rate (veh/hr/ln)[1]	Ramp Volume (per lane)[2]			Delay (min)[3]		Δ in Delay		Sig?
			Total	GP	HOV	GP	HOV	GP	HOV	
I-5 NB & La Costa Ave	AM	n/a	775	713	62					No
	PM	492	541	433	108	0	0	0	0	No
I-5 SB & La Costa Ave	AM	346	609	259	91	0	0	0	0	No
	PM	346	793	345	103	0	0	0	0	No

Notes:
Bold and shaded values indicate a significant project impact.
1. The ramp meter rate represents the most restrictive rate obtained from Caltrans. Cells containing a "n/a" indicate that the meter was not turned on.
2. The split between SOV and HOV is based on actual count data.
3. Delays exceeding 15-minutes are shown in **bold** font.

5.7 Queueing Analysis

Table 5-5 displays the queueing analysis of the eastbound approach at the I-5 Southbound Ramps & La Costa Avenue intersection with the addition of the project.

Table 5-5
Existing Plus Project Peak Hour Queueing Summary

Intersection	Peak Hour	Movement	Storage Length (ft)	Queue Length (ft)[1]				Δ in Queue Length	
				Existing		Existing Plus Proj			
				50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile
I-5 SB Ramps & La Costa Ave	AM	EB	400	200	250	200	250	0	0
	PM			150	225	175	225	25	0

Notes:
Values shown in **bold** indicate movements where the queue length exceeds the available storage length.
1. Queue lengths were rounded up to the nearest 25 feet to represent the length of a typical vehicle.

As shown in the table, the queuing analysis indicates that the project does not significantly increase the queue lengths and would all be less than the available storage length. An increase of 25 feet, or one vehicle, is expected during the PM peak-hour.

Appendix E contains the queueing worksheets.

6 EXISTING PLUS CUMULATIVE CONDITIONS

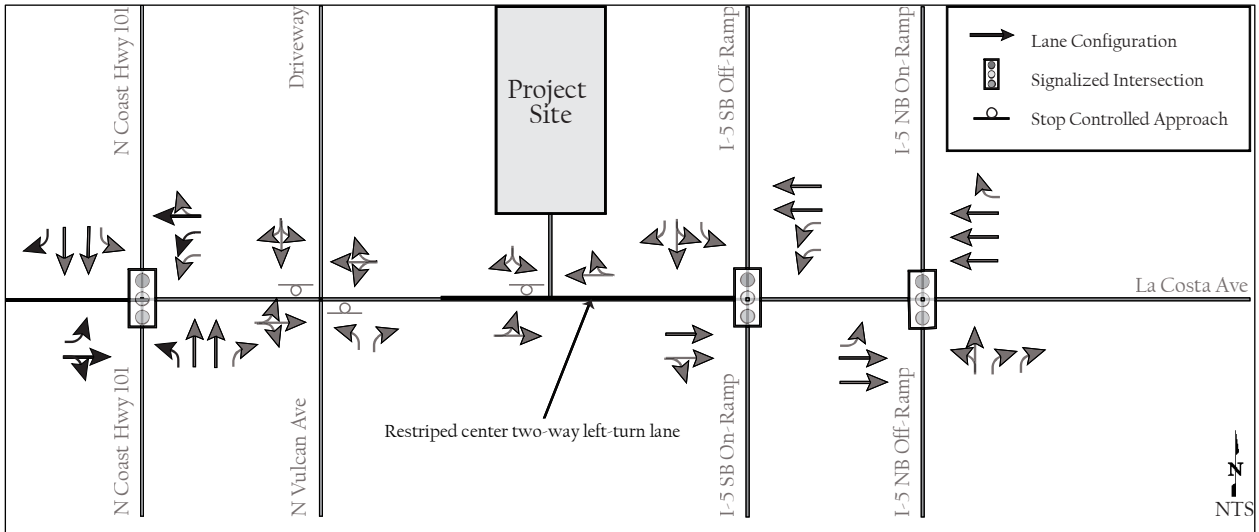
This section provides a summary of operations at the facilities within the study area with the addition of the cumulative projects.

6.1 Roadway Network

A proposed project located immediately to the west of the project site (510 La Costa Avenue Subdivision, TM 15-222) is currently under environmental review. As part of that project, La Costa Avenue will be restriped to include a center two-way left-turn lane extending from their site to the I-5 Southbound Ramps. It is anticipated and assumed that the re-striping of La Costa Avenue will be completed prior to the opening of the project. As a result, the analysis with the project will assume a center two-way left-turn lane. **Appendix F** contains a copy of the proposed striping along La Costa Avenue.

Additionally, the 130-room hotel project (Encinitas 04-268) located at 2100 N Coast Highway 101 will construct the west leg at the N Coast Highway 101 & La Costa Avenue intersection. **Figure 6-1** illustrates the intersection geometrics of all study area intersections, including the project driveway under the Existing Plus Cumulative scenario.

Figure 6-1 Existing Plus Cumulative Intersection Geometrics



Note:
Movements and/or segments shown in **bold** indicate improvements made by cumulative projects.

6.2 Cumulative Projects

Eleven cumulative projects were identified by the City of Encinitas and City of Carlsbad that will contribute traffic to the study area network. These projects are consistent with other submitted studies in the area. It should be noted that many of these projects are located outside of the study area, but will contribute a small percentage of traffic to the study area intersections and roadway segments. A brief description of the 11 cumulative projects include the following:

1) *2100 N Coast Highway 101 (04-268)* – This project consists of a 130-room hotel.
2) *378 Fulvia Street (13-187)* – This project consists of 9 residential dwelling units.
3) *Weston at 510 La Costa Avenue (15-222)* – This project consists of 48 residential dwelling units.
4) *1569 Lorraine Drive (17-152)* – This project consists of 1 residential dwelling unit.
5) *740 N Coast Hwy 101 (17-197)* – This is a mixed-use project.
6) *Surfer's Point at 100 Carlsbad Boulevard (17-205)* – This project consists of a 25-room timeshare/hotel resort.
7) *1251 N Vulcan Avenue (17-280)* – This project consists of 9 residential dwelling units.
8) *555 N Vulcan Avenue (18-220)* – This Vulcan II project consists of 16 residential dwelling units.
9) *1967 N Vulcan Avenue (Encinitas Housing Element AD 8)* – This project has not been submitted to the City for review as of the date of this report. However, it is estimated that the project will consist of 86 multi-family units, but has been rounded up to 90 units as a conservative estimate.
10) *Westside of N Coast Highway 101 and 500 feet south of La Costa Avenue (Multi-003-780-2020)* – This mixed-use project consists of a 30-room hotel, 96 multi-family units, and 18,261 sf of commercial/retail space.
11) *Ponto Beachfront in the vicinity of Carlsbad Boulevard/Avenida Encinas (2016-0002-MS)* – This mixed-use project consists of 137 condos and 18,000 sf for retail and restaurants.

It should be noted that a daily volume of 300 ADT and approximately 25 AM and PM peak-hour trips were added along La Costa Avenue in the study area to account for unknown and/or distant cumulative projects.

Table 6-1 summarizes the trip generation of each cumulative project.

As shown in the table, the total trip generation for the cumulative projects shown above results in approximately 7,242 daily trips with 511 AM peak-hour trips and 611 PM peak-hour trips. However, approximately only 45 percent of the total cumulative project traffic volumes were assigned to the study area.

Figure 6-2 illustrates the traffic volumes of the cumulative projects in the study area. **Appendix G** contains additional details on the cumulative projects.

Table 6-1
Cumulative Trip Generation Summary

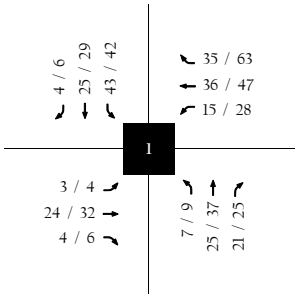
TRIP GENERATION RATES[1]						
		AM PEAK		PM PEAK		
Land Use	Weekday Daily	% ADT	In:Out Ratio	% ADT	In:Out Ratio	
Hotel	10 trips / rm	6%	0.60 : 0.40	8%	0.60 : 0.40	
Restaurant, Sit Down, High Turnover	160 trips / ksf	8%	0.50 : 0.50	8%	0.60 : 0.40	
Restaurant, Quality	100 trips / ksf	1%	0.60 : 0.40	8%	0.70 : 0.30	
Specialty Retail	40 trips / ksf	3%	0.60 : 0.40	9%	0.50 : 0.50	
Residential, Single Family Detached	10 trips / du	8%	0.30 : 0.70	10%	0.70 : 0.30	
Residential, Condominium	6 trips / du	8%	0.20 : 0.80	10%	0.70 : 0.30	
Residential, Condominium	8 trips / du	8%	0.20 : 0.80	10%	0.70 : 0.30	

TRIP GENERATION CALCULATIONS									
			AM PEAK			PM PEAK		
Cumulative Projects	Amount	ADT	In	Out	Total	In	Out	Total
1. Encinitas 04-268	130 rm	1,300	47	31	78	63	41	104
2. Encinitas 13-187	9 du	90	3	5	8	7	2	9
3. Encinitas 15-222	46 du	460	12	25	37	33	13	46
4. Encinitas 17-152	1 du	10	1	0	1	1	0	1
5. Encinitas 17-197	Mixed-use	160	8	8	16	8	8	16
6. Encinitas 17-205	25 rm	250	9	6	15	12	8	20
7. Encinitas 17-280	9 du	90	3	5	8	7	2	9
8. Encinitas 18-220	16 du	Redevelopment project resulting in no increase in traffic						
9. Encinitas Housing Element AD 8	90 du	540	9	35	44	38	16	54
10. Encinitas Multi-003-780-2020	Mixed-use	1,122	22	38	60	58	44	102
11. Carlsbad 2016-0002-MS	Mixed-use	2,920	74	120	194	169	91	260
12. Unknown/Distant		300	25	25	50	25	25	50
CUMULATIVE TOTAL		**7,242**	**213**	**298**	**511**	**421**	**250**	**671**

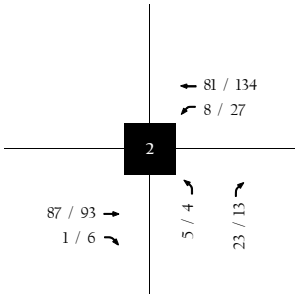
Notes:
rm: rooms, du: dwelling unit, ksf: 1,000 square feet
1. The trip rates are based on *SANDAG's Brief Guide of Vehicular Trip Generation Rates for the San Diego Region, April 2002.*

xx / yy = AM / PM Peak-Hour Turning Movement Volumes
The naming convention for intersections is North / South & East / West

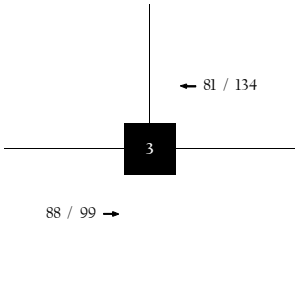
N Coast Hwy 101 & La Costa Ave



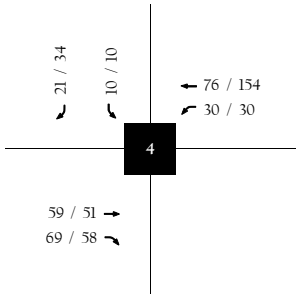
Vulcan Ave & La Costa Ave



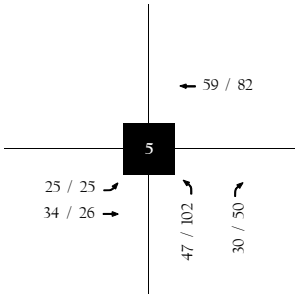
Proj Dwy & La Costa Ave



I-5 SB Ramps & La Costa Ave



I-5 NB Ramps & La Costa Ave



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Cumulative Traffic Volumes

Figure 6-2

6.3 Traffic Volumes

The cumulative traffic volumes were added to Existing traffic volumes. **Figure 6-3** illustrates the Existing Plus Cumulative traffic volumes within the study area.

6.4 Intersection Analysis

Table 6-2 displays the LOS analysis results for the study intersections under the Opening Year scenario.

Table 6-2
Existing Plus Cumulative Peak Hour Intersection LOS Summary

#	Intersection	Traffic Control	Peak Hour	Existing Plus Cumulative	
				Delay[1]	LOS[2]
1	N Coast Hwy & La Costa Ave	Signal	AM	20.0	B
			PM	25.0	C
2	N Vulcan Ave & La Costa Ave	OWSC	AM	**56.5**	**F**
			PM	**83.4**	**F**
3	Proj Dwy & La Costa Ave	OWSC	AM	DNE	
			PM		
4	I-5 SB Ramps & La Costa Ave	Signal	AM	38.3	D
			PM	25.5	C
5	I-5 NB Ramps & La Costa Ave	Signal	AM	23.6	C
			PM	**72.4**	**E**

Notes:
DNE: Does not exist
Signal: Traffic signal, OWSC: One-Way Stopped Control
Bold values indicate intersections operating at LOS E or F.

1. Delays are reported as the average control delay for the entire intersection at signalized intersections and the worst approach at unsignalized intersections.
2. LOS calculations are based on the methodology outlined in the *2010 Highway Capacity Manual* (HCM) and performed using Synchro 10.

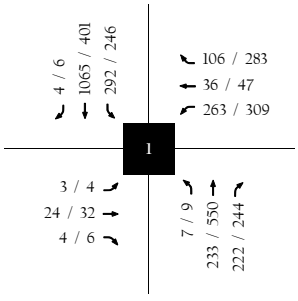
As shown in the table, all intersections would continue to operate at LOS D or better during the weekday peak-hours except for the following intersections:

- N Vulcan Avenue & La Costa Avenue (LOS F – AM and PM peak-hour)
- I-5 NB Ramps & La Costa Avenue (LOS E – PM peak-hour)

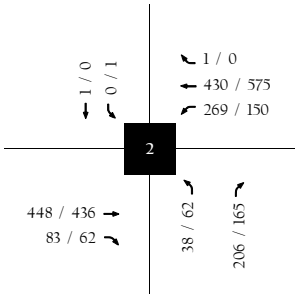
Appendix D contains the intersection LOS worksheets.

xx / yy = AM / PM Peak-Hour Turning Movement Volumes
The naming convention for intersections is North / South & East / West

N Coast Hwy 101 & La Costa Ave



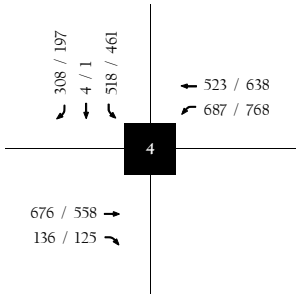
Vulcan Ave & La Costa Ave



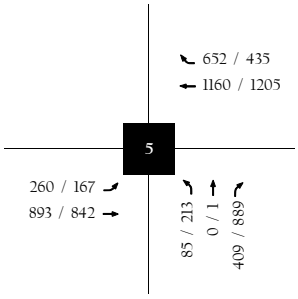
Proj Dwy & La Costa Ave

Intersection does not exist

I-5 SB Ramps & La Costa Ave



I-5 NB Ramps & La Costa Ave



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Existing Plus Cumulative Traffic Volumes

Figure 6-3

6.5 Roadway Segment Analysis

Table 6-3 displays the LOS analysis for the two roadway segments along La Costa Avenue under the Existing Plus Cumulative scenario. As shown in the table, all segments along La Costa Avenue function at LOS E or F with the addition of the cumulative traffic volumes.

Table 6-3
Existing Plus Cumulative Roadway LOS Summary

Roadway Segment	Functional Classification[1]	Capacity (LOS E)	ADT	v/c Ratio	LOS
La Costa Ave					
N Coast Hwy 101 to Vulcan Ave	2-Lane Local Roadway	14,000	13,192	0.94	**E**
Vulcan Ave to Sheridan Rd	2-Lane Local Roadway	14,000	17,032	1.22	**F**
Sheridan Rd to Proj Dwy	2-Lane Local Roadway - Augmented	20,000	18,267	0.91	**E**
Proj Dwy to I-5 SB Ramps	2-Lane Local Roadway - Augmented	20,000	18,601	0.93	**E**

Notes:
Bold values indicate roadway segments operating at LOS E or F.
1. The segments are classified as a 4-lane collector per the City's Circulation Plan. However, the segments currently function as a 2-lane roadway or 2-lane augmented 2-lane roadway with bicycle lanes in each direction.

6.6 Freeway Segment Analysis

Table 6-4 displays the LOS analysis for the two I-5 freeway segments between Poinsettia Lane and Leucadia Boulevard under the Existing Plus Cumulative scenario. As shown in the table, all freeway segments would operate at LOS D or better, except for the following:

- I-5 Northbound between Poinsettia Lane and La Costa Avenue (LOS F – AM & PM Peak)
- I-5 Southbound between La Costa Avenue and Leucadia Boulevard (LOS E – AM Peak)

Table 6-4
Existing Plus Cumulative Freeway Segment LOS Summary

Freeway Segment		Dir	Number of Lanes	Peak-Hour Volume[1]		Capacity[2]	v/c Ratio		LOS	
				AM	PM		AM	PM	AM	PM
I-5	Poinsettia Ln to La Costa Ave	NB	4	12,743	10,509	9,400	1.36	1.12	**F**	**F**
		SB	4	4,621	5,304	9,400	0.49	0.56	B	C
	La Costa Ave to Leucadia Blvd	NB	4	7,257	8,316	9,400	0.77	0.88	D	D
		SB	4	8,825	7,421	9,400	0.94	0.79	**E**	D

Notes:
Bold values indicate freeway segments operating at LOS E or F.
1. Peak-hour volumes were estimated by applying the K and D factors and truck percentages published by Caltrans in 2017.
2. A capacity of 2,350 pcphpl was used based on the *Caltrans Guide for the Preparation of Traffic Impact Studies, December 2002.*

6.7 Ramp Metering Analysis

Table 6-5 displays the ramp metering analysis for the two I-5 freeway segments between Poinsettia Lane and Leucadia Boulevard under the Existing Plus Cumulative scenario. As shown in the table, all ramp meter locations volumes that do not exceed the meter rate and results in no delays except for the following:

- I-5 Southbound & La Costa Avenue On-Ramp: (12 minutes – PM)

Table 6-5
Existing Plus Cumulative Ramp Metering Summary

On-Ramp	Peak Hour	Number of Lanes		Storage Length (ft)		Meter Rate (veh/hr/ln)[1]	Ramp Volume (per lane)[2]			Delay (min)[3]	
		GP	HOV	GP	HOV		Total	GP	HOV	GP	HOV
I-5 NB & La Costa Ave	AM	1	1	410	410	n/a	797	733	64		
	PM					492	565	452	113	0	0
I-5 SB & La Costa Ave	AM	2	1	670	670	346	698	297	105	0	0
	PM					346	876	381	114	12	0

Notes:
1. The ramp meter rate represents the most restrictive rate obtained from Caltrans. Cells containing a "n/a" indicate that the meter was not turned on.
2. The split between SOV and HOV is based on actual count data.
3. Delays exceeding 15-minutes are shown in **bold** font.

6.8 Queueing Analysis

Table 6-6 displays the queueing analysis of the eastbound approach at the I-5 Southbound Ramps & La Costa Avenue intersection with the addition of the project.

Table 6-6
Existing Plus Cumulative Peak Hour Queueing Summary

Intersection	Peak Hour	Movement	Storage Length (ft)	Queue Length (ft)[1]	
				50th %	95th %
I-5 SB Ramps & La Costa Ave	AM	EB	400	250	300
	PM			200	275

Notes:
Values shown in **bold** indicate movements where the queue length exceeds the available storage length.
1. Queue lengths were rounded up to the nearest 25 feet to represent the length of a typical vehicle.

As shown in the table, the queuing analysis for the eastbound movement along La Costa Avenue indicates that all queue lengths in both peak-hours do not exceed the available storage length.

Appendix E contains the queueing worksheets.

7 EXISTING PLUS CUMULATIVE PLUS PROJECT

This section summarizes the operations at the facilities within the study area with the addition of the project traffic onto the Existing Plus Cumulative traffic volumes.

7.1 Roadway Network

No changes to the roadway network will occur with the addition of the project under this scenario.

7.2 Traffic Volumes

The project trips were added to the Existing Plus Cumulative traffic volumes. **Figure 7-1** illustrates the Existing Plus Cumulative Plus Project traffic volumes in the study area.

7.3 Intersection Analysis

Table 7-1 displays the LOS analysis results for the study intersections under the Existing Plus Project scenario.

Table 7-1
Existing Plus Cumulative Plus Project Peak Hour Intersection LOS Summary

#	Intersection	Traffic Control	Peak Hour	Existing Plus Cumulative		Existing Plus Cumulative Plus Project		Δ in Delay	Sig?
				Delay[1]	LOS[2]	Delay[1]	LOS[2]		
1	N Coast Hwy & La Costa Ave	Signal	AM	20.0	B	20.0	B	0.0	No
			PM	25.0	C	25.1	C	0.1	No
2	N Vulcan Ave & La Costa Ave	OWSC	AM	**56.5**	**F**	**57.2**	**F**	0.7	No
			PM	**83.4**	**F**	**83.4**	**F**	0.0	No
3	Proj Dwy & La Costa Ave	OWSC	AM	DNE		21.2	C	21.2	No
			PM			19.3	C	19.3	No
4	I-5 SB Ramps & La Costa Ave	Signal	AM	38.3	D	38.4	D	0.1	No
			PM	25.5	C	25.7	C	0.2	No
5	I-5 NB Ramps & La Costa Ave	Signal	AM	23.6	C	23.7	C	0.1	No
			PM	**72.4**	**E**	**73.0**	**E**	0.6	No

Notes:
DNE: Does not exist
OWSC: One-Way Stopped Control, Signal: Traffic Signal
Bold values indicate intersections operating at LOS E or F.
1. Delays are reported as the average control delay for the entire intersection at signalized intersections and the worst movement at unsignalized intersections.
2. LOS calculations are based on the methodology outlined in the *2010 Highway Capacity Manual* (HCM) and performed using Synchro 10.

As shown in the table, all intersections, including the project driveways, are expected to operate at LOS D or better with the addition of the project traffic except for the following intersections:

- N Vulcan Avenue & La Costa Avenue (LOS F – AM and PM peak-hours)
- I-5 NB Ramps & La Costa Avenue (LOS E – PM peak-hour)

Although the two intersections above operate at LOS E/F with the project, the increase in delay does not exceed the significance threshold and would not result in any significant impacts.

7.3.1 Project Fair Share

Table 7-2 summarizes the project's fair share of new traffic added to the two intersections that would operate at LOS E/F. As shown in the table, the project contributes 2.5 percent of the new traffic added to the Vulcan Avenue & La Costa Avenue intersection and 3.7 percent of the new traffic added to the I-5 NB Ramps & La Costa Avenue intersection.

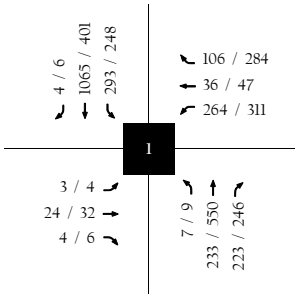
Table 7-2
Fair Share Contribution Summary

#	Intersection	Peak Hour	Existing[1]	Project Traffic	Opening Year 2020 with Proj[2]	Total New Traffic	Project % of New
2	Vulcan Ave & La Costa Ave	AM	1,269	4	1,478	209	1.9%
		PM	1,173	7	1,457	284	**2.5%**
5	I-5 NB Ramps & La Costa Ave	AM	3,264	7	3,466	202	3.5%
		PM	3,467	11	3,763	296	**3.7%**

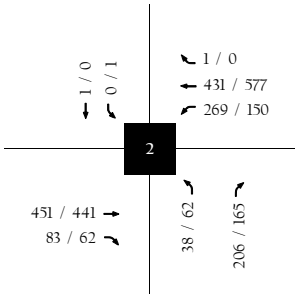
Notes:
Bold values represent the peak-hour with the highest percentage of project traffic.
1. Traffic counts were obtained on Thursday, May 16, 2019.
2. Includes traffic from other cumulative projects in study area as shown in Figure 6-2.

xx / yy = AM / PM Peak-Hour Turning Movement Volumes
The naming convention for intersections is North / South & East / West

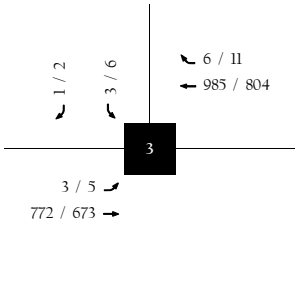
N Coast Hwy 101 & La Costa Ave



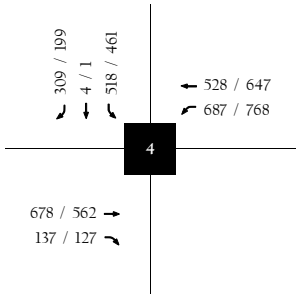
Vulcan Ave & La Costa Ave



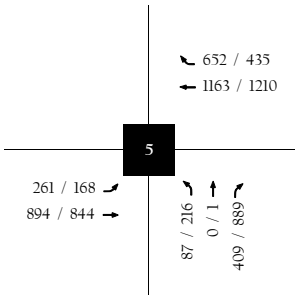
Proj Dwy & La Costa Ave



I-5 SB Ramps & La Costa Ave



I-5 NB Ramps & La Costa Ave



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Existing Plus Cumulative Plus Project Traffic Volumes

Figure 7-1

7.4 Roadway Segment Analysis

Table 7-3 displays the LOS analysis for the two roadway segments along La Costa Avenue under the Existing Plus Cumulative Plus Project scenario.

Table 7-3
Existing Plus Cumulative Plus Project Roadway LOS Summary

Roadway Segment	Existing Plus Cumulative			Existing Plus Cumulative Plus Proj			Δ in V/C	Sig?
	ADT	v/c Ratio	LOS	ADT	v/c Ratio	LOS		
La Costa Ave								
N Coast Hwy 101 to Vulcan Ave	13,192	0.94	E	13,288	0.95	E	0.007	No
Vulcan Ave to Sheridan Rd	17,032	1.22	F	17,128	1.22	F	0.006	No
Sheridan Rd to Proj Dwy	18,267	0.91	E	18,363	0.92	E	0.005	No
Proj Dwy to I-5 SB Ramps	18,601	0.93	E	18,793	0.94	E	0.010	No

Notes:
Bold values indicate roadway segments operating at LOS E or F. **Bold and shaded** values indicate a project significant impact

As shown in the table, all La Costa Avenue segments would function at LOS E/F with the addition of the project traffic. Although all segments function at LOS E/F, the increase in the v/c ratio does not exceed the significance threshold and would not result in any significant impacts.

7.5 Freeway Segment Analysis

Table 7-4 displays the LOS analysis for the two I-5 freeway segments between Poinsettia Lane and Leucadia Boulevard under the Existing Plus Cumulative Plus Project scenario. As shown in the table, all freeway segments would continue to operate at LOS D or better, except for the following:

- I-5 Northbound between Poinsettia Lane and La Costa Avenue (LOS F – AM & PM Peak)
- I-5 Southbound between La Costa Avenue and Leucadia Boulevard (LOS E – AM Peak)

Although the freeway segments above would operate at LOS E/F, the increase in the v/c Ratio would not exceed the significance threshold and would not result in a significant impact.

7.6 Ramp Metering Analysis

Table 7-5 displays the ramp metering analysis for the two I-5 freeway segments between Poinsettia Lane and Leucadia Boulevard under the Existing Plus Cumulative Plus Project scenario. As shown in the table, both ramp meters have volumes that would not exceed the meter rate and results in no delays, except for the following:

- I-5 Southbound & La Costa Avenue On-Ramp: (12 minutes – PM)

Although the ramp meter shown above would have a delay of 12 minutes in the PM peak-hour, the increase in delay would not exceed the significance threshold and would not result in a significant impact.

Table 7-4
Existing Plus Cumulative Plus Project Freeway Segment LOS Summary

Freeway Segment		Dir	Existing Plus Cumulative						Existing Plus Cumulative Plus Project						Δ in v/c		Sig?
			Peak-Hour Volume		v/c Ratio		LOS		Peak-Hour Volume[1]		v/c Ratio		LOS				
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
I-5	Poinsettia Ln to La Costa Ave	NB	12,743	10,509	1.36	1.12	F	F	12,744	10,510	1.36	1.12	F	F	0.00	0.00	No
		SB	4,621	5,304	0.49	0.56	B	C	4,622	5,306	0.49	0.56	B	C	0.00	0.00	No
	La Costa Ave to Leucadia Blvd	NB	7,257	8,316	0.77	0.88	D	D	7,259	8,319	0.77	0.88	D	D	0.00	0.00	No
		SB	8,825	7,421	0.94	0.79	E	D	8,826	7,423	0.94	0.79	E	D	0.00	0.00	No

Notes:
Bold values indicate freeway segments operating at LOS E or F. **Bold and shaded** values indicate a significant project impact.
1. The project traffic for each respective freeway segment was added to the peak-hour volumes.

Table 7-5
Existing Plus Cumulative Plus Project Ramp Metering Summary

On-Ramp	Peak Hour	Meter Rate (veh/hr/ln)[1]	Ramp Volume (per lane)[2]			Delay (min)[3]		Δ in Delay		Sig?
			Total	GP	HOV	GP	HOV	GP	HOV	
I-5 NB & La Costa Ave	AM	n/a	798	734	64					No
	PM	492	566	453	113	0	0	0	0	No
I-5 SB & La Costa Ave	AM	346	699	297	105	0	0	0	0	No
	PM	346	878	382	114	12	0	0	0	No

Notes:
Bold and shaded values indicate a significant project impact.
1. The ramp meter rate represents the most restrictive rate obtained from Caltrans. Cells containing a "n/a" indicate that the meter was not turned on.
2. The split between SOV and HOV is based on actual count data.
3. Delays exceeding 15-minutes are shown in **bold** font.

7.7 Queueing Analysis

Table 7-6 displays the queueing analysis of the eastbound approach at the I-5 Southbound Ramps & La Costa Avenue intersection under the Existing Plus Cumulative Plus Project scenario.

Table 7-6
Existing Plus Cumulative Plus Project Peak Hour Queueing Summary

Intersection	Peak Hour	Movement	Storage Length (ft)	Queue Length (ft)[1]				Δ in Queue Length	
				Existing Plus Cumulative		Existing Plus Cumulative Plus Proj			
				50th %ile	95th %ile	50th %ile	95th %ile	50th %ile	95th %ile
I-5 SB Ramps & La Costa Ave	AM	EB	400	250	300	250	300	0	0
	PM			200	275	200	275	0	0

Notes:
Values shown in **bold** indicate movements where the queue length exceeds the available storage length.
1. Queue lengths were rounded up to the nearest 25 feet to represent the length of a typical vehicle.

As shown in the table, the queuing analysis indicates that the project does not significantly increase the queue lengths and would all be less than the available storage length.

Appendix E contains the queueing worksheets.

8 SUMMARY OF FINDINGS AND RECOMMENDATIONS

The following list provides a summary of the key findings for the project:

- The project consists of constructing a 17-room boutique hotel spread across nine detached bungalow structures and will include a full service public restaurant. The indoor seating is comprised of 820 sf and can accommodate 51 seats. The outdoor seating is comprised of 345 sf and can accommodate 23 seats.
- The project is forecasted to generate a total of 287 daily trips with 13 AM peak-hour trips and 24 PM peak-hour trips.
- Eleven cumulative projects were identified in the study area and they contribute up to 7,242 daily trips.
- All intersections in the study area are expected to operate at an acceptable LOS under all scenarios except for the following:
    - Vulcan Avenue & La Costa Avenue (LOS E/F)
    - I-5 NB Ramps & La Costa Avenue (LOS E)
    - However, the increase in delay resulting from the project would not exceed the significance threshold at these locations and would not result in any significant impacts.
- All roadway segments in the study area are expected to function at an acceptable LOS C with the addition of project traffic except for the La Costa Avenue segment between Vulcan Avenue and Sheridan Road, which would function at LOS F. With the addition of cumulative traffic volumes, all segments of La Costa Avenue would function at LOS E/F with or without the project. However, the increase in the v/c ratios resulting from the project would not exceed the significance threshold at these locations and would not result in any significant impacts.
- All freeway segments in the study area are expected to operate at LOS D or better under all scenarios except for the following:
    - I-5 between Poinsettia Lane and La Costa Avenue (NB – AM & PM)
    - I-5 between La Costa Avenue and Leucadia Boulevard (SB – AM)
    - However, the increase in the v/c ratio resulting from the project would not exceed the significance threshold at these locations and would not result in any significant impacts.
- All ramp meters in the study area are expected to have no delays under all scenarios except for the following:
    - I-5 SB & La Costa Avenue (12 minutes of delay during PM with cumulative traffic volumes)
    - However, the increase in delay resulting from the project would not exceed the significance threshold at these locations and would not result in any significant impacts.
- Up to 300 feet in queue length could be expected in the eastbound movement at the I-5 Southbound Ramps. The project driveway is located approximately 400 feet west of the I-5 Southbound Ramps.
- The project's fair share of traffic at the Vulcan Avenue & La Costa Avenue intersection is 2.5 percent and 3.7 percent at the I-5 Northbound Ramps & La Costa Avenue intersection.

The proposed project will not significantly impact the key facilities in the study area under all scenarios evaluated in this study. As a result, it is recommended that no improvements are required or recommended of the proposed project.

Appendix A

Freeway Data Excerpts

GUIDE FOR THE PREPARATION

OF

TRAFFIC IMPACT STUDIES

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

December 2002

Transition between LOS "C" and LOS "D" Criteria

(Reference Highway Capacity Manual)

BASIC FREEWAY SEGMENTS @ 65 mi/hr

LOS	Maximum Density (pc/mi/ln)	Minimum Speed (mph)	Maximum v/c	Maximum Service Flow Rate (pc/hr/ln)
A	11	65.0	0.30	710
B	18	65.0	0.50	1170
C	26	64.6	0.71	1680
D	35	59.7	0.89	2090
E	45	52.2	1.00	2350

SIGNALIZED INTERSECTIONS and RAMP TERMINALS

LOS	Control Delay per Vehicle (sec/veh)
A	**≤ 10**
B	**> 10 - 20**
C	**> 20 - 35**
D	**> 35 - 55**
E	**> 55 - 80**
F	**> 80**

MULTI-LANE HIGHWAYS @ 55 mi/hr

LOS	Maximum Density (pc/mi/ln)	Minimum Speed (mph)	Maximum v/c	Maximum Service Flow Rate (pc/hr/ln)
A	11	55.0	0.29	600
B	18	55.0	0.47	990
C	26	54.9	0.68	1430
D	35	52.9	0.88	1850
E	41	51.2	1.00	2100

Dotted line represents the transition between LOS "C" and LOS "D"

DIST	RTE	R1	CNTY	PM_PM	PM	DESCRIPTION	BACK_F	BACK_PE	BACK_A	AHEAD_PE	AHEAD_PEAK	AHEAD_AAD
11	005		SD		4.042	SAN DIEGO, CORONADO AVENUE	9700	126000	125000	10700	141000	140000
11	005		SD		4.632	JCT. RTE. 75 WEST	10700	141000	140000	15800	165000	160000
11	005		SD		5.404	SAN DIEGO, MAIN STREET	15800	165000	160000	13800	164000	162000
11	005		SD		6.056	CHULA VISTA, PALOMAR STREET	13800	164000	162000	13500	160000	158000
11	005		SD		6.807	CHULA VISTA, L STREET	13500	160000	158000	14600	172000	171000
11	005		SD		7.300	CHULA VISTA, J STREET	14600	172000	171000	14600	176000	175000
11	005		SD		7.812	CHULA VISTA, H STREET	14600	176000	175000	13800	181000	177000
11	005		SD		8.562	E STREET	13800	181000	177000	11800	144000	137000
11	005		SD		9.396	JCT. RTE. 54	11800	144000	137000	16800	205000	198000
11	005		SD	R	10.042	NATIONAL CITY, 24TH STREET	16800	205000	198000	16700	203000	197000
11	005		SD	R	10.749	NATIONAL CITY, 9TH STREET	16700	203000	197000	15700	196000	187000
11	005		SD	R	11.129	8TH STREET	15700	196000	187000	15700	214000	205000
11	005		SD	R	11.660	SAN DIEGO, DIVISION/MAIN STREET	15700	214000	205000	17300	213000	212000
11	005		SD	R	12.647	JCT. RTE. 15 NORTH	17300	213000	212000	13100	174000	167000
11	005		SD	R	13.386	SAN DIEGO, 28TH STREET	13100	174000	167000	13300	177000	171000
11	005		SD	R	14.077	SAN DIEGO, JCT. RTE. 75 SOUTH	13300	177000	171000	13500	180000	173000
11	005		SD	R	14.740	J STREET	13500	180000	173000	14600	187000	178000
11	005		SD	R	15.036	SAN DIEGO, JCT. RTE. 94	14600	187000	178000	17700	245000	229000
11	005		SD	R	15.405	SAN DIEGO, PERSHING DRIVE	17700	245000	229000	17700	245000	229000
11	005		SD	R	16.069	SAN DIEGO, JCT. RTE. 163	17700	245000	229000	17100	237000	219000
11	005		SD	R	16.311	SAN DIEGO, SIXTH AVENUE	17100	237000	219000	17100	237000	219000
11	005		SD	R	16.589	SAN DIEGO, FIRST AVENUE	17100	237000	219000	13200	186000	174000
11	005		SD	R	16.912	SAN DIEGO, HAWTHORN STREET	13200	186000	174000	16300	226000	207000
11	005		SD	R	17.210	SAN DIEGO, LAUREL STREET	16300	226000	207000	16300	226000	207000
11	005		SD	R	17.250	SAN DIEGO, INDIA/SASSAFRAS STREET	16300	226000	207000	15800	218000	201000
11	005		SD	R	17.530	PACIFIC HIGHWAY VIADUCT	15800	218000	201000	15000	166000	160000
11	005		SD	R	17.770	SAN DIEGO, SASSAFRAS STREET	15000	166000	160000	12600	166000	156000
11	005		SD	R	18.283	SAN DIEGO, WASHINGTON STREET	12600	166000	156000	16500	221000	206000
11	005		SD	R	19.033	SAN DIEGO, OLD TOWN AVENUE	16500	221000	206000	15400	224000	208000
11	005		SD	R	20.056	JCT. RTE. 8/CAMINO DEL RIO	15400	224000	208000	14900	200000	194000
11	005		SD	R	20.818	SAN DIEGO, MISSION BAY DR/SEA WORLD DR	14900	200000	194000	17200	237000	224000
11	005		SD	R	22.262	CLAIREMONT DRIVE	17200	237000	224000	17200	212000	207000
11	005		SD	R	22.872	SAN DIEGO, DE ANZA ROAD	17200	212000	207000	13800	170000	164000
11	005		SD	R	23.476	SAN DIEGO, BALBOA AVENUE	13800	170000	164000	12700	154000	148000
11	005		SD	R	23.930	SAN DIEGO, MISSION BAY DRIVE	12700	154000	148000	11200	229000	212000
11	005		SD	R	25.947	JCT. RTE. 52 EAST	11200	229000	212000	14600	203000	197000
11	005		SD	R	26.790	SAN DIEGO, GILMAN DRIVE	14600	203000	197000	13300	186000	178000
11	005		SD	R	28.159	SAN DIEGO, NOBEL DRIVE	13300	186000	178000	11700	165000	156000
11	005		SD	R	28.428	SAN DIEGO, LA JOLLA DRIVE	11700	165000	156000	12300	172000	171000
11	005		SD	R	29.463	SAN DIEGO, GENESEE AVENUE	12300	172000	171000	12900	179000	178000
11	005		SD	R	30.345	BEGIN RIGHT ALIGN	12900	179000	178000			
11	005		SD	R	30.426	R SAN DIEGO, SORRENTO VALLEY RD, BEGIN RIGHT ALIGN				6900	83000	77000
11	005		SD	R	30.682	R SAN DIEGO, NORTH JCT. RTE. 805	6900	83000	77000	6100	83000	77000
11	005		SD	R	31.188	R END RIGHT ALIGN	9000	122000	114000			
11	005		SD	R	30.426	L SAN DIEGO, SORRENTO VALLEY RD, BEGIN LEFT ALIGN				8200	109000	103000
11	005		SD	R	30.682	L SAN DIEGO, NORTH JCT RTE 805	8200	109000	103000	8400	121000	114000
11	005		SD	R	31.155	L END LEFT ALIGN	8400	121000	114000			
11	005		SD	R	31.805	SAN DIEGO, CARMEL MOUNTAIN ROAD	16000	231000	217000	16000	231000	217000
11	005		SD	R	32.841	JCT RTE 56	16000	231000	217000	15700	232000	217000
11	005		SD	R	32.901	SAN DIEGO, CARMEL VALLEY ROAD	15700	232000	217000	17400	266000	263000
11	005		SD	R	34.134	SAN DIEGO, DEL MAR HEIGHTS ROAD	17400	266000	263000	16700	250000	239000
11	005		SD	R	36.266	VIA DE LA VALLE	16700	250000	239000	17400	252000	239000
11	005		SD	R	37.384	SOLANA BEACH, LOMAS SANTA FE DRIVE	17400	252000	239000	16800	253000	240000
11	005		SD	R	38.624	MANCHESTER AVENUE	16800	253000	240000	14700	225000	212000
11	005		SD	R	39.830	BIRMINGHAM DRIVE	14700	225000	212000	15300	225000	218000
11	005		SD	R	40.597	ENCINITAS, SANTA FE DRIVE	15300	225000	218000	14800	224000	217000
11	005		SD	R	41.509	ENCINITAS BOULEVARD	14800	224000	217000	16000	230000	218000
11	005		SD	R	42.712	LEUCADIA BOULEVARD	16000	230000	218000	15900	230000	215000
11	005		SD	R	44.071	LEUCADIA, LA COSTA AVENUE	15900	230000	215000	15600	225000	211000
11	005		SD	R	45.571	CARLSBAD, POINSETTIA LANE	15600	225000	211000	15500	223000	208000
11	005		SD	R	47.032	CARLSBAD, PALOMAR AIRPORT ROAD	15500	223000	208000	18900	220000	211000
11	005		SD	R	47.975	CARLSBAD, CANNON ROAD	18900	220000	211000	14800	227000	211000
11	005		SD	R	49.278	TAMARACK AVENUE	14800	227000	211000	15500	212000	208000
11	005		SD	R	50.106	CARLSBAD, CARLSBAD VILLAGE DRIVE	15500	212000	208000	15500	210000	206000
11	005		SD	R	50.684	CARLSBAD, LAS FLORES DRIVE	15500	210000	206000	14600	223000	211000
11	005		SD	R	51.201	JCT. RTE. 78 EAST	14600	223000	211000	14900	224000	211000
11	005		SD	R	51.466	OCEANSIDE, CASSIDY STREET	14900	224000	211000	15600	220000	210000
11	005		SD	R	51.847	OCEANSIDE, CALIFORNIA STREET	15600	220000	210000	16200	231000	209000
11	005		SD	R	52.298	OCEANSIDE, OCEANSIDE BOULEVARD	16200	231000	209000	16200	222000	210000
11	005		SD	R	53.430	MISSION AVENUE	12700	187000	174000	13400	187000	174000
11	005		SD	R	53.932	JCT. RTE. 76	13400	187000	174000	11100	149000	145000
11	005		SD	R	54.390	HARBOR DRIVE/VANDERGRIFT	13100	183000	171000	11900	164000	145000
11	005		SD	R	62.078	LAS PULGAS ROAD	12300	160000	145000	11900	160000	144000
11	005		SD	R	71.377	BASILONE ROAD	11900	160000	144000	12400	156000	151000
11	005		SD	R	72.281	CHRISTIANITOS ROAD	12400	156000	151000	12400	156000	151000
11	005		SD	R	72.367	SAN DIEGO/ORANGE COUNTY LINE	12400	156000	151000			
12	005		ORA		0.000	SAN DIEGO/ORANGE COUNTY LINE				11000	142000	138500
12	005		ORA		1.000	SAN CLEMENTE, AVENIDA CALIFIA	10800	143000	139400	11700	151000	147100
12	005		ORA		1.627	SAN CLEMENTE, EL CAMINO REAL	11700	151000	147100	11800	169000	160100
12	005		ORA		2.306	SAN CLEMENTE, AVENIDA PRESIDIO	11800	169000	160100	12000	171000	162100
12	005		ORA		2.663	SAN CLEMENTE, AVENIDA PALIZADA	12000	171000	162100	14000	199000	187500
12	005		ORA		3.393	SAN CLEMENTE, AVENIDA PICO	14000	199000	187500	14900	220000	200100

									AM PEAK							PM PEAK						
DI	RTE	CO	PRE	PM	CS	LEG	YR	Dir	1 WAY PHV	% K	% D	% KD	HR	DAY	MNTH	Dir	1 WAY PHV	% K	% D	% KD	HR	DAY	MNTH
10	004	SJ	T	14.05	54	A	16	W	832	7.53	75.29	5.67	6	MON	APR	E	1340	12.21	74.82	9.14	17	FRI	OCT
10	004	SJ		15.91	113	B	15	W	907	7.09	69.4	4.92	6	TUE	OCT	E	1398	10.43	72.7	7.59	16	FRI	JUL
10	004	SJ	R	16.06	59	A	16	E	3306	8.01	52.59	4.21	7	WED	SEP	E	3182	7.75	52.3	4.05	14	FRI	APR
10	004	SJ		24.87	313	A	16	E	425	9.88	75.49	7.46	11	SAT	FEB	W	481	11.69	72.22	8.44	13	MON	FEB
10	004	SJ		24.87	336	B	16	W	375	10.56	60.98	6.44	11	SUN	JUL	W	438	10.75	69.97	7.52	16	SUN	AUG
11	005	SD	R	.878	501	A	17	S	1680	5.84	64.87	3.79	12	SAT	MAY	S	2686	8.42	71.9	6.05	15	FRI	JUN
11	005	SD	R	11.13	952	A	17	N	8583	6.01	69.66	4.19	6	TUE	AUG	S	9186	7.58	59.14	4.48	14	WED	MAY
11	005	SD	R	12.65	903	A	17	N	8615	6.46	79.92	5.16	6	THU	MAY	S	7950	7.82	60.9	4.76	14	THU	JUN
11	005	SD	R	20.06	800	B	17	S	8018	7.24	53.21	3.85	8	THU	OCT	S	8017	7.46	51.6	3.85	15	SAT	JUL
11	005	SD	R	20.06	931	A	17	S	7442	7	54.84	3.84	8	THU	FEB	S	8602	7.58	58.56	4.44	15	WED	DEC
11	005	SD	R	22.26	801	B	17	N	8741	7.15	54.69	3.91	7	WED	JUN	S	9288	7.81	53.19	4.15	15	FRI	DEC
11	005	SD	R	25.95	802	B	17	N	9558	7.67	58.88	4.51	7	THU	JUL	S	11195	8.43	62.74	5.29	15	WED	MAY
11	005	SD	R	30.68	502	A	17	S	8328	7.45	51.59	3.85	8	THU	MAY	N	8985	7.29	56.89	4.15	15	TUE	FEB
11	005	SD	R	30.68	803	B	17	S	5908	7.55	56.23	4.25	8	MON	JUN	N	6059	8	54.44	4.35	15	THU	OCT
11	005	SD	R	36.27	898	A	17	S	9158	6.99	54.86	3.83	8	TUE	APR	N	8565	6.81	52.68	3.59	14	WED	NOV
11	005	SD	R	49.28	904	B	17	N	12034	7.75	73.48	5.69	5	WED	AUG	N	9922	7.05	66.59	4.69	19	FRI	SEP
11	005	SD	R	51.20	905	A	17	N	7603	6.98	51.76	3.61	10	SAT	JUN	N	7411	6.52	53.96	3.52	17	THU	JUN
11	005	SD	R	52.83	907	O	17	S	7454	6.97	53	3.69	10	SUN	AUG	S	6936	6.19	55.53	3.43	18	SUN	MAY
11	005	SD	R	53.93	906	B	17	N	6602	6.82	55.78	3.8	10	MON	SEP	S	6379	6.63	55.43	3.68	16	FRI	MAY
11	005	SD	R	54.39	954	A	17	N	6030	7.65	54.53	4.17	11	SUN	AUG	N	5496	7.37	51.59	3.8	13	SUN	JUN
12	005	ORA		.483	401	O	16	S	5886	7.63	54.8	4.18	12	SAT	FEB	N	5619	6.68	59.8	3.99	21	SUN	OCT
12	005	ORA	R	25.00	900	O	17	S	10653	6.99	53.85	3.77	8	WED	JAN	S	10887	6.85	56.17	3.85	17	TUE	OCT
12	005	ORA		30.26	904	B	16	N	11223	6.93	57.74	4	7	WED	OCT	S	9871	5.7	61.78	3.52	17	THU	APR
12	005	ORA		30.26	905	A	16	N	12681	6.72	55.61	3.74	7	TUE	MAY	S	11391	6.07	55.32	3.36	16	MON	MAY
12	005	ORA		33.09	906	A	16	N	12558	5.81	58	3.37	7	THU	OCT	N	12093	6.05	53.64	3.25	16	MON	JAN
07	005	LA		.7	475	A	15	S	5444	5.92	53.78	3.18	6	WED	NOV	S	5304	5.61	55.31	3.1	17	MON	OCT
07	005	LA		15.33	27	O	16	N	7932	5.57	57.01	3.18	4	WED	MAR	S	7937	5.84	54.46	3.18	15	SUN	MAR
07	005	LA		17.8	28	O	15	N	7789	6.12	53.1	3.25	7	TUE	OCT	N	7807	5.98	54.46	3.26	14	FRI	OCT
07	005	LA		33.98	754	O	16	S	7826	6.25	63.82	3.99	6	WED	MAR	N	7161	6.52	55.99	3.65	16	MON	FEB
07	005	LA		41	34	B	17	S	6920	5.67	69.34	3.93	5	WED	FEB	N	7654	6.4	67.93	4.34	16	THU	APR
07	005	LA	R	56.60	906	B	17	S	5581	8.14	55.48	4.51	8	SAT	SEP	S	5900	7.66	62.29	4.77	16	MON	FEB
06	005	KER		13.52	631	A	17	S	4620	9.56	54.83	5.24	10	SAT	MAY	S	5172	11.24	52.21	5.87	15	MON	SEP
06	005	KER		19.61	172	B	15	N	2030	10.13	59.15	5.99	10	SAT	SEP	S	2764	13.97	58.44	8.16	13	MON	SEP

2017 Daily Truck Traffic

RTE	DIST	CNTY	POST MILE	LEG	DESCRIPTION	VEHICLE AADT TOTAL	TRUCK AADT TOTAL	TRUCK % TOT VEH	TRUCK AADT By Axle 2	3	4	5+	TOTAL % 2	3	4	5+	EAL 2-WAY (1000)	YEAR VER/ EST
005	11	SD	R15.03(	B	SAN DIEGO, JCT. RTE. 94	178000	6765	3.80	4,133	812	264	1,556	61.10	12.00	3.90	23.00	795	78V
005	11	SD	R16.06(	B	SAN DIEGO, JCT. RTE. 163	229000	8473	3.70	5,609	847	314	1,703	66.20	10.00	3.70	20.10	908	78E
005	11	SD	R16.06(	A	SAN DIEGO, JCT. RTE. 163	219000	8979	4.10	5,639	799	251	2,290	62.80	8.90	2.80	25.50	1,098	85V
005	11	SD	R20.05(	B	JCT. RTE. 8/CAMINO DEL RIO	208000	8529	4.10	5,356	759	239	2,175	62.80	8.90	2.80	25.50	1,043	85V
005	11	SD	R20.05(	A	JCT. RTE. 8/CAMINO DEL RIO	194000	6596	3.40	4,353	660	284	1,299	66.00	10.00	4.30	19.70	703	84V
005	11	SD	R23.47(	B	SAN DIEGO, BALBOA AVE	164000	7380	4.50	4,871	738	317	1,454	66.00	10.00	4.30	19.70	787	84E
005	11	SD	R23.47(	A	SAN DIEGO, BALBOA AVE	148000	5920	4.00	3,499	663	189	1,569	59.10	11.20	3.20	26.50	753	78V
005	11	SD	R25.94[	A	JCT. RTE. 52 EAST	197000	8077	4.10	4,572	848	347	2,310	56.60	10.50	4.30	28.60	1,086	87V
005	11	SD	R30.68[	A	SAN DIEGO, NORTH JCT. RTE. 805	77000	2925	3.80	1,287	219	94	1,325	44.00	7.50	3.20	45.30	1,073	00E
005	11	SD	R41.50(	B	ENCINITAS BLVD	217000	17968	8.28	9,518	1,939	1,572	4,939	52.97	10.79	8.75	27.49	2,447	16E
005	11	SD	R42.71[	B	LEUCADIA BLVD	218000	12033	5.52	6,425	761	281	4,566	53.39	6.32	2.34	37.95	1,912	17E
005	11	SD	R51.20[	A	JCT. RTE. 78 EAST	211000	10128	4.80	3,970	790	395	4,973	39.20	7.80	3.90	49.10	1,985	07E
005	11	SD	R51.20[	B	JCT. RTE. 78 EAST	211000	10149	4.81	3,978	792	396	4,983	39.20	7.80	3.90	49.10	1,989	07V
005	11	SD	R52.83[	O	BROOKS ST OC	210000	15717	7.48	7,884	1,274	798	5,761	50.16	8.11	5.08	36.65	2,496	17E

Source: Caltrans 2017 Annual Average Daily Truck Traffic on the California State Highway System

Appendix B

Ramp Metering Data Excerpts

ATTACHMENT B

RAMP METERING ANALYSIS

Ramp metering analysis should be performed for each horizon year scenario in which ramp metering is expected. The following table shows relevant information that should be included in the ramp meter analysis "Summary of Freeway Ramp Metering Impacts."

LOCATION	DEMAND (veh/hr)[1]	METER RATE (veh/hr)[2]	EXCESS DEMAND (veh/hr)[3]	DELAY (min)[4]	QUEUE (feet)[5]

NOTES:

[1] DEMAND is the peak hour demand expected to use the on-ramp.

[2] METER RATE is the peak hour capacity expected to be processed through the ramp meter. This value should be obtained from Caltrans. Contact Carolyn Rumsey at (619) 467-3029.

[3] EXCESS DEMAND = (DEMAND) – (METER RATE) or zero, whichever is greater.

[4] $$\text{DELAY} = \frac{\text{EXCESS DEMAND}}{\text{METER RATE}} \times 60 \text{ MINUTES/HOUR}$$

[5] QUEUE = (EXCESS DEMAND) X 29 feet/vehicle

NOTE: Delay will be less at the beginning of metering. However, since peaks will almost always be more than one hour, delay will be greater after the first hour of metering. (See discussion on next page.)

SUMMARY OF FREEWAY RAMP METERING IMPACTS
(Lengthen as necessary to include all impacted meter locations)

LOCATION(S)	PEAK HOUR	PEAK HOUR DEMAND D	FLOW (METER RATE) F	EXCESS DEMAND E	DELAY (MINUTES)	QUEUE Q (feet)
	AM PM					
	AM PM					
	AM PM					

City:	Encinitas
Location:	I-5 SB On Ramp at La Costa Avenue
Date:	2/21/2018
Count Type:	On Ramp Split Count

	SOV	HOV	Total
7:30	176	30	206
7:45	172	32	204
8:00	140	27	167
8:15	135	21	156
TOTAL	**623**	**110**	**733**
	85%	15%	

***Longest observed queues were:
SOV Lanes: 15 Cars
HOV Lane: 3 Cars

	SOV	HOV	Total
16:45	148	14	162
17:00	132	26	158
17:15	188	25	213
17:30	157	30	187
TOTAL	**625**	**95**	**720**
	87%	13%	

***Longest observed queues were:
SOV Lanes: 13 Cars
HOV Lane: 3 Cars

City:	Encinitas
Location:	I-5 NB On Ramp at La Costa Avenue
Date:	2/21/2018
Count Type:	On Ramp Split Count

	SOV	HOV	Total
7:30	105	5	110
7:45	180	21	201
8:00	157	11	168
8:15	181	15	196
TOTAL	**623**	**52**	**675**
	92%	8%	

***Ramp Meter not on in the AM

	SOV	HOV	Total
16:45	131	21	152
17:00	102	17	119
17:15	119	47	166
17:30	96	28	124
TOTAL	**448**	**113**	**561**
	80%	20%	

***Longest observed queues were:
SOV Lane: 9 Cars
HOV Lane: 2 Cars

Appendix C

Traffic Volume Data

Prepared by National Data & Surveying Services

I-5 SB Ramps & La Costa Ave

Peak Hour Turning Movement Count

ID: 19-04220-001
City: Encinitas

Day: Thursday
Date: 05/16/2019

PEAK HOURS	COUNT PERIODS
07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

I-5 SB Ramps — SOUTHBOUND

AM	287	4	508	0	0	AM
NOON	0	0	0	0	0	NOON
PM	163	1	451	0	0	PM
	1	0.5	1.5	0		

EASTBOUND — La Costa Ave

AM	NOON	PM	
734	0	647	⇦
0	0	0	0
0	0	0	0
617	0	507	2
67	0	67	0
AM	NOON	PM	

WESTBOUND — La Costa Ave

PM	NOON	AM	
0	0	0	0
484	0	447	2
738	0	655	2
0	0	2	0
958	0	1127	⇨
PM	NOON	AM	

CONTROL

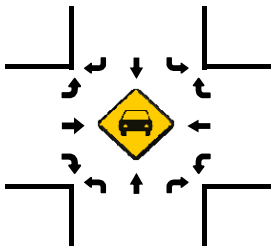
Signalized

TEV	2587	0	2411
	AM	NOON	PM
PHF	0.92		0.93

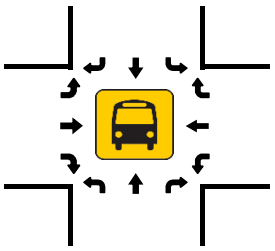
I-5 SB Ramps — NORTHBOUND

PM	806	0	0	0	0	PM
NOON	0	0	0	0	0	NOON
AM	726	0	0	0	0	AM
		0	0	0	0	

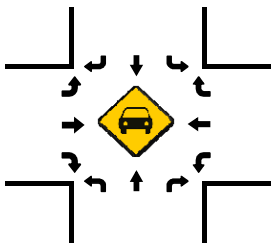
Total Vehicles (AM)



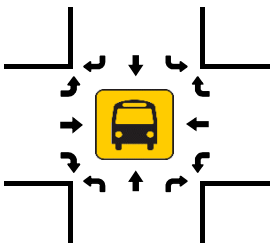
Total Vehicles (AM)



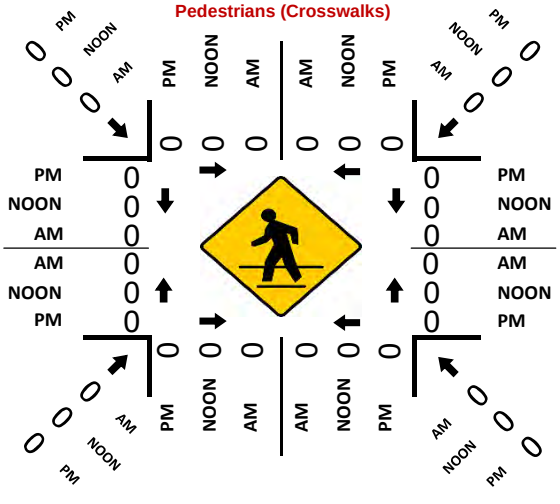
Total Vehicles (NOON)



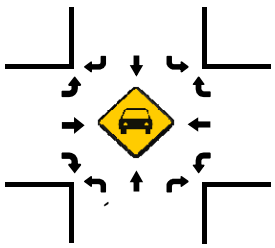
Total Vehicles (NOON)



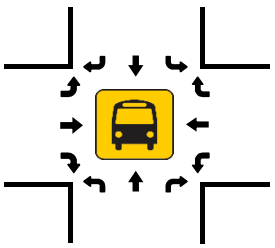
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: I-5 SB Ramps & La Costa Ave
City: Encinitas
Control: Signalized

Project ID: 19-04220-001
Date: 5/16/2019

Total

NS/EW Streets:	I-5 SB Ramps				I-5 SB Ramps				La Costa Ave				La Costa Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	1.5	0.5	1	0	0	2	0	0	2	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	0	0	0	62	8	48	0	0	113	25	0	160	69	0	0	485
7:15 AM	0	0	0	0	72	3	61	0	0	162	20	0	156	89	0	0	563
7:30 AM	0	0	0	0	101	3	67	0	0	163	18	0	188	85	0	1	626
7:45 AM	0	0	0	0	142	0	65	0	0	170	18	0	168	137	0	0	700
8:00 AM	0	0	0	0	130	0	78	0	0	145	17	0	170	124	0	1	665
8:15 AM	0	0	0	0	135	1	77	0	0	139	14	0	129	101	0	0	596
8:30 AM	0	0	0	0	146	1	59	0	0	120	18	0	106	83	0	0	533
8:45 AM	0	0	0	0	137	1	57	0	0	142	16	0	77	96	0	0	526
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	925	17	512	0	0	1154	146	0	1154	784	0	2	4694
APPROACH %'s :					63.62%	1.17%	35.21%	0.00%	0.00%	88.77%	11.23%	0.00%	59.48%	40.41%	0.00%	0.10%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	0	0	0	0	508	4	287	0	0	617	67	0	655	447	0	2	2587
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.894	0.333	0.920	0.000	0.000	0.907	0.931	0.000	0.871	0.816	0.000	0.500	0.924
					0.938				0.910				0.905				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	0	0	0	1.5	0.5	1	0	0	2	0	0	2	2	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	0	0	0	102	1	32	0	0	118	20	0	156	101	0	0	530
4:15 PM	0	0	0	0	111	0	34	0	0	108	20	0	162	121	0	0	556
4:30 PM	0	0	0	0	120	0	36	0	0	131	26	0	186	127	0	0	626
4:45 PM	0	0	0	0	101	1	39	0	0	112	30	0	162	114	0	0	559
5:00 PM	0	0	0	0	110	1	47	0	0	119	14	0	184	105	0	0	580
5:15 PM	0	0	0	0	113	0	39	0	0	134	19	0	195	120	0	0	620
5:30 PM	0	0	0	0	119	0	42	0	0	148	19	0	190	129	0	0	647
5:45 PM	0	0	0	0	109	0	35	0	0	106	15	0	169	130	0	0	564
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	0	0	0	885	3	304	0	0	976	163	0	1404	947	0	0	4682
APPROACH %'s :					74.24%	0.25%	25.50%	0.00%	0.00%	85.69%	14.31%	0.00%	59.72%	40.28%	0.00%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	0	0	0	451	1	163	0	0	507	67	0	738	484	0	0	2411
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.947	0.250	0.867	0.000	0.000	0.856	0.882	0.000	0.946	0.931	0.000	0.000	0.932
					0.955				0.859				0.958				

Prepared by National Data & Surveying Services

I-5 NB Ramps & La Costa Ave

Peak Hour Turning Movement Count

ID: 19-04220-002
City: Encinitas

Day: Thursday
Date: 05/16/2019

PEAK HOURS	COUNT PERIODS
07:15 AM - 08:15 AM	07:00 AM - 09:00 AM
NONE	NONE
05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

SOUTHBOUND — I-5 NB Ramps

AM	0	0	0	0	887	AM
NOON	0	0	0	0	0	NOON
PM	0	0	0	0	578	PM

EASTBOUND — La Costa Ave

AM	NOON	PM	
1139	0	1235	⇦
0	0	1	0
235	0	142	1
859	0	816	2
0	0	0	0
AM	NOON	PM	

WESTBOUND — La Costa Ave

PM	NOON	AM	
435	0	652	1
1123	0	1101	3
0	0	0	0
0	0	0	0
1655	0	1238	⇨
PM	NOON	AM	

CONTROL: Signalized

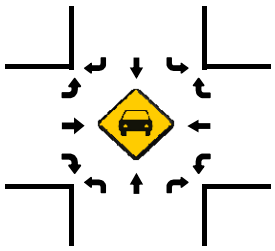
TEV	3264	0	3468
	AM	NOON	PM
PHF	0.94		0.95

NORTHBOUND — I-5 NB Ramps

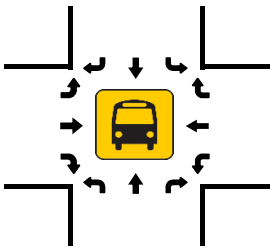
PM	0	0	111	1	839	PM
NOON	0	0	0	0	0	NOON
AM	0	0	38	0	379	AM

0 0 0 0 — 0 0 0.5 0.5 2

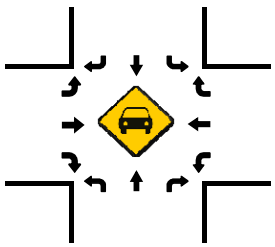
Total Vehicles (AM)



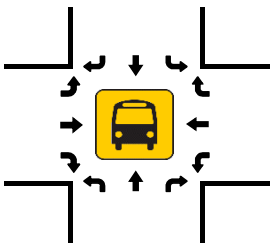
Total Vehicles (AM)



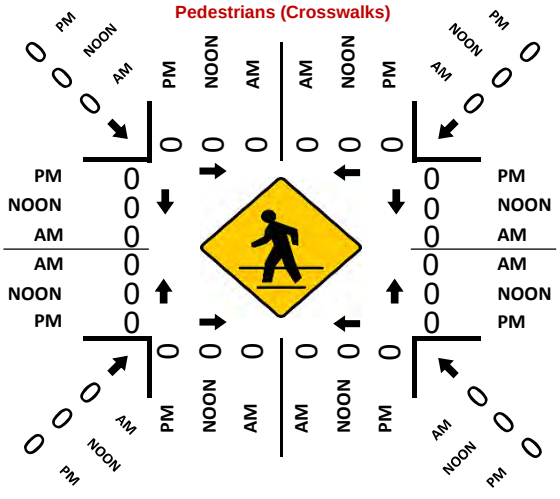
Total Vehicles (NOON)



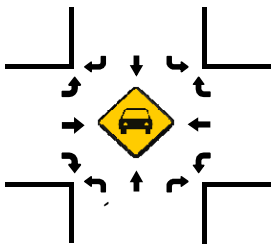
Total Vehicles (NOON)



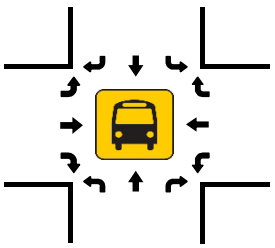
Pedestrians (Crosswalks)



Total Vehicles (PM)



Total Vehicles (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: I-5 NB Ramps & La Costa Ave
City: Encinitas
Control: Signalized

Project ID: 19-04220-002
Date: 5/16/2019

Total

NS/EW Streets:	I-5 NB Ramps				I-5 NB Ramps				La Costa Ave				La Costa Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0.5	0.5	2	0	0	0	0	0	1	2	0	0	0	3	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	8	0	35	0	0	0	0	0	53	132	0	0	0	222	113	0	563
7:15 AM	11	0	75	0	0	0	0	0	56	167	0	0	0	242	175	0	726
7:30 AM	9	0	107	0	0	0	0	0	74	213	0	0	0	277	165	0	845
7:45 AM	10	0	99	0	0	0	0	0	43	254	0	0	0	298	162	0	866
8:00 AM	8	0	98	0	0	0	0	0	62	225	0	0	0	284	150	0	827
8:15 AM	15	0	68	0	0	0	0	0	60	222	0	0	0	205	133	0	703
8:30 AM	7	0	67	0	0	0	0	0	61	196	0	0	0	187	127	0	645
8:45 AM	8	0	54	0	0	0	0	0	69	218	0	0	0	161	128	0	638
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	76	0	603	0	0	0	0	0	478	1627	0	0	0	1876	1153	0	5813
APPROACH %'s :	11.19%	0.00%	88.81%	0.00%					22.71%	77.29%	0.00%	0.00%	0.00%	61.93%	38.07%	0.00%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	38	0	379	0	0	0	0	0	235	859	0	0	0	1101	652	0	3264
PEAK HR FACTOR :	0.864	0.000	0.886	0.000	0.000	0.000	0.000	0.000	0.794	0.845	0.000	0.000	0.000	0.924	0.931	0.000	0.942
	0.899								0.921				0.953				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0.5	0.5	2	0	0	0	0	0	1	2	0	0	0	3	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	31	1	200	0	0	0	0	0	35	184	0	0	0	232	120	0	803
4:15 PM	26	0	188	0	0	0	0	0	34	193	0	0	0	250	112	0	803
4:30 PM	27	0	215	0	0	0	0	0	29	217	0	0	0	292	127	0	907
4:45 PM	37	1	197	0	0	0	0	0	29	195	0	0	0	230	123	0	812
5:00 PM	32	0	211	0	0	0	0	0	40	183	0	0	0	275	97	0	838
5:15 PM	22	1	198	0	0	0	0	0	32	221	0	0	0	283	132	0	889
5:30 PM	31	0	205	0	0	0	0	0	45	219	0	1	0	306	109	0	916
5:45 PM	26	0	225	0	0	0	0	0	25	193	0	0	0	259	97	0	825
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	232	3	1639	0	0	0	0	0	269	1605	0	1	0	2127	917	0	6793
APPROACH %'s :	12.38%	0.16%	87.46%	0.00%					14.35%	85.60%	0.00%	0.05%	0.00%	69.88%	30.12%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	111	1	839	0	0	0	0	0	142	816	0	1	0	1123	435	0	3468
PEAK HR FACTOR :	0.867	0.250	0.932	0.000	0.000	0.000	0.000	0.000	0.789	0.923	0.000	0.250	0.000	0.917	0.824	0.000	0.947
	0.947								0.905				0.939				

Prepared by National Data & Surveying Services

N Coast Hwy 101 & La Costa Ave

Peak Hour Turning Movement Count

ID: 19-04220-003
City: Encinitas

Day: Thursday
Date: 05/16/2019

PEAK HOURS

AM	07:00 AM - 08:00 AM
NOON	NONE
PM	05:00 PM - 06:00 PM

COUNT PERIODS

AM	07:00 AM - 09:00 AM
NOON	NONE
PM	04:00 PM - 06:00 PM

N Coast Hwy 101 — SOUTHBOUND

AM	0	1040	243	6	285	AM
NOON	0	0	0	0	0	NOON
PM	0	372	183	21	754	PM

La Costa Ave — EASTBOUND

AM	NOON	PM		
0	0	0		
0	0	0	↰	0
0	0	0	↑	0
0	0	0	→	0
0	0	0	↱	0
AM	NOON	PM		

WESTBOUND — La Costa Ave

PM	NOON	AM		
220	0	71	↰	1
0	0	0	←	1
281	0	248	↰	0
0	0	0	↰	0
402	0	444		
PM	NOON	AM		

N Coast Hwy 101 — NORTHBOUND

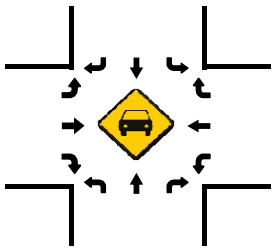
PM	653	0	0	513	219	PM
NOON	0	0	0	0	0	NOON
AM	1288	0	0	208	201	AM

↰	←	↑	↱	
0	0	2	1	

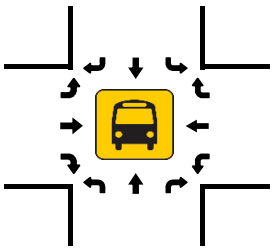
↰	↑	→	↱	
0	2	1	0	

CONTROL			
Signalized			
TEV	2017	0	1809
	AM	NOON	PM
PHF	0.97		0.90

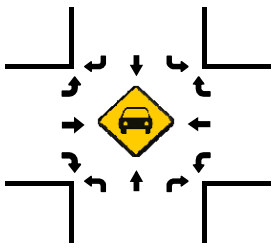
Total Vehicles (AM)



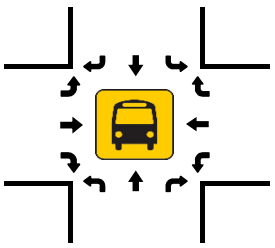
Total Vehicles (AM)



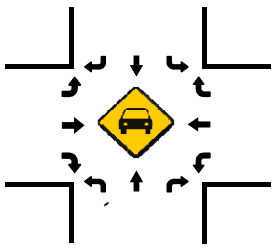
Total Vehicles (NOON)



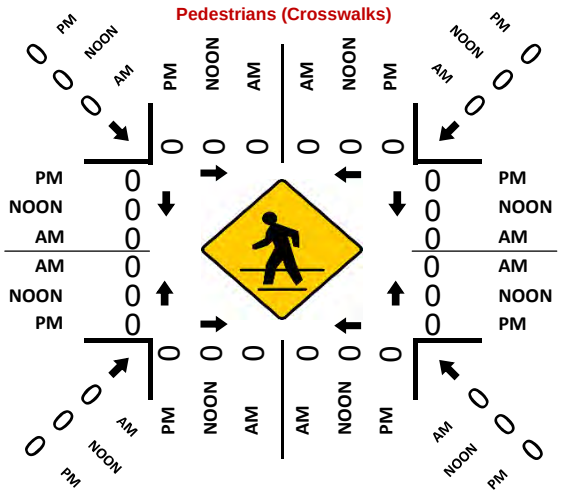
Total Vehicles (NOON)



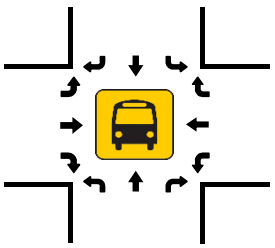
Total Vehicles (PM)



Pedestrians (Crosswalks)



Total Vehicles (PM)



National Data & Surveying Services

Intersection Turning Movement Count

Location: N Coast Hwy 101 & La Costa Ave
City: Encinitas
Control: Signalized

Project ID: 19-04220-003
Date: 5/16/2019

Total

NS/EW Streets:	N Coast Hwy 101				N Coast Hwy 101				La Costa Ave				La Costa Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	1	0	1	2	0	0	0	0	0	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	0	47	48	0	61	270	0	2	0	0	0	0	50	0	17	0	495
7:15 AM	0	48	45	0	52	272	0	1	0	0	0	0	61	0	23	0	502
7:30 AM	0	58	63	0	61	251	0	1	0	0	0	0	74	0	12	0	520
7:45 AM	0	55	45	0	69	247	0	2	0	0	0	0	63	0	19	0	500
8:00 AM	0	61	54	0	53	228	0	4	0	0	0	0	69	0	25	0	494
8:15 AM	0	63	53	0	42	231	0	5	0	0	0	0	79	0	28	0	501
8:30 AM	0	67	38	0	45	224	0	2	0	0	0	0	55	0	26	0	457
8:45 AM	0	88	60	0	60	148	0	6	0	0	0	0	68	0	26	0	456
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	487	406	0	443	1871	0	23	0	0	0	0	519	0	176	0	3925
APPROACH %'s :	0.00%	54.54%	45.46%	0.00%	18.96%	80.06%	0.00%	0.98%					74.68%	0.00%	25.32%	0.00%	
PEAK HR :	07:00 AM - 08:00 AM																TOTAL
PEAK HR VOL :	0	208	201	0	243	1040	0	6	0	0	0	0	248	0	71	0	2017
PEAK HR FACTOR :	0.000	0.897	0.798	0.000	0.880	0.956	0.000	0.750	0.000	0.000	0.000	0.000	0.838	0.000	0.772	0.000	0.970
		0.845				0.968								0.927			

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	2	1	0	1	2	0	0	0	0	0	0	0	1	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	0	123	53	0	44	77	0	7	0	0	0	0	57	0	47	0	408
4:15 PM	0	128	49	0	44	84	0	6	0	0	0	0	65	0	40	0	416
4:30 PM	0	142	54	0	35	97	0	4	0	0	0	0	60	0	62	0	454
4:45 PM	0	116	43	0	40	100	0	6	0	0	0	0	59	0	44	0	408
5:00 PM	0	129	49	0	34	73	0	6	0	0	0	0	61	0	53	0	405
5:15 PM	0	147	62	0	53	106	0	2	0	0	0	0	72	0	63	0	505
5:30 PM	0	118	60	0	54	96	0	5	0	0	0	0	65	0	56	0	454
5:45 PM	0	119	48	0	42	97	0	8	0	0	0	0	83	0	48	0	445
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	0	1022	418	0	346	730	0	44	0	0	0	0	522	0	413	0	3495
APPROACH %'s :	0.00%	70.97%	29.03%	0.00%	30.89%	65.18%	0.00%	3.93%					55.83%	0.00%	44.17%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	0	513	219	0	183	372	0	21	0	0	0	0	281	0	220	0	1809
PEAK HR FACTOR :	0.000	0.872	0.883	0.000	0.847	0.877	0.000	0.656	0.000	0.000	0.000	0.000	0.846	0.000	0.873	0.000	0.896
		0.876				0.894								0.928			

Prepared by National Data & Surveying Services

Vulcan Ave & La Costa Ave

Peak Hour Turning Movement Count

ID: 19-04220-004
City: Encinitas

Day: Thursday
Date: 05/16/2019

	PEAK HOURS	COUNT PERIODS
AM	07:30 AM - 08:30 AM	07:00 AM - 09:00 AM
NOON	NONE	NONE
PM	05:00 PM - 06:00 PM	04:00 PM - 06:00 PM

Vulcan Ave – SOUTHBOUND

	Right	Through	Left	U-Turn	Outbound
AM	0	1	0	0	1
NOON	0	0	0	0	0
PM	0	0	1	0	0
(red)	0	0	0	0	

La Costa Ave – EASTBOUND

Movement	AM	NOON	PM	(red)
Outbound	382	0	499	
U-Turn	0	0	0	0
Left	0	0	0	0
Through	361	0	343	1
Right	82	0	56	0

La Costa Ave – WESTBOUND

Movement	(red)	PM	NOON	AM
Left	0	0	0	1
Through	1	441	0	349
Right	0	123	0	261
U-Turn	0	0	0	0
Outbound		496	0	544

Vulcan Ave – NORTHBOUND

	Outbound	U-Turn	Left	Through	Right
(red)		0	1	0	1
PM	179	0	58	0	152
NOON	0	0	0	0	0
AM	344	0	33	0	183

CONTROL

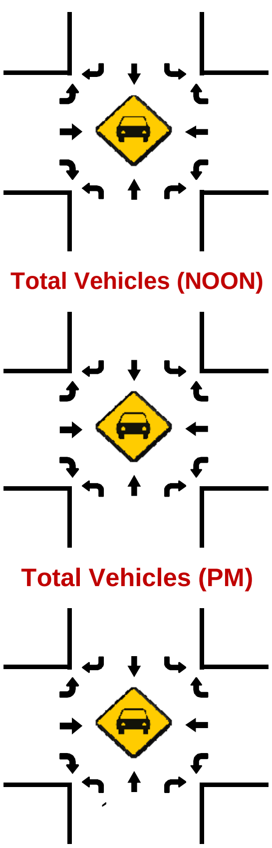
1-Way Stop (NB)

	AM	NOON	PM
TEV	1271	0	1174
PHF	0.96		0.90

Total Vehicles (AM)

Total Vehicles (NOON)

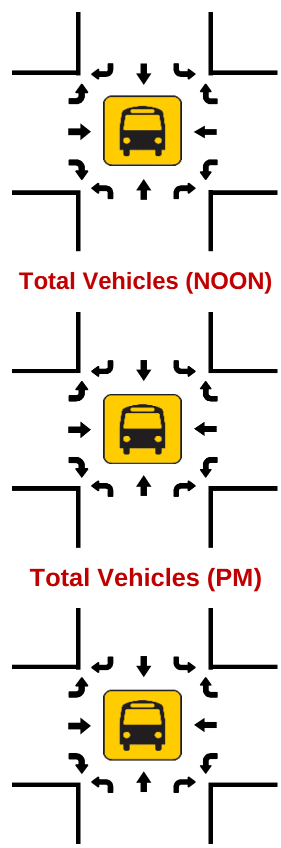
Total Vehicles (PM)



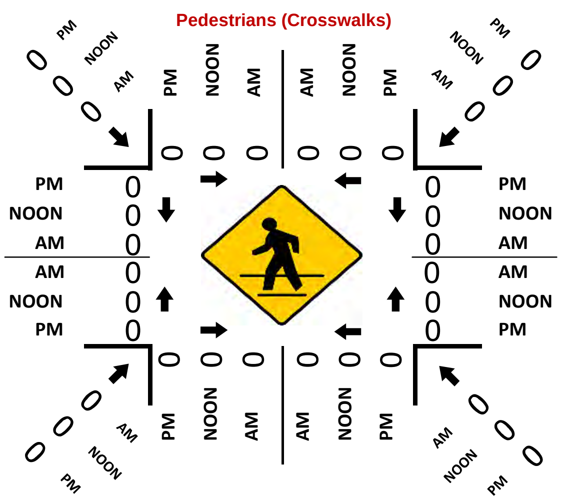
Total Vehicles (AM)

Total Vehicles (NOON)

Total Vehicles (PM)



Pedestrians (Crosswalks)



National Data & Surveying Services

Intersection Turning Movement Count

Location: Vulcan Ave & La Costa Ave
City: Encinitas
Control: 1-Way Stop (NB)

Project ID: 19-04220-004
Date: 5/16/2019

Total

NS/EW Streets:	Vulcan Ave				Vulcan Ave				La Costa Ave				La Costa Ave				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
7:00 AM	10	0	43	0	0	0	0	0	0	84	22	0	38	58	0	0	255
7:15 AM	10	0	50	0	0	0	0	0	0	75	19	0	45	74	0	1	274
7:30 AM	4	0	55	0	0	0	0	0	0	109	18	0	51	83	0	0	320
7:45 AM	6	0	51	0	0	1	0	0	0	86	26	0	75	85	0	0	330
8:00 AM	7	0	40	0	0	0	0	0	0	85	21	0	71	95	0	0	319
8:15 AM	16	0	37	0	0	0	0	0	0	81	17	0	64	86	1	0	302
8:30 AM	4	0	38	0	0	0	0	0	0	65	19	0	54	73	0	0	253
8:45 AM	7	0	49	0	0	0	0	0	0	97	25	0	38	87	0	0	303
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	64	0	363	0	0	1	0	0	0	682	167	0	436	641	1	1	2356
APPROACH %'s :	14.99%	0.00%	85.01%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	80.33%	19.67%	0.00%	40.41%	59.41%	0.09%	0.09%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	33	0	183	0	0	1	0	0	0	361	82	0	261	349	1	0	1271
PEAK HR FACTOR :	0.516	0.000	0.832	0.000	0.000	0.250	0.000	0.000	0.000	0.828	0.788	0.000	0.870	0.918	0.250	0.000	0.963
	0.915				0.250				0.872				0.920				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	1	0	1	0	0	0	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
4:00 PM	19	0	28	0	0	0	0	0	0	84	16	0	25	90	1	0	263
4:15 PM	10	0	40	0	0	0	0	0	0	71	20	0	26	95	0	0	262
4:30 PM	17	0	39	0	0	0	0	0	0	75	15	0	26	107	0	0	279
4:45 PM	10	0	44	0	0	0	0	0	0	67	13	0	34	99	0	0	267
5:00 PM	13	0	35	0	0	0	0	0	0	69	15	0	34	94	0	0	260
5:15 PM	18	0	38	0	1	0	0	0	0	103	15	0	31	121	0	0	327
5:30 PM	15	0	41	0	0	0	0	0	0	99	13	0	27	106	0	0	301
5:45 PM	12	0	38	0	0	0	0	0	0	72	13	0	31	120	0	0	286
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	114	0	303	0	1	0	0	0	0	640	120	0	234	832	1	0	2245
APPROACH %'s :	27.34%	0.00%	72.66%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	84.21%	15.79%	0.00%	21.93%	77.98%	0.09%	0.00%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	58	0	152	0	1	0	0	0	0	343	56	0	123	441	0	0	1174
PEAK HR FACTOR :	0.806	0.000	0.927	0.000	0.250	0.000	0.000	0.000	0.000	0.833	0.933	0.000	0.904	0.911	0.000	0.000	0.898
	0.938				0.250				0.845				0.928				

Prepared by NDS/ATD

VOLUME

La Costa Ave Bet. Seabreeze Ct & I-5 SB Ramps

Day: Thursday
Date: 5/16/2019

City: Encinitas
Project #: CA19_4221_001

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,732	7,629	15,361

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			8		10		18		12:00			105		111		216	
00:15			4		8		12		12:15			119		99		218	
00:30			3		5		8		12:30			96		111		207	
00:45			2	17	4	27	6	44	12:45			119	439	108	429	227	868
01:00			5		4		9		13:00			94		107		201	
01:15			2		2		4		13:15			140		122		262	
01:30			2		3		5		13:30			122		99		221	
01:45			1	10	1	10	2	20	13:45			111	467	122	450	233	917
02:00			3		2		5		14:00			136		112		248	
02:15			3		4		7		14:15			129		96		225	
02:30			4		2		6		14:30			151		139		290	
02:45			2	12	1	9	3	21	14:45			128	544	148	495	276	1039
03:00			3		0		3		15:00			156		133		289	
03:15			3		2		5		15:15			125		133		258	
03:30			3		2		5		15:30			154		122		276	
03:45			2	11	1	5	3	16	15:45			127	562	138	526	265	1088
04:00			8		3		11		16:00			135		135		270	
04:15			5		5		10		16:15			133		156		289	
04:30			9		2		11		16:30			151		162		313	
04:45			17	39	7	17	24	56	16:45			144	563	142	595	286	1158
05:00			22		10		32		17:00			134		154		288	
05:15			22		16		38		17:15			156		163		319	
05:30			38		26		64		17:30			140		170		310	
05:45			39	121	27	79	66	200	17:45			125	555	168	655	293	1210
06:00			46		43		89		18:00			121		140		261	
06:15			59		62		121		18:15			125		139		264	
06:30			83		62		145		18:30			91		133		224	
06:45			112	300	90	257	202	557	18:45			86	423	117	529	203	952
07:00			136		117		253		19:00			101		88		189	
07:15			177		148		325		19:15			110		90		200	
07:30			180		154		334		19:30			86		96		182	
07:45			174	667	201	620	375	1287	19:45			97	394	78	352	175	746
08:00			152		202		354		20:00			70		62		132	
08:15			157		178		335		20:15			67		64		131	
08:30			132		162		294		20:30			64		73		137	
08:45			162	603	154	696	316	1299	20:45			51	252	42	241	93	493
09:00			187		131		318		21:00			45		59		104	
09:15			136		116		252		21:15			44		51		95	
09:30			150		111		261		21:30			30		51		81	
09:45			95	568	106	464	201	1032	21:45			34	153	44	205	78	358
10:00			99		96		195		22:00			36		32		68	
10:15			111		107		218		22:15			25		20		45	
10:30			102		92		194		22:30			19		27		46	
10:45			106	418	85	380	191	798	22:45			23	103	23	102	46	205
11:00			119		85		204		23:00			17		23		40	
11:15			118		90		208		23:15			16		14		30	
11:30			101		129		230		23:30			10		14		24	
11:45			122	460	118	422	240	882	23:45			8	51	13	64	21	115
TOTALS				3226		2986		**6212**	**TOTALS**				4506		4643		**9149**
SPLIT %				51.9%		48.1%		**40.4%**	**SPLIT %**				49.3%		50.7%		**59.6%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,732	7,629	15,361

AM Peak Hour			07:15	07:45	**07:30**	**PM Peak Hour**			16:30	17:00	**17:00**
AM Pk Volume			683	743	**1398**	**PM Pk Volume**			585	655	**1210**
Pk Hr Factor			0.949	0.920	**0.932**	**Pk Hr Factor**			0.938	0.963	**0.948**
7 - 9 Volume	0	0	1270	1316	**2586**	**4 - 6 Volume**	0	0	1118	1250	**2368**
7 - 9 Peak Hour			07:15	07:45	**07:30**	**4 - 6 Peak Hour**			16:30	17:00	**17:00**
7 - 9 Pk Volume	0	0	683	743	**1398**	**4 - 6 Pk Volume**	0	0	585	655	**1210**
Pk Hr Factor	0.000	0.000	0.949	0.920	**0.932**	**Pk Hr Factor**	0.000	0.000	0.938	0.963	**0.948**

Prepared by NDS/ATD

VOLUME

La Costa Ave Bet. Seabreeze Ct & N Vulcan Ave

Day: Thursday
Date: 5/16/2019

City: Encinitas
Project #: CA19_4221_002

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,023	7,010	14,033

AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			7		10		17		12:00			91		99		190	
00:15			4		9		13		12:15			113		95		208	
00:30			4		5		9		12:30			86		97		183	
00:45			1	16	4	28	5	44	12:45			102	392	101	392	203	784
01:00			5		3		8		13:00			90		98		188	
01:15			2		2		4		13:15			130		121		251	
01:30			1		3		4		13:30			114		89		203	
01:45			1	9	1	9	2	18	13:45			96	430	113	421	209	851
02:00			2		2		4		14:00			121		99		220	
02:15			2		3		5		14:15			115		93		208	
02:30			3		2		5		14:30			132		120		252	
02:45			3	10	1	8	4	18	14:45			125	493	129	441	254	934
03:00			2		0		2		15:00			137		119		256	
03:15			3		2		5		15:15			102		126		228	
03:30			3		2		5		15:30			146		119		265	
03:45			1	9	1	5	2	14	15:45			114	499	128	492	242	991
04:00			7		3		10		16:00			141		127		268	
04:15			7		6		13		16:15			118		150		268	
04:30			8		2		10		16:30			131		120		251	
04:45			12	34	6	17	18	51	16:45			126	516	150	547	276	1063
05:00			24		11		35		17:00			147		151		298	
05:15			19		15		34		17:15			141		160		301	
05:30			35		26		61		17:30			106		150		256	
05:45			34	112	27	79	61	191	17:45			106	500	149	610	255	1110
06:00			40		43		83		18:00			124		129		253	
06:15			48		61		109		18:15			118		120		238	
06:30			70		66		136		18:30			85		120		205	
06:45			107	265	83	253	190	518	18:45			84	411	106	475	190	886
07:00			125		118		243		19:00			93		88		181	
07:15			120		124		244		19:15			107		85		192	
07:30			124		155		279		19:30			88		93		181	
07:45			117	486	182	579	299	1065	19:45			89	377	69	335	158	712
08:00			120		182		302		20:00			68		47		115	
08:15			165		150		315		20:15			61		55		116	
08:30			167		155		322		20:30			57		63		120	
08:45			168	620	151	638	319	1258	20:45			47	233	40	205	87	438
09:00			178		118		296		21:00			42		49		91	
09:15			123		111		234		21:15			44		41		85	
09:30			142		101		243		21:30			29		46		75	
09:45			79	522	104	434	183	956	21:45			31	146	35	171	66	317
10:00			91		79		170		22:00			33		30		63	
10:15			88		100		188		22:15			27		18		45	
10:30			92		82		174		22:30			19		23		42	
10:45			95	366	72	333	167	699	22:45			23	102	18	89	41	191
11:00			106		82		188		23:00			16		20		36	
11:15			108		88		196		23:15			17		12		29	
11:30			97		119		216		23:30			10		13		23	
11:45			114	425	102	391	216	816	23:45			7	50	13	58	20	108
TOTALS				2874		2774		**5648**	**TOTALS**				4149		4236		**8385**
SPLIT %				50.9%		49.1%		**40.2%**	**SPLIT %**				49.5%		50.5%		**59.8%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	7,023	7,010	14,033

AM Peak Hour			08:15	07:30	**08:00**	**PM Peak Hour**			16:30	16:45	**16:45**
AM Pk Volume			678	669	**1258**	**PM Pk Volume**			545	611	**1131**
Pk Hr Factor			0.952	0.919	**0.977**	**Pk Hr Factor**			0.927	0.955	**0.939**
7 - 9 Volume	0	0	1106	1217	**2323**	**4 - 6 Volume**	0	0	1016	1157	**2173**
7 - 9 Peak Hour			08:00	07:30	**08:00**	**4 - 6 Peak Hour**			16:30	16:45	**16:45**
7 - 9 Pk Volume	0	0	620	669	**1258**	**4 - 6 Pk Volume**	0	0	545	611	**1131**
Pk Hr Factor	0.000	0.000	0.923	0.919	**0.977**	**Pk Hr Factor**	0.000	0.000	0.927	0.955	**0.939**

Prepared by NDS/ATD

VOLUME

La Costa Ave Bet. N Vulcan Ave & N Coast Hwy 101

Day: Thursday
Date: 5/16/2019

City: Encinitas
Project #: CA19_4221_003

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	5,396	5,070	10,466

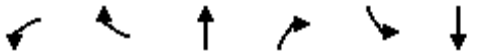
AM Period	NB	SB	EB		WB		TOTAL		PM Period	NB	SB	EB		WB		TOTAL	
00:00			7		4		11		12:00			78		76		154	
00:15			2		4		6		12:15			85		66		151	
00:30			3		3		6		12:30			81		68		149	
00:45			1	13	2	13	3	26	12:45			87	331	80	290	167	621
01:00			5		1		6		13:00			75		69		144	
01:15			2		1		3		13:15			87		87		174	
01:30			1		0		1		13:30			95		59		154	
01:45			1	9	0	2	1	11	13:45			95	352	101	316	196	668
02:00			2		1		3		14:00			94		81		175	
02:15			2		2		4		14:15			77		82		159	
02:30			3		1		4		14:30			96		104		200	
02:45			3	10	1	5	4	15	14:45			81	348	104	371	185	719
03:00			1		0		1		15:00			96		94		190	
03:15			2		1		3		15:15			106		100		206	
03:30			0		1		1		15:30			108		91		199	
03:45			1	4	1	3	2	7	15:45			111	421	103	388	214	809
04:00			5		2		7		16:00			97		107		204	
04:15			5		4		9		16:15			92		106		198	
04:30			10		2		12		16:30			91		120		211	
04:45			5	25	3	11	8	36	16:45			81	361	113	446	194	807
05:00			16		7		23		17:00			83		105		188	
05:15			14		10		24		17:15			113		133		246	
05:30			17		17		34		17:30			114		127		241	
05:45			21	68	21	55	42	123	17:45			88	398	129	494	217	892
06:00			32		32		64		18:00			88		101		189	
06:15			33		49		82		18:15			77		98		175	
06:30			46		43		89		18:30			87		90		177	
06:45			90	201	49	173	139	374	18:45			80	332	70	359	150	691
07:00			108		73		181		19:00			73		63		136	
07:15			91		80		171		19:15			61		66		127	
07:30			129		84		213		19:30			72		63		135	
07:45			118	446	102	339	220	785	19:45			63	269	41	233	104	502
08:00			106		97		203		20:00			56		38		94	
08:15			94		103		197		20:15			42		37		79	
08:30			90		81		171		20:30			30		45		75	
08:45			124	414	101	382	225	796	20:45			24	152	24	144	48	296
09:00			120		93		213		21:00			38		35		73	
09:15			88		91		179		21:15			26		23		49	
09:30			81		73		154		21:30			21		24		45	
09:45			66	355	71	328	137	683	21:45			18	103	12	94	30	197
10:00			78		59		137		22:00			24		13		37	
10:15			86		77		163		22:15			15		9		24	
10:30			72		61		133		22:30			19		12		31	
10:45			84	320	48	245	132	565	22:45			13	71	13	47	26	118
11:00			77		60		137		23:00			22		11		33	
11:15			92		70		162		23:15			12		8		20	
11:30			85		88		173		23:30			7		5		12	
11:45			93	347	81	299	174	646	23:45			5	46	9	33	14	79
TOTALS				2212		1855		**4067**	**TOTALS**				3184		3215		**6399**
SPLIT %				54.4%		45.6%		**38.9%**	**SPLIT %**				49.8%		50.2%		**61.1%**

DAILY TOTALS	NB	SB	EB	WB	Total
	0	0	5,396	5,070	10,466

AM Peak Hour			07:30	07:30	**07:30**	**PM Peak Hour**			15:15	17:00	**17:15**
AM Pk Volume			447	386	**833**	**PM Pk Volume**			422	494	**893**
Pk Hr Factor			0.866	0.937	**0.947**	**Pk Hr Factor**			0.950	0.929	**0.908**
7 - 9 Volume	0	0	860	721	**1581**	**4 - 6 Volume**	0	0	759	940	**1699**
7 - 9 Peak Hour			07:30	07:30	**07:30**	**4 - 6 Peak Hour**			17:00	17:00	**17:00**
7 - 9 Pk Volume	0	0	447	386	**833**	**4 - 6 Pk Volume**	0	0	398	494	**892**
Pk Hr Factor	0.000	0.000	0.866	0.937	**0.947**	**Pk Hr Factor**	0.000	0.000	0.873	0.929	**0.907**

Appendix D

Intersection LOS Worksheets



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	248	71	208	201	249	1040
Future Volume (veh/h)	248	71	208	201	249	1040
Number	3	18	2	12	1	6
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	256	0	214	0	257	1072
Adj No. of Lanes	1	1	2	1	1	2
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	342	305	654	293	327	1823
Arrive On Green	0.19	0.00	0.18	0.00	0.18	0.52
Sat Flow, veh/h	1774	1583	3632	1583	1774	3632
Grp Volume(v), veh/h	256	0	214	0	257	1072
Grp Sat Flow(s),veh/h/ln	1774	1583	1770	1583	1774	1770
Q Serve(g_s), s	4.7	0.0	1.8	0.0	4.7	7.2
Cycle Q Clear(g_c), s	4.7	0.0	1.8	0.0	4.7	7.2
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	342	305	654	293	327	1823
V/C Ratio(X)	0.75	0.00	0.33	0.00	0.79	0.59
Avail Cap(c_a), veh/h	933	833	1862	833	467	3310
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	13.0	0.0	12.1	0.0	13.3	5.8
Incr Delay (d2), s/veh	3.3	0.0	0.3	0.0	5.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	0.9	0.0	2.8	3.5
LnGrp Delay(d),s/veh	16.3	0.0	12.4	0.0	19.0	6.1
LnGrp LOS	B		B		B	A
Approach Vol, veh/h	256		214			1329
Approach Delay, s/veh	16.3		12.4			8.6
Approach LOS	B		B			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	11.3	11.3				22.6		11.6
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0
Max Green Setting (Gmax), s	9.0	18.0				32.0		18.0
Max Q Clear Time (g_c+I1), s	6.7	3.8				9.2		6.7
Green Ext Time (p_c), s	0.2	1.0				8.4		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	10.1
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰		↱		↕	
Traffic Vol, veh/h	0	361	82	261	349	1	33	0	183	0	1	0
Future Vol, veh/h	0	361	82	261	349	1	33	0	183	0	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	376	85	272	364	1	34	0	191	0	1	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	365	0	0	461	0	0	1328	-	419	1423	1370	365
Stage 1	-	-	-	-	-	-	419	-	-	909	909	-
Stage 2	-	-	-	-	-	-	909	-	-	514	461	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	-	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	-	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1194	-	-	1100	-	-	132	0	634	114	146	680
Stage 1	-	-	-	-	-	-	612	0	-	329	354	-
Stage 2	-	-	-	-	-	-	329	0	-	543	565	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1194	-	-	1100	-	-	100	-	634	61	101	680
Mov Cap-2 Maneuver	-	-	-	-	-	-	100	-	-	61	101	-
Stage 1	-	-	-	-	-	-	612	-	-	329	244	-
Stage 2	-	-	-	-	-	-	226	-	-	380	565	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	4	20.1	41
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	100	634	1194	-	-	1100	-	-	101
HCM Lane V/C Ratio	0.344	0.301	-	-	-	0.247	-	-	0.01
HCM Control Delay (s)	58.8	13.1	0	-	-	9.3	0	-	41
HCM Lane LOS	F	B	A	-	-	A	A	-	E
HCM 95th %tile Q(veh)	1.3	1.3	0	-	-	1	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	617	67	657	447	0	0	0	0	508	4	287
Future Volume (veh/h)	0	617	67	657	447	0	0	0	0	508	4	287
Number	5	2	12	1	6	16				7	4	14
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	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	671	73	714	486	0				555	0	312
Adj No. of Lanes	0	2	0	2	2	0				2	0	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, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1282	139	836	2460	0				710	0	317
Arrive On Green	0.00	0.40	0.40	0.32	0.92	0.00				0.20	0.00	0.20
Sat Flow, veh/h	0	3314	350	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	368	376	714	486	0				555	0	312
Grp Sat Flow(s),veh/h/ln	0	1770	1801	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	15.8	15.9	19.4	1.3	0.0				14.8	0.0	19.6
Cycle Q Clear(g_c), s	0.0	15.8	15.9	19.4	1.3	0.0				14.8	0.0	19.6
Prop In Lane	0.00		0.19	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	704	717	836	2460	0				710	0	317
V/C Ratio(X)	0.00	0.52	0.52	0.85	0.20	0.00				0.78	0.00	0.99
Avail Cap(c_a), veh/h	0	704	717	860	2460	0				710	0	317
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.91	0.91	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	22.9	22.9	32.2	1.2	0.0				37.9	0.0	39.9
Incr Delay (d2), s/veh	0.0	2.8	2.7	7.5	0.2	0.0				5.7	0.0	46.4
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	8.2	8.4	10.0	0.6	0.0				7.8	0.0	12.7
LnGrp Delay(d),s/veh	0.0	25.7	25.6	39.7	1.4	0.0				43.6	0.0	86.3
LnGrp LOS		C	C	D	A					D		F
Approach Vol, veh/h		744			1200						867	
Approach Delay, s/veh		25.6			24.2						59.0	
Approach LOS		C			C						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	29.7	45.2		25.1		74.9		
Change Period (Y+Rc), s	5.4	* 5.4		5.1		5.4		
Max Green Setting (Gmax), s	25.0	* 40		20.0		69.5		
Max Q Clear Time (g_c+I1), s	21.4	17.9		21.6		3.3		
Green Ext Time (p_c), s	1.1	4.8		0.0		3.7		

Intersection Summary	
HCM 2010 Ctrl Delay	35.3
HCM 2010 LOS	D

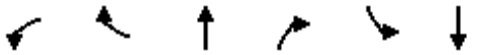
Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	235	859	0	0	1101	652	38	0	379	0	0	0
Future Volume (veh/h)	235	859	0	0	1101	652	38	0	379	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	0	1863	1863	1900	1863	1863			
Adj Flow Rate, veh/h	250	914	0	0	1171	694	40	0	403			
Adj No. of Lanes	1	2	0	0	3	1	0	1	2			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	283	2545	0	0	2606	811	298	0	468			
Arrive On Green	0.32	1.00	0.00	0.00	0.51	0.51	0.17	0.00	0.17			
Sat Flow, veh/h	1774	3632	0	0	5253	1583	1774	0	2787			
Grp Volume(v), veh/h	250	914	0	0	1171	694	40	0	403			
Grp Sat Flow(s),veh/h/ln	1774	1770	0	0	1695	1583	1774	0	1393			
Q Serve(g_s), s	13.4	0.0	0.0	0.0	14.6	38.0	1.9	0.0	14.1			
Cycle Q Clear(g_c), s	13.4	0.0	0.0	0.0	14.6	38.0	1.9	0.0	14.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	283	2545	0	0	2606	811	298	0	468			
V/C Ratio(X)	0.88	0.36	0.00	0.00	0.45	0.86	0.13	0.00	0.86			
Avail Cap(c_a), veh/h	532	2545	0	0	2606	811	355	0	557			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.76	0.76	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	33.2	0.0	0.0	0.0	15.4	21.2	35.4	0.0	40.5			
Incr Delay (d2), s/veh	6.9	0.3	0.0	0.0	0.6	11.2	0.2	0.0	11.4			
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	7.1	0.1	0.0	0.0	7.0	19.1	1.0	0.0	6.2			
LnGrp Delay(d),s/veh	40.1	0.3	0.0	0.0	16.0	32.4	35.6	0.0	51.9			
LnGrp LOS	D	A			B	C	D		D			
Approach Vol, veh/h		1164			1865			443				
Approach Delay, s/veh		8.8			22.1			50.4				
Approach LOS		A			C			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		78.1			20.7	57.4		21.9
Change Period (Y+Rc), s		* 6.2			* 4.7	6.2		5.1
Max Green Setting (Gmax), s		* 69			* 30	34.0		20.0
Max Q Clear Time (g_c+I1), s		2.0			15.4	40.0		16.1
Green Ext Time (p_c), s		8.4			0.6	0.0		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	21.3
HCM 2010 LOS	C

Notes



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	281	220	513	219	204	372
Future Volume (veh/h)	281	220	513	219	204	372
Number	3	18	2	12	1	6
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	312	0	570	0	227	413
Adj No. of Lanes	1	1	2	1	1	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	396	353	906	405	286	1901
Arrive On Green	0.22	0.00	0.26	0.00	0.16	0.54
Sat Flow, veh/h	1774	1583	3632	1583	1774	3632
Grp Volume(v), veh/h	312	0	570	0	227	413
Grp Sat Flow(s),veh/h/ln	1774	1583	1770	1583	1774	1770
Q Serve(g_s), s	6.9	0.0	6.0	0.0	5.1	2.6
Cycle Q Clear(g_c), s	6.9	0.0	6.0	0.0	5.1	2.6
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	396	353	906	405	286	1901
V/C Ratio(X)	0.79	0.00	0.63	0.00	0.79	0.22
Avail Cap(c_a), veh/h	765	683	1527	683	383	2714
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	15.3	0.0	13.8	0.0	16.8	5.1
Incr Delay (d2), s/veh	3.5	0.0	0.7	0.0	8.0	0.1
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	0.0	2.9	0.0	3.1	1.2
LnGrp Delay(d),s/veh	18.8	0.0	14.5	0.0	24.8	5.1
LnGrp LOS	B		B		C	A
Approach Vol, veh/h	312		570			640
Approach Delay, s/veh	18.8		14.5			12.1
Approach LOS	B		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	11.7	15.7				27.4		14.3
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0
Max Green Setting (Gmax), s	9.0	18.0				32.0		18.0
Max Q Clear Time (g_c+I1), s	7.1	8.0				4.6		8.9
Green Ext Time (p_c), s	0.1	2.7				2.9		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	14.4
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	4.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰		↱		↕	
Traffic Vol, veh/h	0	343	56	123	441	0	58	0	152	1	0	0
Future Vol, veh/h	0	343	56	123	441	0	58	0	152	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	381	62	137	490	0	64	0	169	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	490	0	0	443	0	0	1176	-	412	1261	1207	490
Stage 1	-	-	-	-	-	-	412	-	-	764	764	-
Stage 2	-	-	-	-	-	-	764	-	-	497	443	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	-	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	-	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1073	-	-	1117	-	-	168	0	640	147	183	578
Stage 1	-	-	-	-	-	-	617	0	-	396	413	-
Stage 2	-	-	-	-	-	-	396	0	-	555	576	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1073	-	-	1117	-	-	146	-	640	94	152	578
Mov Cap-2 Maneuver	-	-	-	-	-	-	146	-	-	94	152	-
Stage 1	-	-	-	-	-	-	617	-	-	396	343	-
Stage 2	-	-	-	-	-	-	329	-	-	409	576	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.9	22.3	43.8
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	146	640	1073	-	-	1117	-	-	94
HCM Lane V/C Ratio	0.441	0.264	-	-	-	0.122	-	-	0.012
HCM Control Delay (s)	47.8	12.6	0	-	-	8.7	0	-	43.8
HCM Lane LOS	E	B	A	-	-	A	A	-	E
HCM 95th %tile Q(veh)	2	1.1	0	-	-	0.4	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	507	67	738	484	0	0	0	0	451	1	163
Future Volume (veh/h)	0	507	67	738	484	0	0	0	0	451	1	163
Number	5	2	12	1	6	16				7	4	14
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	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	545	72	794	520	0				486	0	175
Adj No. of Lanes	0	2	0	2	2	0				2	0	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93				0.93	0.93	0.93
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	825	109	1332	2511	0				617	0	275
Arrive On Green	0.00	0.26	0.26	0.26	0.48	0.00				0.17	0.00	0.17
Sat Flow, veh/h	0	3238	414	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	306	311	794	520	0				486	0	175
Grp Sat Flow(s),veh/h/ln	0	1770	1790	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	13.9	14.0	18.2	7.7	0.0				11.8	0.0	9.2
Cycle Q Clear(g_c), s	0.0	13.9	14.0	18.2	7.7	0.0				11.8	0.0	9.2
Prop In Lane	0.00		0.23	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	464	469	1332	2511	0				617	0	275
V/C Ratio(X)	0.00	0.66	0.66	0.60	0.21	0.00				0.79	0.00	0.64
Avail Cap(c_a), veh/h	0	464	469	1332	2511	0				942	0	420
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.85	0.85	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	29.6	29.6	27.2	8.9	0.0				35.6	0.0	34.5
Incr Delay (d2), s/veh	0.0	7.2	7.2	0.6	0.2	0.0				2.5	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
%ile BackOfQ(50%),veh/ln	0.0	7.7	7.9	8.8	3.8	0.0				6.0	0.0	4.2
LnGrp Delay(d),s/veh	0.0	36.8	36.8	27.8	9.0	0.0				38.1	0.0	36.9
LnGrp LOS		D	D	C	A					D		D
Approach Vol, veh/h		617			1314						661	
Approach Delay, s/veh		36.8			20.4						37.8	
Approach LOS		D			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	40.2	29.0		20.8		69.2		
Change Period (Y+Rc), s	5.4	* 5.4		5.1		5.4		
Max Green Setting (Gmax), s	27.3	* 24		23.9		55.6		
Max Q Clear Time (g_c+I1), s	20.2	16.0		13.8		9.7		
Green Ext Time (p_c), s	2.0	2.3		1.9		4.0		

Intersection Summary	
HCM 2010 Ctrl Delay	28.7
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	142	816	0	0	1123	435	111	1	839	0	0	0
Future Volume (veh/h)	142	816	0	0	1123	435	111	1	839	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	0	1863	1863	1900	1863	1863			
Adj Flow Rate, veh/h	149	859	0	0	1182	458	117	1	883			
Adj No. of Lanes	1	2	0	0	3	1	0	1	2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	188	2843	0	0	3281	1022	391	3	619			
Arrive On Green	0.21	1.00	0.00	0.00	0.65	0.65	0.22	0.22	0.22			
Sat Flow, veh/h	1774	3632	0	0	5253	1583	1760	15	2787			
Grp Volume(v), veh/h	149	859	0	0	1182	458	118	0	883			
Grp Sat Flow(s),veh/h/ln	1774	1770	0	0	1695	1583	1775	0	1393			
Q Serve(g_s), s	7.2	0.0	0.0	0.0	9.7	13.0	5.0	0.0	20.0			
Cycle Q Clear(g_c), s	7.2	0.0	0.0	0.0	9.7	13.0	5.0	0.0	20.0			
Prop In Lane	1.00		0.00	0.00		1.00	0.99		1.00			
Lane Grp Cap(c), veh/h	188	2843	0	0	3281	1022	394	0	619			
V/C Ratio(X)	0.79	0.30	0.00	0.00	0.36	0.45	0.30	0.00	1.43			
Avail Cap(c_a), veh/h	591	2843	0	0	3281	1022	394	0	619			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.77	0.77	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	34.5	0.0	0.0	0.0	7.4	8.0	29.2	0.0	35.0			
Incr Delay (d2), s/veh	5.8	0.2	0.0	0.0	0.3	1.4	0.4	0.0	200.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	3.8	0.1	0.0	0.0	4.6	6.0	2.5	0.0	24.9			
LnGrp Delay(d),s/veh	40.3	0.2	0.0	0.0	7.7	9.4	29.6	0.0	235.9			
LnGrp LOS	D	A			A	A	C		F			
Approach Vol, veh/h		1008			1640			1001				
Approach Delay, s/veh		6.1			8.2			211.6				
Approach LOS		A			A			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		78.9			14.2	64.7		25.1
Change Period (Y+Rc), s		* 6.2			* 4.7	6.2		5.1
Max Green Setting (Gmax), s		* 59			* 30	24.0		20.0
Max Q Clear Time (g_c+I1), s		2.0			9.2	15.0		22.0
Green Ext Time (p_c), s		7.6			0.4	6.1		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	63.4
HCM 2010 LOS	E

Notes

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	249	71	208	202	250	1040
Future Volume (veh/h)	249	71	208	202	250	1040
Number	3	18	2	12	1	6
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	257	0	214	0	258	1072
Adj No. of Lanes	1	1	2	1	1	2
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	343	306	651	291	328	1822
Arrive On Green	0.19	0.00	0.18	0.00	0.18	0.51
Sat Flow, veh/h	1774	1583	3632	1583	1774	3632
Grp Volume(v), veh/h	257	0	214	0	258	1072
Grp Sat Flow(s),veh/h/ln	1774	1583	1770	1583	1774	1770
Q Serve(g_s), s	4.7	0.0	1.8	0.0	4.8	7.2
Cycle Q Clear(g_c), s	4.7	0.0	1.8	0.0	4.8	7.2
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	343	306	651	291	328	1822
V/C Ratio(X)	0.75	0.00	0.33	0.00	0.79	0.59
Avail Cap(c_a), veh/h	932	832	1859	832	466	3305
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	13.0	0.0	12.1	0.0	13.3	5.8
Incr Delay (d2), s/veh	3.3	0.0	0.3	0.0	5.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	0.9	0.0	2.8	3.5
LnGrp Delay(d),s/veh	16.3	0.0	12.4	0.0	19.1	6.1
LnGrp LOS	B		B		B	A
Approach Vol, veh/h	257		214			1330
Approach Delay, s/veh	16.3		12.4			8.6
Approach LOS	B		B			A

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	11.3	11.3				22.6		11.6
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0
Max Green Setting (Gmax), s	9.0	18.0				32.0		18.0
Max Q Clear Time (g_c+I1), s	6.8	3.8				9.2		6.7
Green Ext Time (p_c), s	0.2	1.0				8.4		0.6

Intersection Summary	
HCM 2010 Ctrl Delay	10.2
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	5.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰		↱		↕	
Traffic Vol, veh/h	0	364	82	261	350	1	33	0	183	0	1	0
Future Vol, veh/h	0	364	82	261	350	1	33	0	183	0	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	379	85	272	365	1	34	0	191	0	1	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	366	0	0	464	0	0	1332	-	422	1427	1374	366
Stage 1	-	-	-	-	-	-	422	-	-	910	910	-
Stage 2	-	-	-	-	-	-	910	-	-	517	464	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	-	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	-	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1193	-	-	1097	-	-	131	0	632	113	145	679
Stage 1	-	-	-	-	-	-	609	0	-	329	353	-
Stage 2	-	-	-	-	-	-	329	0	-	541	564	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1193	-	-	1097	-	-	99	-	632	60	100	679
Mov Cap-2 Maneuver	-	-	-	-	-	-	99	-	-	60	100	-
Stage 1	-	-	-	-	-	-	609	-	-	329	243	-
Stage 2	-	-	-	-	-	-	226	-	-	378	564	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	4	20.2	41.4
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	99	632	1193	-	-	1097	-	-	100
HCM Lane V/C Ratio	0.347	0.302	-	-	-	0.248	-	-	0.01
HCM Control Delay (s)	59.6	13.1	0	-	-	9.4	0	-	41.4
HCM Lane LOS	F	B	A	-	-	A	A	-	E
HCM 95th %tile Q(veh)	1.4	1.3	0	-	-	1	-	-	0

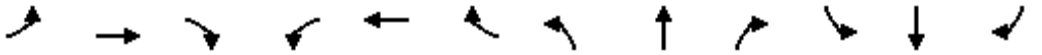
Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	684	904	6	3	1
Future Vol, veh/h	3	684	904	6	3	1
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	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	713	942	6	3	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	948	0	-	0	1664	945
Stage 1	-	-	-	-	945	-
Stage 2	-	-	-	-	719	-
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	724	-	-	-	107	318
Stage 1	-	-	-	-	378	-
Stage 2	-	-	-	-	483	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	724	-	-	-	106	318
Mov Cap-2 Maneuver	-	-	-	-	106	-
Stage 1	-	-	-	-	375	-
Stage 2	-	-	-	-	483	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	34.3
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	724	-	-	-	127
HCM Lane V/C Ratio	0.004	-	-	-	0.033
HCM Control Delay (s)	10	0	-	-	34.3
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	619	68	657	452	0	0	0	0	508	4	288
Future Volume (veh/h)	0	619	68	657	452	0	0	0	0	508	4	288
Number	5	2	12	1	6	16				7	4	14
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	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	673	74	714	491	0				555	0	313
Adj No. of Lanes	0	2	0	2	2	0				2	0	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, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1280	141	836	2460	0				710	0	317
Arrive On Green	0.00	0.40	0.40	0.32	0.92	0.00				0.20	0.00	0.20
Sat Flow, veh/h	0	3310	353	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	370	377	714	491	0				555	0	313
Grp Sat Flow(s),veh/h/ln	0	1770	1800	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	15.9	15.9	19.4	1.3	0.0				14.8	0.0	19.7
Cycle Q Clear(g_c), s	0.0	15.9	15.9	19.4	1.3	0.0				14.8	0.0	19.7
Prop In Lane	0.00		0.20	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	704	717	836	2460	0				710	0	317
V/C Ratio(X)	0.00	0.53	0.53	0.85	0.20	0.00				0.78	0.00	0.99
Avail Cap(c_a), veh/h	0	704	717	860	2460	0				710	0	317
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.91	0.91	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	22.9	22.9	32.2	1.2	0.0				37.9	0.0	39.9
Incr Delay (d2), s/veh	0.0	2.8	2.8	7.5	0.2	0.0				5.7	0.0	47.3
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	8.3	8.4	10.0	0.6	0.0				7.8	0.0	12.8
LnGrp Delay(d),s/veh	0.0	25.7	25.7	39.7	1.4	0.0				43.6	0.0	87.2
LnGrp LOS		C	C	D	A					D		F
Approach Vol, veh/h		747			1205						868	
Approach Delay, s/veh		25.7			24.1						59.3	
Approach LOS		C			C						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	29.7	45.2		25.1		74.9		
Change Period (Y+Rc), s	5.4	* 5.4		5.1		5.4		
Max Green Setting (Gmax), s	25.0	* 40		20.0		69.5		
Max Q Clear Time (g_c+I1), s	21.4	17.9		21.7		3.3		
Green Ext Time (p_c), s	1.1	4.8		0.0		3.8		

Intersection Summary	
HCM 2010 Ctrl Delay	35.4
HCM 2010 LOS	D

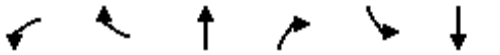
Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	236	860	0	0	1104	652	40	0	379	0	0	0
Future Volume (veh/h)	236	860	0	0	1104	652	40	0	379	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	0	1863	1863	1900	1863	1863			
Adj Flow Rate, veh/h	251	915	0	0	1174	694	43	0	403			
Adj No. of Lanes	1	2	0	0	3	1	0	1	2			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	284	2544	0	0	2603	810	298	0	468			
Arrive On Green	0.32	1.00	0.00	0.00	0.51	0.51	0.17	0.00	0.17			
Sat Flow, veh/h	1774	3632	0	0	5253	1583	1774	0	2787			
Grp Volume(v), veh/h	251	915	0	0	1174	694	43	0	403			
Grp Sat Flow(s),veh/h/ln	1774	1770	0	0	1695	1583	1774	0	1393			
Q Serve(g_s), s	13.4	0.0	0.0	0.0	14.7	38.1	2.1	0.0	14.1			
Cycle Q Clear(g_c), s	13.4	0.0	0.0	0.0	14.7	38.1	2.1	0.0	14.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	284	2544	0	0	2603	810	298	0	468			
V/C Ratio(X)	0.88	0.36	0.00	0.00	0.45	0.86	0.14	0.00	0.86			
Avail Cap(c_a), veh/h	532	2544	0	0	2603	810	355	0	557			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.75	0.75	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	33.1	0.0	0.0	0.0	15.5	21.2	35.5	0.0	40.5			
Incr Delay (d2), s/veh	6.9	0.3	0.0	0.0	0.6	11.3	0.2	0.0	11.4			
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	7.1	0.1	0.0	0.0	7.0	19.1	1.0	0.0	6.2			
LnGrp Delay(d),s/veh	40.0	0.3	0.0	0.0	16.1	32.5	35.7	0.0	51.8			
LnGrp LOS	D	A			B	C	D		D			
Approach Vol, veh/h		1166			1868			446				
Approach Delay, s/veh		8.8			22.2			50.3				
Approach LOS		A			C			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		78.1			20.7	57.4		21.9
Change Period (Y+Rc), s		* 6.2			* 4.7	6.2		5.1
Max Green Setting (Gmax), s		* 69			* 30	34.0		20.0
Max Q Clear Time (g_c+I1), s		2.0			15.4	40.1		16.1
Green Ext Time (p_c), s		8.4			0.6	0.0		0.7

Intersection Summary		
HCM 2010 Ctrl Delay		21.3
HCM 2010 LOS		C

Notes



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	283	221	513	221	206	372
Future Volume (veh/h)	283	221	513	221	206	372
Number	3	18	2	12	1	6
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	314	0	570	0	229	413
Adj No. of Lanes	1	1	2	1	1	2
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	398	355	904	404	288	1902
Arrive On Green	0.22	0.00	0.26	0.00	0.16	0.54
Sat Flow, veh/h	1774	1583	3632	1583	1774	3632
Grp Volume(v), veh/h	314	0	570	0	229	413
Grp Sat Flow(s),veh/h/ln	1774	1583	1770	1583	1774	1770
Q Serve(g_s), s	7.0	0.0	6.0	0.0	5.2	2.6
Cycle Q Clear(g_c), s	7.0	0.0	6.0	0.0	5.2	2.6
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	398	355	904	404	288	1902
V/C Ratio(X)	0.79	0.00	0.63	0.00	0.79	0.22
Avail Cap(c_a), veh/h	762	680	1520	680	381	2702
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	15.3	0.0	13.9	0.0	16.9	5.1
Incr Delay (d2), s/veh	3.5	0.0	0.7	0.0	8.3	0.1
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	0.0	3.0	0.0	3.2	1.2
LnGrp Delay(d),s/veh	18.9	0.0	14.6	0.0	25.2	5.1
LnGrp LOS	B		B		C	A
Approach Vol, veh/h	314		570			642
Approach Delay, s/veh	18.9		14.6			12.3
Approach LOS	B		B			B

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2				6		8
Phs Duration (G+Y+Rc), s	11.8	15.7				27.5		14.4
Change Period (Y+Rc), s	5.0	5.0				5.0		5.0
Max Green Setting (Gmax), s	9.0	18.0				32.0		18.0
Max Q Clear Time (g_c+I1), s	7.2	8.0				4.6		9.0
Green Ext Time (p_c), s	0.1	2.7				2.9		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	14.5
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰		↱		↕	
Traffic Vol, veh/h	0	348	56	123	443	0	58	0	152	1	0	0
Future Vol, veh/h	0	348	56	123	443	0	58	0	152	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	387	62	137	492	0	64	0	169	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	492	0	0	449	0	0	1184	-	418	1269	1215	492
Stage 1	-	-	-	-	-	-	418	-	-	766	766	-
Stage 2	-	-	-	-	-	-	766	-	-	503	449	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	-	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	-	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1071	-	-	1111	-	-	166	0	635	145	181	577
Stage 1	-	-	-	-	-	-	612	0	-	395	412	-
Stage 2	-	-	-	-	-	-	395	0	-	551	572	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1071	-	-	1111	-	-	144	-	635	93	150	577
Mov Cap-2 Maneuver	-	-	-	-	-	-	144	-	-	93	150	-
Stage 1	-	-	-	-	-	-	612	-	-	395	342	-
Stage 2	-	-	-	-	-	-	328	-	-	404	572	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.9	22.7	44.2
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	144	635	1071	-	-	1111	-	-	93
HCM Lane V/C Ratio	0.448	0.266	-	-	-	0.123	-	-	0.012
HCM Control Delay (s)	48.8	12.7	0	-	-	8.7	0	-	44.2
HCM Lane LOS	E	B	A	-	-	A	A	-	E
HCM 95th %tile Q(veh)	2	1.1	0	-	-	0.4	-	-	0

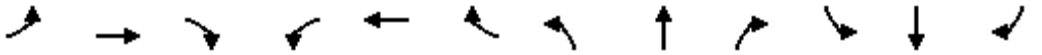
Intersection	
Int Delay, s/veh	0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	574	670	11	6	2
Future Vol, veh/h	5	574	670	11	6	2
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	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	638	744	12	7	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	756	0	-	0	1400	750
Stage 1	-	-	-	-	750	-
Stage 2	-	-	-	-	650	-
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	855	-	-	-	155	411
Stage 1	-	-	-	-	467	-
Stage 2	-	-	-	-	520	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	855	-	-	-	153	411
Mov Cap-2 Maneuver	-	-	-	-	153	-
Stage 1	-	-	-	-	462	-
Stage 2	-	-	-	-	520	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	25.9
HCM LOS			D

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	855	-	-	-	181
HCM Lane V/C Ratio	0.006	-	-	-	0.049
HCM Control Delay (s)	9.2	0	-	-	25.9
HCM Lane LOS	A	A	-	-	D
HCM 95th %tile Q(veh)	0	-	-	-	0.2



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	511	69	738	493	0	0	0	0	451	1	165
Future Volume (veh/h)	0	511	69	738	493	0	0	0	0	451	1	165
Number	5	2	12	1	6	16				7	4	14
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	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	549	74	794	530	0				486	0	177
Adj No. of Lanes	0	2	0	2	2	0				2	0	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93				0.93	0.93	0.93
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	822	111	1332	2510	0				618	0	276
Arrive On Green	0.00	0.26	0.26	0.26	0.48	0.00				0.17	0.00	0.17
Sat Flow, veh/h	0	3230	422	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	309	314	794	530	0				486	0	177
Grp Sat Flow(s),veh/h/ln	0	1770	1788	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	14.1	14.1	18.2	7.9	0.0				11.8	0.0	9.4
Cycle Q Clear(g_c), s	0.0	14.1	14.1	18.2	7.9	0.0				11.8	0.0	9.4
Prop In Lane	0.00		0.24	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	464	469	1332	2510	0				618	0	276
V/C Ratio(X)	0.00	0.67	0.67	0.60	0.21	0.00				0.79	0.00	0.64
Avail Cap(c_a), veh/h	0	464	469	1332	2510	0				942	0	420
HCM Platoon Ratio	1.00	1.00	1.00	0.67	0.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.85	0.85	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	29.7	29.7	27.2	8.9	0.0				35.6	0.0	34.6
Incr Delay (d2), s/veh	0.0	7.4	7.4	0.6	0.2	0.0				2.5	0.0	2.5
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	7.8	7.9	8.8	3.9	0.0				6.0	0.0	4.3
LnGrp Delay(d),s/veh	0.0	37.1	37.1	27.8	9.1	0.0				38.1	0.0	37.1
LnGrp LOS		D	D	C	A					D		D
Approach Vol, veh/h		623			1324						663	
Approach Delay, s/veh		37.1			20.3						37.8	
Approach LOS		D			C						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	40.2	29.0		20.8		69.2		
Change Period (Y+Rc), s	5.4	* 5.4		5.1		5.4		
Max Green Setting (Gmax), s	27.3	* 24		23.9		55.6		
Max Q Clear Time (g_c+I1), s	20.2	16.1		13.8		9.9		
Green Ext Time (p_c), s	2.0	2.3		1.9		4.1		

Intersection Summary	
HCM 2010 Ctrl Delay	28.8
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	143	818	0	0	1128	435	114	1	839	0	0	0
Future Volume (veh/h)	143	818	0	0	1128	435	114	1	839	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	0	1863	1863	1900	1863	1863			
Adj Flow Rate, veh/h	151	861	0	0	1187	458	120	1	883			
Adj No. of Lanes	1	2	0	0	3	1	0	1	2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	190	2847	0	0	3281	1022	389	3	616			
Arrive On Green	0.21	1.00	0.00	0.00	0.65	0.65	0.22	0.22	0.22			
Sat Flow, veh/h	1774	3632	0	0	5253	1583	1760	15	2787			
Grp Volume(v), veh/h	151	861	0	0	1187	458	121	0	883			
Grp Sat Flow(s),veh/h/ln	1774	1770	0	0	1695	1583	1775	0	1393			
Q Serve(g_s), s	7.3	0.0	0.0	0.0	9.7	13.0	5.1	0.0	19.9			
Cycle Q Clear(g_c), s	7.3	0.0	0.0	0.0	9.7	13.0	5.1	0.0	19.9			
Prop In Lane	1.00		0.00	0.00		1.00	0.99		1.00			
Lane Grp Cap(c), veh/h	190	2847	0	0	3281	1022	392	0	616			
V/C Ratio(X)	0.80	0.30	0.00	0.00	0.36	0.45	0.31	0.00	1.43			
Avail Cap(c_a), veh/h	591	2847	0	0	3281	1022	392	0	616			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.77	0.77	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	34.4	0.0	0.0	0.0	7.4	8.0	29.3	0.0	35.1			
Incr Delay (d2), s/veh	5.8	0.2	0.0	0.0	0.3	1.4	0.4	0.0	204.1			
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	3.8	0.1	0.0	0.0	4.6	6.0	2.6	0.0	25.1			
LnGrp Delay(d),s/veh	40.2	0.2	0.0	0.0	7.7	9.4	29.7	0.0	239.2			
LnGrp LOS	D	A			A	A	C		F			
Approach Vol, veh/h		1012			1645			1004				
Approach Delay, s/veh		6.2			8.2			213.9				
Approach LOS		A			A			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		79.0			14.3	64.7		25.0
Change Period (Y+Rc), s		* 6.2			* 4.7	6.2		5.1
Max Green Setting (Gmax), s		* 59			* 30	24.0		19.9
Max Q Clear Time (g_c+I1), s		2.0			9.3	15.0		21.9
Green Ext Time (p_c), s		7.7			0.4	6.1		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	64.0
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	24	4	263	36	106	7	233	222	292	1065	4
Future Volume (veh/h)	3	24	4	263	36	106	7	233	222	292	1065	4
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	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	3	26	4	271	39	109	8	240	0	301	1098	4
Adj No. of Lanes	1	1	0	2	1	0	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.97	0.92	0.97	0.92	0.97	0.97	0.97	0.97	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	6	101	16	416	79	221	120	951	426	369	1448	648
Arrive On Green	0.00	0.06	0.06	0.12	0.18	0.18	0.07	0.27	0.00	0.21	0.41	0.41
Sat Flow, veh/h	1774	1577	243	3442	434	1214	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	3	0	30	271	0	148	8	240	0	301	1098	4
Grp Sat Flow(s),veh/h/ln	1774	0	1820	1721	0	1648	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	0.1	0.0	0.9	4.4	0.0	4.8	0.2	3.1	0.0	9.6	15.7	0.1
Cycle Q Clear(g_c), s	0.1	0.0	0.9	4.4	0.0	4.8	0.2	3.1	0.0	9.6	15.7	0.1
Prop In Lane	1.00		0.13	1.00		0.74	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	6	0	117	416	0	300	120	951	426	369	1448	648
V/C Ratio(X)	0.52	0.00	0.26	0.65	0.00	0.49	0.07	0.25	0.00	0.82	0.76	0.01
Avail Cap(c_a), veh/h	120	0	554	1047	0	892	540	1197	535	870	1855	830
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.4	0.0	26.3	24.8	0.0	21.8	25.8	17.0	0.0	22.3	15.0	10.3
Incr Delay (d2), s/veh	57.6	0.0	1.1	1.7	0.0	1.3	0.2	0.1	0.0	4.4	1.4	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.5	2.2	0.0	2.3	0.1	1.6	0.0	5.1	7.9	0.0
LnGrp Delay(d),s/veh	87.1	0.0	27.5	26.5	0.0	23.0	26.1	17.1	0.0	26.8	16.3	10.4
LnGrp LOS	F		C	C		C	C	B		C	B	B
Approach Vol, veh/h		33			419			248			1403	
Approach Delay, s/veh		32.9			25.3			17.4			18.6	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.3	20.9	12.1	8.8	9.0	29.2	5.2	15.7
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	29.0	20.0	18.0	18.0	18.0	31.0	4.0	32.0
Max Q Clear Time (g_c+I1), s	11.6	5.1	6.4	2.9	2.2	17.7	2.1	6.8
Green Ext Time (p_c), s	0.8	1.2	0.7	0.1	0.0	6.5	0.0	0.8

Intersection Summary	
HCM 2010 Ctrl Delay	20.0
HCM 2010 LOS	B

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	448	83	269	430	1	38	0	206	0	1	0
Future Vol, veh/h	0	448	83	269	430	1	38	0	206	0	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	467	86	280	448	1	40	0	215	0	1	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	449	0	0	553	0	0	1519	-	510	1627	1562	449
Stage 1	-	-	-	-	-	-	510	-	-	1009	1009	-
Stage 2	-	-	-	-	-	-	1009	-	-	618	553	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	-	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	-	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1111	-	-	1017	-	-	97	0	563	82	112	610
Stage 1	-	-	-	-	-	-	546	0	-	290	318	-
Stage 2	-	-	-	-	-	-	290	0	-	477	514	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1111	-	-	1017	-	-	69	-	563	36	71	610
Mov Cap-2 Maneuver	-	-	-	-	-	-	69	-	-	36	71	-
Stage 1	-	-	-	-	-	-	546	-	-	290	201	-
Stage 2	-	-	-	-	-	-	183	-	-	295	514	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.8	30.3	56.5
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	69	563	1111	-	-	1017	-	-	71
HCM Lane V/C Ratio	0.574	0.381	-	-	-	0.276	-	-	0.015
HCM Control Delay (s)	111.8	15.3	0	-	-	9.9	0	-	56.5
HCM Lane LOS	F	C	A	-	-	A	A	-	F
HCM 95th %tile Q(veh)	2.4	1.8	0	-	-	1.1	-	-	0

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	676	136	687	523	0	0	0	0	518	4	308
Future Volume (veh/h)	0	676	136	687	523	0	0	0	0	518	4	308
Number	5	2	12	1	6	16				7	4	14
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	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	735	148	747	568	0				566	0	335
Adj No. of Lanes	0	2	0	2	2	0				2	0	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, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1169	235	836	2460	0				710	0	317
Arrive On Green	0.00	0.40	0.40	0.32	0.92	0.00				0.20	0.00	0.20
Sat Flow, veh/h	0	3030	591	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	443	440	747	568	0				566	0	335
Grp Sat Flow(s),veh/h/ln	0	1770	1758	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	20.1	20.1	20.7	1.5	0.0				15.2	0.0	20.0
Cycle Q Clear(g_c), s	0.0	20.1	20.1	20.7	1.5	0.0				15.2	0.0	20.0
Prop In Lane	0.00		0.34	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	704	700	836	2460	0				710	0	317
V/C Ratio(X)	0.00	0.63	0.63	0.89	0.23	0.00				0.80	0.00	1.06
Avail Cap(c_a), veh/h	0	704	700	860	2460	0				710	0	317
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.88	0.88	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	24.2	24.2	32.6	1.2	0.0				38.1	0.0	40.0
Incr Delay (d2), s/veh	0.0	4.2	4.3	10.3	0.2	0.0				6.4	0.0	66.7
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	10.5	10.5	10.9	0.7	0.0				8.0	0.0	14.6
LnGrp Delay(d),s/veh	0.0	28.4	28.4	42.9	1.4	0.0				44.5	0.0	106.7
LnGrp LOS		C	C	D	A					D		F
Approach Vol, veh/h		883			1315						901	
Approach Delay, s/veh		28.4			25.0						67.6	
Approach LOS		C			C						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	29.7	45.2		25.1		74.9		
Change Period (Y+Rc), s	5.4	* 5.4		5.1		5.4		
Max Green Setting (Gmax), s	25.0	* 40		20.0		69.5		
Max Q Clear Time (g_c+I1), s	22.7	22.1		22.0		3.5		
Green Ext Time (p_c), s	0.8	5.5		0.0		4.5		

Intersection Summary	
HCM 2010 Ctrl Delay	38.3
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	260	893	0	0	1160	652	85	0	409	0	0	0
Future Volume (veh/h)	260	893	0	0	1160	652	85	0	409	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	0	1863	1863	1900	1863	1863			
Adj Flow Rate, veh/h	277	950	0	0	1234	694	90	0	435			
Adj No. of Lanes	1	2	0	0	3	1	0	1	2			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	309	2506	0	0	2475	771	317	0	498			
Arrive On Green	0.35	1.00	0.00	0.00	0.49	0.49	0.18	0.00	0.18			
Sat Flow, veh/h	1774	3632	0	0	5253	1583	1774	0	2787			
Grp Volume(v), veh/h	277	950	0	0	1234	694	90	0	435			
Grp Sat Flow(s),veh/h/ln	1774	1770	0	0	1695	1583	1774	0	1393			
Q Serve(g_s), s	14.8	0.0	0.0	0.0	16.4	40.1	4.4	0.0	15.2			
Cycle Q Clear(g_c), s	14.8	0.0	0.0	0.0	16.4	40.1	4.4	0.0	15.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	309	2506	0	0	2475	771	317	0	498			
V/C Ratio(X)	0.90	0.38	0.00	0.00	0.50	0.90	0.28	0.00	0.87			
Avail Cap(c_a), veh/h	532	2506	0	0	2475	771	355	0	557			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.67	0.67	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	31.7	0.0	0.0	0.0	17.4	23.5	35.5	0.0	39.9			
Incr Delay (d2), s/veh	7.2	0.3	0.0	0.0	0.7	15.7	0.5	0.0	13.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	7.7	0.1	0.0	0.0	7.8	20.7	2.2	0.0	6.8			
LnGrp Delay(d),s/veh	38.9	0.3	0.0	0.0	18.1	39.1	36.0	0.0	53.2			
LnGrp LOS	D	A			B	D	D		D			
Approach Vol, veh/h		1227			1928			525				
Approach Delay, s/veh		9.0			25.7			50.2				
Approach LOS		A			C			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		77.0			22.1	54.9		23.0
Change Period (Y+Rc), s		* 6.2			* 4.7	6.2		5.1
Max Green Setting (Gmax), s		* 69			* 30	34.0		20.0
Max Q Clear Time (g_c+I1), s		2.0			16.8	42.1		17.2
Green Ext Time (p_c), s		8.9			0.7	0.0		0.7

Intersection Summary	
HCM 2010 Ctrl Delay	23.6
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	32	6	309	47	283	9	550	244	246	401	6
Future Volume (veh/h)	4	32	6	309	47	283	9	550	244	246	401	6
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	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	4	35	7	343	51	314	10	611	0	273	446	7
Adj No. of Lanes	1	1	0	2	1	0	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.90	0.92	0.90	0.92	0.90	0.90	0.90	0.90	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	8	212	42	479	62	383	109	810	362	328	1247	558
Arrive On Green	0.00	0.14	0.14	0.14	0.28	0.28	0.06	0.23	0.00	0.18	0.35	0.35
Sat Flow, veh/h	1774	1508	302	3442	226	1391	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	4	0	42	343	0	365	10	611	0	273	446	7
Grp Sat Flow(s),veh/h/ln	1774	0	1810	1721	0	1617	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	0.1	0.0	1.3	6.2	0.0	13.8	0.3	10.5	0.0	9.7	6.1	0.2
Cycle Q Clear(g_c), s	0.1	0.0	1.3	6.2	0.0	13.8	0.3	10.5	0.0	9.7	6.1	0.2
Prop In Lane	1.00		0.17	1.00		0.86	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	8	0	254	479	0	445	109	810	362	328	1247	558
V/C Ratio(X)	0.53	0.00	0.17	0.72	0.00	0.82	0.09	0.75	0.00	0.83	0.36	0.01
Avail Cap(c_a), veh/h	109	0	499	950	0	793	490	1085	486	517	1247	558
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.4	0.0	24.7	26.8	0.0	22.1	28.9	23.4	0.0	25.6	15.7	13.7
Incr Delay (d2), s/veh	46.6	0.0	0.3	2.0	0.0	3.8	0.4	2.1	0.0	6.5	0.2	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.7	3.1	0.0	6.6	0.2	5.3	0.0	5.3	3.0	0.1
LnGrp Delay(d),s/veh	79.0	0.0	25.0	28.8	0.0	25.9	29.3	25.6	0.0	32.1	15.8	13.7
LnGrp LOS	E		C	C		C	C	C		C	B	B
Approach Vol, veh/h		46			708			621			726	
Approach Delay, s/veh		29.7			27.3			25.6			21.9	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.1	19.9	14.1	14.2	9.0	28.0	5.3	23.0
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	19.0	20.0	18.0	18.0	18.0	21.0	4.0	32.0
Max Q Clear Time (g_c+I1), s	11.7	12.5	8.2	3.3	2.3	8.1	2.1	15.8
Green Ext Time (p_c), s	0.5	2.4	0.9	0.1	0.0	2.4	0.0	2.2

Intersection Summary	
HCM 2010 Ctrl Delay	25.0
HCM 2010 LOS	C

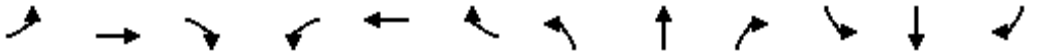
Intersection	
Int Delay, s/veh	8.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰		↱		↕	
Traffic Vol, veh/h	0	436	62	150	575	0	62	0	165	1	0	0
Future Vol, veh/h	0	436	62	150	575	0	62	0	165	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	484	69	167	639	0	69	0	183	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	639	0	0	553	0	0	1492	-	519	1583	1526	639
Stage 1	-	-	-	-	-	-	519	-	-	973	973	-
Stage 2	-	-	-	-	-	-	973	-	-	610	553	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	-	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	-	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	945	-	-	1017	-	-	102	0	557	88	118	476
Stage 1	-	-	-	-	-	-	540	0	-	303	330	-
Stage 2	-	-	-	-	-	-	303	0	-	482	514	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	945	-	-	1017	-	-	82	-	557	47	88	476
Mov Cap-2 Maneuver	-	-	-	-	-	-	82	-	-	47	88	-
Stage 1	-	-	-	-	-	-	540	-	-	303	246	-
Stage 2	-	-	-	-	-	-	226	-	-	323	514	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.9	50.7	83.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	82	557	945	-	-	1017	-	-	47
HCM Lane V/C Ratio	0.84	0.329	-	-	-	0.164	-	-	0.024
HCM Control Delay (s)	146.7	14.6	0	-	-	9.2	0	-	83.4
HCM Lane LOS	F	B	A	-	-	A	A	-	F
HCM 95th %tile Q(veh)	4.3	1.4	0	-	-	0.6	-	-	0.1



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	558	125	768	638	0	0	0	0	461	1	197
Future Volume (veh/h)	0	558	125	768	638	0	0	0	0	461	1	197
Number	5	2	12	1	6	16				7	4	14
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	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	600	134	826	686	0				497	0	212
Adj No. of Lanes	0	2	0	2	2	0				2	0	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93				0.93	0.93	0.93
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	755	168	1318	2496	0				632	0	282
Arrive On Green	0.00	0.26	0.26	0.51	0.94	0.00				0.18	0.00	0.18
Sat Flow, veh/h	0	2971	641	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	368	366	826	686	0				497	0	212
Grp Sat Flow(s),veh/h/ln	0	1770	1750	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	17.5	17.5	15.6	1.5	0.0				12.0	0.0	11.4
Cycle Q Clear(g_c), s	0.0	17.5	17.5	15.6	1.5	0.0				12.0	0.0	11.4
Prop In Lane	0.00		0.37	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	464	459	1318	2496	0				632	0	282
V/C Ratio(X)	0.00	0.79	0.80	0.63	0.27	0.00				0.79	0.00	0.75
Avail Cap(c_a), veh/h	0	464	459	1318	2496	0				942	0	420
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.80	0.80	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	30.9	31.0	17.4	0.9	0.0				35.3	0.0	35.1
Incr Delay (d2), s/veh	0.0	13.1	13.4	0.8	0.2	0.0				2.6	0.0	4.1
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	10.2	10.1	7.4	0.7	0.0				6.1	0.0	5.3
LnGrp Delay(d),s/veh	0.0	44.0	44.4	18.2	1.1	0.0				38.0	0.0	39.2
LnGrp LOS		D	D	B	A					D		D
Approach Vol, veh/h		734			1512						709	
Approach Delay, s/veh		44.2			10.4						38.4	
Approach LOS		D			B						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	39.9	29.0		21.1		68.9		
Change Period (Y+Rc), s	5.4	* 5.4		5.1		5.4		
Max Green Setting (Gmax), s	27.3	* 24		23.9		55.6		
Max Q Clear Time (g_c+I1), s	17.6	19.5		14.0		3.5		
Green Ext Time (p_c), s	2.5	1.7		2.0		5.6		

Intersection Summary	
HCM 2010 Ctrl Delay	25.5
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	167	842	0	0	1205	435	213	1	889	0	0	0
Future Volume (veh/h)	167	842	0	0	1205	435	213	1	889	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	0	1863	1863	1900	1863	1863			
Adj Flow Rate, veh/h	176	886	0	0	1268	458	224	1	936			
Adj No. of Lanes	1	2	0	0	3	1	0	1	2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	215	2843	0	0	3204	998	393	2	619			
Arrive On Green	0.24	1.00	0.00	0.00	0.63	0.63	0.22	0.22	0.22			
Sat Flow, veh/h	1774	3632	0	0	5253	1583	1767	8	2787			
Grp Volume(v), veh/h	176	886	0	0	1268	458	225	0	936			
Grp Sat Flow(s),veh/h/ln	1774	1770	0	0	1695	1583	1774	0	1393			
Q Serve(g_s), s	8.4	0.0	0.0	0.0	11.1	13.5	10.2	0.0	20.0			
Cycle Q Clear(g_c), s	8.4	0.0	0.0	0.0	11.1	13.5	10.2	0.0	20.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	215	2843	0	0	3204	998	394	0	619			
V/C Ratio(X)	0.82	0.31	0.00	0.00	0.40	0.46	0.57	0.00	1.51			
Avail Cap(c_a), veh/h	591	2843	0	0	3204	998	394	0	619			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.68	0.68	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	33.2	0.0	0.0	0.0	8.2	8.7	31.2	0.0	35.0			
Incr Delay (d2), s/veh	5.3	0.2	0.0	0.0	0.4	1.5	2.0	0.0	238.5			
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	4.4	0.1	0.0	0.0	5.3	6.3	5.2	0.0	28.2			
LnGrp Delay(d),s/veh	38.5	0.2	0.0	0.0	8.6	10.2	33.1	0.0	273.5			
LnGrp LOS	D	A			A	B	C		F			
Approach Vol, veh/h		1062			1726			1161				
Approach Delay, s/veh		6.5			9.0			226.9				
Approach LOS		A			A			F				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		78.9			15.6	63.3		25.1
Change Period (Y+Rc), s		* 6.2			* 4.7	6.2		5.1
Max Green Setting (Gmax), s		* 59			* 30	24.0		20.0
Max Q Clear Time (g_c+I1), s		2.0			10.4	15.5		22.0
Green Ext Time (p_c), s		8.0			0.4	6.0		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	72.4
HCM 2010 LOS	E

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	24	4	264	36	106	7	233	223	293	1065	4
Future Volume (veh/h)	3	24	4	264	36	106	7	233	223	293	1065	4
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	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	3	26	4	272	39	109	8	240	0	302	1098	4
Adj No. of Lanes	1	1	0	2	1	0	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.97	0.92	0.97	0.92	0.97	0.97	0.97	0.97	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	6	101	16	417	79	221	120	949	425	370	1448	648
Arrive On Green	0.00	0.06	0.06	0.12	0.18	0.18	0.07	0.27	0.00	0.21	0.41	0.41
Sat Flow, veh/h	1774	1577	243	3442	434	1214	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	3	0	30	272	0	148	8	240	0	302	1098	4
Grp Sat Flow(s),veh/h/ln	1774	0	1820	1721	0	1648	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	0.1	0.0	0.9	4.5	0.0	4.8	0.2	3.2	0.0	9.6	15.7	0.1
Cycle Q Clear(g_c), s	0.1	0.0	0.9	4.5	0.0	4.8	0.2	3.2	0.0	9.6	15.7	0.1
Prop In Lane	1.00		0.13	1.00		0.74	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	6	0	117	417	0	300	120	949	425	370	1448	648
V/C Ratio(X)	0.52	0.00	0.26	0.65	0.00	0.49	0.07	0.25	0.00	0.82	0.76	0.01
Avail Cap(c_a), veh/h	120	0	554	1047	0	891	540	1196	535	869	1854	829
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.4	0.0	26.3	24.8	0.0	21.8	25.8	17.0	0.0	22.3	15.0	10.4
Incr Delay (d2), s/veh	57.6	0.0	1.1	1.7	0.0	1.3	0.2	0.1	0.0	4.4	1.4	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.1	0.0	0.5	2.2	0.0	2.3	0.1	1.6	0.0	5.2	7.9	0.0
LnGrp Delay(d),s/veh	87.1	0.0	27.5	26.5	0.0	23.0	26.1	17.1	0.0	26.8	16.4	10.4
LnGrp LOS	F		C	C		C	C	B		C	B	B
Approach Vol, veh/h		33			420			248			1404	
Approach Delay, s/veh		32.9			25.3			17.4			18.6	
Approach LOS		C			C			B			B	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.3	20.9	12.2	8.8	9.0	29.2	5.2	15.8
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	29.0	20.0	18.0	18.0	18.0	31.0	4.0	32.0
Max Q Clear Time (g_c+I1), s	11.6	5.2	6.5	2.9	2.2	17.7	2.1	6.8
Green Ext Time (p_c), s	0.8	1.2	0.7	0.1	0.0	6.5	0.0	0.8

Intersection Summary		
HCM 2010 Ctrl Delay		20.0
HCM 2010 LOS		C

Intersection	
Int Delay, s/veh	6.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	451	83	269	431	1	38	0	206	0	1	0
Future Vol, veh/h	0	451	83	269	431	1	38	0	206	0	1	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	96	96	96	96	96	96	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	470	86	280	449	1	40	0	215	0	1	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	450	0	0	556	0	0	1523	-	513	1631	1566	450
Stage 1	-	-	-	-	-	-	513	-	-	1010	1010	-
Stage 2	-	-	-	-	-	-	1010	-	-	621	556	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	-	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	-	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1110	-	-	1015	-	-	97	0	561	81	111	609
Stage 1	-	-	-	-	-	-	544	0	-	289	317	-
Stage 2	-	-	-	-	-	-	289	0	-	475	513	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1110	-	-	1015	-	-	68	-	561	36	70	609
Mov Cap-2 Maneuver	-	-	-	-	-	-	68	-	-	36	70	-
Stage 1	-	-	-	-	-	-	544	-	-	289	200	-
Stage 2	-	-	-	-	-	-	182	-	-	293	513	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3.8	30.8	57.2
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	68	561	1110	-	-	1015	-	-	70
HCM Lane V/C Ratio	0.582	0.383	-	-	-	0.276	-	-	0.015
HCM Control Delay (s)	114.6	15.3	0	-	-	9.9	0	-	57.2
HCM Lane LOS	F	C	A	-	-	A	A	-	F
HCM 95th %tile Q(veh)	2.5	1.8	0	-	-	1.1	-	-	0

Intersection	
Int Delay, s/veh	0

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	3	772	985	6	3	1
Future Vol, veh/h	3	772	985	6	3	1
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	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	96	96	96	96	96	96
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	3	804	1026	6	3	1

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	1032	0	-	0	1839	1029
Stage 1	-	-	-	-	1029	-
Stage 2	-	-	-	-	810	-
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	673	-	-	-	83	284
Stage 1	-	-	-	-	345	-
Stage 2	-	-	-	-	438	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	673	-	-	-	82	284
Mov Cap-2 Maneuver	-	-	-	-	212	-
Stage 1	-	-	-	-	342	-
Stage 2	-	-	-	-	438	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	21.2
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	673	-	-	-	226
HCM Lane V/C Ratio	0.005	-	-	-	0.018
HCM Control Delay (s)	10.4	0	-	-	21.2
HCM Lane LOS	B	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	678	137	687	528	0	0	0	0	518	4	309
Future Volume (veh/h)	0	678	137	687	528	0	0	0	0	518	4	309
Number	5	2	12	1	6	16				7	4	14
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	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	737	149	747	574	0				566	0	336
Adj No. of Lanes	0	2	0	2	2	0				2	0	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, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1168	236	836	2460	0				710	0	317
Arrive On Green	0.00	0.40	0.40	0.32	0.92	0.00				0.20	0.00	0.20
Sat Flow, veh/h	0	3028	593	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	444	442	747	574	0				566	0	336
Grp Sat Flow(s),veh/h/ln	0	1770	1758	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	20.2	20.2	20.7	1.6	0.0				15.2	0.0	20.0
Cycle Q Clear(g_c), s	0.0	20.2	20.2	20.7	1.6	0.0				15.2	0.0	20.0
Prop In Lane	0.00		0.34	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	704	700	836	2460	0				710	0	317
V/C Ratio(X)	0.00	0.63	0.63	0.89	0.23	0.00				0.80	0.00	1.06
Avail Cap(c_a), veh/h	0	704	700	860	2460	0				710	0	317
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.88	0.88	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	24.2	24.2	32.6	1.2	0.0				38.1	0.0	40.0
Incr Delay (d2), s/veh	0.0	4.3	4.3	10.3	0.2	0.0				6.4	0.0	67.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.7	10.6	10.9	0.7	0.0				8.0	0.0	14.7
LnGrp Delay(d),s/veh	0.0	28.5	28.5	42.9	1.4	0.0				44.5	0.0	107.6
LnGrp LOS		C	C	D	A					D		F
Approach Vol, veh/h		886			1321						902	
Approach Delay, s/veh		28.5			24.9						68.0	
Approach LOS		C			C						E	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	29.7	45.2		25.1		74.9		
Change Period (Y+Rc), s	5.4	* 5.4		5.1		5.4		
Max Green Setting (Gmax), s	25.0	* 40		20.0		69.5		
Max Q Clear Time (g_c+I1), s	22.7	22.2		22.0		3.6		
Green Ext Time (p_c), s	0.8	5.5		0.0		4.6		

Intersection Summary	
HCM 2010 Ctrl Delay	38.4
HCM 2010 LOS	D

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	261	894	0	0	1163	652	87	0	409	0	0	0
Future Volume (veh/h)	261	894	0	0	1163	652	87	0	409	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	0	1863	1863	1900	1863	1863			
Adj Flow Rate, veh/h	278	951	0	0	1237	694	93	0	435			
Adj No. of Lanes	1	2	0	0	3	1	0	1	2			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	310	2506	0	0	2472	770	317	0	499			
Arrive On Green	0.35	1.00	0.00	0.00	0.49	0.49	0.18	0.00	0.18			
Sat Flow, veh/h	1774	3632	0	0	5253	1583	1774	0	2787			
Grp Volume(v), veh/h	278	951	0	0	1237	694	93	0	435			
Grp Sat Flow(s),veh/h/ln	1774	1770	0	0	1695	1583	1774	0	1393			
Q Serve(g_s), s	14.8	0.0	0.0	0.0	16.5	40.1	4.5	0.0	15.2			
Cycle Q Clear(g_c), s	14.8	0.0	0.0	0.0	16.5	40.1	4.5	0.0	15.2			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	310	2506	0	0	2472	770	317	0	499			
V/C Ratio(X)	0.90	0.38	0.00	0.00	0.50	0.90	0.29	0.00	0.87			
Avail Cap(c_a), veh/h	532	2506	0	0	2472	770	355	0	557			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.67	0.67	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	31.6	0.0	0.0	0.0	17.4	23.5	35.6	0.0	39.9			
Incr Delay (d2), s/veh	7.2	0.3	0.0	0.0	0.7	15.8	0.5	0.0	13.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	7.7	0.1	0.0	0.0	7.8	20.7	2.3	0.0	6.8			
LnGrp Delay(d),s/veh	38.9	0.3	0.0	0.0	18.2	39.3	36.1	0.0	53.1			
LnGrp LOS	D	A			B	D	D		D			
Approach Vol, veh/h		1229			1931			528				
Approach Delay, s/veh		9.0			25.8			50.1				
Approach LOS		A			C			D				

Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		77.0			22.2	54.8		23.0
Change Period (Y+Rc), s		* 6.2			* 4.7	6.2		5.1
Max Green Setting (Gmax), s		* 69			* 30	34.0		20.0
Max Q Clear Time (g_c+I1), s		2.0			16.8	42.1		17.2
Green Ext Time (p_c), s		8.9			0.7	0.0		0.7

Intersection Summary		
HCM 2010 Ctrl Delay		23.7
HCM 2010 LOS		C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	32	6	311	47	284	9	550	246	248	401	6
Future Volume (veh/h)	4	32	6	311	47	284	9	550	246	248	401	6
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	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	4	35	7	346	51	316	10	611	0	276	446	7
Adj No. of Lanes	1	1	0	2	1	0	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.90	0.92	0.90	0.92	0.90	0.90	0.90	0.90	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	8	210	42	478	62	381	105	841	376	333	1295	580
Arrive On Green	0.00	0.14	0.14	0.14	0.27	0.27	0.06	0.24	0.00	0.19	0.37	0.37
Sat Flow, veh/h	1774	1508	302	3442	225	1392	1774	3539	1583	1774	3539	1583
Grp Volume(v), veh/h	4	0	42	346	0	367	10	611	0	276	446	7
Grp Sat Flow(s),veh/h/ln	1774	0	1810	1721	0	1617	1774	1770	1583	1774	1770	1583
Q Serve(g_s), s	0.2	0.0	1.4	6.5	0.0	14.4	0.4	10.7	0.0	10.1	6.2	0.2
Cycle Q Clear(g_c), s	0.2	0.0	1.4	6.5	0.0	14.4	0.4	10.7	0.0	10.1	6.2	0.2
Prop In Lane	1.00		0.17	1.00		0.86	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	8	0	252	478	0	443	105	841	376	333	1295	580
V/C Ratio(X)	0.53	0.00	0.17	0.72	0.00	0.83	0.10	0.73	0.00	0.83	0.34	0.01
Avail Cap(c_a), veh/h	132	0	483	918	0	743	473	1312	587	631	1627	728
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	0.00	1.00	1.00	0.00	1.00	1.00	1.00	0.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.5	0.0	25.6	27.8	0.0	23.0	30.0	23.7	0.0	26.4	15.5	13.6
Incr Delay (d2), s/veh	46.7	0.0	0.3	2.1	0.0	4.0	0.4	1.2	0.0	5.3	0.2	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.0	0.7	3.2	0.0	6.9	0.2	5.4	0.0	5.4	3.0	0.1
LnGrp Delay(d),s/veh	80.2	0.0	25.9	29.9	0.0	27.0	30.4	24.9	0.0	31.7	15.7	13.6
LnGrp LOS	F		C	C		C	C	C		C	B	B
Approach Vol, veh/h		46			713			621			729	
Approach Delay, s/veh		30.6			28.4			25.0			21.7	
Approach LOS		C			C			C			C	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.7	21.0	14.4	14.4	9.0	29.7	5.3	23.5
Change Period (Y+Rc), s	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Max Green Setting (Gmax), s	24.0	25.0	18.0	18.0	18.0	31.0	5.0	31.0
Max Q Clear Time (g_c+I1), s	12.1	12.7	8.5	3.4	2.4	8.2	2.2	16.4
Green Ext Time (p_c), s	0.6	3.3	0.9	0.1	0.0	3.0	0.0	2.1

Intersection Summary	
HCM 2010 Ctrl Delay	25.1
HCM 2010 LOS	C

Intersection	
Int Delay, s/veh	9.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	441	62	150	577	0	62	0	165	1	0	0
Future Vol, veh/h	0	441	62	150	577	0	62	0	165	1	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	90	90	90	90	90	90	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	490	69	167	641	0	69	0	183	1	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	641	0	0	559	0	0	1500	-	525	1591	1534	641
Stage 1	-	-	-	-	-	-	525	-	-	975	975	-
Stage 2	-	-	-	-	-	-	975	-	-	616	559	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	-	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	-	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	-	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	-	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	943	-	-	1012	-	-	100	0	552	87	116	475
Stage 1	-	-	-	-	-	-	536	0	-	303	330	-
Stage 2	-	-	-	-	-	-	303	0	-	478	511	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	943	-	-	1012	-	-	80	-	552	47	86	475
Mov Cap-2 Maneuver	-	-	-	-	-	-	80	-	-	47	86	-
Stage 1	-	-	-	-	-	-	536	-	-	303	246	-
Stage 2	-	-	-	-	-	-	225	-	-	319	511	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.9	52.9	83.4
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	80	552	943	-	-	1012	-	-	47
HCM Lane V/C Ratio	0.861	0.332	-	-	-	0.165	-	-	0.024
HCM Control Delay (s)	154.4	14.7	0	-	-	9.3	0	-	83.4
HCM Lane LOS	F	B	A	-	-	A	A	-	F
HCM 95th %tile Q(veh)	4.4	1.4	0	-	-	0.6	-	-	0.1

Intersection	
Int Delay, s/veh	0.1

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	5	673	804	11	6	2
Future Vol, veh/h	5	673	804	11	6	2
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	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	90	90	90	90	90	90
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	748	893	12	7	2

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	905	0	-	0	1659	899
Stage 1	-	-	-	-	899	-
Stage 2	-	-	-	-	760	-
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	752	-	-	-	107	338
Stage 1	-	-	-	-	397	-
Stage 2	-	-	-	-	462	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	752	-	-	-	106	338
Mov Cap-2 Maneuver	-	-	-	-	241	-
Stage 1	-	-	-	-	391	-
Stage 2	-	-	-	-	462	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	19.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	752	-	-	-	260
HCM Lane V/C Ratio	0.007	-	-	-	0.034
HCM Control Delay (s)	9.8	0	-	-	19.3
HCM Lane LOS	A	A	-	-	C
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	562	127	768	647	0	0	0	0	461	1	199
Future Volume (veh/h)	0	562	127	768	647	0	0	0	0	461	1	199
Number	5	2	12	1	6	16				7	4	14
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	0	1863	1900	1863	1863	0				1863	1863	1863
Adj Flow Rate, veh/h	0	604	137	826	696	0				497	0	214
Adj No. of Lanes	0	2	0	2	2	0				2	0	1
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93				0.93	0.93	0.93
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	752	170	1318	2496	0				632	0	282
Arrive On Green	0.00	0.26	0.26	0.51	0.94	0.00				0.18	0.00	0.18
Sat Flow, veh/h	0	2962	649	3442	3632	0				3548	0	1583
Grp Volume(v), veh/h	0	372	369	826	696	0				497	0	214
Grp Sat Flow(s),veh/h/ln	0	1770	1748	1721	1770	0				1774	0	1583
Q Serve(g_s), s	0.0	17.7	17.8	15.6	1.5	0.0				12.0	0.0	11.6
Cycle Q Clear(g_c), s	0.0	17.7	17.8	15.6	1.5	0.0				12.0	0.0	11.6
Prop In Lane	0.00		0.37	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	464	458	1318	2496	0				632	0	282
V/C Ratio(X)	0.00	0.80	0.80	0.63	0.28	0.00				0.79	0.00	0.76
Avail Cap(c_a), veh/h	0	464	458	1318	2496	0				942	0	420
HCM Platoon Ratio	1.00	1.00	1.00	1.33	1.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.80	0.80	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	31.0	31.0	17.4	0.9	0.0				35.3	0.0	35.1
Incr Delay (d2), s/veh	0.0	13.6	14.0	0.8	0.2	0.0				2.6	0.0	4.4
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	10.3	10.3	7.4	0.7	0.0				6.1	0.0	5.4
LnGrp Delay(d),s/veh	0.0	44.6	45.0	18.2	1.1	0.0				38.0	0.0	39.6
LnGrp LOS		D	D	B	A					D		D
Approach Vol, veh/h		741			1522						711	
Approach Delay, s/veh		44.8			10.4						38.5	
Approach LOS		D			B						D	

Timer	1	2	3	4	5	6	7	8
Assigned Phs	1	2		4		6		
Phs Duration (G+Y+Rc), s	39.9	29.0		21.1		68.9		
Change Period (Y+Rc), s	5.4	* 5.4		5.1		5.4		
Max Green Setting (Gmax), s	27.3	* 24		23.9		55.6		
Max Q Clear Time (g_c+I1), s	17.6	19.8		14.0		3.5		
Green Ext Time (p_c), s	2.5	1.7		2.0		5.7		

Intersection Summary	
HCM 2010 Ctrl Delay	25.7
HCM 2010 LOS	C

Notes

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	168	844	0	0	1210	435	216	1	889	0	0	0
Future Volume (veh/h)	168	844	0	0	1210	435	216	1	889	0	0	0
Number	5	2	12	1	6	16	3	8	18			
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	0	0	1863	1863	1900	1863	1863			
Adj Flow Rate, veh/h	177	888	0	0	1274	458	227	1	936			
Adj No. of Lanes	1	2	0	0	3	1	0	1	2			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	216	2847	0	0	3207	999	391	2	616			
Arrive On Green	0.24	1.00	0.00	0.00	0.63	0.63	0.22	0.22	0.22			
Sat Flow, veh/h	1774	3632	0	0	5253	1583	1767	8	2787			
Grp Volume(v), veh/h	177	888	0	0	1274	458	228	0	936			
Grp Sat Flow(s),veh/h/ln	1774	1770	0	0	1695	1583	1774	0	1393			
Q Serve(g_s), s	8.5	0.0	0.0	0.0	11.1	13.5	10.3	0.0	19.9			
Cycle Q Clear(g_c), s	8.5	0.0	0.0	0.0	11.1	13.5	10.3	0.0	19.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	216	2847	0	0	3207	999	392	0	616			
V/C Ratio(X)	0.82	0.31	0.00	0.00	0.40	0.46	0.58	0.00	1.52			
Avail Cap(c_a), veh/h	591	2847	0	0	3207	999	392	0	616			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.67	0.67	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	33.1	0.0	0.0	0.0	8.2	8.6	31.3	0.0	35.1			
Incr Delay (d2), s/veh	5.2	0.2	0.0	0.0	0.4	1.5	2.2	0.0	241.8			
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	4.4	0.1	0.0	0.0	5.3	6.3	5.3	0.0	28.3			
LnGrp Delay(d),s/veh	38.4	0.2	0.0	0.0	8.6	10.2	33.5	0.0	276.9			
LnGrp LOS	D	A			A	B	C		F			
Approach Vol, veh/h		1065			1732			1164				
Approach Delay, s/veh		6.5			9.0			229.2				
Approach LOS		A			A			F				

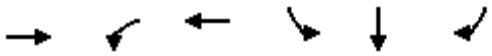
Timer	1	2	3	4	5	6	7	8
Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		79.0			15.6	63.4		25.0
Change Period (Y+Rc), s		* 6.2			* 4.7	6.2		5.1
Max Green Setting (Gmax), s		* 59			* 30	24.0		19.9
Max Q Clear Time (g_c+I1), s		2.0			10.5	15.5		21.9
Green Ext Time (p_c), s		8.0			0.4	6.1		0.0

Intersection Summary	
HCM 2010 Ctrl Delay	73.0
HCM 2010 LOS	E

Notes

Appendix E

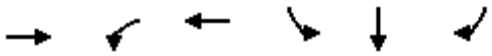
Queuing Worksheets



Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	744	714	486	276	280	312
v/c Ratio	0.52	0.83	0.20	0.85	0.86	0.56
Control Delay	23.8	31.9	1.2	63.5	64.7	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.8	31.9	1.2	63.5	64.7	8.4
Queue Length 50th (ft)	183	224	7	178	182	0
Queue Length 95th (ft)	240	#311	10	#320	#326	71
Internal Link Dist (ft)	317		400		964	
Turn Bay Length (ft)		150				390
Base Capacity (vph)	1420	858	2485	336	337	566
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	0.52	0.83	0.20	0.82	0.83	0.55

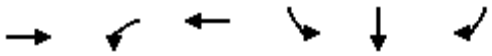
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	617	794	520	242	244	175
v/c Ratio	0.57	0.76	0.22	0.66	0.66	0.36
Control Delay	28.7	25.9	1.0	40.6	40.8	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.7	25.9	1.0	40.6	40.8	6.6
Queue Length 50th (ft)	150	228	3	132	133	0
Queue Length 95th (ft)	220	299	11	204	205	48
Internal Link Dist (ft)	317		400		964	
Turn Bay Length (ft)		150				390
Base Capacity (vph)	1084	1041	2352	446	447	548
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	0.57	0.76	0.22	0.54	0.55	0.32

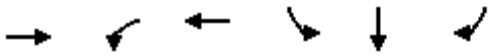
Intersection Summary



Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	747	714	491	276	280	313
v/c Ratio	0.53	0.83	0.20	0.85	0.86	0.56
Control Delay	23.9	32.0	1.2	63.5	64.7	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	23.9	32.0	1.2	63.5	64.7	8.4
Queue Length 50th (ft)	184	224	8	178	182	0
Queue Length 95th (ft)	241	#310	11	#320	#326	72
Internal Link Dist (ft)	317		400		964	
Turn Bay Length (ft)		150				390
Base Capacity (vph)	1420	858	2485	336	337	567
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	0.53	0.83	0.20	0.82	0.83	0.55

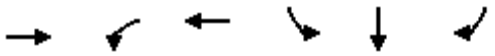
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	623	794	530	242	244	177
v/c Ratio	0.57	0.76	0.23	0.66	0.66	0.37
Control Delay	28.8	26.0	1.1	40.6	40.8	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	28.8	26.0	1.1	40.6	40.8	6.6
Queue Length 50th (ft)	152	228	3	132	133	0
Queue Length 95th (ft)	222	300	12	204	205	48
Internal Link Dist (ft)	317		400		964	
Turn Bay Length (ft)		150				390
Base Capacity (vph)	1085	1041	2352	446	447	550
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	0.57	0.76	0.23	0.54	0.55	0.32

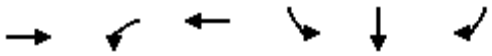
Intersection Summary



Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	883	747	568	281	286	335
v/c Ratio	0.63	0.87	0.23	0.86	0.87	0.58
Control Delay	25.5	34.3	1.9	64.7	66.4	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.5	34.3	1.9	64.7	66.4	8.4
Queue Length 50th (ft)	226	238	16	182	186	0
Queue Length 95th (ft)	293	#336	21	#327	#335	74
Internal Link Dist (ft)	317		400		964	
Turn Bay Length (ft)		150				390
Base Capacity (vph)	1411	858	2480	336	337	584
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	0.63	0.87	0.23	0.84	0.85	0.57

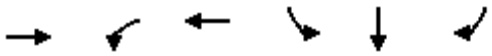
Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	734	826	686	248	249	212
v/c Ratio	0.68	0.79	0.29	0.67	0.67	0.41
Control Delay	30.9	27.8	2.6	41.0	41.0	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	30.9	27.8	2.6	41.0	41.0	6.6
Queue Length 50th (ft)	184	241	20	135	136	0
Queue Length 95th (ft)	265	310	31	209	209	52
Internal Link Dist (ft)	317		400		964	
Turn Bay Length (ft)		150				390
Base Capacity (vph)	1079	1041	2346	446	447	576
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	0.68	0.79	0.29	0.56	0.56	0.37

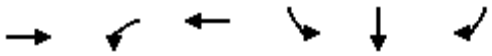
Intersection Summary



Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	886	747	574	281	286	336
v/c Ratio	0.63	0.87	0.23	0.86	0.87	0.58
Control Delay	25.6	34.3	2.0	64.7	66.4	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	25.6	34.3	2.0	64.7	66.4	8.4
Queue Length 50th (ft)	227	238	17	182	186	0
Queue Length 95th (ft)	295	#336	21	#327	#335	74
Internal Link Dist (ft)	317		400		964	
Turn Bay Length (ft)		150				390
Base Capacity (vph)	1411	858	2480	336	337	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	0.63	0.87	0.23	0.84	0.85	0.57

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.



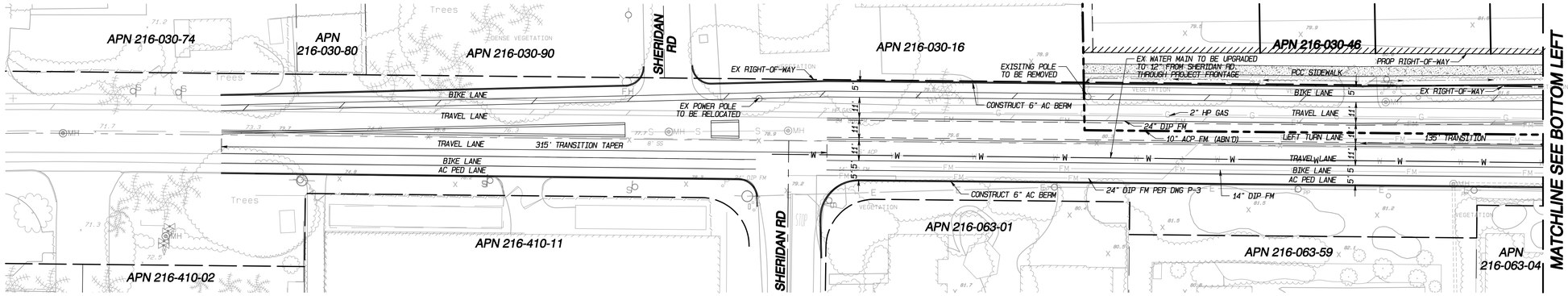
Lane Group	EBT	WBL	WBT	SBL	SBT	SBR
Lane Group Flow (vph)	741	826	696	248	249	214
v/c Ratio	0.69	0.79	0.30	0.67	0.67	0.42
Control Delay	31.2	27.9	2.7	41.0	41.0	6.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.2	27.9	2.7	41.0	41.0	6.6
Queue Length 50th (ft)	187	241	20	135	136	0
Queue Length 95th (ft)	268	310	32	209	209	52
Internal Link Dist (ft)	317		400		964	
Turn Bay Length (ft)		150				390
Base Capacity (vph)	1078	1041	2346	446	447	577
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	0.69	0.79	0.30	0.56	0.56	0.37

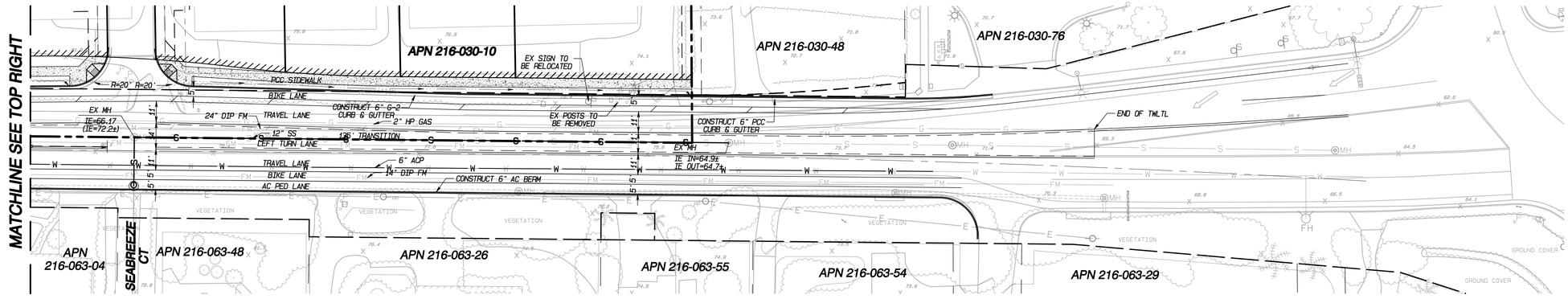
Intersection Summary

Appendix F

Proposed Striping Plan

STRIPING & PUBLIC IMPROVEMENT EXHIBIT
LA COSTA 48
15–222 TMDB/DR/CDP/EIA





PREPARED BY:
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535 North Highway 101, Ste A, Solana Beach, CA 92075
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GRAPHIC SCALE 1"=30'
0 30 60 90

PLSA 2323

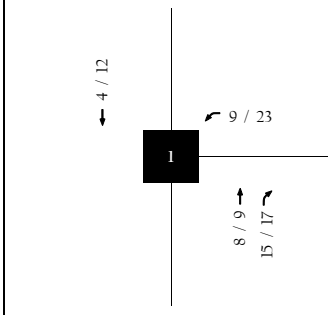
Appendix G

Cumulative Project Details

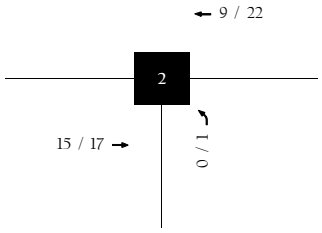
xx / yy - AM / PM Peak-Hour Turning Movement Volumes
The naming convention for intersections is North / South & East / West

xx,xxx ADT

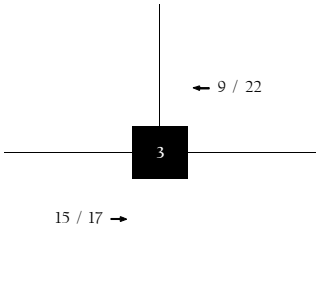
N Coast Hwy 101 & La Costa Ave



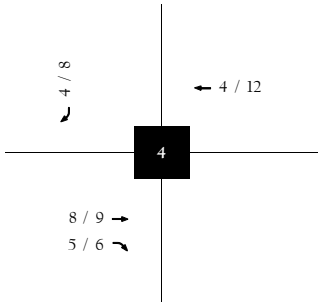
Vulcan Ave & La Costa Ave



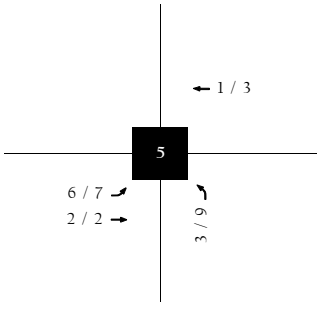
Proj Dwy & La Costa Ave



I-5 SB Ramps & La Costa Ave



I-5 NB Ramps & La Costa Ave



MIZUTA TRAFFIC CONSULTING

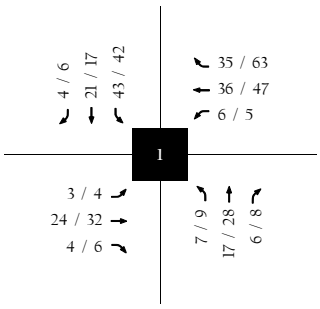
516 La Costa Development

Fenway Mixed-Use N Coast Hwy 101 Project Traffic Volumes

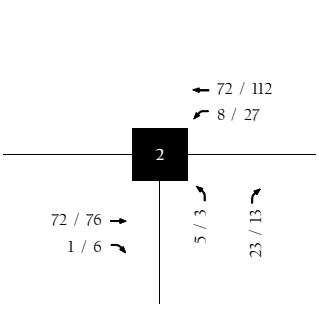
xx / yy - AM / PM Peak-Hour Turning Movement Volumes
The naming convention for intersections is North / South & East / West

xx,xxx ADT

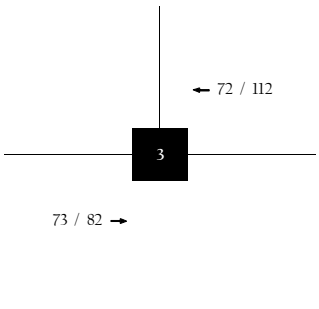
N Coast Hwy 101 & La Costa Ave



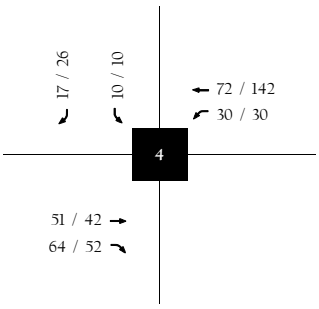
Vulcan Ave & La Costa Ave



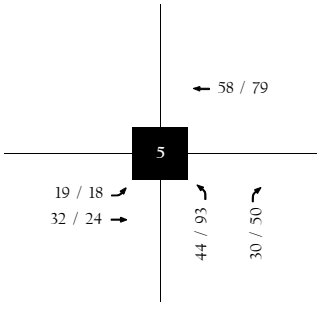
Proj Dwy & La Costa Ave



I-5 SB Ramps & La Costa Ave



I-5 NB Ramps & La Costa Ave



MIZUTA TRAFFIC CONSULTING

516 La Costa Development

Fenway Mixed-Use N Coast Hwy 101 Cumulative Traffic Volumes