The Junipers Project
Environmental Impact Report
SCH No. 2018041032 - Project No. 586670

Appendix B

Transportation Impact Analysis and Trigger Analysis Memo

February 2020

LINSCOTT LAW & GREENSPAN engineers

TRANSPORTATION IMPACT ANALYSIS

THE JUNIPERS

San Diego, California
October 15, 2019

LLG Ref. 3-16-2689

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EXECUTIVE SUMMARY

Linscott, Law & Greenspan, Engineers (LLG) has been retained to assess the traffic impacts associated with The Junipers Project (hereby referred to as the proposed "Project"). The site is immediately west of Interstate 15 (I-15), north of Carmel Mountain Road, east of Peñasquitos Drive, within the Community of Rancho Peñasquitos in the City of San Diego.

The site previously functioned as the Carmel Highlands Golf Resort, which closed permanently in March 2015. The Project proposes the redevelopment of the 112+ acre defunct golf course with age-qualified (55+) housing. The Project proposes an age-qualified residential neighborhood featuring 455 attached and detached, for-sale multi-family housing units and 81 multi-family, for-rent affordable housing units for a total of 536 housing units. The Project will require a Community Plan Amendment, Rezone, Tentative Map, and Site Development Permit.

No trip credits have been taken for the previous golf course land use. The Project is anticipated to generate 2,144 ADT with 107 AM peak hour trips (43 inbound/64 outbound) and 150 PM peak hour trips (90 inbound/60 outbound).

Site access is proposed via two locations: 1) Full access at the Peñasquitos Drive/ Janal Way intersection and 2) A right-turn in only driveway on Carmel Mountain Road, southwest of the Interstate 15 / Carmel Mountain Road interchange.

Per the City of San Diego's significance criteria, significant direct and cumulative impacts are calculated at two (2) intersections, the intersections of Peñasquitos Drive with Cuca Street and Janal Way. Installation of a roundabout at Peñasquitos Drive / Janal Way and a traffic signal at Peñasquitos Drive / Cuca Street are proposed to mitigate the Project's impacts.

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TRANSPORTATION IMPACT ANALYSIS

THE JUNIPERS

San Diego, California
October 15, 2019

1.0 INTRODUCTION

The following traffic study has been prepared to determine and evaluate the transportation impacts on the local circulation system due to the redevelopment of the permanently closed Carmel Highlands Golf Resort property with the proposed The Junipers Project (proposed "Project") in the Community of Rancho Peñasquitos, west of Interstate 15 in the City of San Diego. The purpose of this study is to assess the potential impacts to the local circulation system as a result of the Project.

Included in this traffic study are the following:

- Project Description
- Existing Conditions Discussion
- Study Area, Analysis Approach & Methodology
- Significance Criteria
- Analysis of Existing Conditions
- Trip Generation, Distribution & Assignment
- Analysis of Existing + Project Scenario
- Near-Term (Opening Year 2020) Cumulative Conditions Discussion
- Analysis of Near-Term (Opening Year 2020) Scenarios
- Horizon Year 2050 Conditions Discussion
- Analysis of Horizon Year 2050 Scenarios
- Other Transportation Modes
- Parking Assessment
- Access Assessment & Off-Site Improvements
- Construction Impacts
- Significance of Impacts and Mitigation Measures

2.0 PROJECT DESCRIPTION

2.1 Project Location

The Project is located immediately west of Interstate 15 (I-15), north of Carmel Mountain Road, and east of Peñasquitos Drive within the Community of Rancho Peñasquitos in the City of San Diego.

Figure 2–1 shows the vicinity map. ***Figure 2–2*** shows a more detailed Project area map.

2.2 Project Description

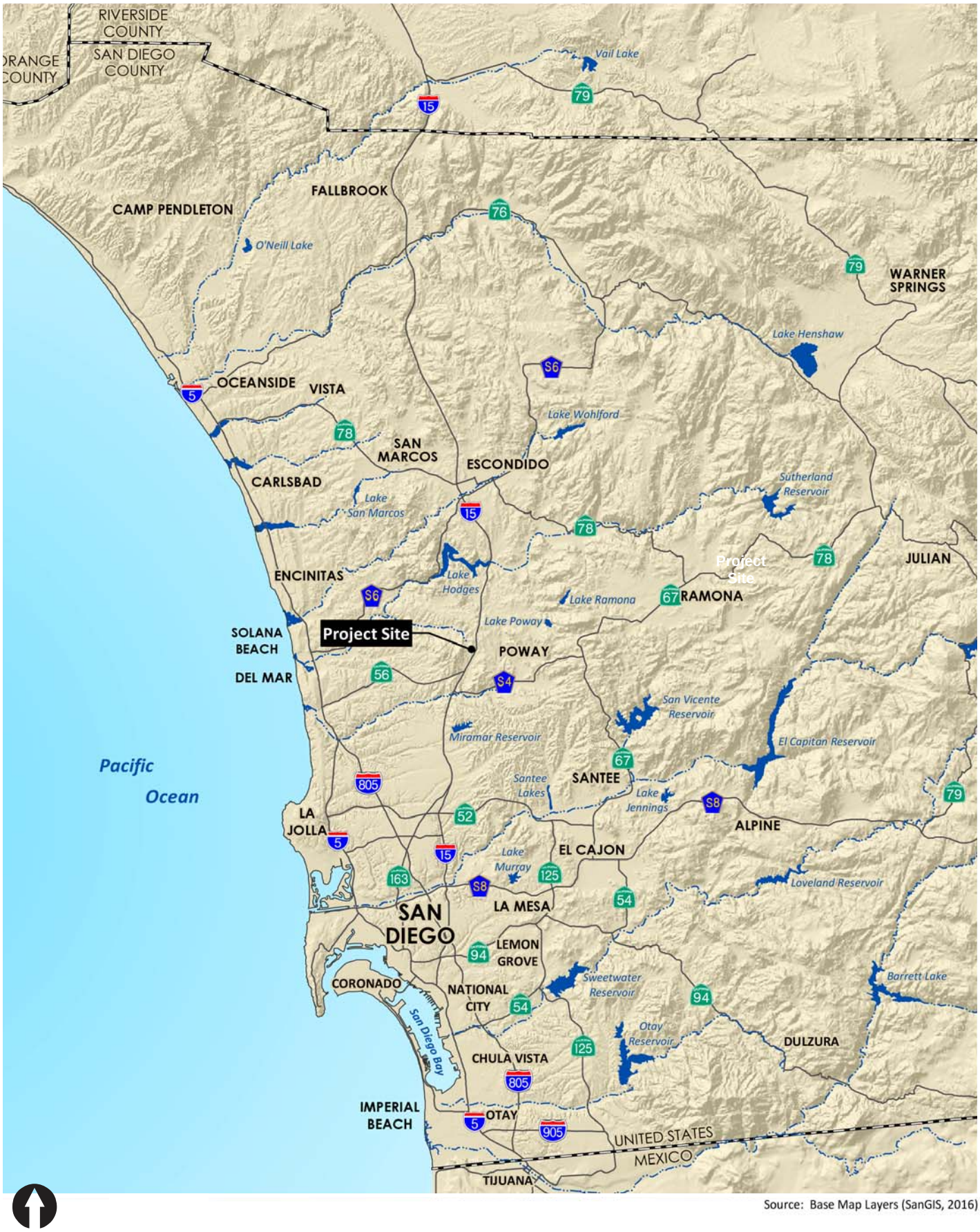
The Project proposes the redevelopment of the defunct golf course (closed permanently in March 2015), as well as the demolition of the existing operational tennis courts serving the Hotel Karlan. The Project proposes an age-qualified (55+) residential neighborhood featuring 455 attached and detached, for-sale multi-family housing units and 81 multi-family, for-rent affordable housing units for a total of 536 housing units.

Access to the site is proposed via two entry drives. The main full access entry drive is proposed to complete the fourth leg of the Peñasquitos Drive/ Janal Way intersection. This intersection will be modified as a roundabout as a project mitigation. A second access entry drive is proposed on Carmel Mountain Road via a right-turn in only entry drive. Outbound egress would be restricted for emergency situations only and controlled by a radio frequency gate operated remotely by police and fire departments in emergency situations. The gate at the Carmel Mountain Road exit from the project (Private Drive V) would be activated only by emergency personnel. It would be a single-arm swing gate (13 feet wide) which would accommodate emergency egress to eastbound traveling vehicles as well as incoming emergency vehicles. It would include an Opticom and/or Knox key switch to San Diego Fire and Rescue code requirements. A more detailed discussion on Project access is included in *Section 15.0* of this report. ***Figure 2–3*** shows the conceptual site plan.

The Project will require a Community Plan Amendment to re-designate the site from Open Space/Recreational to Multi-Family Residential, Rezone from RS-1-14 (Residential – Single Unit) to RM-3-7 (Residential – Multiple Unit), Vesting Tentative Map, Sewer Easement Vacation, and Planned Development Permit for the subdivision of 112.31 acres. The project will also incorporate a Mobility Zone and Bike Hub, a private centralized multi-modal node at the southern portion of the project. Its main function would be to provide a centralized area for private multimodal transportation options, including rideshare services and bicycle parking. The 18 active EV charging stalls, required by the City of San Diego Climate Action Plan would be clustered together between the Mobility Zone and Bike Hub to allow for centralized access to all residents. The project will provide EV-ready prewiring in all 455 market-rate residential garages, exceeding the pre-wiring requirement of 36 stalls by 419 spaces. A bicycle repair, rental, and maintenance kiosk also would be included in the Bike Hub to promote non-vehicular methods of travel.

A pedestrian access network will be provided that internally links all uses and connects to all existing external streets and pedestrian facilities contiguous with the project site.

A total parking supply of 1,241 spaces is proposed, consisting of 1,008 spaces for the 455-market rate age-qualified dwelling units and 152 common area parking spaces. The 81 affordable units will be provided with 81 parking spaces for tenants and visitors. A more detailed assessment of parking is provided in *Section 14.*



Source: Base Map Layers (SanGIS, 2016)

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Figure 2-1

Vicinity Map

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Figure 2-2

Project Area Map

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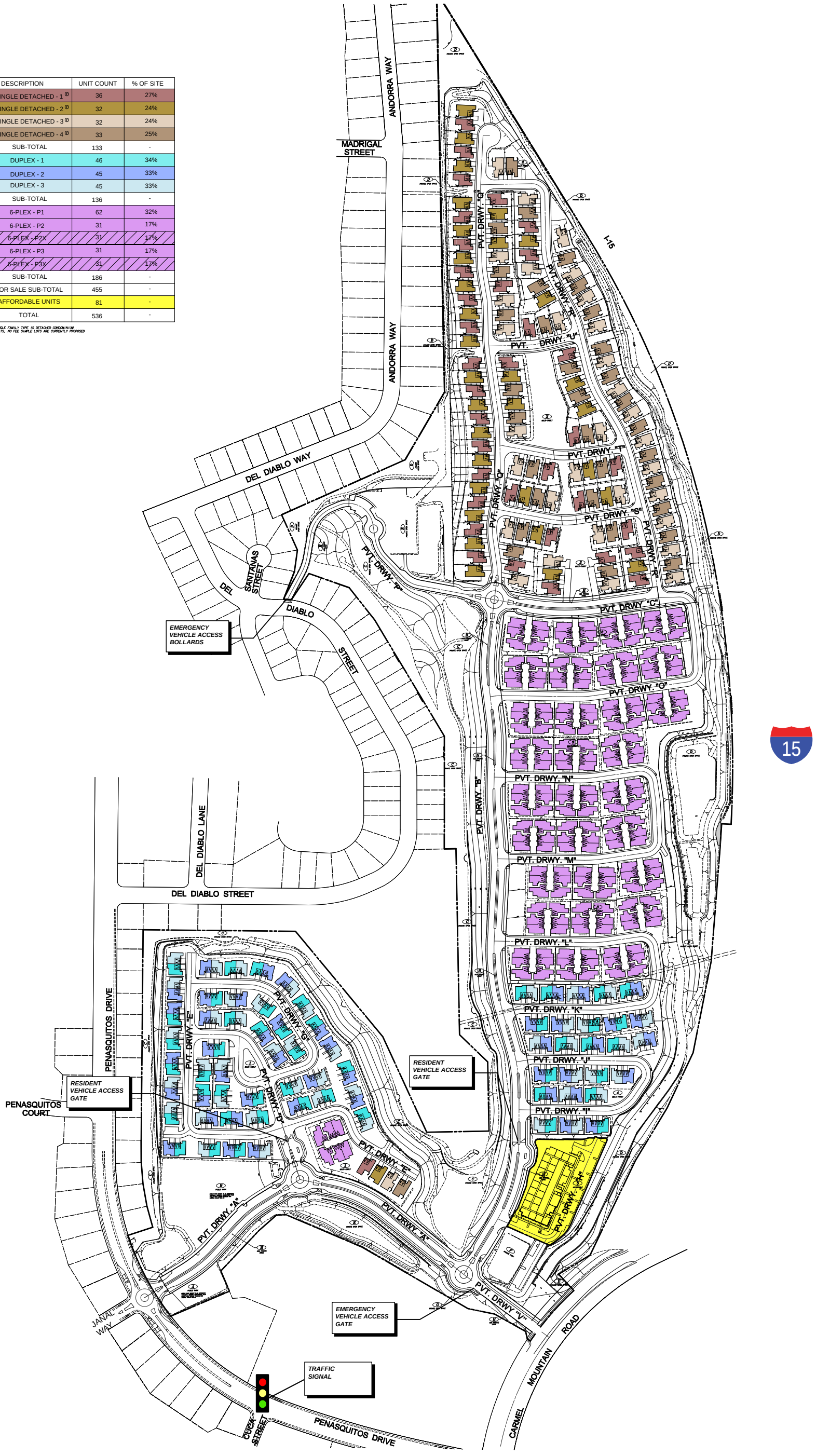
DESCRIPTION	UNIT COUNT	% OF SITE
SINGLE DETACHED - 1 ⓘ	36	27%
SINGLE DETACHED - 2 ⓘ	32	24%
SINGLE DETACHED - 3 ⓘ	32	24%
SINGLE DETACHED - 4 ⓘ	33	25%
SUB-TOTAL	133	-
DUPLEX - 1	46	34%
DUPLEX - 2	45	33%
DUPLEX - 3	45	33%
SUB-TOTAL	136	-
6-PLEX - P1	62	32%
6-PLEX - P2	31	17%
~~6-PLEX - P2X~~	~~31~~	~~17%~~
6-PLEX - P3	31	17%
~~6-PLEX - P3X~~	~~31~~	~~17%~~
SUB-TOTAL	186	-
FOR SALE SUB-TOTAL	455	-
AFFORDABLE UNITS	81	-
TOTAL	536	-

ⓘ SINGLE FAMILY TYPE IS DETACHED CONDOMINIUM UNITS, NO FEE SIMPLE LOTS ARE CURRENTLY PROPOSED



SOURCE: Hunsaker & Associates, August 2019

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Figure 2-3

Conceptual Site Plan

PACIFIC VILLAGE

3.0 EXISTING CONDITIONS

3.1 Existing Street System

The following provides a brief description of the street system directly within the Project study area. ***Figure 3–1*** illustrates existing conditions in terms of traffic lanes, intersection controls, location of transit stops, and bicycle facilities.

Interstate 15 (I-15) is a north/south freeway generally providing 12 lanes in the vicinity of the Project (plus four high-occupancy vehicle – HOV lanes) regionally connecting San Diego County with Riverside County.

State Route 56 (SR 56) is an east/west four-lane freeway between Interstate 5 and Interstate 15 providing two travel lanes in each direction. SR 56 is planned to be widened to six lanes in the future, however, funding is not yet identified for this improvement and the widening is not programmed in the SANDAG Regional Transportation Plan until Year 2040.

Carmel Mountain Road is classified and currently built as a Six-Lane Prime Arterial on the *Carmel Mountain Ranch Community Plan Circulation Element* from Stoney Peak Drive to the Community Plan boundary at the I-15 Northbound Ramps, within the study area. Carmel Mountain Road is a Six-Lane Major roadway on the *Rancho Peñasquitos Community Plan Circulation Element* from the I-15 Northbound Ramps to Peñasquitos Drive and currently built as a five-lane major roadway with three (3) northbound travel lanes and two (2) southbound. From Peñasquitos Drive to Rancho Peñasquitos Boulevard it is classified and currently built as a Four-Lane Major roadway. The posted speed limit is 35 mph east of I-15 and 40 mph west of I-15 within the study area. Bus stops are provided and curbside parking is permitted along the section of the roadway between Gerana Street and Cuca Street.

Peñasquitos Drive is classified as a Four-Lane Major roadway on the *Rancho Peñasquitos Community Plan Circulation Element* from Carmel Mountain Road to Cuca Street and a Four-Lane Collector roadway from Cuca Street to Avenida Maria. From Avenida Maria to its northern terminus at Almazon Street, it is referred to as a "local street". It is currently built as a three-lane roadway with one (1) northbound travel lane and two (2) southbound lanes divided by a two-way left-turn lane (TWLTL) between Carmel Mountain Road and Cuca Street. North of Cuca Street to its existing terminus at the northern Community Plan boundary, it is built as a two-lane divided roadway separated by a raised median with a paved curb-to-curb width of 64 feet. The posted speed limit is 35 mph. Bus stops are not provided and curbside parking is generally allowed.

Peñasquitos Drive was originally planned on the *Rancho Peñasquitos Community Plan Circulation Element* to connect to Paseo Valdear (extending from Avenida Maria) and ultimately Carmel Mountain Road in the west. This connection resulted in the need for the increased capacity of a Four-Lane Major road as more through traffic would have used Peñasquitos Drive as a thoroughfare to connect between the various neighborhoods. However, the Paseo Valdear connection has been eliminated from the *Rancho Peñasquitos Circulation Element* and *Public Facilities Financing Plans FY 2014* (PFFP) as the City rezoned the land into Open Space prohibiting future development.

Per PFFP Project T-7A, completed in 1989, Peñasquitos Drive from Almazon Street in the north to Cuca Street has been improved to:

> "...include a landscaped median to provide for a Four-Lane Collector and local street, with Class II bike lanes. This portion of Peñasquitos Drive was reconstructed to accommodate the increase in traffic generated within the Peñasquitos community. This project is consistent with the City's General Plan and the Rancho Peñasquitos Community Plan."

Although the PFFP and the Community Plan describe a Four-Lane Collector, this segment of Peñasquitos Drive is currently constructed with two travel lanes.

Per PFFP Project T-7C, completed in 1990, Peñasquitos Drive from Cuca Street to Carmel Mountain Road has been improved as stated:

> "The median was improved to provide a Modified Four-Lane Major Street. Peñasquitos Drive is the major access to the northeastern section of this community. This portion of Peñasquitos Drive was constructed to accommodate the increase in traffic generated within the Peñasquitos community. This project is consistent with the City's General Plan and the Rancho Peñasquitos Community Plan."

Per the Community Plan and PFFP, roadway improvements have been completed along Peñasquitos Drive for its entirety and no future improvements are planned. In addition, no public right-of-way is available to further widen the roadway. Therefore, modified roadway capacities associated with the current functional classifications were used in the analysis to represent the capacity-enhancing improvements that have been completed. For the divided two-lane section north of Cuca Street, an enhanced LOS E capacity of 22,500 ADT was used. This blends the 30,000 ADT LOS E capacity of a Four-Lane Collector with the 15,000 ADT LOS E capacity of a two-lane road, with the enhancement provided through the 12-foot raised median.

For the segment south of Cuca Street, an enhanced 30,000 ADT LOS E capacity was used. A Four-Lane Major Road provides a 40,000 ADT LOS E capacity assuming 10,000 ADT per lane. However, per the PFFP, the road is built as a "modified" major. The roadway provides two southbound travel lanes which transition to three travel lanes at the intersection of Carmel Mountain Road, a TWLTL, and one northbound travel lane, providing a total of four lanes. Thus, capacity of 30,000 ADT was used in the analysis.

The application of these capacities is consistent with the buildout traffic volumes in the Community Plan. A future volume of 16,000 ADT north of Cuca Street and a future volume of 22,000 ADT south of Cuca Street are accommodated per the completed PFFP roadway improvements. A copy of Community Plan and PFFP excerpts providing this information is included in ***Appendix A***.

It should also be noted that there is no large-scale development that could be constructed along this corridor as the area to the north has been designated as the Black Mountain Open Space Preserve. Thus, traffic volumes would not be expected to materially increase in the area as a result of future development.

3.2 Existing Bicycle Network

Based on a review of the City of San Diego *Bicycle Master Plan, Carmel Mountain Ranch Community Plan, Rancho Peñasquitos Community Plan* and field observations, there are existing Class II bike lanes provided along Carmel Mountain Road and Peñasquitos Drive within the study area. From Cuca Street to Caminata Soleado and between Rancho Peñasquitos Boulevard to Paseo Montalban, curbside parking is permitted along Carmel Mountain Road, disconnecting sections of the Class II bike lanes. The existing Class II bike lanes are planned to be maintained as Class II bike lanes based on a review of these planning documents, and have recently been upgraded to buffered Class II bike lanes on Peñasquitos Drive. ***Figure 3–2*** shows a regional connectivity map and ***Figure 3–3*** shows a local connectivity map.

3.3 Existing Transit Conditions

Based on the most recent information on the San Diego Metropolitan Transit System (MTS) website, the following transit conditions are noted.

Existing transit service in the study area is provided by MTS Route 20. Route 20 travels between the Rancho Bernardo Transit Station and Downtown San Diego via Carmel Mountain Road through the study area. The nearest stop to the Project site is located at Carmel Mountain Road / Peñasquitos Drive. The signalized intersection at this location provides a protected pedestrian crossing to access the stop in either direction. Monday through Friday Route 20 provides 15 minute frequencies in the morning and 15-30 minute frequencies in the evening, with service running between 4:55 AM and 11:26 PM. On Saturdays, Route 20 operates between 5:07 AM and 9:17 PM with 30 minute frequencies. Sundays it travels between 6:07 AM and 8:36 PM with hour long frequencies. ***Appendix B*** contains the transit schedule provided by MTS.

3.4 Existing Pedestrian Conditions

Based on field observations within the study area, the following pedestrian conditions are noted:

Carmel Mountain Road: Non-contiguous sidewalks east of Rancho Carmel Drive and contiguous sidewalks to the west are provided along both sides of Carmel Mountain Road within the study area. Crosswalks are provided at all signalized intersections within the study area.

Peñasquitos Drive: Contiguous sidewalks are provided on both sides of Peñasquitos Drive in the study area.

3.5 Existing Traffic Volumes

Existing AM and PM peak hour traffic volumes at key area intersections and 24-hour street segment counts were collected on Tuesday February 6, 2018 while schools were in session. ***Table 3–1*** shows the existing street segment Average Daily Traffic (ADT) volumes in the Project area. ***Figure 3–4*** shows the existing AM/PM peak hour turning movements and ADTs.

Appendix C contains the peak hour intersection and daily segment count sheets.

TABLE 3–1
EXISTING TRAFFIC VOLUMES

Street Segments	ADT [a]
Carmel Mountain Road	
1. Stoney Peak Drive to Rancho Carmel Drive	32,609
2. Rancho Carmel Drive to I-15 Northbound Ramps	46,156
3. I-15 Southbound Ramps to Project Right-In Only Access	25,463
4. Project Right-In Only Access to Peñasquitos Drive [b]	25,463
5. Peñasquitos Drive to Cuca Street	12,824
6. Cuca Street to Paseo Cardiel	13,565
7. Paseo Cardiel to Rancho Peñasquitos Boulevard	16,617
Peñasquitos Drive	
8. Carmel Mountain Road to Cuca Street	14,504
9. Cuca Street to Janal Way	11,393

Footnotes:

a. Average Daily Traffic Volumes. Data collected by LLG, Engineers on Tuesday February 6, 2018 while schools were in session.

b. Segments #3 and 4 operate as a single segment with no intervening intersections under existing conditions.

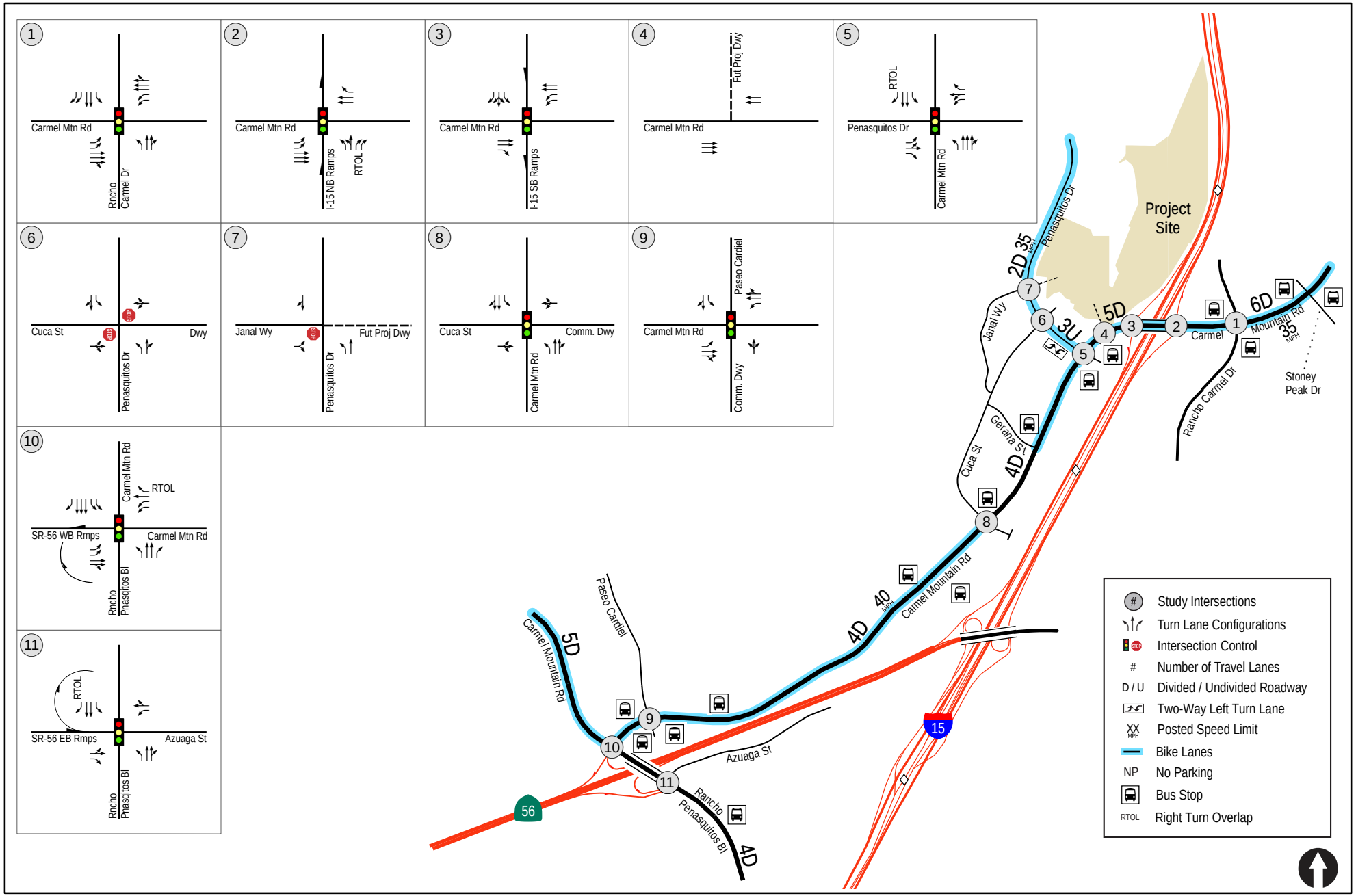

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Figure 3-1

Existing Conditions Diagram

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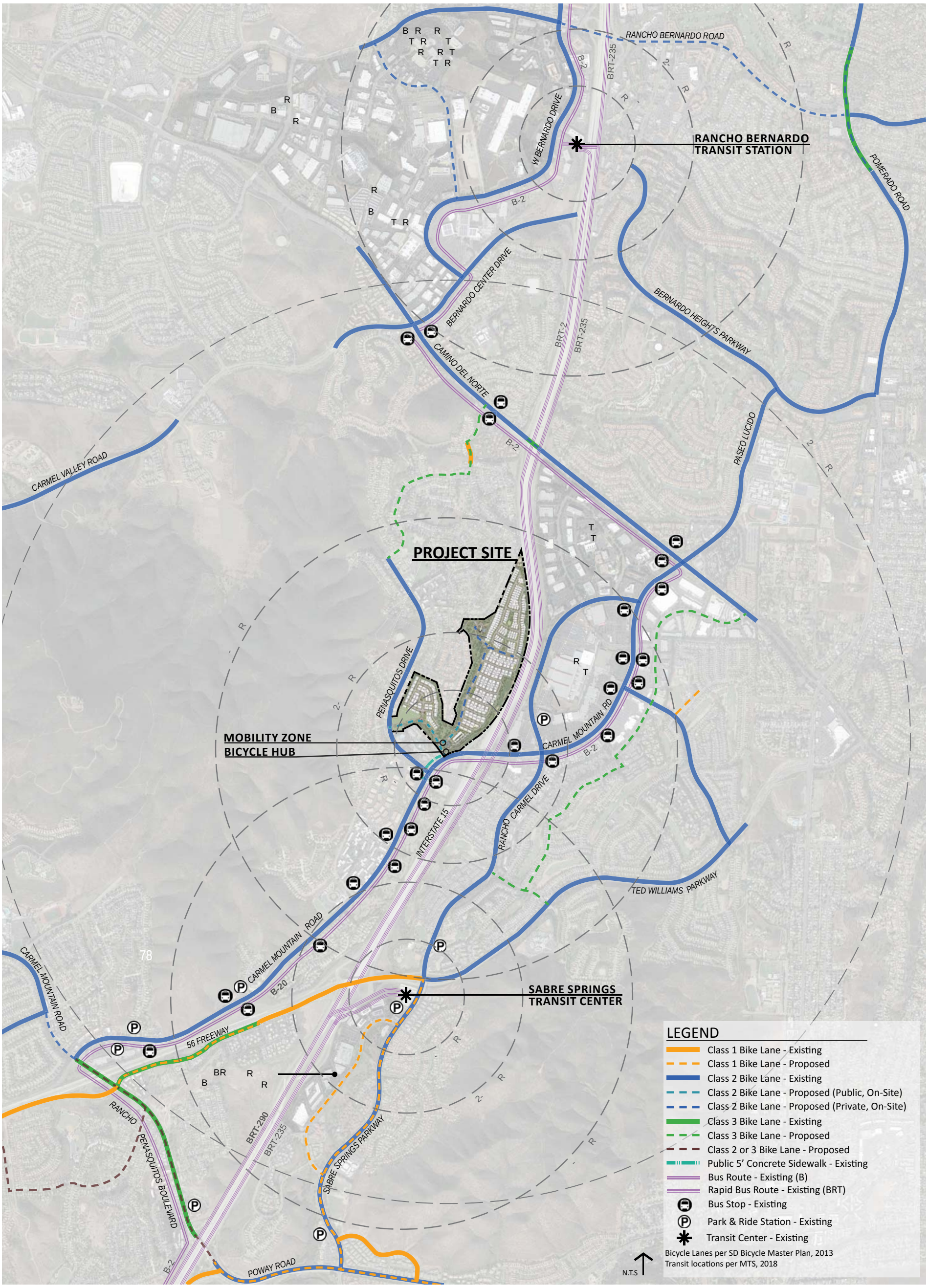

Source: Schmidt Design Group, May 2019

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Figure 3-2

Regional Connectivity Map

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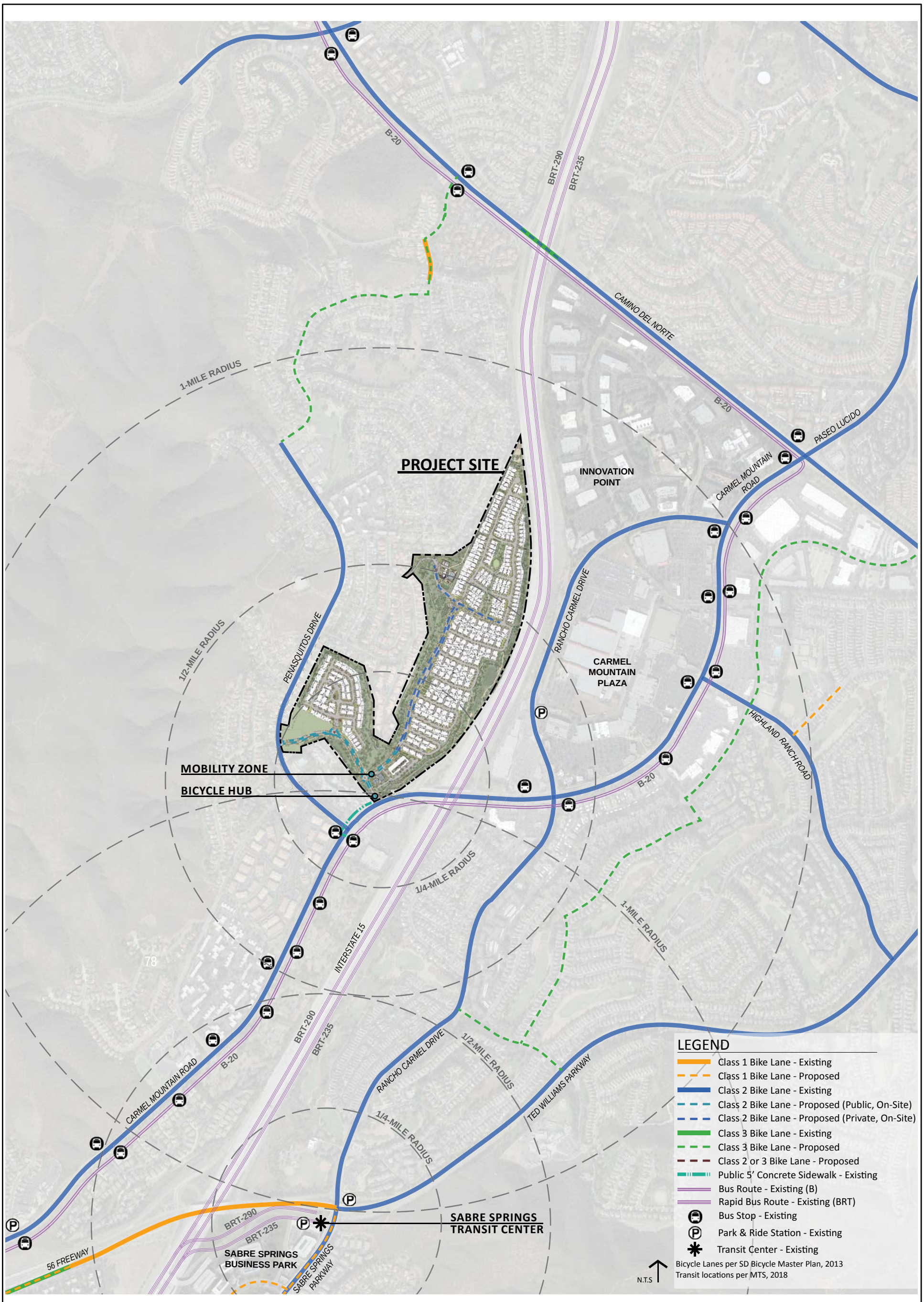

Source: Schmidt Design Group, May 2019

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Figure 3-3

Local Connectivity Map

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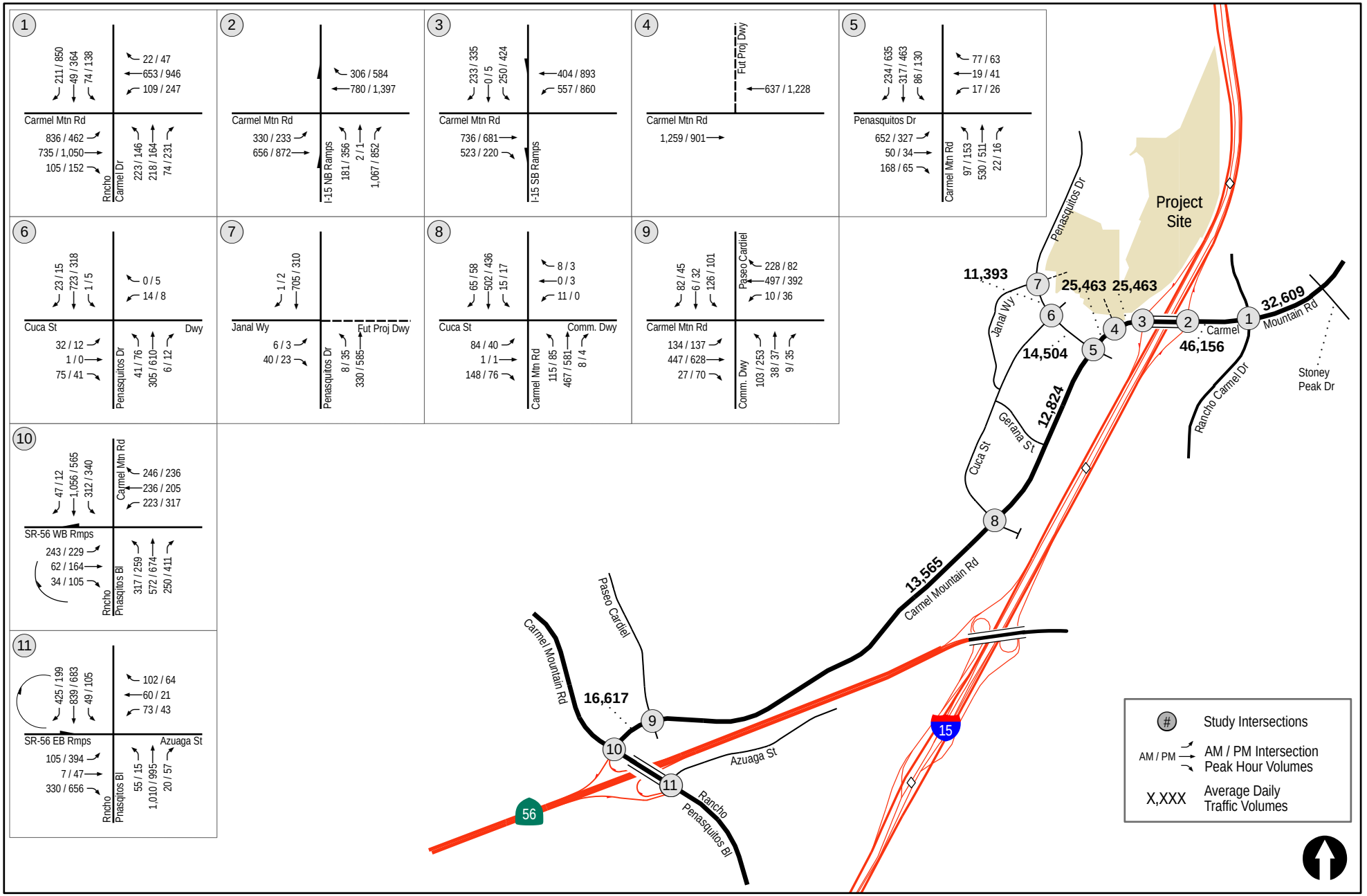

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Figure 3-4

Existing Traffic Volumes

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4.0 STUDY AREA, ANALYSIS APPROACH AND METHODOLOGY

4.1 Study Area

The study area was based on the criteria identified in the City of San Diego *Traffic Impact Study Manual*, July 1998. Based on these criteria, the traffic study shall evaluate all adjacent intersections plus the first major signalized intersection in each direction of the site. Per the guidelines, "Beyond this minimum requirement, all known congested or potentially congested locations that may be impacted by the proposed development *should* be studied." In addition, the study area *must* include "all regionally significant arterial system segments and intersections, including mainline freeway locations, and on/off ramp intersections, where the project will add 50 or more peak hour trips in either direction to the adjacent street traffic."

In addition, there are metered freeway on-ramps in the Project study area. Per regionally adopted San Diego Traffic Engineer's Council/Institute of Transportation Engineers (SANTEC/ITE) guidelines, the threshold to conduct ramp meter analysis is 20 peak hour trips.

The Project is calculated to add fewer than 50 peak hour trips to nearby area freeways. Thus, a freeway analysis was not prepared. The Project would be expected to add less than 20 peak hour trips to any metered freeway ramps. Therefore, a ramp meter analysis was not conducted.

Given these criteria, this traffic analysis evaluates the operations of study area intersections and street segments only.

The Project study area includes the following locations:

Intersections

1. Carmel Mountain Road/ Rancho Carmel Drive (signalized)
2. Carmel Mountain Road/ I-15 Southbound Ramps (signalized)
3. Carmel Mountain Road/ I-15 Northbound Ramps (signalized)
4. Carmel Mountain Road/ Project Right-In Only Access (free)
5. Carmel Mountain Road/ Peñasquitos Drive (signalized)
6. Peñasquitos Drive/ Cuca Street/ Hotel Karlan Driveway (unsignalized)
7. Peñasquitos Drive/ Janal Way/ Project Access (unsignalized)
8. Carmel Mountain Road/ Cuca Street (signalized)
9. Carmel Mountain Road/ Paseo Cardiel (signalized)
10. Carmel Mountain Road/Rancho Peñasquitos Boulevard/ SR 56 Westbound Ramps (signalized)
11. Rancho Peñasquitos Boulevard/ SR 56 Eastbound Ramps (signalized)

Segments

Carmel Mountain Road

1. Stoney Peak Drive to Rancho Carmel Road
2. Rancho Carmel Road to I-15 Northbound Ramps

3. I-15 Southbound Ramps to Project Right-In Only Access
4. Project Right-In Only Access to Peñasquitos Drive
5. Peñasquitos Drive to Cuca Street
6. Cuca Street to Paseo Cardiel
7. Paseo Cardiel to Rancho Peñasquitos Boulevard/SR 56 Westbound Ramps

Peñasquitos Drive

8. Carmel Mountain Road to Cuca Street
9. Cuca Street to Janal Way

Although the Project will not add a sufficient number of trips to warrant traffic analysis of Janal Way, this street and its potential as a cut-through route are discussed in detail in *Section 7.2*.

4.2 Analysis Approach

The Project site formerly functioned as the Carmel Highland golf course, which closed permanently in March 2015. Since the operations of the golf course have been defunct since 2015, no existing trip credits were taken for the previous use. The Project proposes an age-qualified 55+ residential neighborhood featuring 455 attached and detached, for-sale multi-family housing units and 81 multi-family, for-rent affordable housing units for a total of 536 housing units. The total trips generated by the housing units were analyzed in this report. *Section 7.0* of this report discusses the trip generation in more detail.

Table 4–1 shows the analyses performed for each of the scenarios to determine the potential impacts to the road network.

TABLE 4–1
ANALYSIS SCENARIOS

Scenario	Level of Service Analysis Performed
Existing & Near-Term Conditions	
▪ Existing ▪ Existing + Project ▪ Near-Term (Opening Year 2020) ▪ Near-Term (Opening Year 2020) + Project	AM/PM Peak Hour Intersection Analysis
	Street Segment Analysis
Year 2050 Conditions	
▪ Year 2050 Without Project ▪ Year 2050 With Project	AM/PM Peak Hour Intersection Analysis
	Street Segment Analysis

4.3 Methodology

Level of service (LOS) is the term used to denote the different operating conditions which occur on a given roadway segment or intersection under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries,

signal phasing, speed, travel delay, and freedom to maneuver. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level of service designation is reported differently for signalized and unsignalized intersections, as well as for roadway segments.

4.3.1 *Intersections*

Signalized intersections were analyzed under weekday 7:00-9:00 AM and 4:00-6:00 PM peak hour conditions. Average vehicle delay was determined utilizing the methodology found in Chapter 19 of the *Highway Capacity Manual 6 (HCM),* with the assistance of the *Synchro* (version 10) computer software. The delay values (represented in seconds) were qualified with a corresponding intersection Level of Service (LOS). City of San Diego and Caltrans location-specific signal timing information such as minimum greens, cycle lengths, phasing, and splits for the freeway interchanges, where available, and real-time peak hour field observations were included in the analysis.

Unsignalized intersections were analyzed under weekday 7:00-9:00 AM and 4:00-6:00 PM peak hour conditions. Average vehicle delay and Levels of Service (LOS) were determined based upon the procedures found in Chapters 20 and 21 of the *HCM 6,* with the assistance of the *Synchro* (version 10) computer software.

4.3.2 *Street Segments*

Street segment ultimate classifications were taken from the *Carmel Mountain Ranch* and *Rancho Peñasquitos Community Plan Circulation Elements*. Street segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the City of San Diego's *Roadway Classification, Level of Service, and ADT Table*. This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics. Copies of the Community Plan Circulation Element maps and the City of San Diego roadway classification table are attached in ***Appendix D.***

5.0 SIGNIFICANCE CRITERIA

According to the City of San Diego's *Significance Determination Thresholds* report dated January 2007, a project is considered to have a significant impact if the new project traffic has decreased the operations of surrounding roadways by a City defined threshold. For projects deemed complete on or after January 1, 2011, the City defined threshold by roadway type or intersection is shown in ***Table 5–1***.

The impact is designated either a "direct" or "cumulative" impact. According to the City's *Significance Determination Thresholds* report,

> "*Direct* traffic impacts are those projected to occur at the time a proposed development becomes operational, including other developments not presently operational but which are anticipated to be operational at that time (near term)."
>
> "*Cumulative* traffic impacts are those projected to occur at some point after a proposed development becomes operational, such as during subsequent phases of a project and when additional proposed developments in the area become operational (short-term cumulative) or when affected community plan area reaches full planned buildout (long-term cumulative)."
>
> "It is possible that a project's near term (direct) impacts may be reduced in the long term, as future projects develop and provide additional roadway improvements (for instance, through implementation of traffic phasing plans). In such a case, the project may have direct impacts but not contribute considerably to a cumulative impact."
>
> "For intersections and roadway segments affected by a project, LOS D or better is considered acceptable under both direct and cumulative conditions."

If the project exceeds the thresholds in *Table 5–1*, then the project may be considered to have a significant "direct" or "cumulative" project impact. A significant impact can also occur if a project causes the LOS to degrade from D to E, even if the allowable increases in *Table 5–1* are not exceeded. A feasible mitigation measure will need to be identified to return the impact within the City thresholds, or the impact will be considered significant and unmitigated.

TABLE 5–1
CITY OF SAN DIEGO
TRAFFIC IMPACT SIGNIFICANT THRESHOLDS

Level of Service with Project [b]	Allowable Increase Due to Project Impacts [a]					
	Freeways		Roadway Segments		Intersections	Ramp Metering [c]
	V/C	Speed (mph)	V/C	Speed (mph)	Delay (sec.)	Delay (min.)
E	0.010	1.0	0.02	1.0	2.0	2.0
F	0.005	0.5	0.01	0.5	1.0	1.0

Footnotes:

a. If a proposed project's traffic causes the values shown in the table to be exceeded, the impacts are determined to be significant. The project applicant shall then identify feasible improvements (within the Traffic Impact Study) that will restore/and maintain the traffic facility at an acceptable LOS. If the LOS with the proposed project becomes unacceptable (see note b), or if the project adds a significant amount of peak-hour trips to cause any traffic queues to exceed on- or off-ramp storage capacities, the project applicant shall be responsible for mitigating the project's direct significant and/or cumulatively considerable traffic impacts.

b. All LOS measurements are based upon Highway Capacity Manual procedures for peak-hour conditions. However, V/C ratios for roadway segments are estimated on an ADT/24-hour traffic volume basis (using Table 2 of the City's Traffic Impact Study Manual). The acceptable LOS for freeways, roadways, and intersections is generally "D" ("C" for undeveloped locations). For metered freeway ramps, LOS does not apply. However, ramp meter delays above 15 minutes are considered excessive.

c. The allowable increase in delay at a ramp meter with more than 15 minutes delay and freeway LOS E is 2 minutes. The allowable increase in delay at a ramp meter with more than 15 minutes delay and freeway LOS F is 1 minute. *No ramp meters were analyzed in this report since none of the study area freeway on-ramps are currently metered.*

General Notes:

1. Delay = Average control delay per vehicle measured in seconds for intersections or minutes for ramp meters
2. LOS = Level of Service
3. V/C = Volume to Capacity ratio
4. Speed = Arterial speed measured in miles per hour

6.0 ANALYSIS OF EXISTING CONDITIONS

The following section presents the analysis of existing study area locations.

6.1 Peak Hour Intersection Operations

Table 6–1 summarizes the existing intersections LOS. As seen in *Table 6–1*, all intersections are calculated to currently operate at the acceptable LOS D or better except for the following:

- Intersection #6. Peñasquitos Drive/ Cuca Street – LOS E during the AM peak hour
- Intersection #11. Rancho Peñasquitos Boulevard / SR 56 EB Ramps – LOS E during the PM peak hour

The unacceptable existing LOS E for Intersection #6. Peñasquitos Drive/ Cuca Street is the stop-controlled left-turn movement from the Hotel Karlan driveway onto Peñasquitos Drive (14 peak hour trips). The intersection as a whole is operating at LOS A with no delay to vehicles on Peñasquitos Drive.

Appendix E contains the Existing intersection analysis worksheets.

6.2 Daily Street Segment Operations

Table 6–2 summarizes the existing roadway segment operations. As seen in *Table 6–2*, all study area segments are calculated to currently operate at LOS C or better.

TABLE 6–1
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing	
			Delay [a]	LOS [b]
1. Carmel Mountain Rd / Rancho Carmel Dr	Signal	AM	46.5	D
		PM	44.8	D
2. Carmel Mountain Rd / I-15 NB Ramps	Signal	AM	31.4	C
		PM	45.3	D
3. Carmel Mountain Rd / I-15 SB Ramps	Signal	AM	25.1	C
		PM	31.4	C
4. Carmel Mountain Rd / Project Right-In Only Access	DNE	AM	—	—
		PM	—	—
5. Carmel Mountain Rd / Peñasquitos Dr	Signal	AM	20.1	C
		PM	23.1	C
6. Peñasquitos Dr / Cuca St/ Hotel Karlan Driveway	MSSC	AM	43.3	E
		PM	23.9	C
7. Peñasquitos Dr / Janal Way	MSSC	AM	16.6	C
		PM	11.5	B
8. Carmel Mountain Rd / Cuca St	Signal	AM	13.5	B
		PM	11.9	B
9. Carmel Mountain Rd / Paseo Cardiel	Signal	AM	14.7	B
		PM	17.4	B
10. Rancho Peñasquitos Blvd/ Carmel Mountain Road / SR 56 WB Ramps	Signal	AM	51.7	D
		PM	47.6	D
11. Rancho Peñasquitos Blvd / SR 56 EB Ramps	Signal	AM	38.7	D
		PM	60.5	E

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. MSSC = Minor Street Stop-Controlled intersection. Worst critical movement delay reported.

General Notes:

1. DNE = Does not exist.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 6–2
EXISTING DAILY STREET SEGMENT OPERATIONS

Street Segment	Community Plan	Functional Road Classification	Capacity (LOS E) [a]	ADT [b]	LOS [c]	V/C [d]
Carmel Mountain Road						
1. Stoney Peak Drive to Rancho Carmel Drive	Carmel Mountain Ranch	6-Ln Primary Arterial	60,000	32,609	B	0.543
2. Rancho Carmel Dr to I-15 NB Ramps	Carmel Mountain Ranch	6-Ln Primary Arterial	60,000	46,156	C	0.769
3. I-15 SB Ramps to Project Right-In Only Access	Rancho Peñasquitos	5-Ln Major	45,000	25,463	C	0.566
4. Project Right-In Only Access to Peñasquitos Drive [e]	Rancho Peñasquitos	5-Ln Major	45,000	25,463	C	0.566
5. Peñasquitos Drive to Cuca Street	Rancho Peñasquitos	4-Ln Major	40,000	12,824	A	0.321
6. Cuca Street to Paseo Cardiel	Rancho Peñasquitos	4-Ln Major	40,000	13,565	A	0.339
7. Paseo Cardiel to Rancho Peñasquitos Boulevard/ SR 56 WB Ramps	Rancho Peñasquitos	4-Ln Major	40,000	16,617	B	0.415
Peñasquitos Drive [f]						
8. Carmel Mountain Road to Cuca Street	Rancho Peñasquitos	Modified 4-Ln Major (w/ TWLTL)	30,000	14,504	C	0.485
9. Cuca Street to Janal Way	Rancho Peñasquitos	Modified 4-Ln Collector (w/ Raised Median)	22,500	11,393	C	0.506

Footnotes:

a. Capacities based on City of San Diego Roadway Classification & LOS table (See *Appendix D*).
b. Average Daily Traffic Volumes.
c. Level of Service.
d. Volume to Capacity.
e. Carmel Mountain Road from I-15 SB to Peñasquitos Drive currently provides three lanes in the NB direction and two lanes SB for an increased capacity of 45,000 ADT. Segments #3 and 4 operate as a single segment with no intervening intersections under existing conditions.
f. Per the Rancho Peñasquitos PFFP, Peñasquitos Drive has been improved to Modified 4-lane Collector and Modified 4-Lane Major standards capable of accommodating the forecasted buildout traffic volumes per the Community Plan. Therefore, the functional capacities used are consistent with those improvements.

General Notes:

1. Ln = Lane
2. TWLTL = Two-way left-turn lane

7.0 TRIP GENERATION/DISTRIBUTION/ASSIGNMENT

As discussed in *Section 2.2* of this report, the Project proposes to develop the site with 536 age-qualified residential units (455 attached and detached multi-family homes, and 81 multi-family for-rent affordable units). No existing trip generation credits were taken for the former golf course use.

The following is a discussion of the traffic expected to be generated with the development of these homes.

7.1 Trip Generation

The Project proposes to develop three (3) unit types for this age-qualified 55+ neighborhood featuring 455 attached and detached, for-sale multi-family housing units and 81 multi-family, for-rent affordable housing units for a total of 536 housing units. For purposes of this analysis, the trip generation for all 536 housing units was calculated using the City of San Diego *Trip Generation Manual, May 2003*, trip generation rate for "Retirement/Senior Citizen Housing". Peak hour rates are not provided by the City's manual. The *SANDAG (Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region, April 2002*, was used to calculate the peak hour trip generation.

Using both sources, the proposed Project is forecasted to generate a total of 2,144 ADT with 107 trips during the AM peak hour (43 inbound / 64 outbound) and 150 trips during the PM peak hour (90 inbound / 60 outbound).

Table 7–1 shows the proposed Project traffic generation.

TABLE 7–1
PROJECT TRIP GENERATION

Land Use	Size	Daily Trip Ends (ADTs) [a]		AM Peak Hour					PM Peak Hour				
		Rate [b]	Volume	% of ADT [b]	In:Out Split [b]	Volume In	Volume Out	Volume Total	% of ADT [b]	In:Out Split [b]	Volume In	Volume Out	Volume Total
PROPOSED PROJECT													
Age-Qualified (55+) Residential	536 DU	4/DU	2,144	5%	40:60	43	64	107	7%	60:40	90	60	150

Footnotes:

a. ADT = Average Daily Traffic.

b. Rates taken from City of San Diego *Trip Generation Manual, May 2003* and *SANDAG (Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region, April 2002.*

General Notes:

1. DU = dwelling units

7.2 Trip Distribution/Assignment

In order to distribute and assign vehicular trips to the study area street system, LLG used professional engineering judgment based on the existing travel patterns in the area, the proximity of the Project land uses to complimentary uses, proximity to I-15, and general knowledge of the area.

Residents of age-qualified housing include both retirees who would tend to avoid unnecessary peak hour trips and travel to a variety of local and regional destinations, and those still in the workforce whose travel patterns reflect that of a more typical commuter. Using the above mentioned assumptions, approximately 20% of the daily Project trips were regionally distributed on I-15 to the north with 25% to the south, with 11% oriented to/from the west on SR 56. The remaining 44% were distributed to the local network. A small amount of Project-related traffic may make use of Cuca Street and Janal Way to access destinations further to the west via Carmel Mountain Road.

The incentive to use either roadway as cut-through route for destinations is low, given the good traffic operations along the main roadways (LOS C on Peñasquitos Drive, LOS A on Carmel Mountain Road between Cuca Street and Peñasquitos Drive, LOS C during AM/PM peak hours at Carmel Mountain Road / Peñasquitos Drive intersection). However, of the two, Cuca Street is more direct, with fewer fronting land uses, and as such, 3% of Project traffic was distributed via this roadway. Janal Way is a steep, circuitous, and unappealing as a cut-through route. This is borne out by the existing peak hour turning movement volumes, which show a total of 7 AM and 5 PM peak hour trips between Janal Way and the entirety of the development served by Peñasquitos Drive to the north.

As a conservative assumption, this study distributes zero trips north on Peñasquitos Drive. Realistically, there will be some Project-related trips to this area. However, any reasonable distribution of trips to the north would not be sufficient to generate any impacts and would only reduce the number Project trips being studied at more congested intersections, such as Carmel Mountain Road or at the freeway interchanges.

Figure 7–1 shows the Project Trip Distribution.

The Project-generated traffic was assigned to the study area street system. ***Figure 7–2*** depicts the Project traffic assignment.

For arriving at the Existing plus Project traffic volumes, the total Project trip generation was then added to the existing traffic volumes. ***Figure 7–3*** shows the Existing + Project traffic volumes.

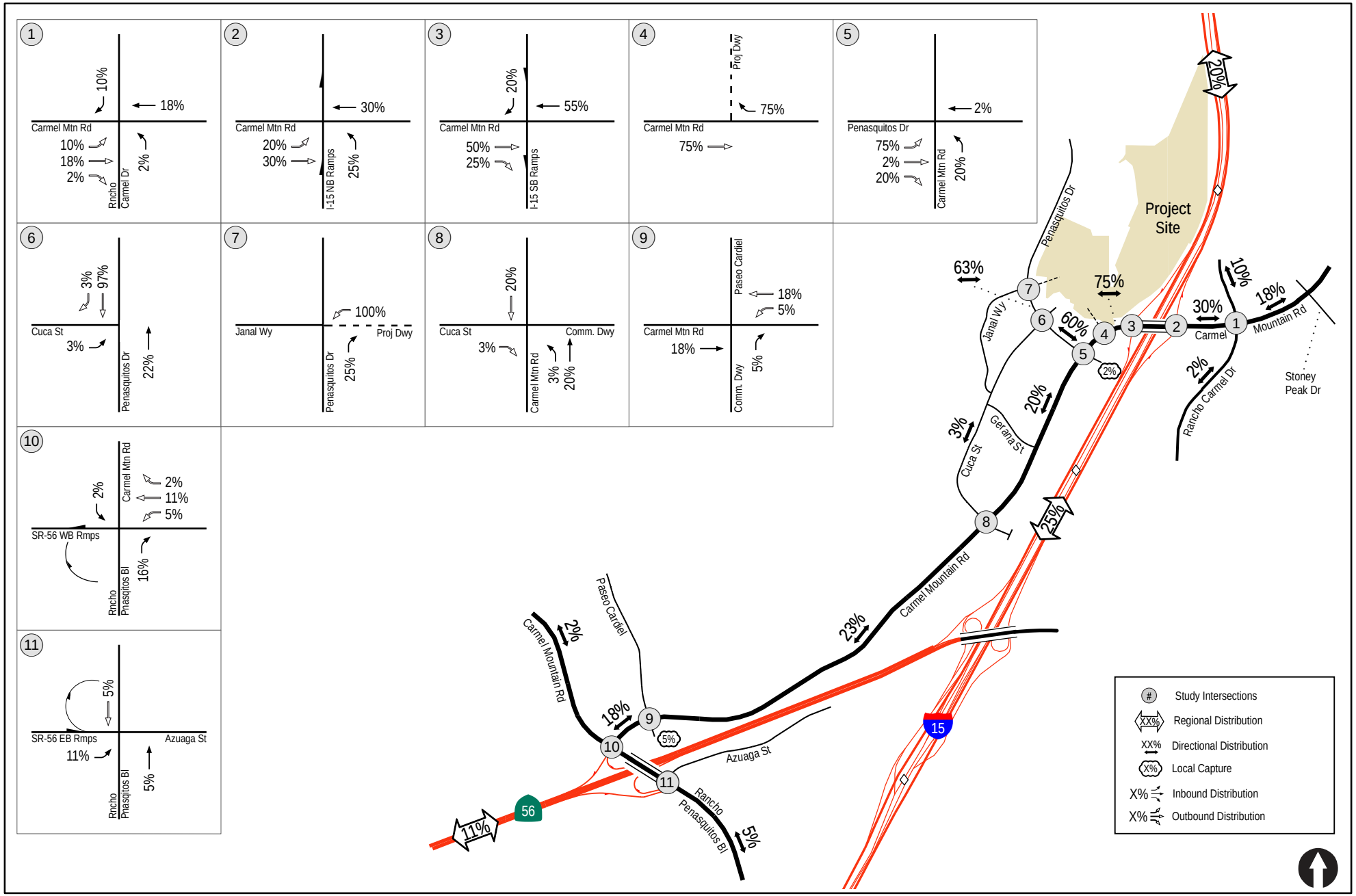

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Figure 7-1

Project Traffic Distribution

THE JUNIPERS

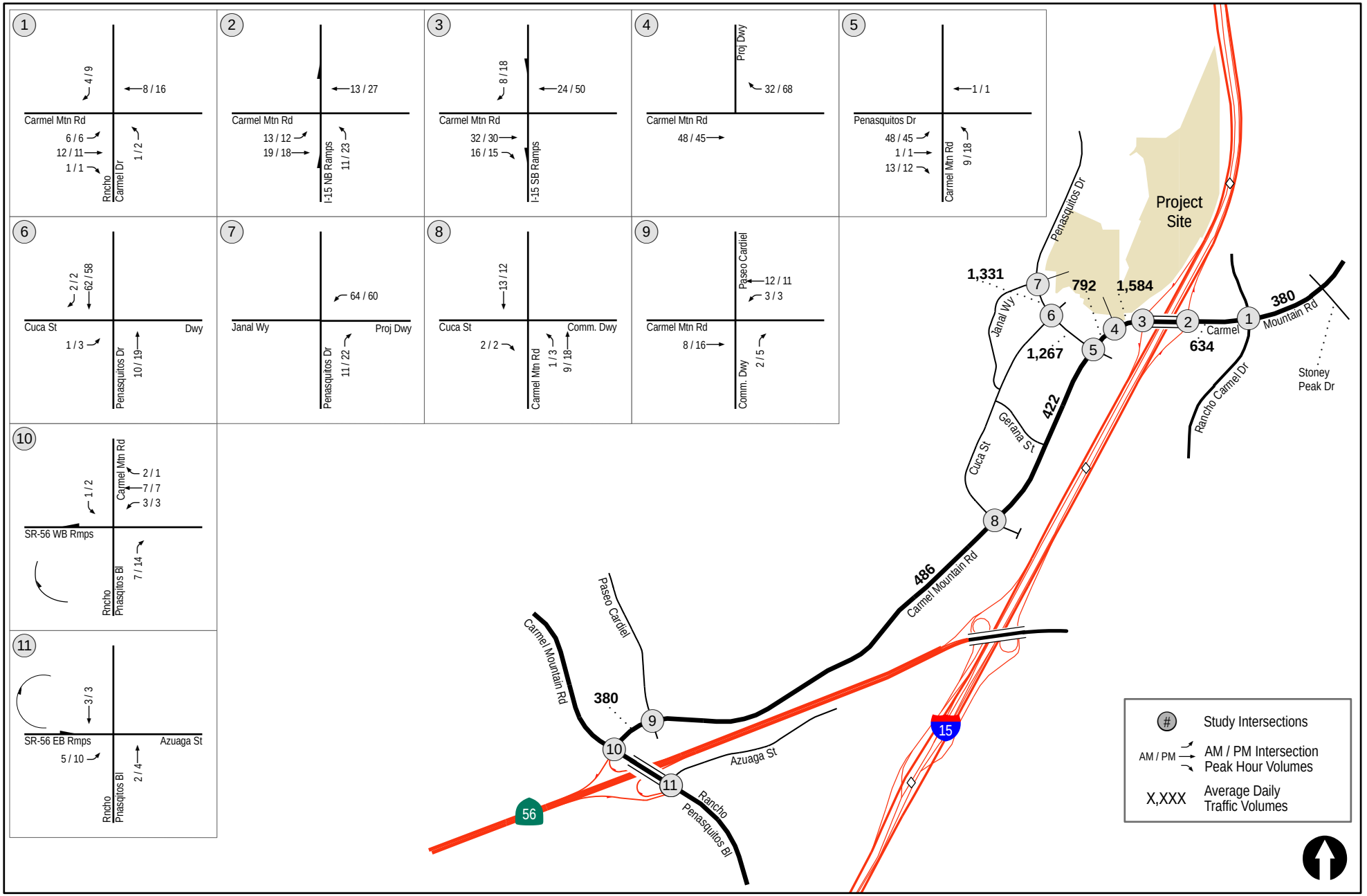

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Figure 7-2

Project Traffic Volumes

THE JUNIPERS

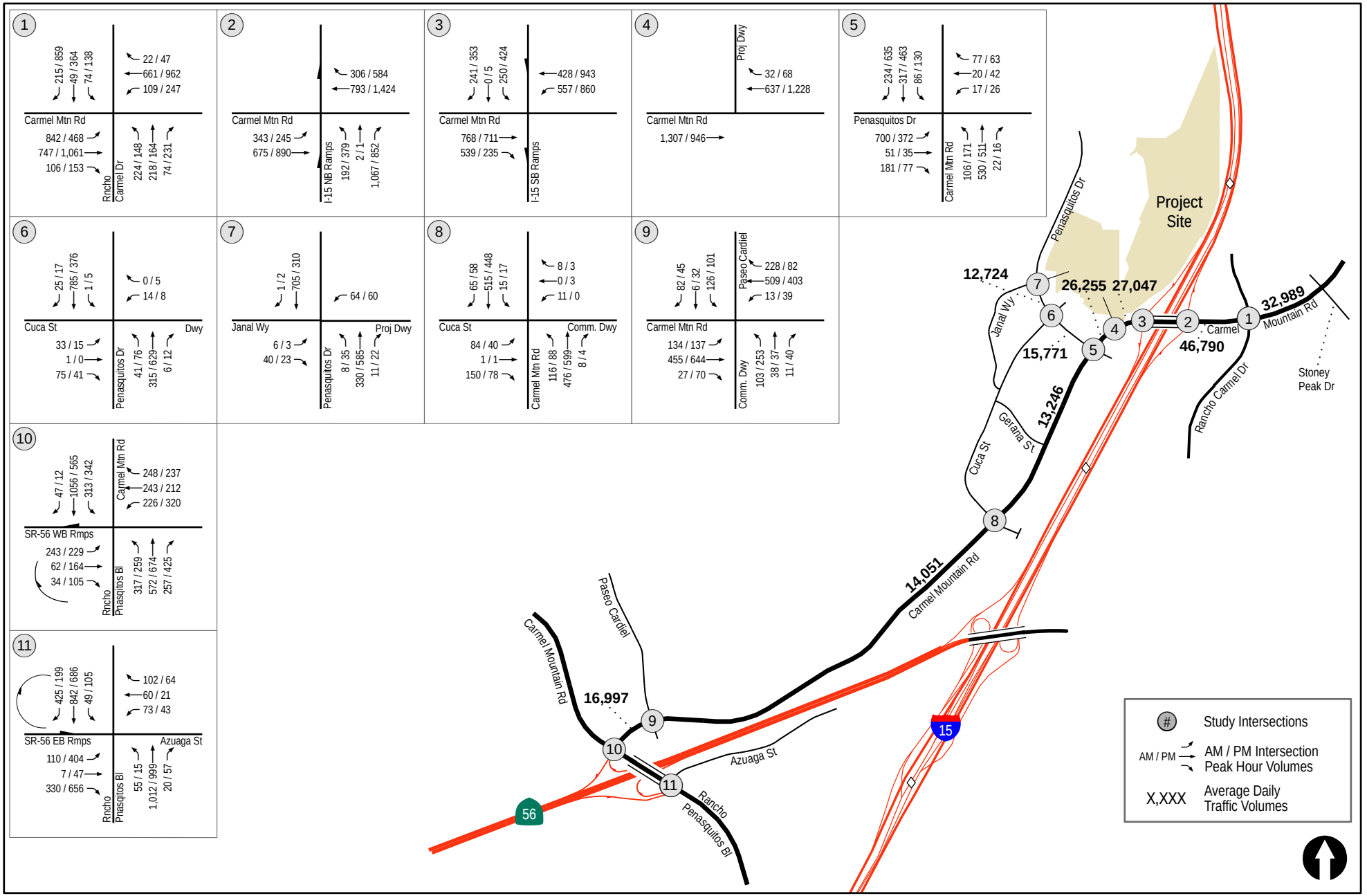

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Figure 7-3

Existing + Project Traffic Volumes

THE JUNIPERS

8.0 ANALYSIS OF EXISTING + PROJECT CONDITIONS

The following section presents the analysis of study area locations under Existing + Project conditions. The Existing + Project condition represents the effect of Project traffic on the existing street network, at the time of traffic data collection (February 2018) without assuming either additional cumulative projects or additional road improvements in the baseline condition other than those proposed as part of the Project (fourth leg of Peñasquitos Drive / Janal Way intersection and the right-turn in only access and frontage improvements on Carmel Mountain Road).

8.1 Peak Hour Intersection Operations

Table 8–1 summarizes the existing intersections LOS. As seen in *Table 8–1*, with the addition of Project traffic all intersections are calculated to continue to operate at acceptable LOS D or better except for the following:

- **Intersection #6. Peñasquitos Drive / Cuca Street / Hotel Karlan Driveway – LOS F during the AM peak hour**
- **Intersection #7. Peñasquitos Drive / Janal Way / Project Access – LOS E during the AM peak hour**
- Intersection #11. Rancho Peñasquitos Boulevard / SR 56 EB Ramps – LOS E during the PM peak hour

The Project-related increase in delay to the worst critical movement exceeds the allowable thresholds at the two intersections **bolded** and underlined above. Therefore, **two (2) significant direct impacts** are calculated. The Project-related increase in delay at Intersection #11 is less than the allowable 2.0 seconds for an LOS E-operating intersection. ***Appendix F*** contains the Existing + Project intersection analysis worksheets.

8.2 Daily Street Segment Operations

Table 8–2 summarizes the existing roadway segment operations. As seen in *Table 8–2*, with the addition of Project traffic, all study area segments are calculated to continue to operate at LOS C.

Based on City of San Diego significance criteria, **no significant direct impacts** were calculated with the addition of Project traffic on the street segments.

TABLE 8–1
EXISTING + PROJECT INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing		Existing + Project			
			Delay [a]	LOS [b]	Delay	LOS	Delay Δ [c]	Sig?
1. Carmel Mountain Rd / Rancho Carmel Dr	Signal	AM	46.5	D	47.2	D	0.7	No
		PM	44.8	D	46.1	D	1.3	
2. Carmel Mountain Rd / I-15 NB Ramps	Signal	AM	31.4	C	31.4	C	0.0	No
		PM	45.3	D	47.6	D	2.3	
3. Carmel Mountain Rd / I-15 SB Ramps	Signal	AM	25.1	C	25.2	C	0.1	No
		PM	31.4	C	34.6	C	3.2	
4. Carmel Mountain Rd / Project Right-In Only Access [e]	DNE/ Uncontrolled	AM	—	—	0.0	A	—	No
		PM	—	—	0.0	A	—	
5. Carmel Mountain Rd / Peñasquitos Dr	Signal	AM	20.1	C	20.7	C	0.6	No
		PM	23.1	C	25.1	C	2.0	
6. Peñasquitos Dr / Cuca St / Hotel Karlan Drwy	MSSC [d]	AM	43.3	E	**51.1**	**F**	**7.8**	**Yes**
		PM	23.9	C	26.5	D	2.6	
7. Peñasquitos Dr / Janal Way/ Project Access [f]	MSSC [d]	AM	16.6	C	**48.2**	**E**	**31.6**	**Yes**
		PM	11.5	B	31.9	D	20.4	
8. Carmel Mountain Rd / Cuca St	Signal	AM	13.5	B	13.6	B	0.1	No
		PM	11.9	B	12.0	B	0.1	
9. Carmel Mountain Rd / Paseo Cardiel	Signal	AM	14.7	B	14.8	B	0.1	No
		PM	17.4	B	17.7	B	0.3	
10. Rancho Peñasquitos Blvd/ Carmel Mountain Road / SR 56 WB Ramps	Signal	AM	51.7	D	51.8	D	0.1	No
		PM	47.6	D	47.7	D	0.1	
11. Rancho Peñasquitos Blvd / SR 56 EB Ramps	Signal	AM	38.7	D	38.7	D	0.0	No
		PM	60.5	E	60.8	E	0.3	

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Δ denotes the increase in delay due to Project.
d. MSSC = Minor Street Stop-Controlled intersection. Worst critical movement delay reported.
e. No delay is reported at this intersection as the only turn movement is a free right-turn into the site.
f. With the completion of the fourth leg of this intersection to serve as the Project access, the critical movement becomes the westbound left-turn.

General Notes:

1. Sig = Significant impact, yes or no.
2. **Bold** typeface and shading represents a significant direct impact.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

TABLE 8–2
EXISTING + PROJECT STREET SEGMENT OPERATIONS

Street Segment	Existing Capacity (LOS E)[a]	Existing			Existing + Project				
		ADT [b]	LOS [c]	V/C [d]	ADT	LOS	V/C	Δ [e]	Sig?
Carmel Mountain Road									
1. Stoney Peak Drive to Rancho Carmel Drive	60,000	32,609	B	0.543	32,989	B	0.550	0.007	No
2. Rancho Carmel Dr to I-15 NB Ramps	60,000	46,156	C	0.769	46,790	C	0.780	0.011	No
3. I-15 SB Ramps to Right-In Only Project Access [f]	45,000	25,463	C	0.566	27,047	C	0.601	0.035	No
4. Right-In Only Project Access to Peñasquitos Drive [f]	45,000	25,463	C	0.566	26,255	C	0.583	0.018	No
5. Peñasquitos Drive to Cuca Street	40,000	12,824	A	0.321	13,246	A	0.331	0.010	No
6. Cuca Street to Paseo Cardiel	40,000	13,565	A	0.339	14,051	A	0.351	0.012	No
7. Paseo Cardiel to Rancho Peñasquitos Boulevard/ SR 56 WB Ramps	40,000	16,617	B	0.415	16,997	B	0.425	0.010	No
Peñasquitos Drive [g]									
8. Carmel Mountain Road to Cuca Street	30,000	14,504	C	0.485	15,771	C	0.527	0.042	No
9. Cuca Street to Janal Way	22,500	11,393	C	0.506	12,724	C	0.566	0.060	No

Footnotes:

a. Capacities based on City of San Diego Roadway Classification & LOS table (See *Appendix D*).
b. Average Daily Traffic.
c. Level of Service.
d. Volume to Capacity ratio.
e. Δ denotes a Project-induced increase in the Volume to Capacity ratio.
f. Carmel Mountain Road from I-15 SB to Peñasquitos Drive currently provides three lanes in the NB direction and two lanes SB for an increased capacity of 45,000 ADT.
g. Per the Rancho Peñasquitos PFFP, Peñasquitos Drive has been improved to modified 4-lane collector and modified 4-lane major standards capable of accommodating the forecasted buildout traffic volumes per the Community Plan. Therefore, the functional capacities used are consistent with those improvements.

General Notes:

1. Sig = Significant impact, yes or no.
2. **Bold** typeface and shading represents a significant direct impact.

9.0 NEAR-TERM (OPENING YEAR 2020) CUMULATIVE PROJECTS CONDITIONS

Cumulative projects are other projects in the study area that will add traffic to the local circulation system in the near future. LLG reviewed the City's Open DSD website to identify relevant, pending cumulative projects in the study area that could be constructed and generating traffic in the study area vicinity by the expected opening year of the Project in Year 2020. Based on this research, three (3) cumulative projects are planned nearby that would add to traffic to study area intersections and street segments. Traffic generated by these projects was added to the existing traffic volumes to develop the Near-Term (Opening Year 2020) condition. Project traffic was added to the near-term traffic volumes to arrive at the Near-Term (Opening Year 2020) + Project condition. The following is a brief description of each of the cumulative projects. ***Table 9–1*** provides a summary of the cumulative project trip generation summary.

It is noted that current Project scheduling shows full buildout and 100 percent occupation in 2023. Based on traffic level changes from 2020 to 2050, the growth rate in the project study area is less than one percent per annum. As shown on Tables 10–1 and 10–2 for 2020, this rate of growth would not result in exceeding performance thresholds for either road segments or intersections. The 2050 analyses remain unchanged.

9.1 Description of Cumulative Projects

1. **Pacific Village** proposes the redevelopment of an existing 41-acre, 332-unit, one and two bedroom apartment rental complex known as Peñasquitos Village. The project is located west of Interstate 15 (I-15), east of Carmel Mountain Road, and south of the Peñasquitos Drive Shopping Center. Pacific Village proposes 99 single-family cluster homes, 105 multi-family tri-plex units, and 120 row homes, for a total of 324 units. In addition, the northern portion of the site will be entitled for 277 apartments for rent. The total allowable development is 600 dwelling units. The project discretionary permit application number with the City is (PTS#470158) and was approved by City Council on March 5, 2018. The proposed Pacific Village project was included in both the near-term and long-term analyses. Subtracting the existing site trip generation from the proposed Project, the net new trips expected on the street system with redevelopment of the site is 1,796 net new ADT with 144 net new trips during the AM peak hour (29 inbound / 115 outbound) and 163 net new trips during the PM peak hour (114 inbound / 49 outbound). *Trip generation, distribution and assignment taken from the Approved Pacific Village EIR Traffic Impact Study, prepared by LLG Engineers, dated November 7, 2017.*

2. **Merge 56** proposes to develop 525,000 square feet of commercial, office, theater and hotel uses, and 242 residential dwelling units. The residential units would include a mix of housing types including multi-family (approximately 47 affordable units), townhomes (approximately 111 units), and single family (approximately 84 units). The project includes the construction of Camino Del Sur south of Torrey Santa Fe Road to its current terminus north of Dormouse Road and the realignment and construction of Carmel Mountain Road from Via Las Lenas to Camino Del Sur. The project discretionary permit application number with the City is

(PTS#360009) and was approved by City Council on May 22, 2018. The proposed Merge 56 project was included in both the near-term and long-term analyses. The project is calculated to generate approximately 19,468 ADT with 806 inbound and 386 outbound trips in the AM peak hour, and 929 inbound and 1,166 outbound trips in the PM peak hour. *Trip generation, distribution and assignment taken from the Approved EIR Traffic Impact Study, prepared by LLG Engineers, dated January 14, 2016.*

3. **The Preserve at Torrey Highlands (Community Plan Amendment request previously referred to as the "Kilroy Development")** proposes to develop 450,000 SF of commercial office space with parking structures south of Torrey Santa Fe Road and west of future Camino Del Sur. The property is currently approved to construct a 1,200-seat church with a Kindergarten through eighth grade school. The project requires a Community Plan Amendment and currently has a discretionary permit application into the City (PTS#442880). The proposed Preserve project was included in both the near-term and long-term analysis. The project is calculated to generate approximately 5,264 ADT with 616 inbound and 68 outbound trips in the AM peak hour, and 147 inbound and 589 outbound trips in the PM peak hour. *Trip distribution and assignment taken from a SANDAG Series 12 Year 2035 Select Zone Assignment prepared for a custom zone assigned to The Preserve used in the City-staff approved LLG traffic study dated June 7, 2018.*

TABLE 9–1
CUMULATIVE DEVELOPMENT PROJECTS SUMMARY

No.	Name	Project	ADT [a]	AM		PM		Status
				In	Out	In	Out	
1	Pacific Village	601 Mixed Residential Units	1,796	29	115	114	49	Approved by City Council 3/5/18
2	Merge 56	525 KSF Commercial/ Office + 242 Residential Units	19,468	806	386	929	1,166	Approved by City Council 5/22/18
3	The Preserve at Torrey Highlands	450 KSF Commercial Office	5,260	616	68	147	589	Staff Approved Traffic Study- project still under review PTS# 442880
Total Cumulative Projects			**26,524**	**1,451**	**569**	**1,190**	**1,804**	–

Footnotes:

a. Average daily traffic.

Figure 9–1 shows the locations of the cumulative projects and ***Figure 9–2*** depicts the cumulative projects traffic volumes. ***Figure 9–3*** depicts the Near-Term (Opening Year 2020) traffic volumes and ***Figure 9–4*** depicts the Near-Term (Opening Year 2020) + Project traffic volumes.

Appendix G contains the cumulative projects assignment sheets.

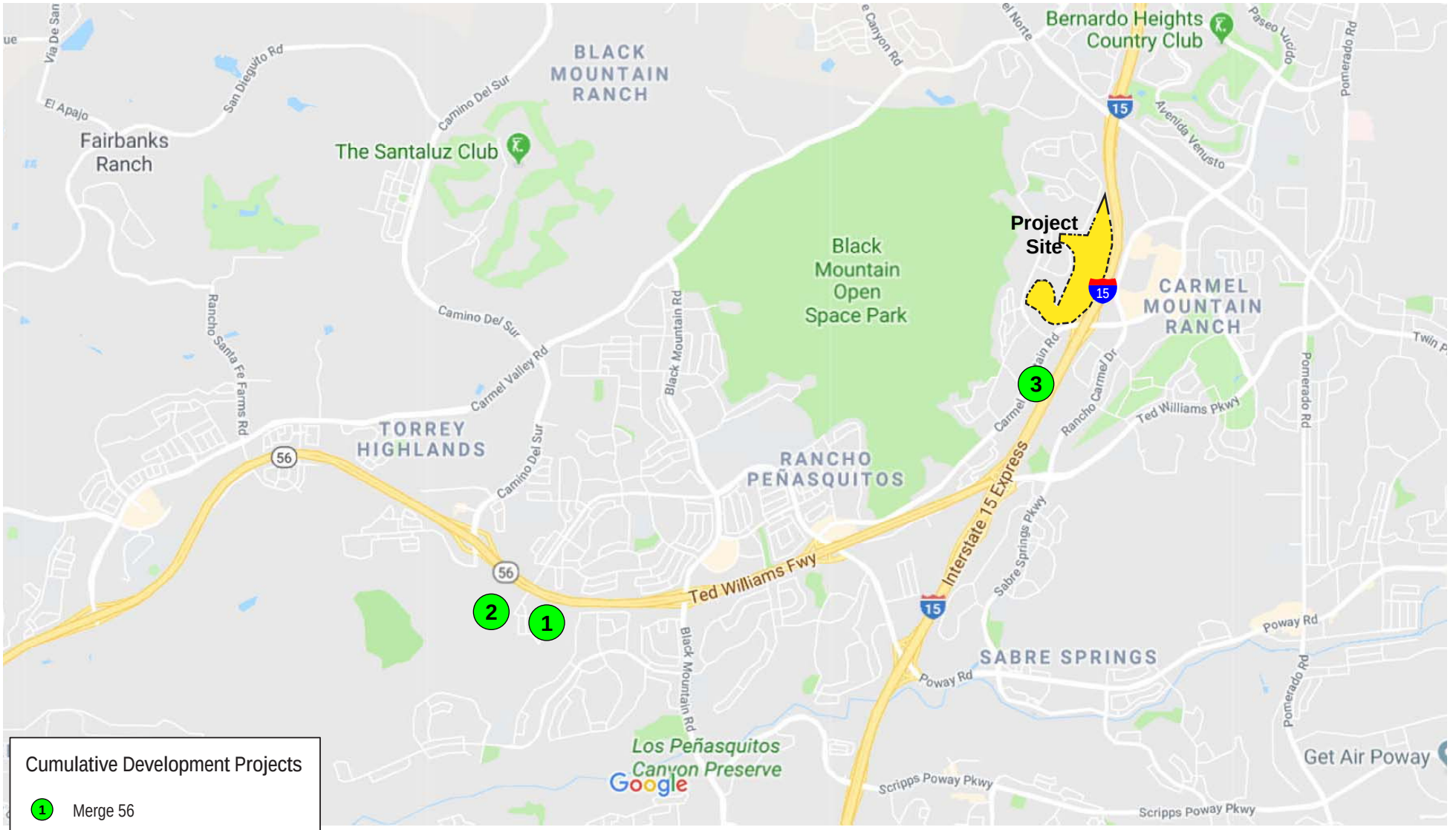

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Figure 9-1

Cumulative Projects Location Map

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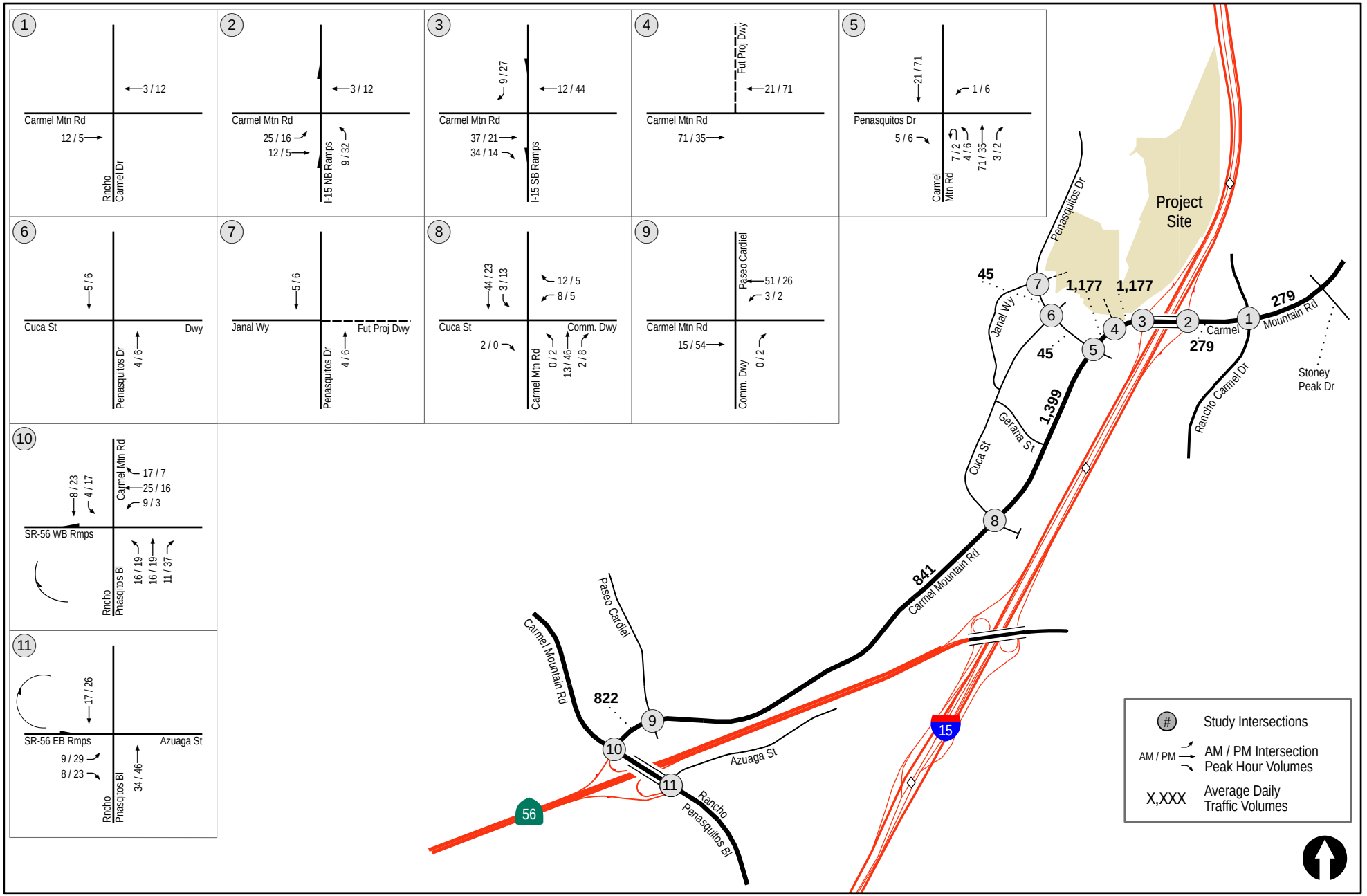

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Figure 9-2

Cumulative Projects Traffic Volumes

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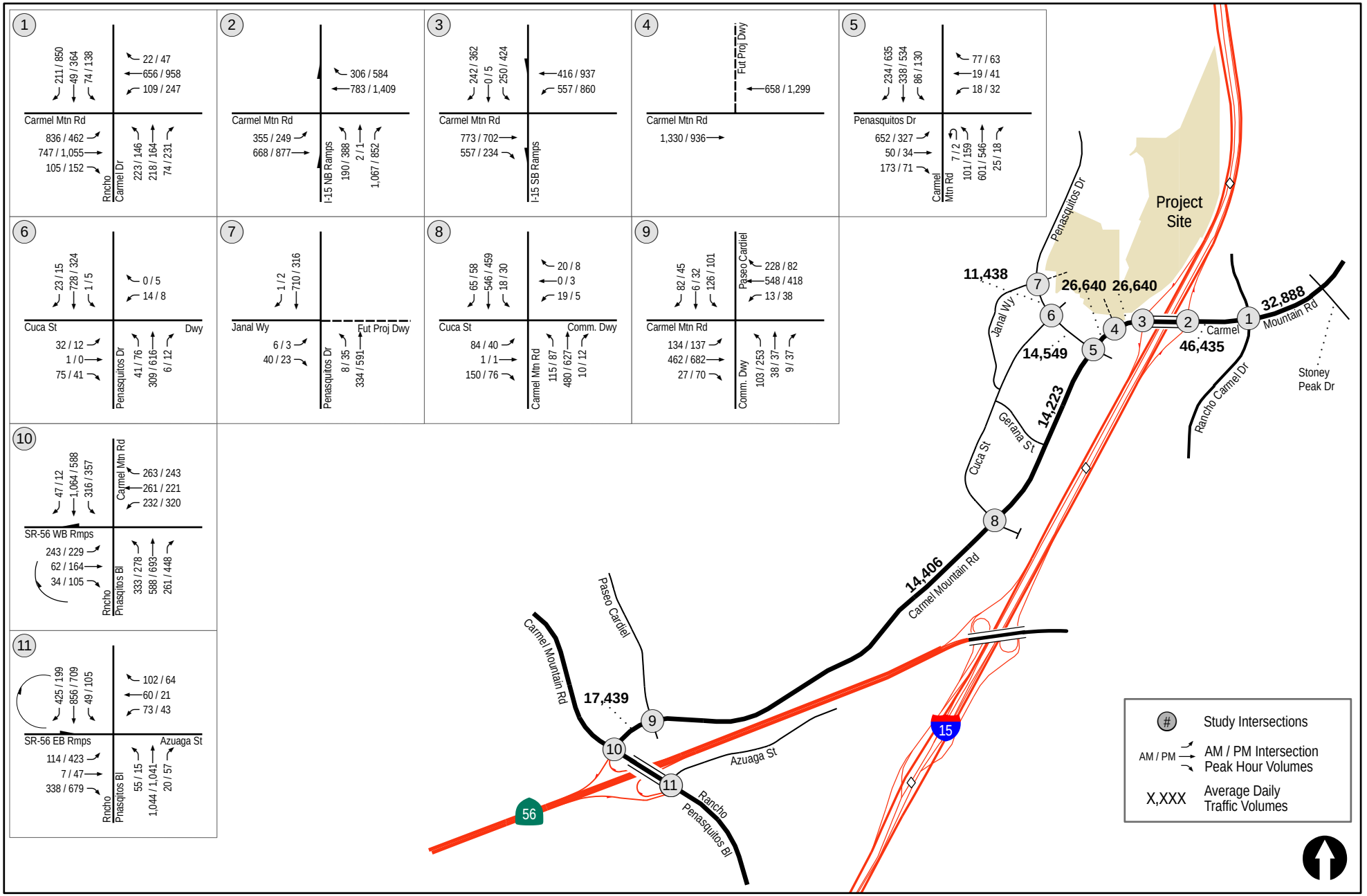

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Figure 9-3

Near-Term (Opening Year 2020) Traffic Volumes

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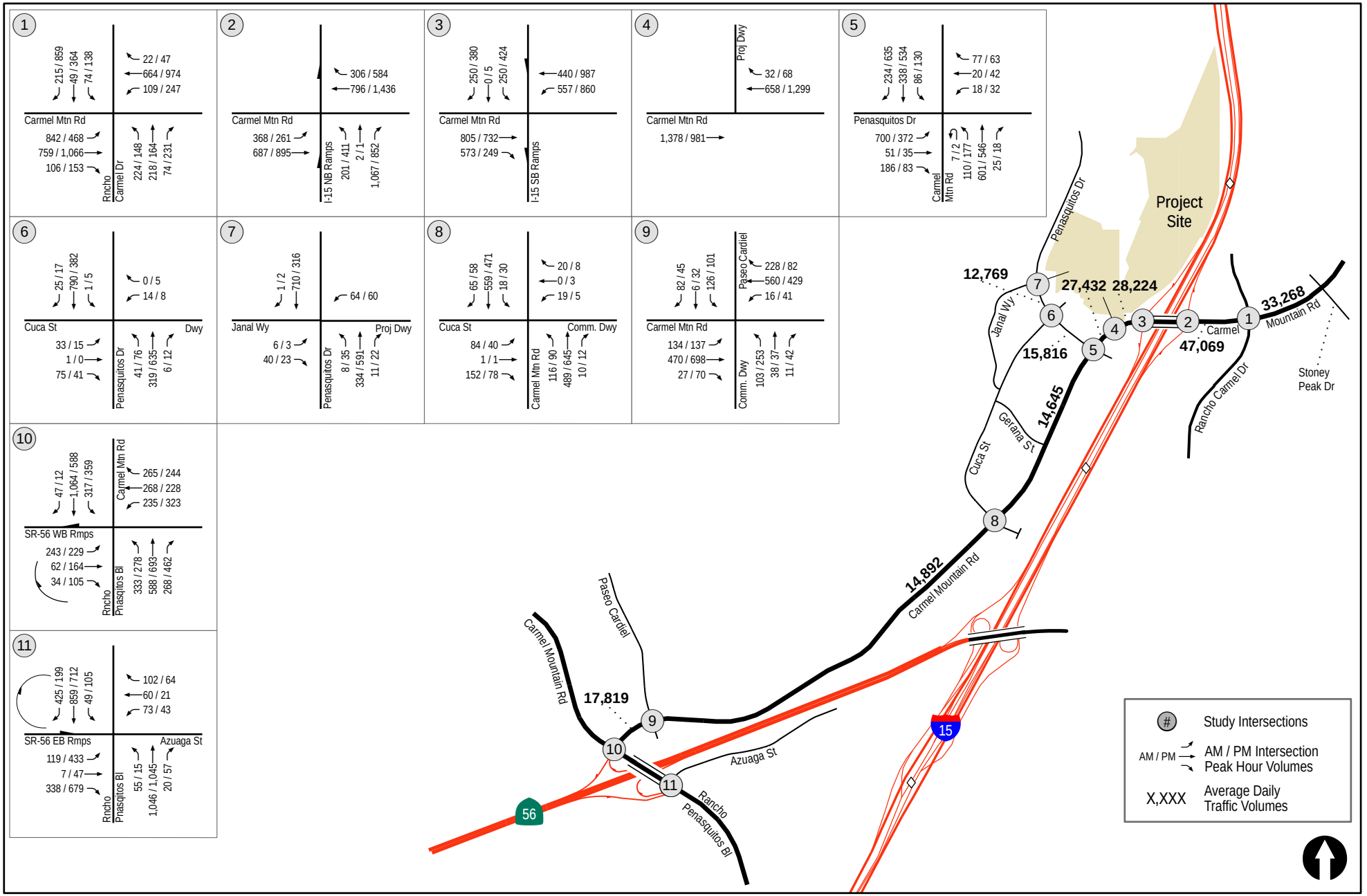

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Figure 9-4

Near-Term (Opening Year 2020) + Project Traffic Volumes

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10.0 ANALYSIS OF NEAR-TERM SCENARIOS

The following section presents the analysis of study area locations under two scenarios. The Near-Term (Opening Year 2020) condition includes nearby cumulative development projects, but not the project. This scenario assumes the existing lane geometrics. The Near-Term (Opening Year 2020 + Project) scenario represents the effect of adding Project traffic to the existing street network with no improvements assumed, except for the addition of a fourth leg at the Peñasquitos Drive / Janal Way intersection and the right-turn in only access and frontage improvements on Carmel Mountain Road as constructed by the project.

10.1 Near-Term (Opening Year 2020)

10.1.1 *Intersection Analysis*

Table 10–1 summarizes the peak hour intersection operations for the Near-Term (Opening Year 2020) condition. As seen in *Table 10–1*, with the addition of cumulative projects traffic, all intersections are calculated to operate at acceptable LOS D or better except for the following:

- Intersection #6. Peñasquitos Drive/ Cuca Street/ Hotel Karlan Driveway – LOS E during the AM peak hour
- Intersection #11. Rancho Peñasquitos Boulevard / SR 56 EB Ramps – LOS E during the PM peak hour

The LOS E for Intersection #6. Peñasquitos Drive/ Cuca Street/ Hotel Karlan Driveway is the stop-controlled left-turn movement from the Hotel Karlan driveway onto Peñasquitos Drive (14 peak hour trips). The intersection as a whole is operating at an overall LOS A.

Appendix H contains the peak hour intersection analysis worksheets for the Near-Term (Opening Year 2020) condition.

10.1.2 *Segment Operations*

Table 10–2 summarizes the key segment operations in the study area for the Near-Term (Opening Year 2020) condition. As seen in *Table 10–2*, with the addition of cumulative projects traffic, all study area segments are calculated to operate at LOS C or better.

10.2 Near-Term (Opening Year 2020) + Project

10.2.1 *Intersection Analysis*

Table 10–1 summarizes the peak hour intersection operations for Near-Term (Opening Year 2020) + Project conditions. As seen in *Table 10–1*, with the addition of cumulative projects and Project traffic all intersections are calculated to continue to operate at acceptable LOS D or better except for the following:

- **Intersection #6. Peñasquitos Drive / Cuca Street / Hotel Karlan Driveway – LOS F during the AM peak hour**

- **<u>Intersection #7. Peñasquitos Drive / Janal Way / Project Access – LOS E during the AM peak hour</u>**
- Intersection #11. Rancho Peñasquitos Boulevard / SR 56 EB Ramps – LOS E during the PM peak hour

The Project-related increase in delay to the worst critical movement at the two intersections shown bolded and underlined above exceeds the allowable threshold. Therefore, **<u>two (2) significant direct</u>** impacts are calculated at this location. The Project-related increase in delay at Intersection #11 is less than the allowable 2.0 seconds for an LOS E-operating intersection.

Appendix I contains the peak hour intersection analysis worksheets for the Near-Term (Opening Year 2020) + Project condition.

10.2.2 *Segment Operations*

Table 10–2 summarizes the key segment operations in the study area for the Near-Term (Opening Year 2020) + Project conditions. As seen in *Table 10–2*, with the addition of cumulative projects and Project traffic, all study area segments are calculated to continue to operate at LOS C or better.

Based on City of San Diego significance criteria, **<u>no significant direct impacts</u>** were calculated with the addition of Project traffic.

TABLE 10–1
NEAR-TERM INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Near-Term (Opening Year 2020)		Near-Term (Opening Year 2020) + Project			
			Delay [a]	LOS [b]	Delay	LOS	Delay Δ [c]	Sig?
1. Carmel Mountain Rd / Rancho Carmel Dr	Signal	AM	46.6	D	47.2	D	0.6	No
		PM	45.1	D	46.4	D	1.3	
2. Carmel Mountain Rd / I-15 NB Ramps	Signal	AM	31.4	C	31.4	C	0.0	No
		PM	46.4	D	48.7	D	2.3	
3. Carmel Mountain Rd / I-15 SB Ramps	Signal	AM	25.8	C	26.1	C	0.3	No
		PM	34.8	C	35.0	C	0.2	
4. Carmel Mountain Rd / Project Right-In Only Access [e]	DNE/ Uncontrolled	AM	—	—	—	—	—	No
		PM	—	—	—	—	—	
5. Carmel Mountain Rd / Peñasquitos Dr	Signal	AM	20.6	C	21.1	C	0.5	No
		PM	23.4	C	25.6	C	2.2	
6. Peñasquitos Dr / Cuca St/ Hotel Karlan Dwy	*MSSC* [d]	AM	44.1	E	**52.3**	**F**	**8.2**	**Yes**
		PM	24.3	C	27.0	D	2.7	
7. Peñasquitos Dr / Janal Way/ Project Access [f]	*MSSC* [d]	AM	17.5	C	**49.8**	**E**	**32.3**	**Yes**
		PM	12.0	B	32.7	D	20.7	
8. Carmel Mountain Rd / Cuca St	Signal	AM	13.7	B	13.8	B	0.1	No
		PM	12.4	B	12.4	B	0.0	
9. Carmel Mountain Rd / Paseo Cardiel	Signal	AM	15.0	B	15.2	B	0.2	No
		PM	17.9	B	18.3	B	0.4	
10. Rancho Peñasquitos Blvd/ Carmel Mountain Road / SR 56 WB Ramps	Signal	AM	53.4	D	53.6	D	0.2	No
		PM	48.0	D	48.0	D	0.0	
11. Rancho Peñasquitos Blvd / SR 56 EB Ramps	Signal	AM	39.3	D	39.4	D	0.1	No
		PM	65.8	E	66.3	E	0.5	

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Δ denotes the increase in delay (in seconds) due to Project.
d. MSSC = Minor Street Stop-Controlled intersection. Worst critical movement delay reported.
e. No delay is reported at this intersection as the only turn movement is a free right-turn into the site.
f. With the completion of the fourth leg of this intersection to serve as the Project access, the critical movement becomes the westbound left-turn.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

General Notes:

1. Sig = Significant impact, yes or no.
2. **Bold** typeface and shading represents a significant direct impact.
3. DNE = Does not exist.

TABLE 10–2
NEAR-TERM STREET SEGMENT OPERATIONS

Street Segment	Existing Capacity (LOS E)[a]	Near-Term (Opening Year 2020)			Near-Term (Opening Year 2020) + Project				
		ADT [b]	LOS [c]	V/C [d]	ADT	LOS	V/C	Δ [e]	Sig?
Carmel Mountain Road									
1. Stoney Peak Drive to Rancho Carmel Drive	60,000	32,888	B	0.548	33,268	B	0.554	0.006	No
2. Rancho Carmel Dr to I-15 NB Ramps	60,000	46,435	C	0.774	47,069	C	0.784	0.010	No
3. I-15 SB Ramps to Right-In Only Project Access [f]	45,000	26,640	C	0.592	28,224	C	0.627	0.035	No
4. Right-In Only Project Access to Peñasquitos Drive [f]	45,000	26,640	C	0.592	27,432	C	0.610	0.018	No
5. Peñasquitos Drive to Cuca Street	40,000	14,223	A	0.356	14,645	A	0.366	0.010	No
6. Cuca Street to Paseo Cardiel	40,000	14,406	A	0.360	14,892	A	0.372	0.012	No
7. Paseo Cardiel to Rancho Peñasquitos Boulevard/ SR 56 WB Ramps	40,000	17,439	B	0.436	17,819	B	0.445	0.009	No
Peñasquitos Drive [g]									
8. Carmel Mountain Road to Cuca Street	30,000	14,549	C	0.485	15,816	C	0.527	0.042	No
9. Cuca Street to Janal Way	22,500	11,438	C	0.508	12,769	C	0.568	0.060	No

Footnotes:

a. Capacities based on City of San Diego Roadway Classification & LOS table (See *Appendix D*).
b. Average Daily Traffic.
c. Level of Service.
d. Volume to Capacity ratio.
e. Δ denotes a Project-induced increase in the Volume to Capacity ratio.
f. Carmel Mountain Road from I-15 SB to Peñasquitos Drive currently provides three lanes in the NB direction and two lanes SB for an increased capacity of 45,000 ADT.
g. Per the Rancho Peñasquitos PFFP, Peñasquitos Drive has been improved to modified 4-lane collector and modified 4-lane major standards capable of accommodating the forecasted buildout traffic volumes per the Community Plan. Therefore, the capacities used are consistent with those improvements.

General Notes:

1. Sig = Significant impact, yes or no.
2. **Bold** typeface and shading represents a significant direct impact.

11.0 HORIZON YEAR 2050 CONDITIONS

Given that the project requires a Community Plan Amendment, the City requires the horizon year analysis of Community Plan Buildout Year 2050 conditions. The following summarizes the assumptions and methods used to assess Year 2050 street system conditions and traffic volumes.

11.1 Horizon Year 2050 Network Conditions

The Year 2050 street network in the SANDAG Series 12 forecast model includes SR 56 as four-lane facility (two eastbound, two westbound lanes) in the immediate vicinity of the Project and Carmel Mountain Road at its current configuration. Specifics on these two network components are mentioned below:

- Carmel Mountain Road from I-15 to Peñasquitos Drive is classified as a six-lane Major roadway in the Rancho Peñasquitos Community Plan. In the *Rancho Peñasquitos Public Facilities Financing Plan*, Project No. T-12 indicates that funding for this improvement is currently unidentified.

The time frame for implementation and funding source for the network changes listed above are currently unknown. Therefore, no street segment or intersection improvements over existing on-the-ground conditions were assumed in the Year 2050 analyses of study area intersections and streets segments included in this report.

Table 11–1 provides a summary of the Community Plan Roadway Classifications and capacities assumed in the analysis.

TABLE 11–1
COMMUNITY PLAN ROADWAY CLASSIFICATIONS

Street Segment	Current Configuration [c] (Assumed in Year 2050 Analysis)	Community Plan Classification [a]
Carmel Mountain Road		
1. Stoney Peak Drive to Rancho Carmel Drive	6-Ln Primary Arterial	6-Ln Primary Arterial
2. Rancho Carmel Dr to I-15 NB Ramps	6-Ln Primary Arterial	6-Ln Primary Arterial
3. I-15 SB Ramps to Peñasquitos Drive	**5-Ln Major Road**	6-Ln Major Road
4. Peñasquitos Drive to Cuca Street	4-Ln Major Road	4-Ln Major Road
5. Cuca Street to Paseo Cardiel	4-Ln Major Road	4-Ln Major Road
6. Paseo Cardiel to Rancho Peñasquitos Boulevard/ SR 56 WB Ramps	4-Ln Major Road	4-Ln Major Road
Peñasquitos Drive [b]		
7. Carmel Mountain Road to Cuca Street	**4-Ln Major Road (Modified)**	4-Ln Major Road
8. Cuca Street to Janal Way	**4-Ln Collector (Modified)**	4-Ln Collector

Footnotes:

a. City of San Diego General Plan Classification based on *Rancho Peñasquitos Community Plan.*
b. Per the Rancho Peñasquitos PFFP, Peñasquitos Drive has been improved to Four-Lane Collector and Modified Four-Lane Major Road standards capable of accommodating the forecasted buildout traffic volumes per the Community Plan. Therefore, increased capacities consistent with those improvements have been applied in the analysis.
c. The baseline traffic analysis in this report utilized the current network configurations in the Year 2050 analysis.

11.2 Horizon Year 2050 Traffic Volumes

The Year 2050 volumes were obtained from the SANDAG Series 12 Year 2050 forecast traffic model to forecast the roadway segment baseline traffic volumes representing the Year 2050 Without Project conditions.

In accordance with the City's preferred methodology for forecasting Year 2050 volumes, LLG compared the Series 12 Year 2008 (base year) volumes to the Series 12 Year 2050 forecast volumes on study area roadway segments and calculated the annual growth rate of the 42-year period for the major road through the study area, Carmel Mountain Road. This growth rate was applied to the Existing (Year 2018) traffic volumes used in this study for a period of 32 years to arrive at Year 2050 without Project traffic volumes.

The peak hour turning movement volumes at an intersection were estimated from future ADT volumes using the relationship between existing peak hour turning movements and the existing ADT volumes. This same relationship can be assumed to generally continue in the future.

The net increase in traffic with the proposed Project was then added to the baseline Year 2050 traffic volumes to arrive at Year 2050 With Project conditions.

Figure 11–1 depicts the Horizon Year 2050 Without Project traffic volumes. ***Figure 11–2*** depicts the Horizon Year 2050 With Project traffic volumes.

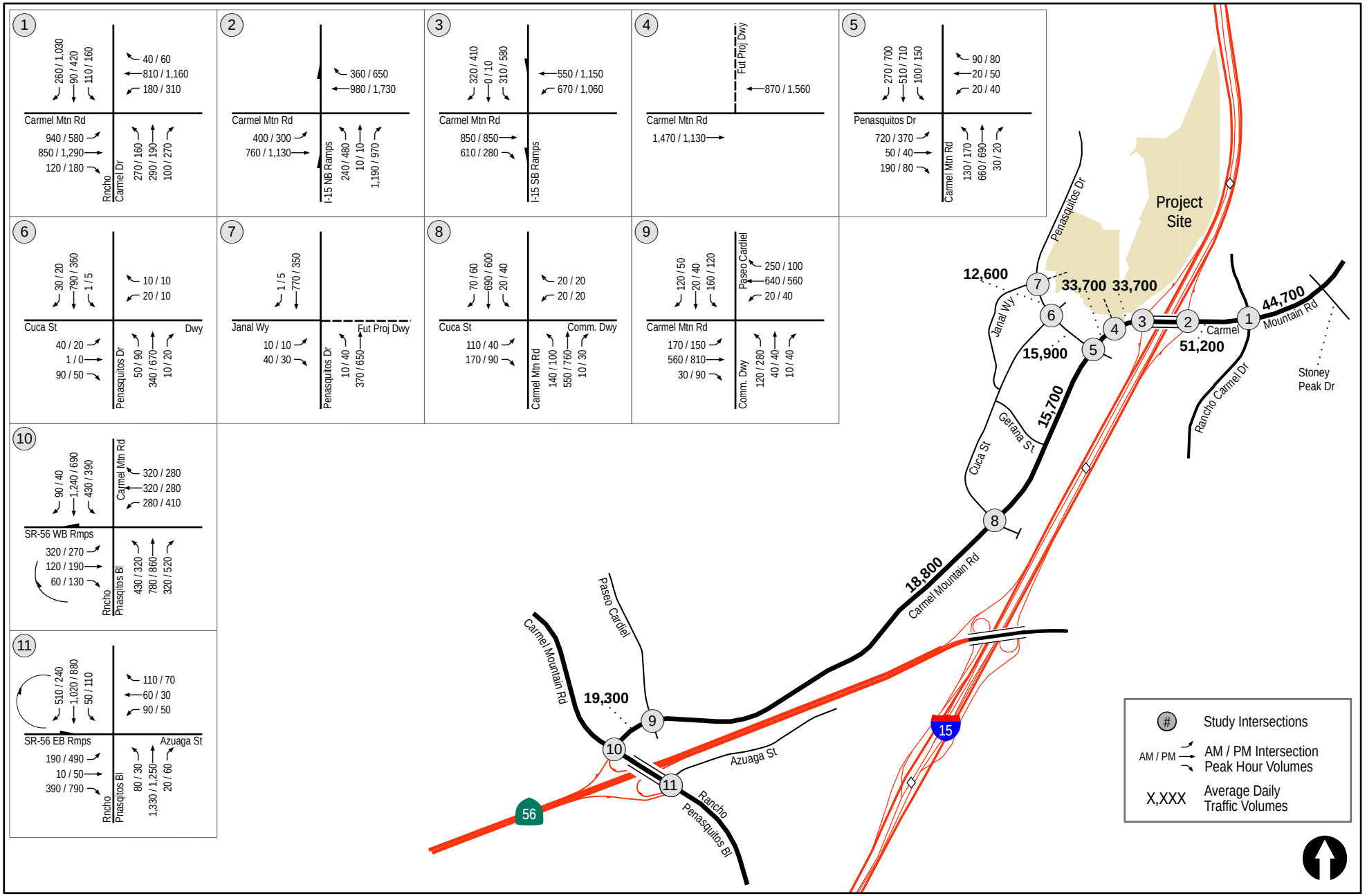

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Figure 11-1

Horizon Year 2050 Without Project Traffic Volumes

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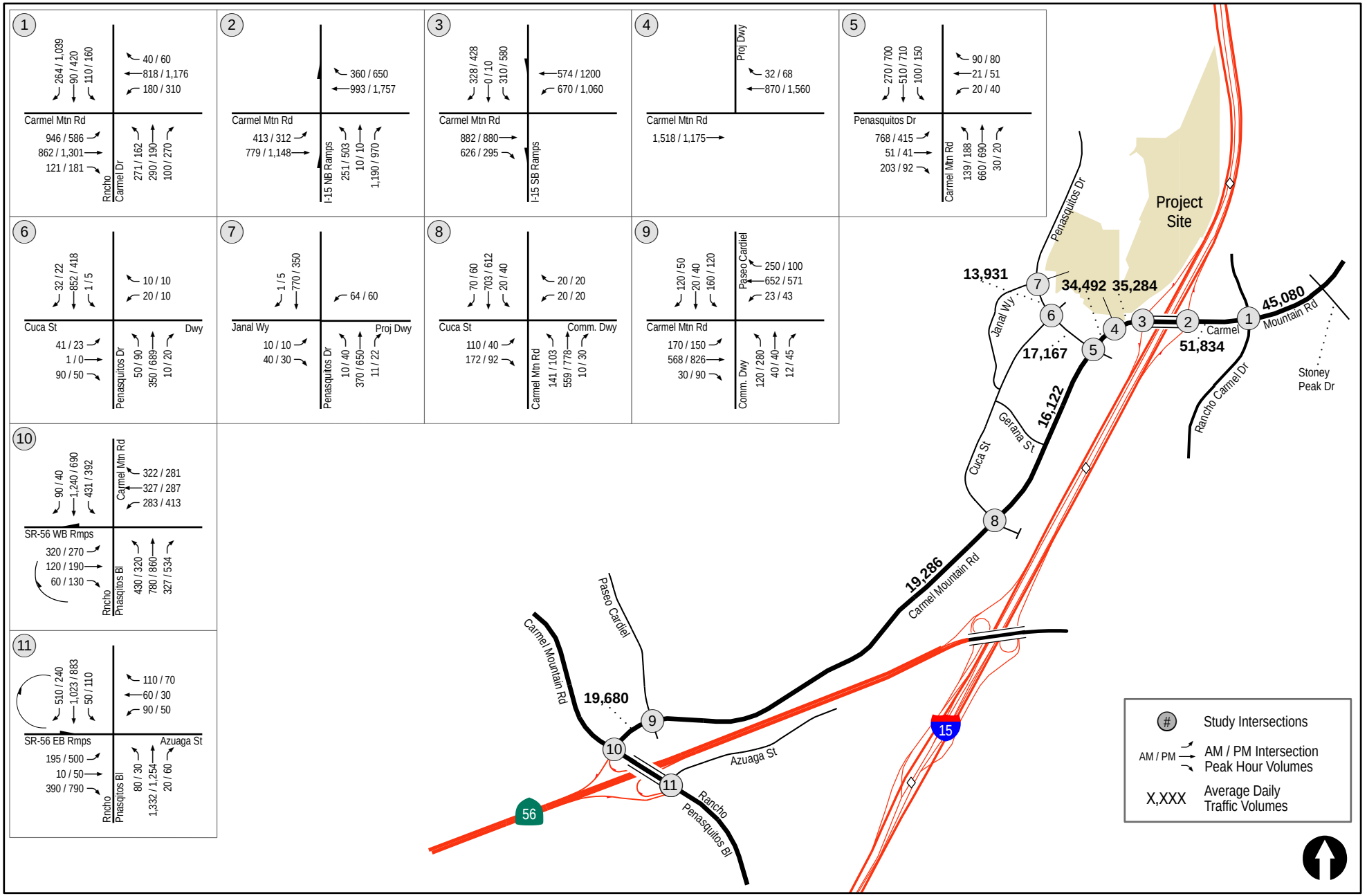

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Figure 11-2

Horizon Year 2050 With Project Traffic Volumes

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12.0 ANALYSIS OF HORIZON YEAR 2050 SCENARIOS

The following section presents the analysis of study area locations under Horizon Year 2050 conditions for two scenarios. The Horizon Year 2050 without project assumes the network conditions presented in Section 11.1 and without the project. The Horizon Year 2050 with project condition evaluates the effect of Project traffic on the street network and includes only the network changes proposed to provide access to the Project (fourth leg of Penasquitos Drive / Janal Way intersection and the right-turn-in only access and frontage improvements on Carmel Mountain Road). Mitigation measures for near-term impacts previously identified are not assumed.

12.1 Horizon Year 2050 Without Project

12.1.1 *Intersection Analysis*

Table 12–1 summarizes the peak hour intersection operations for the Horizon Year 2050 without Project condition. As seen in *Table 12–1*, all intersections are calculated to continue to operate at LOS D or better except for the following:

- Intersection #1. Carmel Mountain Road/ Rancho Carmel Drive – LOS E during the AM/PM peak hours
- Intersection #6. Peñasquitos Drive/ Cuca Street/ Hotel Karlan Driveway – LOS F during the AM peak hour
- Intersection #10. Rancho Peñasquitos Boulevard/Carmel Mountain Road / SR 56 WB Ramps – LOS E during the AM peak hour
- Intersection #11. Rancho Peñasquitos Boulevard / SR 56 EB Ramps – LOS E/F during the AM/PM peak hours

Appendix J contains the peak hour intersection analysis worksheets for the Horizon Year 2050 Without Project condition.

12.1.2 *Segment Operations*

Table 12–2 summarizes the key segment operations in the study area for the Horizon Year 2050 without Project condition. As seen in *Table 12–2*, all study area segments are calculated to operate at LOS D or better.

12.2 Horizon Year 2050 With Project

12.2.1 *Intersection Analysis*

Table 12–1 summarizes the peak hour intersection operations for the Horizon Year 2050 With Project condition. As seen in *Table 12–1*, with the addition of Project traffic all intersections are calculated to continue to operate at LOS D or better except for the following:

- Intersection #1. Carmel Mountain Road/ Rancho Carmel Drive – LOS E during the AM/PM peak hours
- **Intersection #6. Peñasquitos Drive / Cuca Street / Hotel Karlan Driveway – LOS F during the AM peak hour**

- **<u>Intersection #7. Peñasquitos Drive / Janal Way / Project Access – LOS F/E during the AM/PM peak hours</u>**
- Intersection #10. Rancho Peñasquitos Boulevard/Carmel Mountain Road / SR 56 WB Ramps – LOS E during the AM peak hour
- Intersection #11. Rancho Peñasquitos Boulevard / SR 56 EB Ramps – LOS E/F during the AM/PM peak hours

For the intersections shown **bolded** and <u>underlined</u> above the Project-related increase in delay to the worst critical movement exceeds the allowable thresholds. Therefore, **<u>two (2) significant cumulative impacts</u>** are calculated at these locations. For the remaining intersections, the Project-related increase in delay is less than the allowable threshold of 2.0 seconds for an LOS E-operating intersection and 1.0 seconds for an LOS F-operating intersection.

Appendix K contains the peak hour intersection analysis worksheets for the Horizon Year 2050 with Project condition.

12.2.2 *Segment Operations*

Table 12–2 summarizes the key segment operations in the study area for the Horizon Year 2050 With Project condition. As seen in *Table 12–2,* all study area segments are calculated to operate at LOS C or better:

Based on City of San Diego significance criteria, **<u>no significant cumulative impacts</u>** were calculated with the addition of Project traffic.

TABLE 12–1
HORIZON YEAR 2050 INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Horizon Year 2050 Without Project		Horizon Year 2050 With Project			
			Delay [a]	LOS [b]	Delay	LOS	Delay Δ [c]	Sig?
1. Carmel Mountain Rd / Rancho Carmel Dr	Signal	AM	58.1	E	58.8	E	0.7	No
		PM	69.7	E	71.4	E	1.7	
2. Carmel Mountain Rd / I-15 NB Ramps	Signal	AM	40.2	D	40.9	D	0.7	No
		PM	51.5	D	53.4	D	1.9	
3. Carmel Mountain Rd / I-15 SB Ramps	Signal	AM	33.9	C	35.3	D	1.4	No
		PM	31.6	C	32.7	C	1.1	
4. Carmel Mountain Rd / Project Right-In Only Access [e]	DNE/ Uncontrolled	AM	—	—	—	—	—	No
		PM	—	—	—	—	—	
5. Carmel Mountain Rd / Peñasquitos Dr	Signal	AM	24.3	C	25.5	C	1.2	No
		PM	26.2	C	28.3	C	2.1	
6. Peñasquitos Dr / Cuca St/ Hotel Karlan Dwy	MSSC [d]	AM	51.0	F	**67.0**	**F**	**16.0**	**Yes**
		PM	27.3	D	30.5	D	3.2	
7. Peñasquitos Dr / Janal Way/ Project Access [f]	MSSC [d]	AM	21.1	C	**66.9**	**F**	**45.8**	**Yes**
		PM	15.5	C	**42.2**	**E**	**26.7**	
8. Carmel Mountain Rd / Cuca St	Signal	AM	16.0	B	16.1	B	0.1	No
		PM	13.1	B	13.1	B	0.0	
9. Carmel Mountain Rd / Paseo Cardiel	Signal	AM	20.8	C	21.1	C	0.3	No
		PM	21.6	C	22.1	C	0.5	
10. Rancho Peñasquitos Blvd/ Carmel Mountain Road / SR 56 WB Ramps	Signal	AM	74.2	E	74.2	E	0.0	No
		PM	50.8	D	50.9	D	0.1	
11. Rancho Peñasquitos Blvd / SR 56 EB Ramps	Signal	AM	55.5	E	55.7	E	0.2	No
		PM	102.6	F	103.4	F	0.8	

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Δ denotes the increase in delay (in seconds) due to Project.
d. MSSC = Minor Street Stop-Controlled intersection. Worst critical movement delay reported.
e. No delay is reported at this intersection as the only turn movement is a free right-turn into the site.
f. With the completion of the fourth leg of this intersection to serve as the Project access, the critical movement becomes the westbound left-turn.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 ≤ 10.0	A	0.0 ≤ 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
≥ 80.1	F	≥ 50.1	F

General Notes:

1. Sig = Significant impact, yes or no.
2. **Bold** typeface and shading represents a significant cumulative impact.
3. DNE = Does not exist.

TABLE 12–2
HORIZON YEAR 2050 STREET SEGMENT OPERATIONS

Street Segment	Existing Capacity (LOS E)[a]	Horizon Year 2050 Without Project			Horizon Year 2050 With Project				
		ADT [b]	LOS [c]	V/C [d]	ADT	LOS	V/C	Δ [e]	Sig?
Carmel Mountain Road									
1. Stoney Peak Drive to Rancho Carmel Drive	60,000	44,700	C	0.745	45,080	C	0.751	0.006	No
2. Rancho Carmel Dr to I-15 NB Ramps	60,000	51,200	D	0.853	51,834	D	0.864	0.011	No
3. I-15 SB Ramps to Right-In Only Project Access [f]	45,000	33,700	C	0.749	35,284	D	0.784	0.035	No
4. Right-In Only Project Access to Peñasquitos Drive [f]	45,000	33,700	C	0.749	34,492	C	0.766	0.017	No
5. Peñasquitos Drive to Cuca Street	40,000	15,700	B	0.393	16,122	B	0.403	0.010	No
6. Cuca Street to Paseo Cardiel	40,000	18,800	B	0.470	19,286	B	0.482	0.012	No
7. Paseo Cardiel to Rancho Peñasquitos Boulevard/ SR 56 WB Ramps	40,000	19,300	B	0.483	19,680	B	0.492	0.009	No
Peñasquitos Drive [g]									
8. Carmel Mountain Road to Cuca Street	30,000	15,900	C	0.530	17,167	C	0.572	0.042	No
9. Cuca Street to Janal Way	22,500	12,600	C	0.560	13,931	C	0.619	0.059	No

Footnotes:

a. Capacities based on City of San Diego Roadway Classification & LOS table (See *Appendix C*).
b. Average Daily Traffic.
c. Level of Service.
d. Volume to Capacity ratio.
e. Δ denotes a Project-induced increase in the Volume to Capacity ratio.
f. Carmel Mountain Road from I-15 SB to Peñasquitos Drive currently provides three lanes in the NB direction and two lanes SB for an increased capacity of 45,000 ADT.
g. Per the Rancho Peñasquitos PFFP, Peñasquitos Drive has been improved to Four-Lane Collector and Modified Four-Lane Major Road standards capable of accommodating the forecasted buildout traffic volumes per the Community Plan. Therefore, the capacities used are consistent with those improvements.

General Notes:

1. Sig = Significant impact, yes or no.
2. **Bold** typeface and shading represents a significant direct impact.

13.0 OTHER TRANSPORTATION MODES

13.1 Pedestrians & Bicycles

Pedestrian circulation routes have been provided throughout the site to create enhanced pedestrian circulation and connectivity both within the site and to the surrounding streets. The Project proposes a publicly accessible "Social Loop" that covers a 2.75-mile route through the site. The Social Loop is proposed as a multi-use trail within and around The Junipers for use by the neighboring community and residents of The Junipers. The Social Loop and additional designated recreation and green space areas will be ungated and publicly accessible to the existing community residents. It will connect to existing public sidewalks on Carmel Mountain Road and Peñasquitos Drive. ***Figure 13–1*** illustrates the pedestrian connectivity provided by the Social Loop concept.

Public access to the Social Loop trail will be provided for via a recreation easement. Pedestrian paths along Private Drive "A" and Private Drive "V" will also provide public pedestrian access easements to allow public pedestrian access to the Social Loop trail.

Private Drive "A" and Private Drive "V" will also provide public access via a public access easement for bicycles and westbound traffic between Carmel Mountain Road and Peñasquitos Drive. Eastbound vehicular traffic on Private Drive "V" will be limited to emergency vehicle access and will be controlled by an emergency vehicle access gate at the intersection of Private Drive "V" and Private Drive "B".

Class II bike lanes will be provided throughout much of the project, connecting to existing Class II bike lanes on Carmel Mountain Road and Peñasquitos Drive. Specifically, bike lanes will be provided on private drives "A", "B", "C", "O", and "V". *Figure 13-1* illustrates the on-site and local bicycle connectivity. *Figures 3–2 and 3–3* show bicycle connectivity at a larger regional and expanded local level.

In addition, the new access to Carmel Mountain Road will reduce the distance pedestrians would need to travel to reach the transit stops along Carmel Mountain Road, particularly the stop at the Peñasquitos Drive/ Carmel Mountain Road intersection.

In the Project vicinity, Carmel Mountain Road is classified as a Six-Lane Major and Four-Lane Major Road in the *Rancho Peñasquitos Community Plan*. This classification provides for a Class II bike lane. Carmel Mountain Road currently provides Class II bike lanes in both directions, with the exception of a gap north of Cuca Street for approximately $^1/_3$ mile. Peñasquitos Drive also provides Class II bike lanes within the Project vicinity. Residents of The Junipers will have direct access to these bike lanes via both Project access points.

13.2 Transit

As mentioned earlier in *Section 3.3* of this report, existing transit service is provided by MTS Route 20. The nearest stop to the Project site is located at Carmel Mountain Road / Peñasquitos Drive, less than ¼ mile walking distance from the project's access to Carmel Mountain Road. The bus stops for each direction of travel are shown on *Figure 13–1*.

Route 20 travels between the Rancho Bernardo Transit Station and Downtown San Diego. Monday through Friday it travels with 15-minute frequencies in the morning and 15 to 30-minute frequencies in the evening, between 4:55 AM and 11:26 PM. On Saturdays, it travels between 5:07 AM and 9:17 PM with 30-minute frequencies. Sundays it travels between 6:07 AM and 8:36 PM with hour long frequencies. As noted earlier, *Appendix B* contains the MTS route schedule

.

Pedestrian and Bicycle Connectivity Legend

Symbol	Width, Type	Material	Ownership	Maintenance	Publicly Accessible	Standard Guideline
	6' Social Loop Trail	Stabilized D.G.*	H.O.A.	H.O.A.	Yes	San Diego Consultants Guide, Appendix K**
	10' Social Loop Trail	Stabilized D.G.*	H.O.A.	H.O.A.	Yes	
	12' Social Loop Trail	Stabilized D.G.*	H.O.A.	H.O.A.	Yes	
	10' Pedestrian Way	Concrete	H.O.A.	H.O.A.	Yes	San Diego Street Design Manual, Section 1.8
	10' Pedestrian Way	Stabilized D.G.*	H.O.A.	H.O.A.	No	
	6' Sidewalk	Concrete	H.O.A.	H.O.A.	Yes	San Diego Standard Drawing SDG - 155
	6' Pathway	Stabilized D.G.*	H.O.A.	H.O.A.	No	San Diego Consultants Guide, Appendix K**
	4' Sidewalk	Concrete	H.O.A.	H.O.A.	No	San Diego Standard Drawing SDG - 155
	5' Sidewalk	Concrete	H.O.A.	H.O.A.	No	San Diego Standard Drawing SDG - 155
	4.5' Sidewalk (Existing Offsite)	Concrete	City of San Diego	City of San Diego	Yes	N/A
	Class 2 Bike Lane	Asphalt	H.O.A.	H.O.A.	Yes	San Diego Bicycle Master Plan, Fig. 3.2
	Class 2 Bike Lane	Asphalt	H.O.A.	H.O.A.	No	San Diego Bicycle Master Plan, Fig. 3.2
	Class 2 Bike Lane (Existing Offsite)	Asphalt	City of San Diego	City of San Diego	Yes	N/A

Notes: 1) See sheet C23 for additional easement information.

*Stabilized DG is an ADA accessible, all-weather surface. Stabilized DG is compacted to 95% compaction and stabilized with a binding polymer to create a firm and stable surface.

**Trail Standards: Loop Trail and associated seating, interpretive education, fitness stations, and scenic overlooks in conformance with the City of San Diego General Plan and Trail Policies and Standards (Appendix K) in the Consultants Guide to Park Design and Development. Trail width to be predominantly 6ft. wide with widths up to 12ft. in some areas.

Transit Connectivity Legend

Symbol	Type
	Bus Route (B) - (Existing Offsite)
	Rapid Bus Route (BRT) - (Existing Offsite)
	Bus Stop - (Existing Offsite)
P	Park and Ride Station - (Existing Offsite)

Source: Schmidt Design Group, November 2019

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Date: 11/07/19

Figure 13-1

Site Connectivity Map

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14.0 PARKING ASSESSMENT

The Project provides several types of housing options; 2 bedroom homes, 3+ bedroom homes, and affordable apartments. Each of these has a different parking rate per the San Diego Municipal Code. The Project is proposing to comply with these regulations. The Project proposes a Common Area Parking standard reduction to 15% of the total off-street spaces. This is not a deviation, but rather is consistent with the discretionary authority of the City per the LDC Section 14.0525(c)(1)(A).

Pursuant to San Diego Municipal Code section 142.0525(c)(1)(A) common area parking required for multiple dwelling unit development that is being processed in conjunction with a Planned Development Permit and located within specified communities, including Rancho Peñasquitos. Part "c" notes that "the following standards will be applied by the decision maker to determine the number of common area parking spaces to require as a condition of approval." The section defines the standards as follows:

> (1) The number of common area parking spaces that may be required is 20 percent of the total off-street parking spaces required. This requirement may, however, be increased or decreased based on consideration by the decision maker of the following:
>
> A. For large developments, generally in **excess of 200 dwelling units**, the number of common area parking may be decreased to no less than **15 percent** of the total off-street parking spaces required.

The Project would include a total of 455 market-rate age qualified dwelling units and is therefore eligible for the 15% common area parking supply per part (c)(1)(A) (instead of 20%). In addition, the proposed Project is a 55+ senior community. Senior communities typically demand fewer guest spaces and fewer parking spaces overall. The project is also constructing affordable housing on-site consistent with the City's inclusionary housing ordinance instead of paying the in-lieu fee, which also has a typically lower parking demand as compared to market rate housing. Finally, the Project is proximate to existing transit service, plans to provide pedestrian and bicycle connections to existing facilities, and will provide a mobility zone and bike hub to encourage shared rides and alternate forms of transportation. These Project characteristics all support a reduced parking requirement under part (c)(1)(A).

In consideration of the above, a reduction in the common area parking requirement to 15% of the total off-street spaces (instead of 20%) is supported by staff due to the age-restricted (55+) nature of the Project. The Project plans to provide parking as follows.

Table 14–1 summarizes the Project parking calculations as proposed for both the for-sale and affordable components, which are discussed in further detail in the following sections.

TABLE 14–1
PARKING SUMMARY

Land Use	Quantity	Parking Rate	Minimum Required Parking Spaces	Provided Parking Spaces
Market Rate Units				
3-4 bedroom	393	2.25/ unit [a]	884	884 [d]
2 bedroom	62	2.00/ unit [a]	124	124 [e]
Subtotal	**455**	**—**	**1,008**	**1,008**
Common Area Multiplier	—	15% [b]	152	152
Subtotal	**—**	**—**	**1,160**	**1,160**
Affordable [c]				
1-bedroom	65	0.75/unit	49	49
2-bedroom	16	1.0/unit	16	16
Visitor	81	0.15/unit	12	12
Staff		0.05/unit	4	4
Subtotal	81	—	81	81
Total	***536***		***1,241***	***1,241***

Footnotes:

a. SDMC Table 142-05C
b. SDMC Section 142.0525 (c)(1)(A)
c. SDMC Table 142-05D
d. Includes 786 garage spaces and 98 common area spaces.
e. In garages.

14.1 For-sale Components Parking

As noted above, pursuant to the City's parking requirements using the 15% common area parking multiplier provided for by City code, the project should provide 1,160 vehicle parking spaces for the 455 for-sale units. All for-sale units would include two garage spaces per unit, for a total of 910 garage spaces as well as 250 spaces for the common areas. Hence, the required 124 spaces for the 2 bedroom units would be provided entirely in garages. Of the 884 spaces required for the 3-4 bedroom units, 786 would be provided in garage and the 98 in common areas. The remaining balance of 152 common area spaces satisfies the required 15% common area parking multiplier. The 250 common area spaces include 231 parallel spaces, 12 standard spaces, and 7 accessible spaces. Additionally, 46 motorcycle spaces are required and 46 are provided.

The Project would place 18 fully active and usable EV charging stations throughout the for-sale portion of the proposed development (approximately 50 percent of the 37 total spaces), as required by code. In addition 36 of the 455 residential garages would be EV ready. The remaining garages

would all be pre-wired to accommodate future EV setup and to provide maximum flexibility regarding the type of EV eventually installed.

Residential bicycle parking would be accommodated within the garage spaces; additionally bicycle racks would be located adjacent to the public park areas, along the private park in the northern portion of the project, and at the private pool and spa area.

14.2 Affordable For-rent Component Parking

For-rent component parking would be in a surface lot with some parking stalls located within carports. The roof of the carports would support photovoltaic panels. A total of 81 spaces will be provided, which would satisfy the minimum parking requirement for the affordable units. Such parking would conform to automobile spaces required per residential unit under the "housing for senior citizens" parking ratio referenced on Table 142-05D of the SDMC Chapter 14, Article 2, Division 5. 36 bicycle parking spaces in bike racks will be provided for the affordable residential units.

15.0 ACCESS ASSESSMENT

15.1 Site Access

Vehicular access is proposed via two locations: 1) Full access at the Peñasquitos Drive/ Janal Way intersection and 2) A right-turn in only driveway on Carmel Mountain Road, northeast of Peñasquitos Drive.

Peñasquitos Drive/ Janal Way/ Project Access (Intersection #7) would serve as the only egress point for residents of the proposed Project. It is expected to serve about 25% of the ingress trips. A roundabout is proposed at this intersection to mitigate the Project's significant impact. With implementation of the proposed roundabout as mitigation, this intersection will operate at LOS B during peak hours (see *Section 17.2*).

At Peñasquitos Drive, Private Drive "A" will be the fourth leg of the roundabout. It is proposed to be a new roadway 48 feet curb-to-curb consisting of two 12 foot travel lanes, buffered bike lanes and an eight foot raised median. Decomposed granite paths are proposed on both sides of the private drive separated from the travel way by a 6.5 foot landscaped buffer.

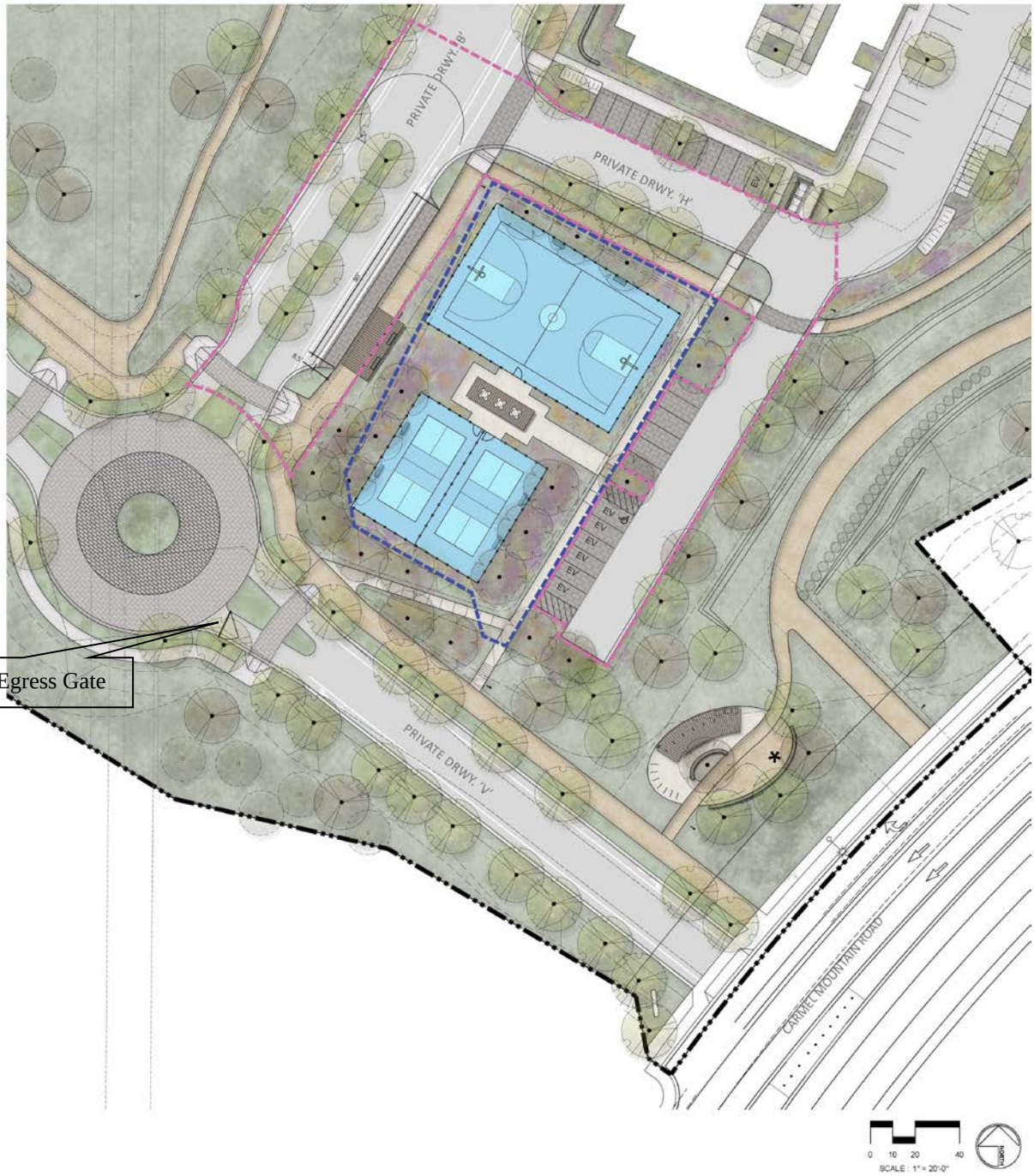
Carmel Mountain Road/ Project Right-In Only Access (Intersection #4) would serve as the primary ingress point for residents given its close proximity to I-15 and the majority of trips are destined to/from the east (75%). The purpose of this 25 foot wide driveway is to capture the majority of the trips from the east and to minimize additional Project trips on Peñasquitos Drive. In order to separate the 28 AM/59 PM inbound Project trips from the through flow of traffic on Carmel Mountain Road, a dedicated right-turn lane is required.

Driveway Function - Private Driveway "V", is designed to allow inbound only movements from Carmel Mountain Road. The right-turn lane and deceleration lane on Carmel Mountain Road that the Project will construct would allow a refuge for turning vehicles to exit the main flow of traffic, thus reducing the conflict between through vehicles and slowing vehicles turning into the Project's driveway. Class II bike lanes will be provided on both sides of the driveway. A depiction of this configuration is shown on the following page.

Regarding use of this driveway for emergency evacuation, a radio-controlled gate will be placed at the first internal intersection (a roundabout) within the driveway to allow for emergency egress under Police/Fire control only, but prohibit regular usage. It would be a 13-foot wide single-arm swing gate and operated by Opticom and/or Knox key switch to San Diego Fire and Rescue code requirements. To allow egressing vehicles to head east on Carmel Mountain Road toward I-15 during emergency evacuations the Project proposes to construct a mountable median with rolled curb and bollards to allow emergency egress. The ability to access eastbound lanes directly from this point on Carmel Mountain Road is considered a benefit over the current single access point from Peñasquitos Drive onto Carmel Mountain Road.

- The mountable median would allow for emergency access into the project from Carmel Mountain Road by emergency personnel (both fire and police) in case of emergency without detour along Peñasquitos Drive.

- Direct egress from the project onto Carmel Mountain Road would allow greater flexibility for law enforcement to direct vehicles exiting the Glens neighborhood (as well as project residents).



Deceleration Lane – A deceleration lane is required. According to City records, the 85th percentile speed on Carmel Mountain Road is 47 MPH. Using a design speed of 50 MPH, the deceleration lane would be 435 feet. However, the Caltrans Highway Design Manual (HDM) 2018 allows for 10 to 20 MPH of deceleration in the through lane. Using a 10 MPH speed reduction from 50 to 40 MPH design speed, a deceleration lane length of 315 feet is recommended and within HDM standards. At a minimum, the HDM recommends that space for two vehicles should be provided for queue storage (50 feet total). However, given this is a right-turn lane with no conflicting traffic movements and no traffic control device, there is no need for storage. Therefore, it is recommended that the 50-foot storage pocket be included in the 315 foot deceleration lane.

Therefore, it is suggested that the Project be served by a 315-foot-long right-turn lane plus a 90-foot bay taper. This will require widening within Caltrans' right-of-way.

15.2 Frontage Improvements

Carmel Mountain Road is classified as a 6-Lane Major in the Community Plan from I-15 to Peñasquitos Drive. FBA Project T-12 shows that there is an unfunded improvement to provide the third westbound lane from the I-15 southbound ramps to Peñasquitos Drive. The southeast side of Carmel Mountain Road has been previously widened by the Peñasquitos Village shopping center development to provide the third eastbound lane from Peñasquitos Drive to I-15. The project will construct half-width widening accordingly within its frontage, plus off-site widening to the east to provide additional deceleration length for the right-turn lane serving the project driveway.

If and when FBA Project T-12 to widen Carmel Mountain Road to 6 lanes is completed, the right-turn lane constructed by the project would be converted to the number 3 westbound lane. The project would no longer have a separate right-turn lane. There is a 350-foot-long southbound right-turn lane on Carmel Mountain Road at Peñasquitos Drive that operates well. With the proposed right-turn lane into the Project, these right-turn lanes are functionally beneficial in increasing efficiency of the roadway and greatly lessening the need for a third westbound lane. A draft conceptual drawing of this driveway layout is provided in ***Figure 15–1***.

It should also be noted that a Class II buffered bike lane will be provided along this section of Carmel Mountain Road. Appropriate signage and/or striping will be installed to identify the bike lane and the mixing of right-turning traffic with the crossing of the bike lane will be treated consistent with the striping provided at the Carmel Mountain Road/ Peñasquitos Drive intersection.

15.3 Off-Site Improvements

The Project is proposing to install a roundabout on Peñasquitos Drive at the intersection of Janal Way/ Project Access and a traffic signal at the intersection of Cuca Street/Hotel Karlan Driveway as mitigation for the significant impacts identified earlier in this report.

The roundabout would provide single-lane approaches on all sides with a single circulating lane, consistent with the existing cross-section of Peñasquitos Drive. Bicyclists in the existing buffered bike lanes would be given the option to merge into the auto lane and navigate the roundabout as a vehicle, or alternatively, to divert to a bypass that would allow them to use sidewalks. ***Figure 15–2a*** provides a draft conceptual drawing of the proposed roundabout.

The traffic signal would be consistent with the existing cross-section of Peñasquitos Drive, providing left-turn lanes with protected phasing on Peñasquitos Drive. ***Figure 15–2b*** provides a draft conceptual drawing of the proposed traffic signal.

The project frontage improvements and the deceleration lane along Carmel Mountain Road are thoroughly discussed in the two previous sections.

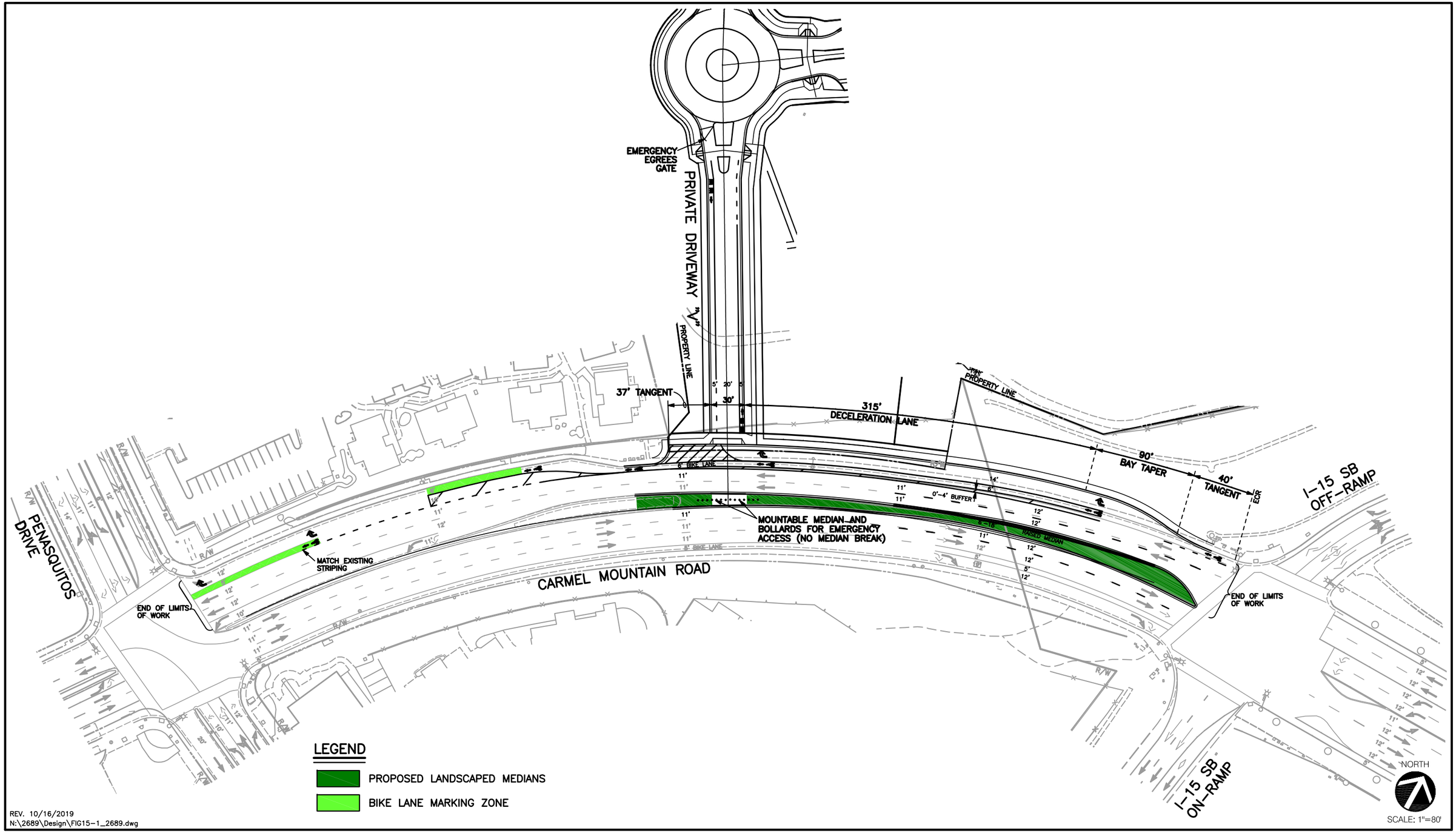


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Figure 15-1

Carmel Mountain Road Frontage & Off-site Conceptual Improvements

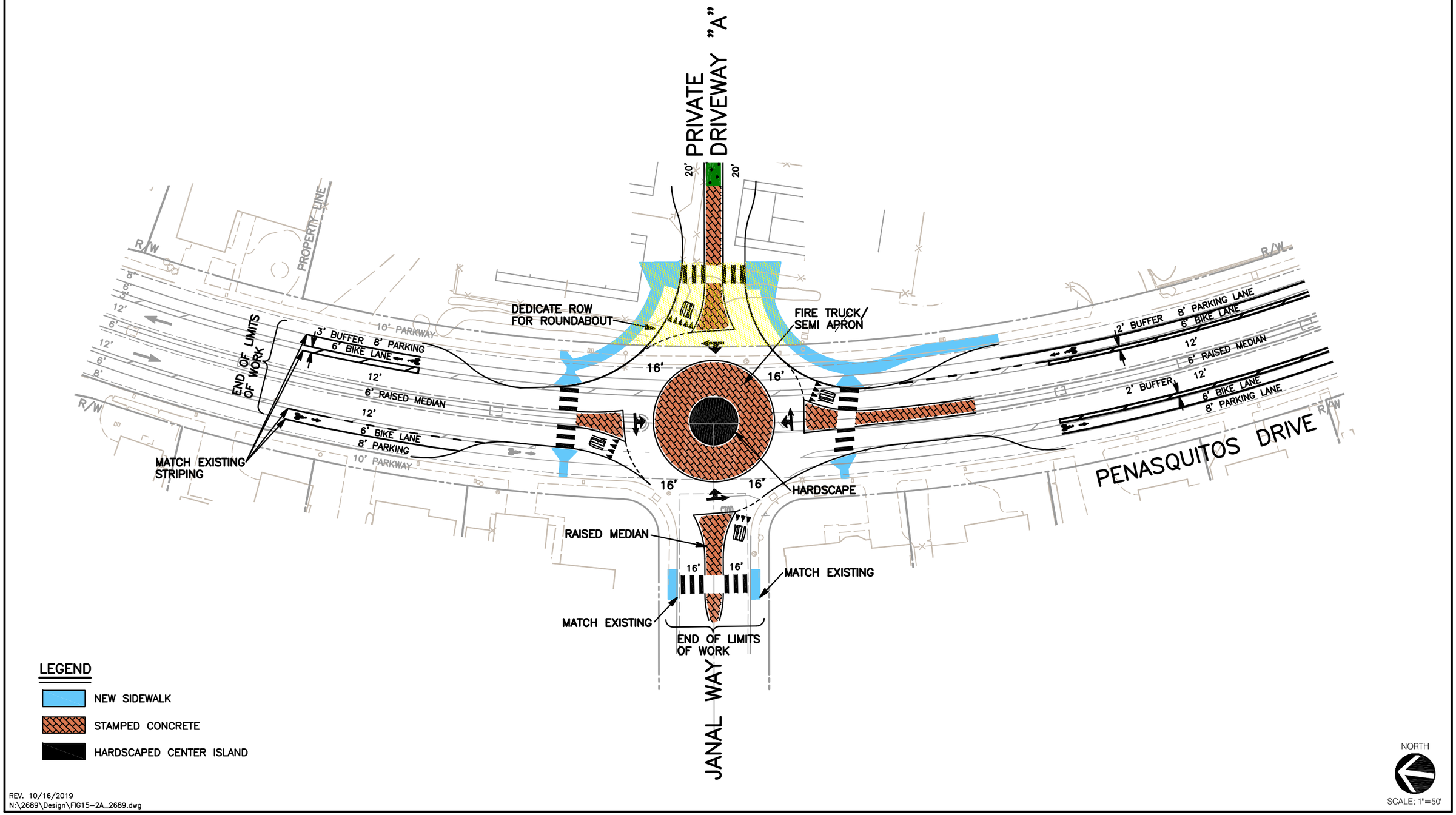

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Figure 15-2A

Penasquitos Drive - Janal Way Roundabout Improvements

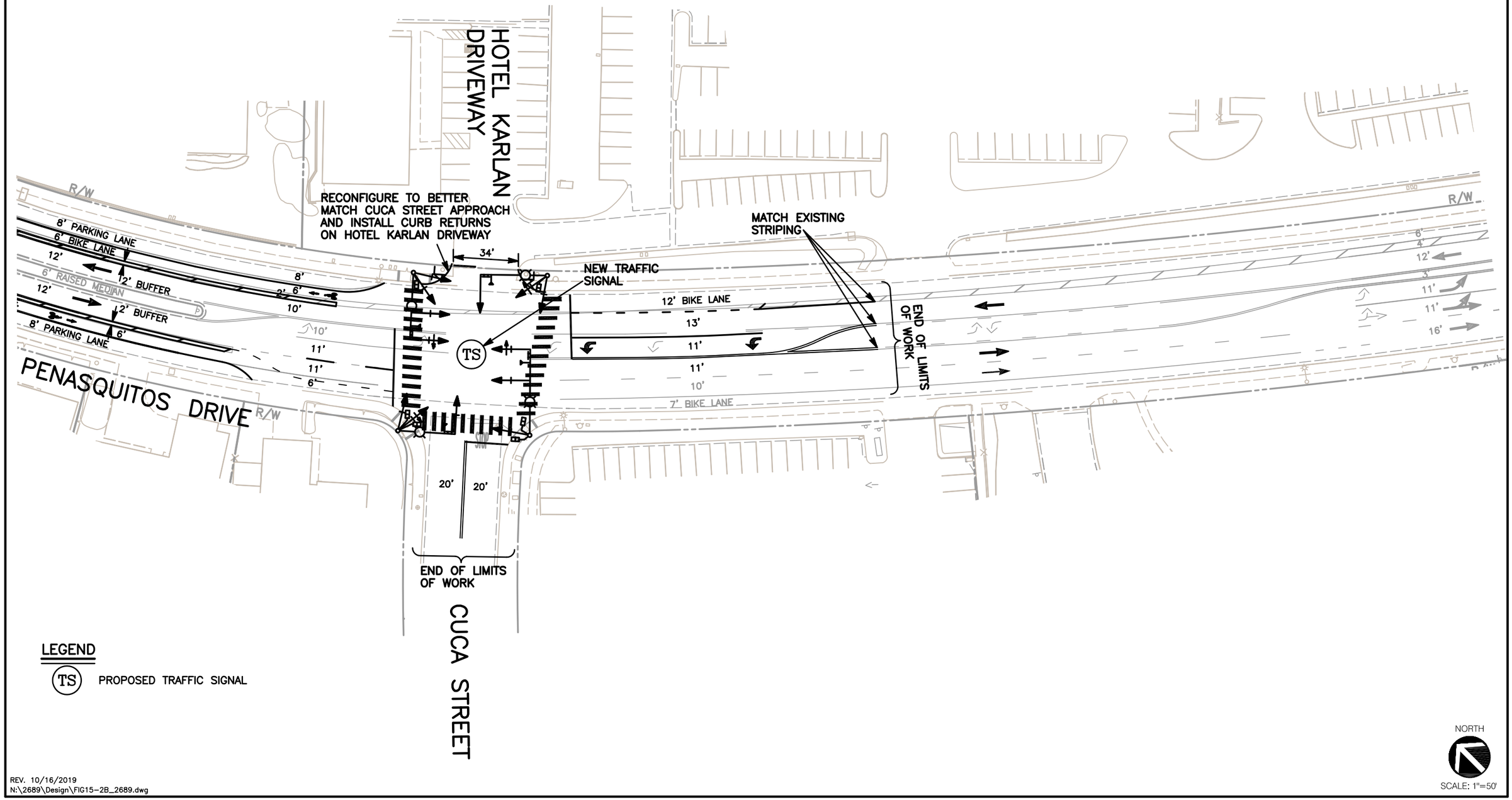

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Figure 15-2B

Penasquitos Drive - Cuca Street Traffic Signal Improvements

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16.0 CONSTRUCTION IMPACTS

Construction is anticipated to take a little over three years to complete. Building construction would be the final and longest phase (approximately 600 working days), and would be expected to generate the most vehicle trips.

Construction activity is expected to occur between 7:00 AM and 4:00 PM and consist of worker vehicles and heavy vehicles. It is estimated that up to 50 workers could be on site on any given day, and that those workers could each leave and return to the site once per day. This results in a "worst case" estimate of 4 vehicle trips per worker per day, or a total of 200 vehicle trips per day. It is conservatively assumed that all workers would arrive and depart during the morning and evening peak hours, although some workers will likely arrive at the site before the AM peak hour and leave before the PM peak hour. The site grading would be very nearly balanced, with little or no excavated material expected to be imported or exported from the site. Heavy vehicle trips to the site would therefore include primarily deliveries of construction equipment and materials, and hauling away of debris and recycled/waste materials. The number of daily truck trips would vary over the course of construction, but is conservatively estimated to be about 20 trucks per day during initial demolition/grading (peak phase for truck trips), for a total of 40 truck trips per day. It is expected that about 20 percent of these would occur during the AM peak hour and 20 percent during the PM peak hour, and a passenger car equivalent of 2.5 is applied to each truck trip to account for the additional delay that trucks can cause at intersections. Thus, the total number of vehicle trips generated by project construction is conservatively estimated at 300 trips per day, with 70 trips occurring during the AM peak hour and 70 trips occurring during the PM peak hour. Construction trip generation is presented in ***Table 16–1*** below.

Construction traffic is expected to use Circulation Element roadways, including Peñasquitos Drive and Carmel Mountain Road, and would not need to use residential streets. Construction traffic occurring during the morning peak hour would have the potential to exacerbate the existing LOS E condition at the intersection of Peñasquitos Drive and Cuca Street. Construction traffic control plans would be prepared to identify truck routes, the hours of construction activity, work zones, staging areas, and other traffic controls as necessary. Construction traffic control plans would be satisfactory to the City Engineer prior to construction activities for the project.

TABLE 16–1
CONSTRUCTION TRAFFIC GENERATION

Construction Trip Type	Quantity	Daily Volumes (ADT)			AM Peak Hour			PM Peak Hour		
		Rate [a]	PCE [b]	Volume	In	Out	Total	In	Out	Total
Worker Trips	50	4 /worker	1.0	200	50	0	50	0	50	50
Truck Trips	20	2 /RT[c]	2.5	100	10	10	20	10	10	20
Total	70	—	—	300	60	10	70	10	60	70

Footnotes:

a. Estimated weekday vehicle trip generation rate per project-specific construction schedule.
b. Passenger Car Equivalent
c. RT = round trip

General Notes:

- Peak construction period expected to take 600 working days.

17.0 SIGNIFICANCE OF IMPACTS AND MITIGATION MEASURES

17.1 Significance of Impacts

Per City of San Diego significance thresholds and the analysis methodology presented in this report, Project-related traffic is calculated to result in two (2) direct and cumulative impacts. The following section identifies the significant impacts and recommended mitigation.

INTERSECTIONS

TRA-1. Intersection #6. Peñasquitos Drive / Cuca Street / Hotel Karlan Driveway
(Direct & Cumulative Impact)

TRA-2. Intersection #7. Peñasquitos Drive / Janal Way / Project Access
(Direct & Cumulative Impact)

STREET SEGMENTS

None.

17.2 Mitigation Measures

In order to mitigate the Project's direct and cumulative traffic impacts, the following is recommended.

INTERSECTIONS

TRA-1. **Intersection #6. Peñasquitos Drive / Cuca Street / Hotel Karlan Driveway:** Prior to issuance of the first building permit, Owner/Permitee shall assure by permit and bond the construction of a traffic signal. The traffic signal will provide dedicated left-turn lanes with protected phasing on Peñasquitos Drive, and permissive phasing on the minor street (Cuca Street / Hotel Karlan Driveway) approaches, satisfactory to the City Engineer. Improvements shall be completed and operational prior to Project's first occupancy.

Signal warrants were evaluated for the proposed traffic signal at this location. Based on the evaluation in ***Appendix M***, warrants are not met for this intersection.

TRA-2. **Intersection #7. Peñasquitos Drive / Janal Way / Project Access:** Prior to issuance of the first building permit, Owner/Permitee shall assure by permit and bond the construction of a single lane roundabout at Peñasquitos Drive / Janal Way / Project Access, satisfactory to the City Engineer. Improvements shall be completed and operational prior to Project's first occupancy.

Table 17–1 provides the Opening Year 2020 pre- and post-mitigation intersection operations. ***Table 17–2*** provides the same for Horizon Year 2050 conditions. As shown, the mitigated intersections are calculated to operate at LOS A during peak hours under both Opening Year 2020 and Horizon Year 2050 conditions. The post-mitigation intersection analysis worksheets are provided in ***Appendix L***.

Tables 17–1 and *17–2* also show the 95th percentile queueing on Peñasquitos Drive under post-mitigation conditions. As shown in these tables, the longest calculated queue shown is 425 feet in the northbound direction at Cuca Street during the PM peak hour under Horizon Year 2050 conditions. The distance between Janal Way and Cuca Street is approximately 550 feet. The distance between Cuca Street and Carmel Mountain Road is approximately 780 feet. As such, these results indicate that the queueing at these intersections is not expected to back up and affect the operations of any upstream intersection. The queueing worksheets are also included in *Appendix L*.

A traffic signal was also considered as a potential mitigation measure for the Project's direct and cumulative traffic impacts at Peñasquitos Drive / Janal Way / Project Access. This intersection also failed to meet signal warrants. This signal warrant analysis is also included in *Appendix M*.

TABLE 17–1
OPENING YEAR 2020 MITIGATION MEASURES & POST-MITIGATION OPERATIONS

MM#	Intersection	Traffic Control	Peak Hour	Year 2020 Without Project		Year 2020 With Project Pre-Mitigation		Year 2020 With Project Post-Mitigation					Fully Mitigated?
				Delay	LOS	Delay	LOS	Recommended Improvements	Delay	LOS	95th Percentile Queue (ft)		
											NB	SB	
TRA-1	Intersection #6: Peñasquitos Dr/ Cuca St/ Hotel Karlan Dwy	MSSC/ Signal	AM	44.1	E	52.3	F	Install a traffic signal.	8.3	A	170	210	Yes
			PM	24.3	C	27.0	D		8.1	A	372	97	
TRA-2	Intersection #7: Peñasquitos Dr/ Janal Way/ Project Access	MSSC/ Round-about	AM	17.5	C	49.8	E	Install a roundabout.	8.5	A	25	125	Yes
			PM	12.0	B	32.7	D		7.0	A	75	25	

General Notes:

1. MM# = Mitigation measure number.
2. MSSC = Minor street stop control. Worst movement delay reported.
3. LOS = Level of service.
4. Fully mitigated indicates the direct and cumulative impacts are reduced to below significant levels.
5. 95th percentile queue lengths on major street (Peñasquitos Drive) shown. Where the analysis output is given in vehicles, results converted to feet assuming 25 feet per vehicle.

TABLE 17–2
HORIZON YEAR 2050 MITIGATION MEASURES & POST-MITIGATION OPERATIONS

MM#	Intersection	Traffic Control	Peak Hour	Year 2050 Without Project		Year 2050 With Project Pre-Mitigation		Year 2050 With Project Post-Mitigation					Fully Mitigated?
				Delay	LOS	Delay	LOS	Recommended Improvements	Delay	LOS	95th Percentile Queue (ft)		
											NB	SB	
TRA-1	Intersection #6: Peñasquitos Dr/ Cuca St/ Hotel Karlan Dwy	MSSC/ Signal	AM	51.0	F	67.0	F	Install a traffic signal.	9.2	A	191	226	Yes
			PM	27.3	D	30.5	D		8.9	A	425	107	
TRA-2	Intersection #7: Peñasquitos Dr/ Janal Way/ Project Access	MSSC/ Round-about	AM	21.1	C	66.9	F	Install a roundabout.	9.5	A	25	150	Yes
			PM	15.5	C	42.2	E		7.7	A	100	25	

General Notes:

1. MM# = Mitigation measure number.
2. MSSC = Minor street stop control. Worst movement delay reported.
3. LOS = Level of service.
4. Fully mitigated indicates the direct and cumulative impacts are reduced to below significant levels.
5. 95th percentile queue lengths on major street (Peñasquitos Drive) shown. Where the analysis output is given in vehicles, results converted to feet assuming 25 feet per vehicle.

End of Report

LINSCOTT LAW & GREENSPAN engineers

TECHNICAL APPENDICES

THE JUNIPERS

San Diego, California
October 15, 2019

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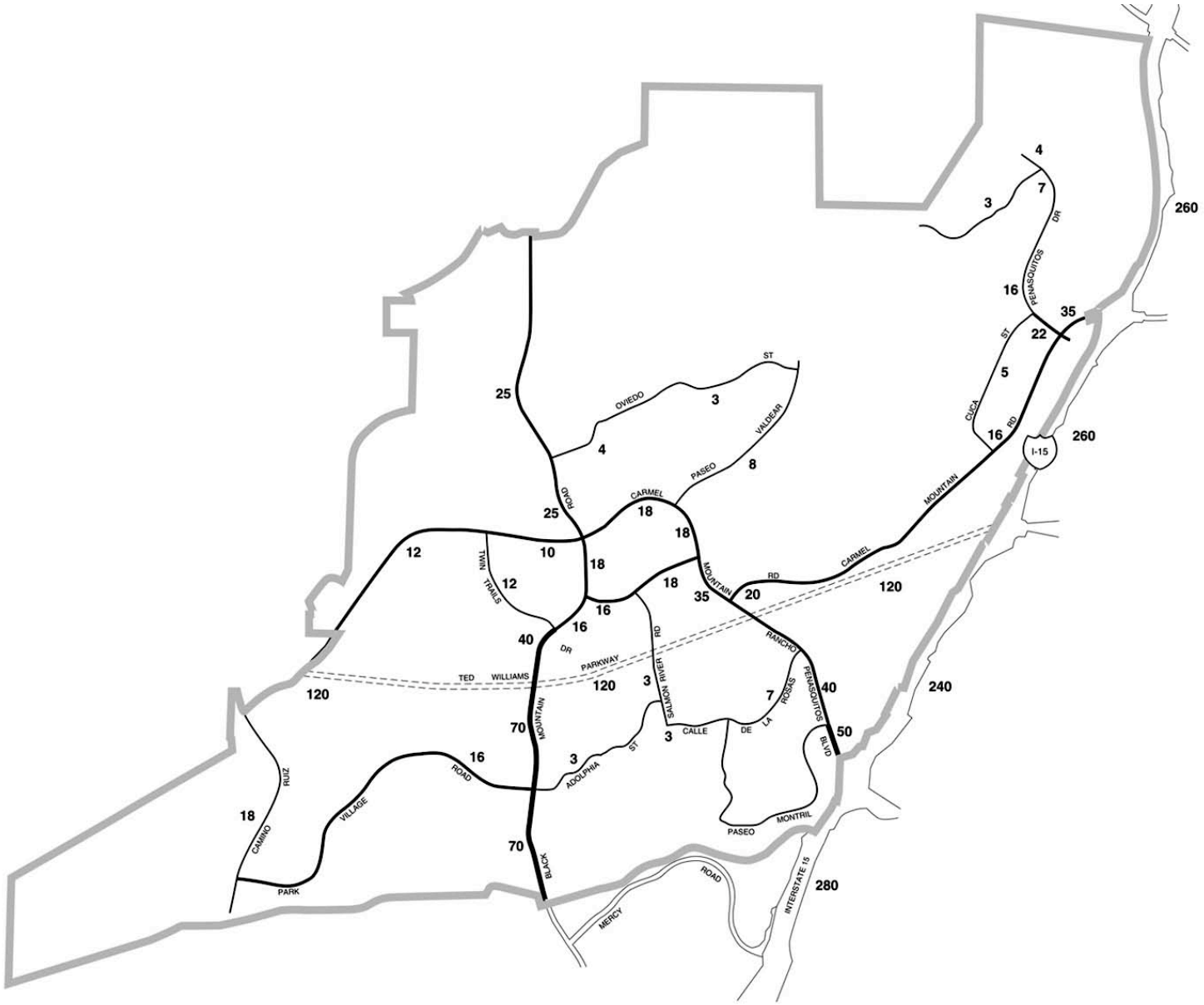
APPENDICES

APPENDIX	
A.	Rancho Peñasquitos Community Plan and PFFP Excerpts
B.	MTS Bus Route Schedule
C.	Intersection and Segment Count Sheets
D.	City of San Diego Roadway Classification Table, Rancho Peñasquitos and Carmel Mountain Ranch Circulation Element Excerpts
E.	Existing Intersection Analysis Worksheets
F.	Existing + Project Intersection Analysis Worksheets
G.	Cumulative Projects Assignment
H.	Near-Term (Opening Year 2020) Intersection Analysis Worksheets
I.	Near-Term (Opening Year 2020) + Project Intersection Analysis Worksheets
J.	Horizon Year 2050 Without Project Intersection Analysis Worksheets
K.	Horizon Year 2050 With Project Intersection Analysis Worksheets
L.	Post-Mitigation Intersection Analysis Worksheets
M.	Signal Warrant Analysis

APPENDIX A

RANCHO PEÑASQUITOS COMMUNITY PLAN AND PUBLIC FACILITIES FINANCING PLAN EXCERPTS



Average Daily Traffic at Buildout (in thousands)

Rancho Peñasquitos Community Plan

27 FIGURE

SPECIFIC RECOMMENDATIONS

Roadway Improvements

The following recommendations regarding specific roadway improvements have been developed based upon the recently completed traffic study and expressed desires of the community. Transportation improvements will be constructed in accordance with the phasing schedule in the Public Facilities Financing Plan. Roadway classifications shown on **Figure 28** which are not discussed in this section are unchanged from the previous community plan.

- **State Route 56.** State Route 56 (Ted Williams Parkway) should be constructed as a six-lane freeway from I-15 to the western boundary of Rancho Peñasquitos using TRANSNET and Facility Benefit Assessment (FBA) funds earmarked for this purpose. State Route 56 from I-15 to I-5 is a critical east-west link between Rancho Peñasquitos and surrounding communities and coastal areas. Money is currently being collected from assessments in six communities, including Rancho Peñasquitos, to obtain right-of-way for the portion of SR-56 that would traverse the future urbanizing area. It is recommended that, if environmental issues can be resolved, a financing mechanism should be developed to construct SR-56 as at least a four-lane facility through the future urbanizing area and that this road be built when sufficient funds have been obtained.

- **Black Mountain Road.** From just north of Twin Trails Drive to the southern community boundary, this road may be improved to modified six-lane arterial status with Class II bicycle lanes.

- **Camino Ruiz Extension across Los Peñasquitos Canyon.** The Camino Ruiz extension has been deleted from this Plan due to widespread opposition from residents and community groups in Rancho Peñasquitos and Mira Mesa. They feel that the environmental impacts of the roadway to Los Peñasquitos Canyon Preserve outweigh the benefits to traffic flow and access that would be achieved if the roadway extension were built, and they accept the severe congestion that will result on Black Mountain Road.

- **Camino del Sur.** Northerly terminus to Carmel Mountain Road – Retain four-lane major classification. The road should be designed in an environmentally and aesthetically sensitive manner, having minimal impact upon the natural open space system. The median can be reduced where there is no fronting property, which will help to minimize grading impacts.

- **Carmel Mountain Road.** Paseo Montalban to Rancho Peñasquitos Boulevard – Classify as a modified five-lane major street (3EB, 2WB).

- **Carmel Mountain Road.** Interstate 15 to Peñasquitos Drive – Classify as a modified six-lane major street.

- **Paseo Valdear.** Westerly portion, from Oviedo Street approximately 300 feet north – Classify as four-lane collector street; to limit of development in Montana Mirador classify as a local street. Cul-de-sac at Montana Mirador subdivision. Provide an emergency access road to westerly portion of Paseo Valdear.

- **Paseo Valdear.** Easterly portion, from Peñasquitos Drive to terminus – Retain two-lane collector street classification. Cul-de-sac at Paraiso Cumbres subdivision. Provide an emergency access road to westerly portion of Paseo Valdear.

- **Rancho Peñasquitos Boulevard.** Carmel Mountain Road to Azuaga Street, i.e., southerly ramps for Ted Williams Parkway – Classify as a modified five-lane major (3EB, 2WB) with Class II bicycle lanes as illustrated on the attached street classification map (**Figure 28**).

- **Rancho Peñasquitos Boulevard.** Azuaga Street, i.e., southerly ramps for Ted Williams Parkway to I-15 – Classify as a four-lane major with Class II bicycle lanes as illustrated on the attached street classification map (**Figure 28**).

- **Salmon River Road.** Paseo Montalban to Adolphia Street – The existing two-lane collector street is sufficient to accommodate the traffic volumes forecasted in the recent traffic study. Therefore, the recommended classification for this roadway, formerly four-lane collector, is a two-lane collector.

- **Peñasquitos Drive.** Paseo Valdear to northerly community boundary – This road previously designated as a four-lane collector is now recommended for classification as a local street due to rough topography and low anticipated traffic.

Public Transportation

The existing transit services connecting Rancho Peñasquitos to downtown Poway and the I-15 corridor should be increased in frequency and should be supplemented by intra-community transit service. Intra-community transit service must be developed to provide an alternative to automobile dependence, despite the serious difficulties encountered in providing transit service to an area with hilly topography, low density and an irregular street system. Increased availability and use of transit is one of the goals the City's Transportation Demand Management Program. The following recommendations are offered to accomplish these goals, recognizing that funding to develop all the desirable services may not be available in the short term.

- **Existing Express Bus Service.** Existing express bus service from Rancho Peñasquitos to downtown San Diego should be increased in frequency.

- **New I-15 Bus Service.** Express and/or limited stop bus service should be provided from Rancho Peñasquitos to major employment and community activity centers outside downtown San Diego.

- **Light Rail (Trolley).** A light rail line should be constructed along the I-15 corridor, connecting Rancho Peñasquitos with downtown, Mission Valley and other major activity centers. Two or more stops should be provided adjacent to the community to assure adequate access. Studies should also be undertaken to determine the feasibility of light rail along SR-56. These are long-term recommendations which would reduce the need for express bus service.

CITY OF SAN DIEGO
FACILITIES FINANCING PROGRAM

TITLE: **PEÑASQUITOS DRIVE, ALMAZON STREET TO CUCA STREET**

PROJECT: **T-7A**

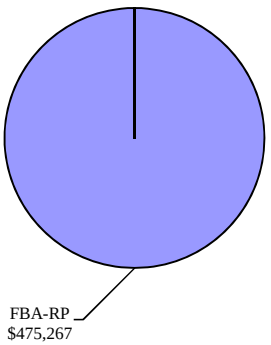
DEPARTMENT: ENGINEERING & CAPITAL PROJECTS
CIP or JO #: 52-368.0

COUNCIL DISTRICT: 5&6
COMMUNITY PLAN: RP

SOURCE	**FUNDING:**	EXPENDED	CONT APPROP	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
FBA-RP	**$475,267**	$475,267						
RP COMM								
FBA-CVN								
SPF								
PARKFEE								
STATE								
DEV/SUBD								
PRIVATE								
MTDB								
OTHER								
UNIDENT								
TOTAL	**$475,267**	$475,267	$0	$0	$0	$0	$0	$0

SOURCE	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
FBA-RP								
RP COMM								
FBA-CVN								
SPF								
PARKFEE								
STATE								
DEV/SUBD								
PRIVATE								
MTDB								
OTHER								
UNIDENT								
TOTAL	$0	$0	$0	$0	$0	$0	$0	$0

FUNDING SOURCES



CITY OF SAN DIEGO
FACILITIES FINANCING PROGRAM

TITLE: **PEÑASQUITOS DRIVE, ALMAZON STREET TO CUCA STREET**

		PROJECT:	**T-7A**
DEPARTMENT:	ENGINEERING & CAPITAL PROJECTS	COUNCIL DISTRICT:	5&6
CIP or JO #:	52-368.0	COMMUNITY PLAN:	RP

DESCRIPTION:

THIS PROJECT INVOLVED PEÑASQUITOS DRIVE FROM ALMAZON STREET TO CUCA STREET. THE PROJECT INCLUDED A LANDSCAPED MEDIAN TO PROVIDE A FOUR-LANE COLLECTOR AND LOCAL STREET WITH CLASS II BICYCLE LANES.

JUSTIFICATION:

THIS PORTION OF PEÑASQUITOS DRIVE WAS RECONSTRUCTED TO ACCOMMODATE THE INCREASE IN TRAFFIC GENERATED WITHIN THE PEÑASQUITOS COMMUNITY.

RELATIONSHIP TO GENERAL PLAN AND COMMUNITY PLAN(S):

THIS PROJECT IS CONSISTENT WITH THE CITY'S GENERAL PLAN AND THE RANCHO PEÑASQUITOS COMMUNITY PLAN.

SCHEDULE:

PROJECT COMPLETED.

CITY OF SAN DIEGO
FACILITIES FINANCING PROGRAM

TITLE: **PEÑASQUITOS DRIVE, NORTH COMMUNITY BOUNDARY TO ALMAZON STREET**

PROJECT: **T-7B**

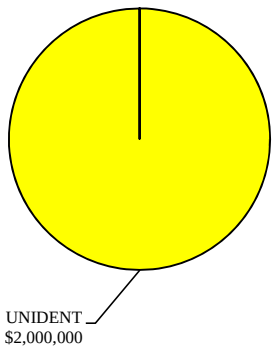
DEPARTMENT: ENGINEERING & CAPITAL PROJECTS
CIP or JO #: N/A

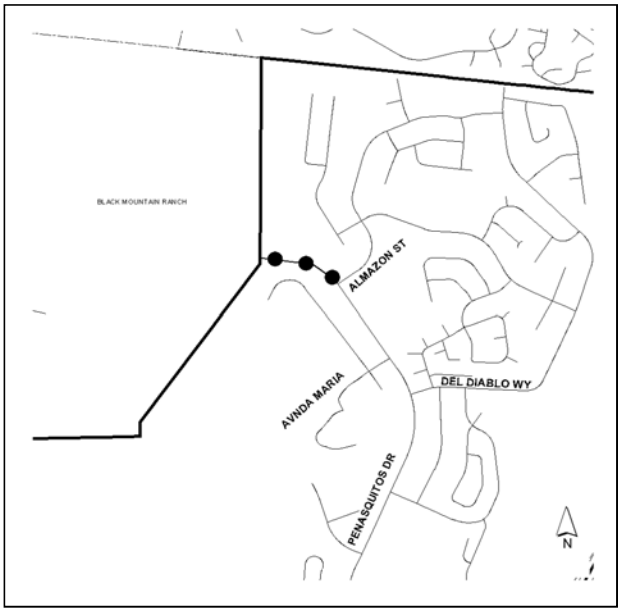
COUNCIL DISTRICT: 5&6
COMMUNITY PLAN: RP

SOURCE	**FUNDING:**	EXPENDED	CONT APPROP	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018
FBA-RP								
RP COMM								
FBA-CVN								
SPF								
PARKFEE								
STATE								
DEV/SUBD								
PRIVATE								
MTDB								
OTHER								
UNIDENT	**$2,000,000**							
TOTAL	**$2,000,000**	$0	$0	$0	$0	$0	$0	$0

SOURCE	FY 2019	FY 2020	FY 20	FY 20	FY 20	FY 20	FY 20	FY 20
FBA-RP								
RP COMM								
FBA-CVN								
SPF								
PARKFEE								
STATE								
DEV/SUBD								
PRIVATE								
MTDB								
OTHER								
UNIDENT								
TOTAL	$0	$0	$0	$0	$0	$0	$0	$0

FUNDING SOURCES





CITY OF SAN DIEGO
FACILITIES FINANCING PROGRAM

TITLE: **PEÑASQUITOS DRIVE, NORTH COMMUNITY BOUNDARY TO ALMAZON STREET**

		PROJECT:	**T-7B**
DEPARTMENT:	ENGINEERING & CAPITAL PROJECTS	COUNCIL DISTRICT:	5&6
CIP or JO #:	N/A	COMMUNITY PLAN:	RP

DESCRIPTION:

THIS PROJECT INVOLVES THE CONSTRUCTION OF A TWO-LANE LOCAL STREET ON PEÑASQUITOS DRIVE FROM THE NORTH COMMUNITY BOUNDARY TO ALMAZON STREET.

JUSTIFICATION:

THIS PORTION OF PEÑASQUITOS DRIVE IS BEING RECONSTRUCTED TO ACCOMMODATE THE INCREASE IN TRAFFIC GENERATED WITHIN THE RANCHO PEÑASQUITOS COMMUNITY.

RELATIONSHIP TO GENERAL PLAN AND COMMUNITY PLAN(S):

THIS PROJECT IS CONSISTENT WITH THE CITY'S GENERAL PLAN AND THE RANCHO PEÑASQUITOS COMMUNITY PLAN.

SCHEDULE:

DESIGN AND CONSTRUCTION WILL BE SCHEDULED WHEN FUNDING IS IDENTIFIED.

CITY OF SAN DIEGO
FACILITIES FINANCING PROGRAM

TITLE: **PEÑASQUITOS DRIVE, CUCA STREET TO CARMEL MOUNTAIN ROAD**

PROJECT: **T-7C**

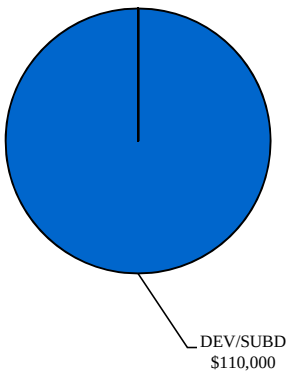
DEPARTMENT: ENGINEERING & CAPITAL PROJECTS
CIP or JO #: N/A

COUNCIL DISTRICT: 5&6
COMMUNITY PLAN: RP

SOURCE	**FUNDING:**	EXPENDED	CONT APPROP	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
FBA-RP								
RP COMM								
FBA-CVN								
SPF								
PARKFEE								
STATE								
DEV/SUBD	**$110,000**	$110,000						
PRIVATE								
MTDB								
OTHER								
UNIDENT								
TOTAL	**$110,000**	$110,000	$0	$0	$0	$0	$0	$0

SOURCE	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
FBA-RP								
RP COMM								
FBA-CVN								
SPF								
PARKFEE								
STATE								
DEV/SUBD								
PRIVATE								
MTDB								
OTHER								
UNIDENT								
TOTAL	$0	$0	$0	$0	$0	$0	$0	$0

FUNDING SOURCES



CITY OF SAN DIEGO
FACILITIES FINANCING PROGRAM

TITLE: **PEÑASQUITOS DRIVE, CUCA STREET TO CARMEL MOUNTAIN ROAD**

		PROJECT:	**T-7C**
DEPARTMENT:	ENGINEERING & CAPITAL PROJECTS	COUNCIL DISTRICT:	5&6
CIP or JO #:	N/A	COMMUNITY PLAN:	RP

DESCRIPTION:

THIS PROJECT INVOLVED PEÑASQUITOS DRIVE FROM CUCA STREET TO CARMEL MOUNTAIN ROAD. THE MEDIAN WAS IMPROVED TO PROVIDE A MODIFIED FOUR-LANE MAJOR STREET.

JUSTIFICATION:

PEÑASQUITOS DRIVE IS THE MAJOR ACCESS TO THE NORTHEASTERN SECTION OF THIS COMMUNITY. THIS PORTION OF PEÑASQUITOS DRIVE WAS CONSTRUCTED TO ACCOMMODATE THE INCREASE IN TRAFFIC GENERATED WITHIN THE PEÑASQUITOS COMMUNITY.

RELATIONSHIP TO GENERAL PLAN AND COMMUNITY PLAN(S):

THIS PROJECT IS CONSISTENT WITH THE CITY'S GENERAL PLAN AND THE RANCHO PEÑASQUITOS COMMUNITY PLAN.

SCHEDULE:

PROJECT COMPLETED.

APPENDIX B

MTS BUS ROUTE SCHEDULE

CASH FARES / *Tarifas en efectivo*

Exact fare, please / *Favor de pagar la cantidad exacta*

Day Pass (Regional) / *Pase diario (Regional)* Compass Card required ($2) / *Se requiere un Compass Card ($2)*	$5.00
One-Way Fare / *Tarifa de una direccíon*	$2.50
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	$1.25*
Children 5 & under / *Niños de 5 años o menos* Up to two children ride free per paying adult / *Máximo dos niños viajan gratis por cada adulto*	FREE / *GRATIS*

MONTHLY PASSES / *Pases mensual*

Adult / *Adulto*	$72.00
Senior (60+)/Disabled/Medicare *Mayores de 60 años/Discapacitados/Medicare*	$18.00*
Youths (18 and under) *Jóvenes (18 años o menos)*	$36.00*

*I.D. required for discount fare or pass.
**Se requiere identificación para tarifas o pases de descuento.*

DAY PASS (REGIONAL) / *Pase diario (Regional)*

All passes are sold on Compass Card, which can be reloaded and reused for up to five years. Compass Cards are available for $2 at select outlets. A $5 Day Pass requires a Compass Card. A paper Day Pass can be purchased on board buses for an additional $2 fee.

Todos los pases se venden en el Compass Card, el cual puede ser recargado y reutilizado por hasta cinco años. Compass Cards están disponibles por $2 en selectas sucursales. Un pase de un día por $5 requiere un Compass Card. Un pase de un día de papel se puede obtener a bordo los autobuses por un costo adicional de $2.

DIRECTORY / *Directorio*

Regional Transit Information *Información de transporte público regional*	**511** or/ó **(619) 233-3004**
TTY/TDD (teletype for hearing impaired) *Teletipo para sordos*	**(619) 234-5005** or/ó **(888) 722-4889**
InfoExpress (24-hour info via Touch-Tone phone) *Información las 24 horas (via teléfono de teclas)*	**(619) 685-4900**
Customer Service / Suggestions *Servicio al cliente / Sugerencias*	**(619) 557-4555**
SafeWatch	**(619) 557-4500**
Lost & Found *Objetos extraviados*	**(619) 557-4555**
Transit Store	**(619) 234-1060** 12th & Imperial Transit Center M–F 8am–5pm
For MTS online trip planning *Planificación de viajes por Internet*	**sdmts.com**

For more information on riding MTS services, pick up a Rider's Guide on a bus or at the Transit Store, or visit **sdmts.com**.

*Para obtener más información sobre el uso de los servicios de MTS, recoja un 'Rider's Guide' en un autobús o en la Transit Store, o visita a **www.sdmts.com**.*

Thank you for riding MTS! ***¡Gracias por viajar con MTS!***

Effective JANUARY 28, 2018

20

Downtown – Rancho Bernardo Station

via Fashion Valley

110

Downtown – Mira Mesa Express

via I-15 / Hwy 163

DESTINATIONS

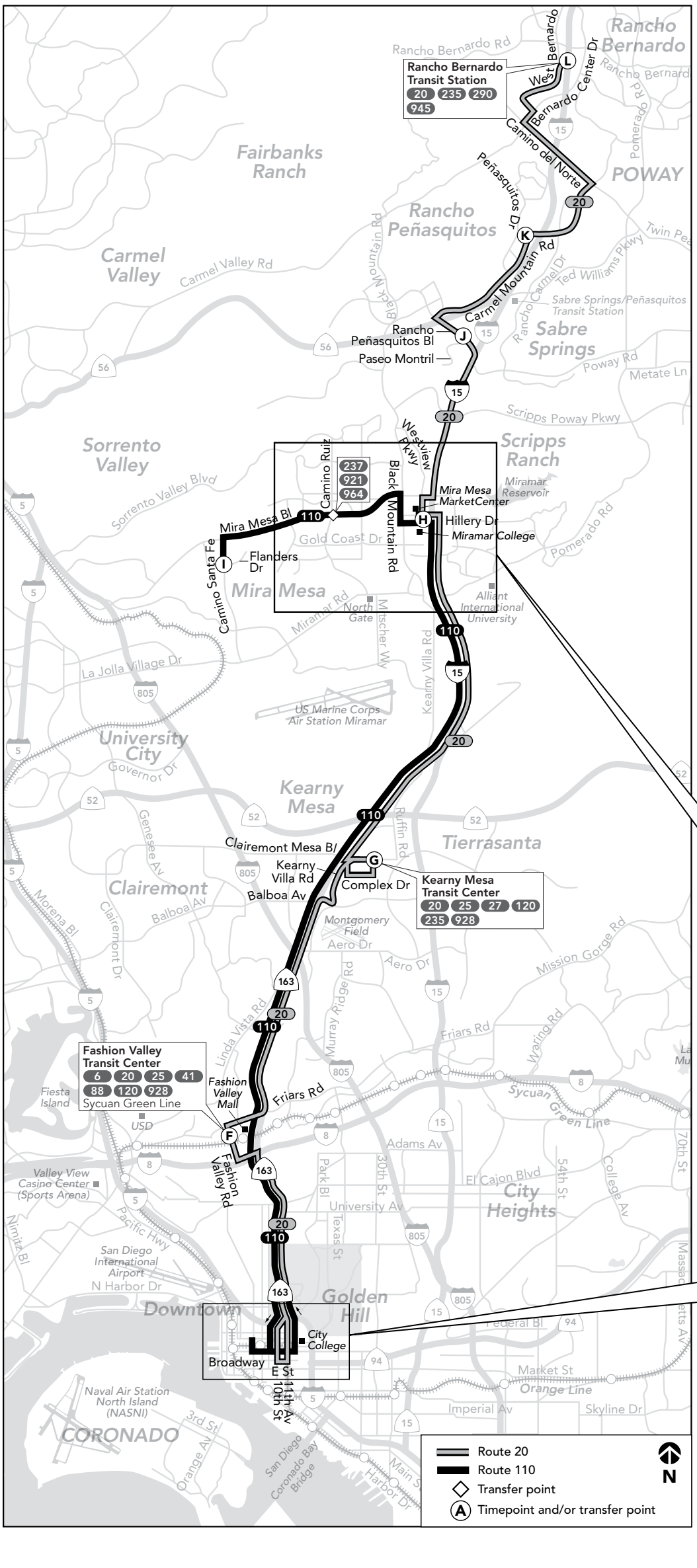
- City College
- Downtown Courthouses (110)
- Fashion Valley Mall (20)
- Miramar College
- Mira Mesa MarketCenter

TROLLEY CONNECTIONS
City College
Fashion Valley (20)

MTS Metropolitan Transit System

01/18

Alternative formats available upon request. Please call: (619) 557-4555 / *Formato alternativo disponible al preguntar. Favor de llamar: (619) 557-4555*



Route 110 – Monday through Friday / *lunes a viernes*

Morning only

Mira Mesa ➡ Downtown

Ⓘ Camino Santa Fe & Flanders Dr. **DEPART**	Ⓗ Miramar College Transit Station	Ⓓ 10th Av. & B St.	Ⓒ Broadway & 5th Av.	Ⓑ Broadway & 1st Av. **ARRIVE**
6:02a	6:15a	6:35a	6:39a	6:44a
6:22	6:35	6:55	6:59	7:04
6:40	6:55	7:17	7:21	7:27
7:05	7:20	7:42	7:46	7:52

Route 110 – Monday through Friday / *lunes a viernes*

Afternoon only

Downtown ➡ Mira Mesa

Ⓐ Front St. & B St. **DEPART**	Ⓒ Broadway & 3rd Av.	Ⓔ City College Transit Center (11th & B)	Ⓗ Miramar College Transit Station	Ⓘ Camino Santa Fe & Flanders Dr. **ARRIVE**
4:02p	**4:05p**	**4:12p**	**4:31p**	**4:47p**
4:27	**4:30**	**4:37**	**4:58**	**5:15**
4:52	**4:55**	**5:02**	**5:23**	**5:40**
5:22	**5:25**	**5:32**	**5:53**	**6:10**

The schedules and other information shown in this timetable are subject to change. MTS does not assume responsibility for errors in timetables nor for any inconvenience caused by delayed buses.

Los horarios e información que se indican en este itinerario están sujetos a cambios. MTS no asume responsabilidad por errores en los itinerarios, ni por ningún perjuicio que se origine por los autobuses demorados.

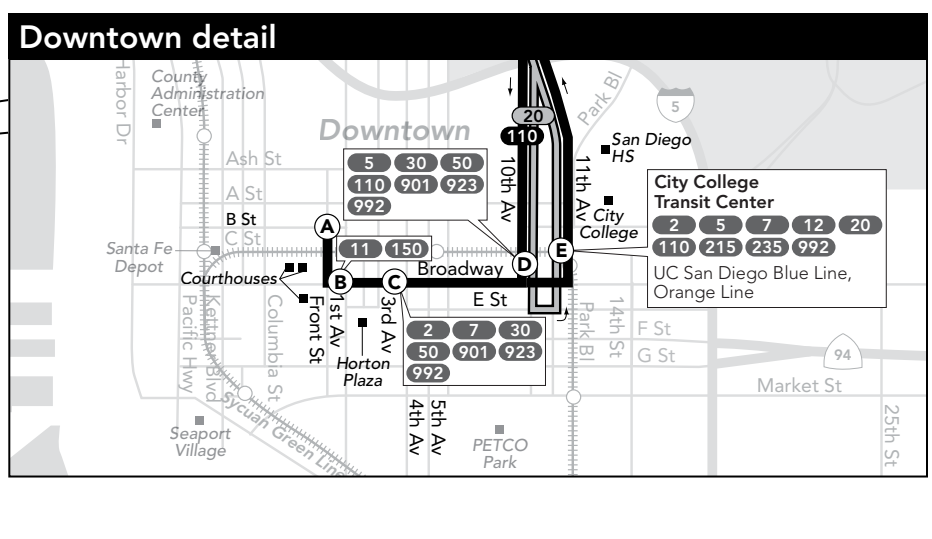
Route 110 does not operate on weekends or on the following holidays and observed holidays
La ruta 110 no ofrece servicio durante el fin de semana ó durante los siguientes días festivos y feriados observados

>>>

New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving, Christmas

Mira Mesa detail

Downtown detail



Route 20 – Monday through Friday / *lunes a viernes*

Downtown ➡ Kearny Mesa ➡ Rancho Bernardo

Ⓓ 10th Av. & Broadway **DEPART**	Ⓔ City College Transit Center (11th & C)	Ⓕ Fashion Valley Transit Center **ARRIVE**	Ⓕ Fashion Valley Transit Center **DEPART**	Ⓖ Kearny Mesa Transit Center	Ⓗ Miramar College Transit Station	Ⓙ Rancho Peñasquitos Bl. & Paseo Montril	Ⓚ Carmel Mtn. Rd. & Peñasquitos Dr.	Ⓛ Rancho Bernardo Transit Station **ARRIVE**
—	4:57a	5:07a	5:09a	5:21a	5:32a	5:39a	5:47a	6:02a
—	5:27	5:37	5:39	5:52	6:03	6:10	6:18	6:34
—	5:42	5:52	5:54	6:08	—	—	—	—
5:54a	5:57	6:07	6:09	6:23	6:34	6:42	6:50	7:07
6:09	6:12	6:22	6:24	6:39	—	—	—	—
6:23	6:26	6:36	6:38	6:53	7:05	7:13	7:22	7:40
6:38	6:41	6:51	6:53	7:08	—	—	—	—
6:53	6:56	7:06	7:08	7:23	7:35	7:43	7:52	8:10
7:08	7:11	7:21	7:23	7:38	—	—	—	—
7:23	7:26	7:36	7:38	7:53	8:05	8:13	8:22	8:40
7:39	7:42	7:52	7:54	8:09	—	—	—	—
7:54	7:57	8:07	8:09	8:24	8:36	8:44	8:53	9:11
8:09	8:12	8:22	8:24	8:39	—	—	—	—
8:24	8:27	8:37	8:39	8:54	9:06	9:14	9:23	9:41
8:39	8:42	8:52	8:54	9:09	—	—	—	—
8:54	8:57	9:07	9:09	9:24	9:35	9:43	9:52	10:10
9:23	9:26	9:36	9:38	9:53	10:04	10:12	10:21	10:38
9:53	9:56	10:06	10:08	10:23	10:34	10:42	10:51	11:08
10:23	10:26	10:36	10:38	10:53	11:04	11:12	11:21	11:38
10:53	10:56	11:06	11:08	11:23	11:34	11:42	11:51	**12:08p**
11:23	11:26	11:36	11:38	11:53	**12:04p**	**12:12p**	**12:21p**	**12:38**
11:53	11:56	**12:07p**	**12:09p**	**12:24p**	**12:35**	**12:44**	**12:53**	**1:10**
12:23p	**12:26p**	**12:37**	**12:39**	**12:54**	**1:05**	**1:14**	**1:23**	**1:40**
12:53	**12:56**	**1:07**	**1:09**	**1:24**	**1:35**	**1:44**	**1:53**	**2:10**
1:23	**1:26**	**1:37**	**1:39**	**1:55**	**2:06**	**2:15**	**2:25**	**2:42**
1:53	**1:56**	**2:08**	**2:10**	**2:26**	**2:37**	**2:46**	**2:56**	**3:14**
2:23	**2:26**	**2:38**	**2:40**	**2:56**	**3:08**	**3:18**	**3:29**	**3:47**
2:53	**2:56**	**3:08**	**3:10**	**3:26**	**3:38**	**3:48**	**3:59**	**4:17**
3:08	**3:11**	**3:23**	**3:25**	**3:41**	—	—	—	—
3:23	**3:26**	**3:38**	**3:40**	**3:56**	**4:09**	**4:19**	**4:30**	**4:48**
3:38	**3:41**	**3:53**	**3:55**	**4:11**	—	—	—	—
3:53	**3:56**	**4:08**	**4:10**	**4:26**	**4:39**	**4:49**	**5:00**	**5:18**
4:08	**4:11**	**4:23**	**4:25**	**4:41**	—	—	—	—
4:23	**4:26**	**4:38**	**4:40**	**4:56**	**5:09**	**5:19**	**5:30**	**5:48**
4:38	**4:41**	**4:53**	**4:55**	**5:11**	—	—	—	—
4:53	**4:56**	**5:08**	**5:10**	**5:26**	**5:39**	**5:49**	**6:00**	**6:18**
5:08	**5:11**	**5:23**	**5:25**	**5:41**	—	—	—	—
5:23	**5:26**	**5:38**	**5:40**	**5:56**	**6:09**	**6:19**	**6:29**	**6:46**
5:54	**5:57**	**6:08**	**6:10**	**6:25**	**6:37**	**6:46**	**6:55**	**7:11**
6:24	**6:27**	**6:38**	**6:40**	**6:55**	**7:07**	**7:16**	**7:25**	**7:41**
6:54	**6:57**	**7:07**	**7:09**	**7:23**	**7:35**	**7:44**	**7:53**	**8:08**
7:24	**7:27**	**7:37**	**7:39**	**7:52**	**8:03**	**8:11**	**8:19**	**8:34**
7:54	**7:57**	**8:07**	**8:09**	**8:22**	**8:33**	**8:41**	**8:49**	**9:04**
8:54	**8:57**	**9:07**	**9:09**	**9:22**	—	—	—	—

Rancho Bernardo ➡ Kearny Mesa ➡ Downtown

Ⓛ Rancho Bernardo Transit Station **DEPART**	Ⓚ Carmel Mtn. Rd. & Peñasquitos Dr.	Ⓙ Rancho Peñasquitos Bl. & Paseo Montril	Ⓗ Miramar College Transit Station	Ⓖ Kearny Mesa Transit Center	Ⓕ Fashion Valley Transit Center **ARRIVE**	Ⓕ Fashion Valley Transit Center **DEPART**	Ⓓ 10th Av. & Broadway **ARRIVE**
5:15a	5:29a	5:37a	5:46a	5:56a	6:08a	6:10a	6:20a
5:41	5:56	6:05	6:14	6:25	6:38	6:40	6:51
—	—	—	—	6:55	7:08	7:10	7:22
6:18	6:36	6:48	6:59	7:10	7:23	7:25	7:37
—	—	—	—	7:25	7:38	7:40	7:52
6:48	7:06	7:18	7:29	7:40	7:53	7:55	8:07
—	—	—	—	7:55	8:08	8:10	8:22
7:18	7:36	7:48	7:59	8:10	8:23	8:25	8:37
—	—	—	—	8:26	8:39	8:41	8:53
7:49	8:07	8:19	8:30	8:41	8:54	8:56	9:08
8:21	8:38	8:49	8:59	9:10	9:23	9:25	9:36
8:51	9:08	9:19	9:29	9:40	9:53	9:55	10:06
9:24	9:40	9:49	9:58	10:09	10:22	10:24	10:35
9:54	10:10	10:19	10:28	10:39	10:52	10:54	11:05
10:24	10:40	10:49	10:58	11:09	11:22	11:24	11:35
10:54	11:10	11:19	11:28	11:39	11:52	11:54	**12:05p**
11:22	11:39	11:48	11:57	**12:08p**	**12:22p**	**12:24p**	**12:35**
11:52	**12:09p**	**12:18p**	**12:27p**	**12:38**	**12:52**	**12:54**	**1:05**
12:22p	**12:39**	**12:48**	**12:57**	**1:08**	**1:22**	**1:24**	**1:35**
12:52	**1:09**	**1:18**	**1:27**	**1:38**	**1:52**	**1:54**	**2:05**
1:21	**1:38**	**1:47**	**1:57**	**2:08**	**2:23**	**2:25**	**2:37**
—	—	—	—	**2:22**	**2:38**	**2:40**	**2:52**
1:50	**2:07**	**2:16**	**2:26**	**2:37**	**2:53**	**2:55**	**3:07**
—	—	—	—	**2:51**	**3:07**	**3:09**	**3:21**
2:17	**2:35**	**2:45**	**2:55**	**3:06**	**3:22**	**3:24**	**3:36**
—	—	—	—	**3:21**	**3:37**	**3:39**	**3:51**
2:46	**3:04**	**3:14**	**3:24**	**3:36**	**3:52**	**3:54**	**4:06**
—	—	—	—	**3:51**	**4:07**	**4:09**	**4:22**
3:15	**3:33**	**3:43**	**3:53**	**4:06**	**4:22**	**4:24**	**4:37**
—	—	—	—	**4:21**	**4:37**	**4:39**	**4:52**
3:44	**4:03**	**4:13**	**4:23**	**4:36**	**4:52**	**4:54**	**5:07**
—	—	—	—	**4:51**	**5:07**	**5:09**	**5:22**
4:12	**4:31**	**4:41**	**4:51**	**5:04**	**5:20**	**5:22**	**5:35**
—	—	—	—	**5:19**	**5:35**	**5:37**	**5:50**
4:42	**5:01**	**5:11**	**5:21**	**5:34**	**5:50**	**5:52**	**6:05**
—	—	—	—	**5:49**	**6:05**	**6:07**	**6:20**
5:12	**5:31**	**5:41**	**5:51**	**6:04**	**6:20**	**6:22**	**6:35**
5:46	**6:05**	**6:15**	**6:24**	**6:35**	**6:50**	**6:52**	**7:04**
6:19	**6:37**	**6:46**	**6:55**	**7:06**	**7:20**	**7:22**	**7:33**
6:51	**7:08**	**7:17**	**7:26**	**7:37**	**7:50**	**7:52**	**8:03**
7:22	**7:39**	**7:48**	**7:57**	**8:07**	**8:20**	**8:22**	**8:33**
8:12	**8:27**	**8:35**	**8:43**	**8:53**	**9:05**	**9:07**	**9:18**
9:14	**9:27**	**9:35**	**9:43**	**9:53**	**10:05**	**10:07**	**10:17**

Route 20 – Saturday / *sábado*

Downtown ➡ Kearny Mesa ➡ Rancho Bernardo

Ⓓ 10th Av. & Broadway **DEPART**	Ⓔ City College Transit Center (11th & C)	Ⓕ Fashion Valley Transit Center **ARRIVE**	Ⓕ Fashion Valley Transit Center **DEPART**	Ⓖ Kearny Mesa Transit Center	Ⓗ Miramar College Transit Station	Ⓙ Rancho Peñasquitos Bl. & Paseo Montril	Ⓚ Carmel Mtn. Rd. & Peñasquitos Dr.	Ⓛ Rancho Bernardo Transit Station **ARRIVE**
—	5:41a	5:51a	5:53a	6:06a	6:17a	6:24a	6:32a	6:46a
—	6:11	6:21	6:23	6:36	6:47	—	—	—
—	6:41	6:51	6:53	7:07	7:18	7:26	7:34	7:48
7:09a	7:12	7:22	7:24	7:38	7:49	—	—	—
7:39	7:42	7:52	7:54	8:08	8:19	8:27	8:35	8:49
8:09	8:12	8:22	8:24	8:38	8:49	—	—	—
8:39	8:42	8:52	8:54	9:08	9:19	9:27	9:36	9:51
9:09	9:12	9:22	9:24	9:38	9:49	—	—	—
9:39	9:42	9:52	9:54	10:08	10:19	10:27	10:36	10:51
10:08	10:11	10:22	10:24	10:38	10:49	—	—	—
10:38	10:41	10:52	10:54	11:08	11:19	11:28	11:37	11:53
11:08	11:11	11:22	11:24	11:38	11:49	—	—	—
11:38	11:41	11:52	11:54	**12:08p**	**12:19p**	**12:28p**	**12:37p**	**12:53p**
12:07p	**12:10p**	**12:21p**	**12:23p**	**12:38**	**12:49**	—	—	—
12:37	**12:40**	**12:51**	**12:53**	**1:08**	**1:19**	**1:28**	**1:37**	**1:54**
1:07	**1:10**	**1:21**	**1:23**	**1:38**	**1:49**	—	—	—
1:37	**1:40**	**1:51**	**1:53**	**2:08**	**2:19**	**2:28**	**2:37**	**2:54**
2:08	**2:11**	**2:22**	**2:24**	**2:39**	**2:50**	—	—	—
2:38	**2:41**	**2:52**	**2:54**	**3:09**	**3:20**	**3:29**	**3:38**	**3:55**
3:08	**3:11**	**3:22**	**3:24**	**3:39**	**3:50**	—	—	—
3:38	**3:41**	**3:52**	**3:54**	**4:09**	**4:20**	**4:29**	**4:38**	**4:55**
4:08	**4:11**	**4:22**	**4:24**	**4:39**	**4:50**	—	—	—
4:38	**4:41**	**4:52**	**4:54**	**5:09**	**5:20**	**5:29**	**5:38**	**5:55**
5:08	**5:11**	**5:22**	**5:24**	**5:39**	**5:50**	—	—	—
5:39	**5:42**	**5:53**	**5:55**	**6:09**	**6:20**	**6:29**	**6:38**	**6:54**
6:09	**6:12**	**6:23**	**6:25**	**6:39**	**6:50**	—	—	—
6:39	**6:42**	**6:53**	**6:55**	**7:09**	**7:20**	**7:29**	**7:38**	**7:54**
7:39	**7:42**	**7:52**	**7:54**	**8:07**	**8:18**	**8:26**	**8:34**	**8:49**

Rancho Bernardo ➡ Kearny Mesa ➡ Downtown

Ⓛ Rancho Bernardo Transit Station **DEPART**	Ⓚ Carmel Mtn. Rd. & Peñasquitos Dr.	Ⓙ Rancho Peñasquitos Bl. & Paseo Montril	Ⓗ Miramar College Transit Station	Ⓖ Kearny Mesa Transit Center	Ⓕ Fashion Valley Transit Center **ARRIVE**	Ⓕ Fashion Valley Transit Center **DEPART**	Ⓓ 10th Av. & Broadway **ARRIVE**
—	—	—	6:12a	6:23a	6:35a	6:37a	6:47a
6:13a	6:26a	6:34a	6:42	6:53	7:05	7:07	7:17
—	—	—	7:12	7:23	7:35	7:37	7:47
7:11	7:25	7:34	7:42	7:53	8:05	8:07	8:17
—	—	—	8:12	8:23	8:35	8:37	8:48
8:08	8:23	8:33	8:42	8:53	9:05	9:07	9:18
—	—	—	9:12	9:23	9:35	9:37	9:48
9:08	9:23	9:33	9:42	9:53	10:05	10:07	10:18
—	—	—	10:12	10:23	10:35	10:37	10:48
10:07	10:23	10:33	10:42	10:53	11:05	11:07	11:18
—	—	—	11:11	11:22	11:35	11:37	11:49
11:05	11:22	11:32	11:41	11:52	**12:05p**	**12:07p**	**12:19p**
—	—	—	**12:11p**	**12:22p**	**12:35**	**12:37**	**12:49**
12:05p	**12:22p**	**12:32p**	**12:41**	**12:52**	**1:05**	**1:07**	**1:19**
—	—	—	**1:11**	**1:22**	**1:35**	**1:37**	**1:49**
1:05	**1:22**	**1:32**	**1:41**	**1:52**	**2:05**	**2:07**	**2:19**
—	—	—	**2:11**	**2:22**	**2:35**	**2:37**	**2:49**
2:06	**2:23**	**2:33**	**2:42**	**2:53**	**3:06**	**3:08**	**3:20**
—	—	—	**3:12**	**3:23**	**3:36**	**3:38**	**3:50**
3:06	**3:23**	**3:33**	**3:42**	**3:53**	**4:06**	**4:08**	**4:20**
—	—	—	**4:12**	**4:23**	**4:36**	**4:38**	**4:50**
4:07	**4:24**	**4:34**	**4:43**	**4:54**	**5:07**	**5:09**	**5:21**
—	—	—	**5:13**	**5:24**	**5:37**	**5:39**	**5:51**
5:07	**5:24**	**5:34**	**5:43**	**5:54**	**6:07**	**6:09**	**6:21**
—	—	—	**6:11**	**6:22**	**6:35**	**6:37**	**6:48**
6:07	**6:23**	**6:32**	**6:41**	**6:52**	**7:05**	**7:07**	**7:18**
—	—	—	**7:11**	**7:22**	**7:35**	**7:37**	**7:48**
7:07	**7:23**	**7:32**	**7:41**	**7:52**	**8:05**	**8:07**	**8:18**
8:13	**8:27**	**8:35**	**8:43**	**8:53**	**9:05**	**9:07**	**9:17**

Route 20 – Sunday / *domingo*

Downtown ➡ Kearny Mesa ➡ Rancho Bernardo

Ⓓ 10th Av. & Broadway **DEPART**	Ⓔ City College Transit Center (11th & C)	Ⓕ Fashion Valley Transit Center **ARRIVE**	Ⓕ Fashion Valley Transit Center **DEPART**	Ⓖ Kearny Mesa Transit Center	Ⓗ Miramar College Transit Station	Ⓙ Rancho Peñasquitos Bl. & Paseo Montril	Ⓚ Carmel Mtn. Rd. & Peñasquitos Dr.	Ⓛ Rancho Bernardo Transit Station **ARRIVE**
—	5:41a	5:51a	5:53a	6:06a	6:17a	6:24a	6:32a	6:46a
—	6:41	6:51	6:53	7:07	7:18	7:26	7:34	7:48
7:39a	7:42	7:52	7:54	8:08	8:19	8:27	8:35	8:49
8:39	8:42	8:52	8:54	9:08	9:19	9:27	9:36	9:51
9:39	9:42	9:52	9:54	10:08	10:19	10:27	10:36	10:51
10:38	10:41	10:52	10:54	11:08	11:19	11:28	11:37	11:53
11:38	11:41	11:52	11:54	**12:08p**	**12:19p**	**12:28p**	**12:37p**	**12:53p**
12:37p	**12:40p**	**12:51p**	**12:53p**	**1:08**	**1:19**	**1:28**	**1:37**	**1:54**
1:37	**1:40**	**1:51**	**1:53**	**2:08**	**2:19**	**2:28**	**2:37**	**2:54**
2:38	**2:41**	**2:52**	**2:54**	**3:09**	**3:20**	**3:29**	**3:38**	**3:55**
3:38	**3:41**	**3:52**	**3:54**	**4:09**	**4:20**	**4:29**	**4:38**	**4:55**
4:38	**4:41**	**4:52**	**4:54**	**5:09**	**5:20**	**5:29**	**5:38**	**5:55**
5:39	**5:42**	**5:53**	**5:55**	**6:09**	**6:20**	**6:29**	**6:38**	**6:54**
6:39	**6:42**	**6:53**	**6:55**	**7:09**	**7:20**	**7:29**	**7:38**	**7:54**
7:39	**7:42**	**7:52**	**7:54**	**8:07**	**8:18**	**8:26**	**8:34**	**8:49**

Rancho Bernardo ➡ Kearny Mesa ➡ Downtown

Ⓛ Rancho Bernardo Transit Station **DEPART**	Ⓚ Carmel Mtn. Rd. & Peñasquitos Dr.	Ⓙ Rancho Peñasquitos Bl. & Paseo Montril	Ⓗ Miramar College Transit Station	Ⓖ Kearny Mesa Transit Center	Ⓕ Fashion Valley Transit Center **ARRIVE**	Ⓕ Fashion Valley Transit Center **DEPART**	Ⓓ 10th Av. & Broadway **ARRIVE**
6:13a	6:26a	6:34a	6:42a	6:53a	7:05a	7:07a	7:17a
7:11	7:25	7:34	7:42	7:53	8:05	8:07	8:17
8:08	8:23	8:33	8:42	8:53	9:05	9:07	9:18
9:08	9:23	9:33	9:42	9:53	10:05	10:07	10:18
10:07	10:23	10:33	10:42	10:53	11:05	11:07	11:18
11:05	11:22	11:32	11:41	11:52	**12:05p**	**12:07p**	**12:19p**
12:05p	**12:22p**	**12:32p**	**12:41p**	**12:52p**	**1:05**	**1:07**	**1:19**
1:05	**1:22**	**1:32**	**1:41**	**1:52**	**2:05**	**2:07**	**2:19**
2:06	**2:23**	**2:33**	**2:42**	**2:53**	**3:06**	**3:08**	**3:20**
3:06	**3:23**	**3:33**	**3:42**	**3:53**	**4:06**	**4:08**	**4:20**
4:07	**4:24**	**4:34**	**4:43**	**4:54**	**5:07**	**5:09**	**5:21**
5:07	**5:24**	**5:34**	**5:43**	**5:54**	**6:07**	**6:09**	**6:21**
6:07	**6:23**	**6:32**	**6:41**	**6:52**	**7:05**	**7:07**	**7:18**
7:07	**7:23**	**7:32**	**7:41**	**7:52**	**8:05**	**8:07**	**8:18**

A Saturday or Sunday schedule will be operated on the following holidays and observed holidays
Se operará con horario de sábado o domingo durante los siguientes días festivos y feriados observados

>>>

New Year's Day, Presidents' Day, Memorial Day, Independence Day, Labor Day, Thanksgiving, Christmas

APPENDIX C

INTERSECTION AND SEGMENT COUNT SHEETS

INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: PACIFIC TECHNICAL DATA

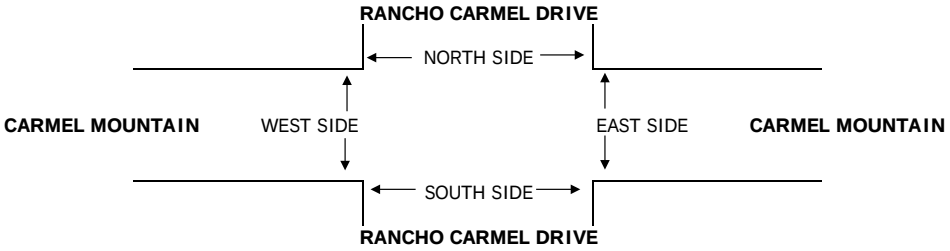
DATE:	LOCATION:	SAN DIEGO - RANCHO PENASQUITOS	PROJECT #:	PTD18-0209-01
2/6/18	NORTH & SOUTH:	RANCHO CARMEL DRIVE	LOCATION #:	1
TUESDAY	EAST & WEST:	CARMEL MOUNTAIN	CONTROL:	SIGNAL

NOTES:

INCLUDE BIKE / PED

AM / PM / MD / OTHER / OTHER — N / W / E / S

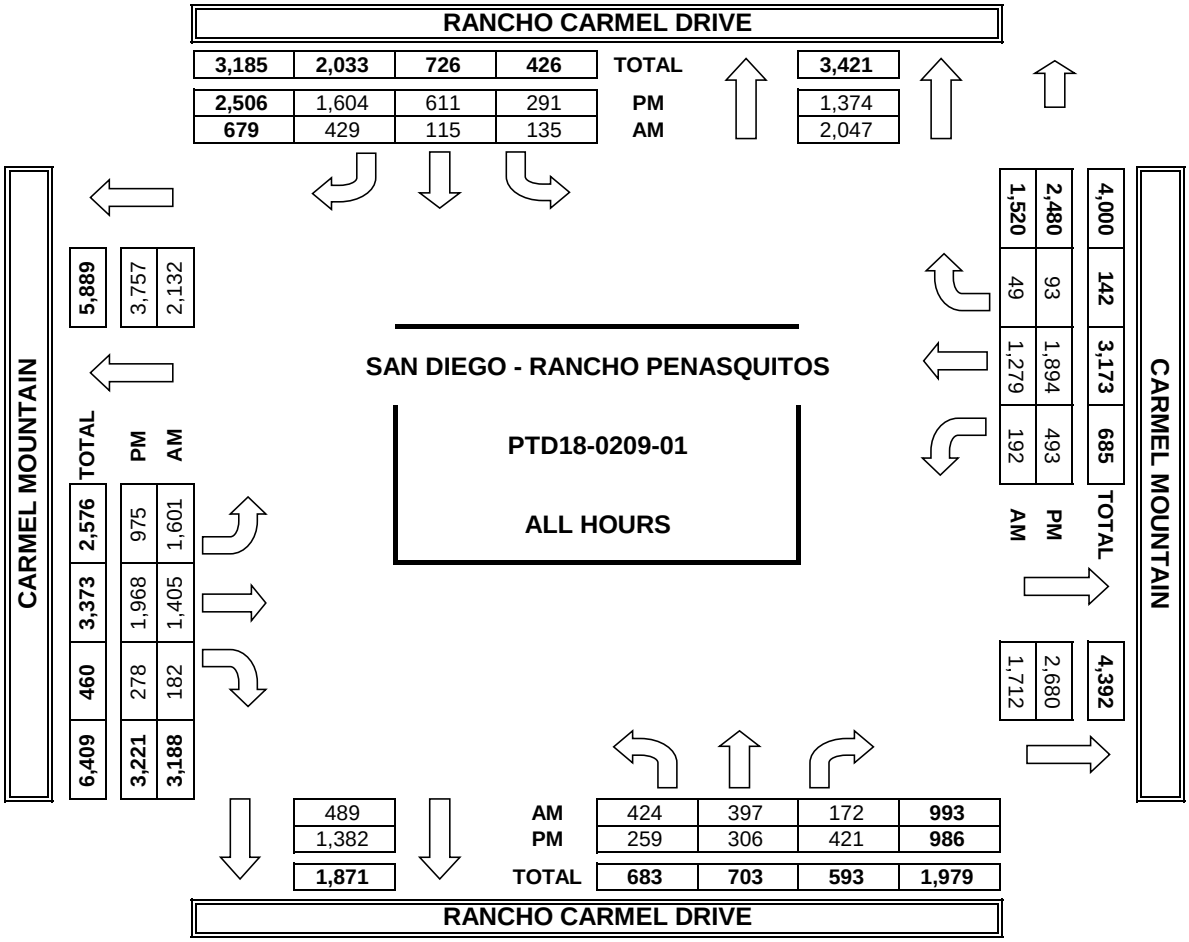
		NORTHBOUND RANCHO CARMEL DRIVE			SOUTHBOUND RANCHO CARMEL DRIVE			EASTBOUND CARMEL MOUNTAIN			WESTBOUND CARMEL MOUNTAIN				U-TURNS				
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 2	EL 2	ET 3	ER 0	WL 2	WT 3	WR 0	TOTAL	NB X	SB X	EB X	WB X	TTL
AM	7:00 AM	69	53	31	13	17	59	156	151	10	18	132	2	711	1	6	17		24
	7:15 AM	56	40	25	15	15	44	206	180	21	24	171	4	801		8	20		28
	7:30 AM	68	52	10	16	8	54	185	166	20	31	178	6	794		9	18		27
	7:45 AM	57	62	20	19	15	49	259	208	29	23	176	4	921		10	6		16
	8:00 AM	50	55	20	17	11	50	186	175	29	26	154	5	778		6	21		27
	8:15 AM	48	49	24	22	15	58	206	186	27	29	145	7	816		11	16		27
	8:30 AM	46	38	20	14	20	62	193	146	28	24	176	12	779		6	18		24
	8:45 AM	30	48	22	19	14	53	210	193	18	17	147	9	780		8	21		29
	VOLUMES	424	397	172	135	115	429	1,601	1,405	182	192	1,279	49	6,380	1	64	137	0	202
	APPROACH %	43%	40%	17%	20%	17%	63%	50%	44%	6%	13%	84%	3%						
	APP/DEPART	993	/	2,047	679	/	489	3,188	/	1,712	1,520	/	2,132	0					
	BEGIN PEAK HR		7:30 AM																
	VOLUMES	223	218	74	74	49	211	836	735	105	109	653	22	3,309					
	APPROACH %	43%	42%	14%	22%	15%	63%	50%	44%	6%	14%	83%	3%						
	PEAK HR FACTOR		0.926			0.879			0.845			0.912		0.898					
	APP/DEPART	515	/	1,076	334	/	263	1,676	/	883	784	/	1,087	0					
PM	4:00 PM	25	39	34	46	65	235	137	214	29	63	225	8	1,120	1	4	17		22
	4:15 PM	31	22	44	37	66	153	128	230	28	44	220	16	1,019		6	22		28
	4:30 PM	29	51	55	43	71	219	114	218	31	54	209	9	1,103		7	11	2	20
	4:45 PM	36	32	50	35	75	210	114	269	40	59	231	11	1,162	1	5	18	1	25
	5:00 PM	41	43	68	24	109	225	109	257	33	59	228	11	1,207		2	14		16
	5:15 PM	33	45	56	40	104	209	107	279	38	64	236	14	1,225		8	12		20
	5:30 PM	36	44	57	39	76	206	132	245	41	65	251	11	1,203		8	19		27
	5:45 PM	28	30	57	27	45	147	134	256	38	85	294	13	1,154		9	20		29
	VOLUMES	259	306	421	291	611	1,604	975	1,968	278	493	1,894	93	9,193	2	49	133	3	187
	APPROACH %	26%	31%	43%	12%	24%	64%	30%	61%	9%	20%	76%	4%						
	APP/DEPART	986	/	1,374	2,506	/	1,382	3,221	/	2,680	2,480	/	3,757	0					
	BEGIN PEAK HR		4:45 PM																
	VOLUMES	146	164	231	138	364	850	462	1,050	152	247	946	47	4,797					
	APPROACH %	27%	30%	43%	10%	27%	63%	28%	63%	9%	20%	76%	4%						
	PEAK HR FACTOR		0.890			0.944			0.981			0.948		0.979					
	APP/DEPART	541	/	673	1,352	/	763	1,664	/	1,419	1,240	/	1,942	0					

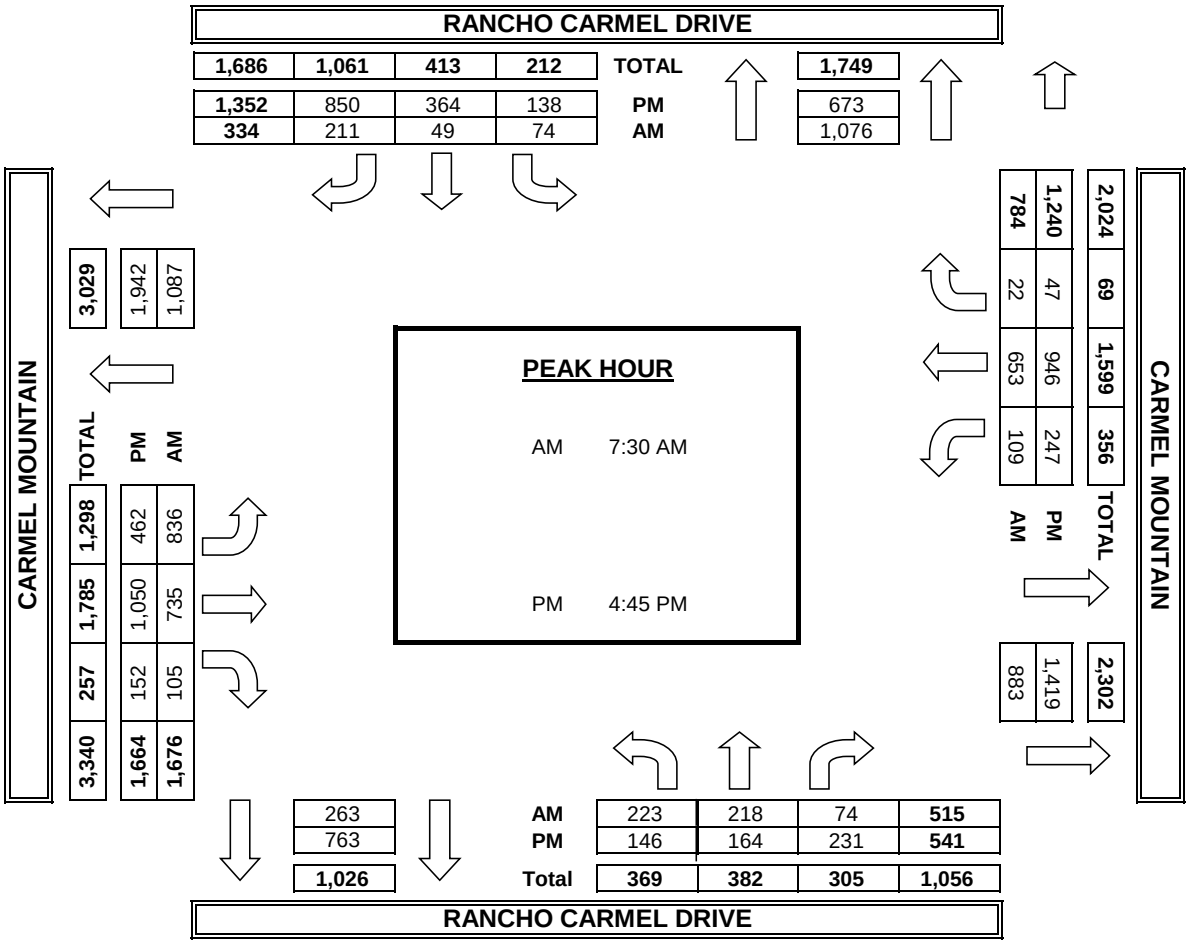


		PEDESTRIAN CROSSINGS					PEDESTRIAN ACTIVATIONS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM					0					0		1		1	2
	7:15 AM		1			1					0			1		1
	7:30 AM			1		1					0					0
	7:45 AM	1	3	2		6					0					0
	8:00 AM	1		2		3					0			1		1
	8:15 AM		2	1		3					0					0
	8:30 AM			2		2					0			1		1
	8:45 AM			3		3					0			3		3
	TOTAL	2	6	11	0	19	0	0	0	0	0	0	1	6	1	8
PM	4:00 PM		1		1	2					0					0
	4:15 PM			2		2					0					0
	4:30 PM	3	3	3		9					0			1		1
	4:45 PM		2	3		5					0					0
	5:00 PM			1		1					0					0
	5:15 PM	1		1		2					0					0
	5:30 PM		3	6		9					0		1			1
	5:45 PM		1	2		3					0					0
	TOTAL	4	10	18	1	33	0	0	0	0	0	0	1	1	0	2

PACIFIC TECHNICAL DATA

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: PACIFIC TECHNICAL DATA

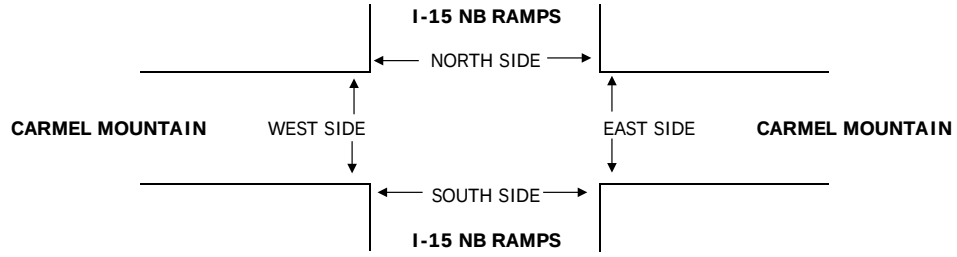
DATE:	LOCATION:	SAN DIEGO - RANCHO PENASQUITOS	PROJECT #:	PTD18-0209-01
2/6/18	NORTH & SOUTH:	I-15 NB RAMPS	LOCATION #:	2
TUESDAY	EAST & WEST:	CARMEL MOUNTAIN	CONTROL:	SIGNAL

NOTES:

INCLUDE BIKE / PED

AM / PM / MD / OTHER / OTHER — N / W / E / S

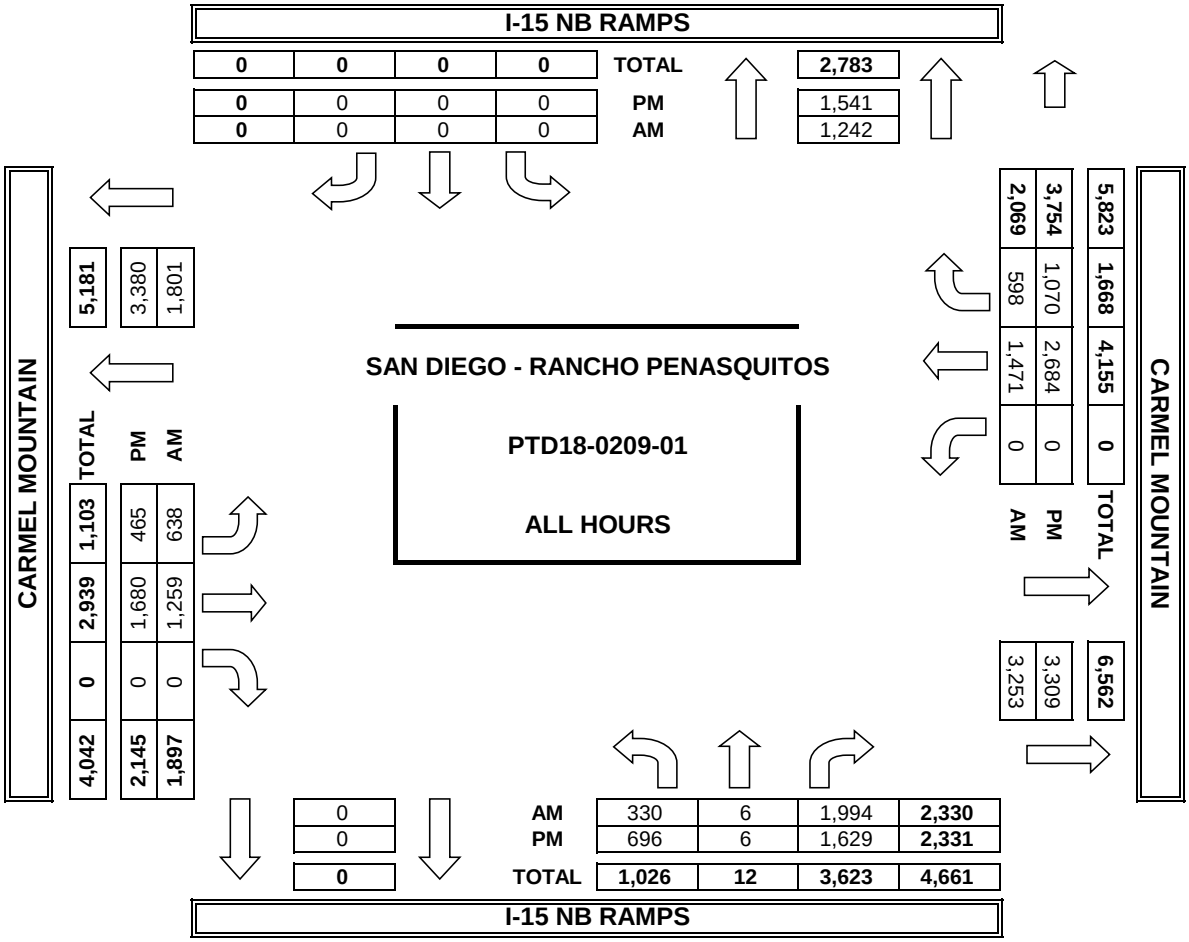
		NORTHBOUND I-15 NB RAMPS			SOUTHBOUND I-15 NB RAMPS			EASTBOUND CARMEL MOUNTAIN			WESTBOUND CARMEL MOUNTAIN				U-TURNS				
	LANES:	NL 1.5	NT 0.5	NR 2	SL X	ST X	SR X	EL 2	ET 3	ER X	WL X	WT 2	WR 1	TOTAL	NB X	SB X	EB X	WB X	TTL
AM	7:00 AM	31	0	166				63	151			179	72	662					0
	7:15 AM	35	1	253				76	147			182	82	776					0
	7:30 AM	54	0	246				84	165			203	81	833					0
	7:45 AM	48	0	300				88	176			189	77	878					0
	8:00 AM	44	1	268				82	166			196	66	823					0
	8:15 AM	45	1	259				83	138			169	76	771					0
	8:30 AM	37	2	240				75	151			198	76	779					0
	8:45 AM	36	1	262				87	165			155	68	774					0
	VOLUMES	330	6	1,994	0	0	0	638	1,259	0	0	1,471	598	6,296	0	0	0	0	0
	APPROACH %	14%	0%	86%	0%	0%	0%	34%	66%	0%	0%	71%	29%						
	APP/DEPART	2,330	/	1,242	0	/	0	1,897	/	3,253	2,069	/	1,801	0					
	BEGIN PEAK HR		7:15 AM																
	VOLUMES	181	2	1,067	0	0	0	330	654	0	0	770	306	3,310					
	APPROACH %	14%	0%	85%	0%	0%	0%	34%	66%	0%	0%	72%	28%						
	PEAK HR FACTOR		0.898			0.000			0.932			0.947		0.942					
	APP/DEPART	1,250	/	638	0	/	0	984	/	1,721	1,076	/	951	0					
PM	4:00 PM	74	2	188				56	203			326	138	987					0
	4:15 PM	69	2	189				48	194			310	112	924					0
	4:30 PM	93	0	185				70	205			331	117	1,001					0
	4:45 PM	82	0	211				65	212			341	145	1,056					0
	5:00 PM	93	1	211				44	214			363	135	1,061					0
	5:15 PM	87	0	213				57	205			343	152	1,057					0
	5:30 PM	89	0	217				67	241			332	152	1,098					0
	5:45 PM	109	1	215				58	206			338	119	1,046					0
	VOLUMES	696	6	1,629	0	0	0	465	1,680	0	0	2,684	1,070	8,230	0	0	0	0	0
	APPROACH %	30%	0%	70%	0%	0%	0%	22%	78%	0%	0%	71%	29%						
	APP/DEPART	2,331	/	1,541	0	/	0	2,145	/	3,309	3,754	/	3,380	0					
	BEGIN PEAK HR		4:45 PM																
	VOLUMES	351	1	852	0	0	0	233	872	0	0	1,379	584	4,272					
	APPROACH %	29%	0%	71%	0%	0%	0%	21%	79%	0%	0%	70%	30%						
	PEAK HR FACTOR		0.984			0.000			0.897			0.985		0.973					
	APP/DEPART	1,204	/	818	0	/	0	1,105	/	1,724	1,963	/	1,730	0					

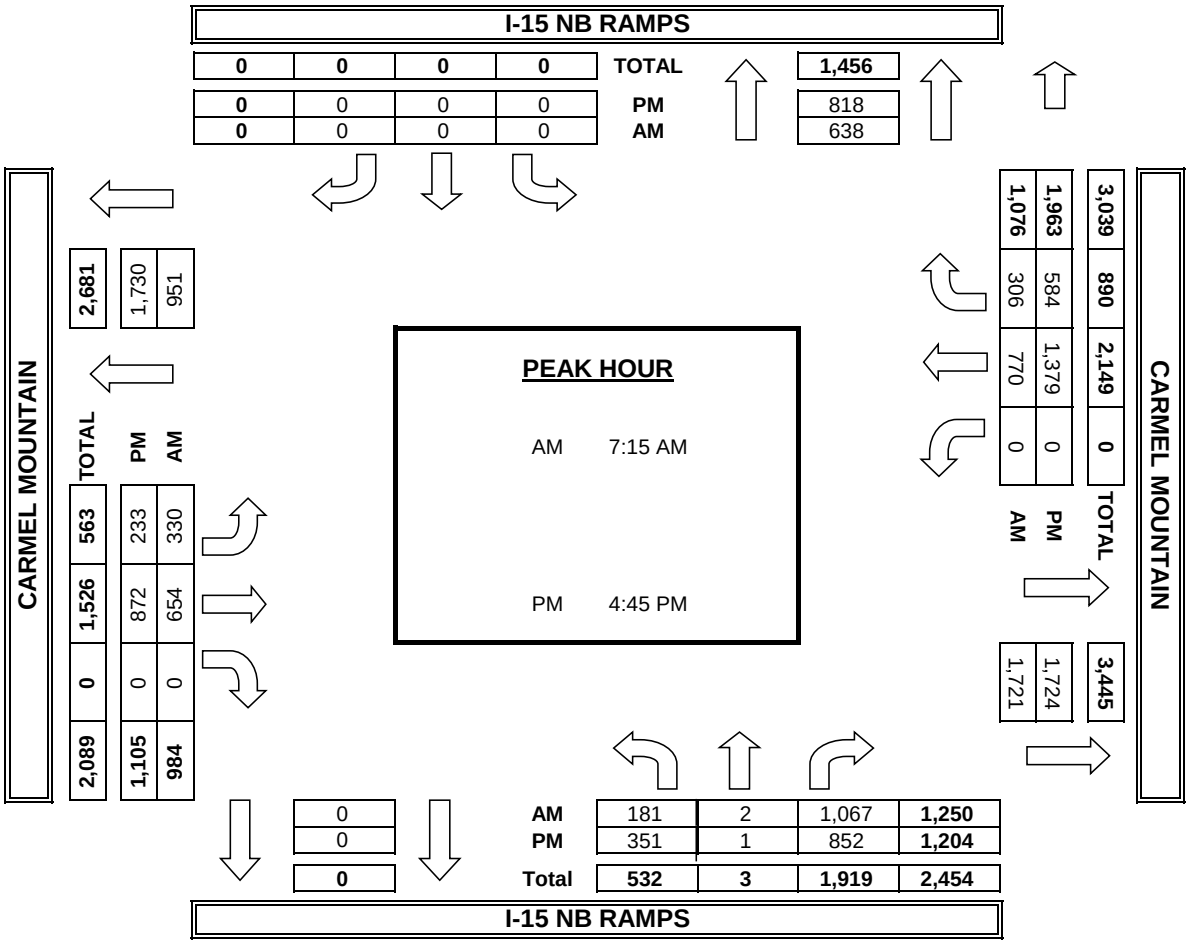


		PEDESTRIAN CROSSINGS					PEDESTRIAN ACTIVATIONS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM					0					0					0
	7:15 AM					0					0					0
	7:30 AM					0					0					0
	7:45 AM	1				1					0					0
	8:00 AM					0					0					0
	8:15 AM					0					0					0
	8:30 AM		1			1					0					0
	8:45 AM					0					0		1			1
	TOTAL	1	1	0	0	2	0	0	0	0	0	0	1	0	0	1
PM	4:00 PM					0					0					0
	4:15 PM					0					0		1			1
	4:30 PM					0					0					0
	4:45 PM					0					0					0
	5:00 PM					0					0					0
	5:15 PM					0					0		1			1
	5:30 PM					0					0					0
	5:45 PM					0					0					0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2

PACIFIC TECHNICAL DATA

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: PACIFIC TECHNICAL DATA

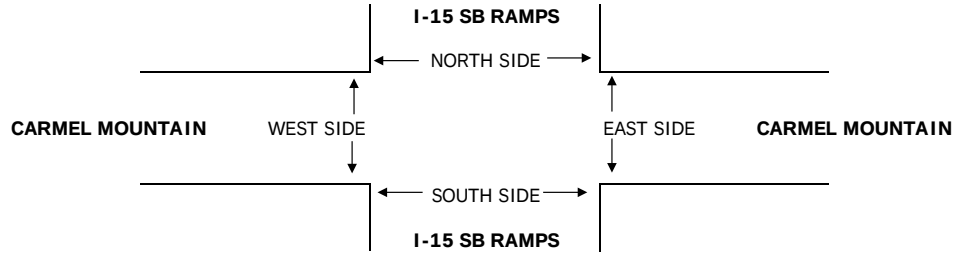
DATE:	LOCATION:	SAN DIEGO - RANCHO PENASQUITOS	PROJECT #:	PTD18-0209-01
2/6/18	NORTH & SOUTH:	I-15 SB RAMPS	LOCATION #:	3
TUESDAY	EAST & WEST:	CARMEL MOUNTAIN	CONTROL:	SIGNAL

NOTES:

INCLUDE BIKE / PED

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

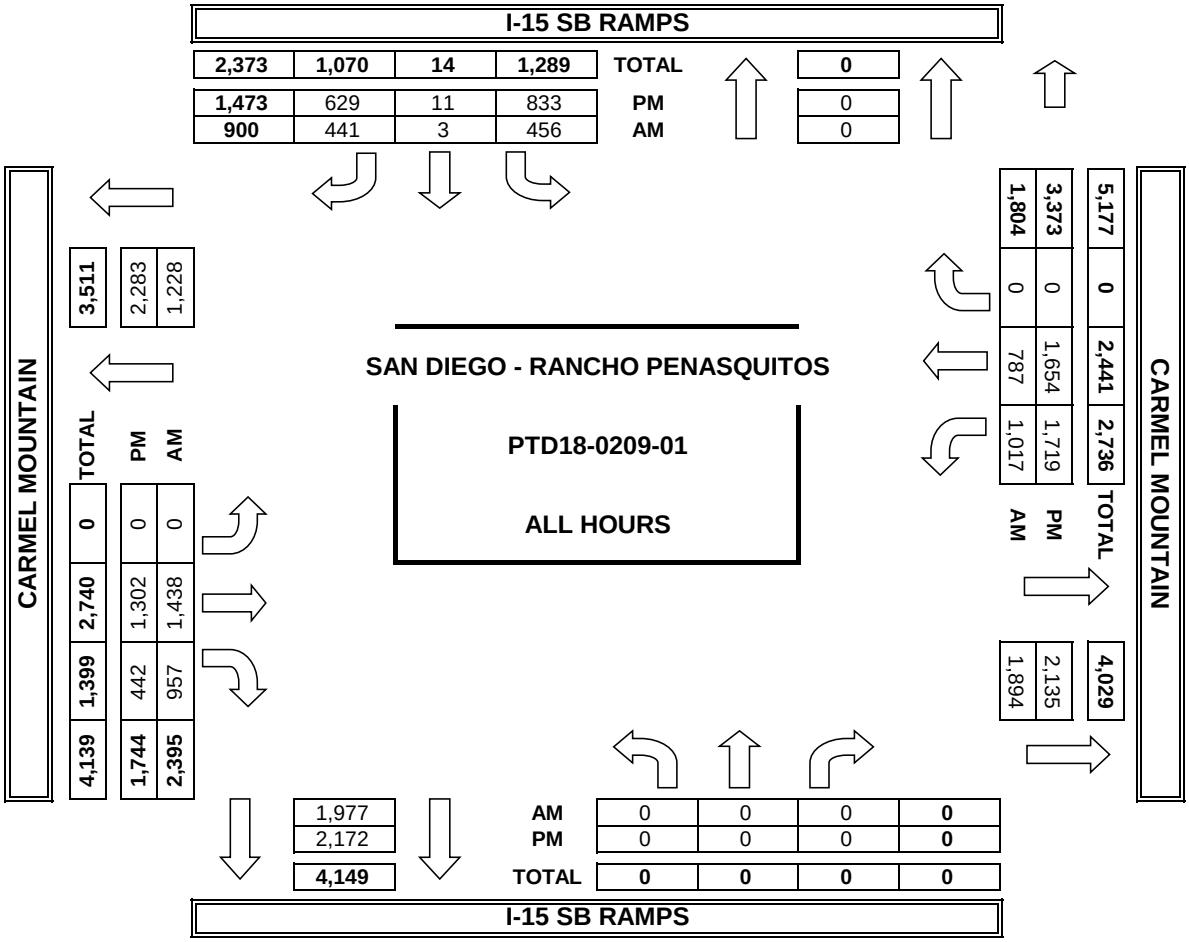
		NORTHBOUND I-15 SB RAMPS			SOUTHBOUND I-15 SB RAMPS			EASTBOUND CARMEL MOUNTAIN			WESTBOUND CARMEL MOUNTAIN				U-TURNS				
	LANES:	NL X	NT X	NR X	SL 1.33	ST 0.33	SR 1.33	EL X	ET 2	ER 1	WL 2	WT 2	WR X	TOTAL	NB X	SB X	EB X	WB X	TTL
AM	7:00 AM				43	0	61	-	169	125	117	88		603					0
	7:15 AM				56	0	53		169	137	135	87		637					0
	7:30 AM				60	0	56		189	140	159	105		709					0
	7:45 AM				62	0	70		200	121	130	114		697					0
	8:00 AM				72	0	54		178	125	133	98		660					0
	8:15 AM				57	1	49		163	90	115	104		579					0
	8:30 AM				50	2	51		175	122	121	102		623					0
	8:45 AM				56	0	47		195	97	107	89		591					0
	VOLUMES	0	0	0	456	3	441	0	1,438	957	1,017	787	0	5,099	0	0	0	0	0
	APPROACH %	0%	0%	0%	51%	0%	49%	0%	60%	40%	56%	44%	0%						
	APP/DEPART	0	/	0	900	/	1,977	2,395	/	1,894	1,804	/	1,228	0					
	BEGIN PEAK HR		7:15 AM																
	VOLUMES	0	0	0	250	0	233	0	736	523	557	404	0	2,703					
	APPROACH %	0%	0%	0%	52%	0%	48%	0%	58%	42%	58%	42%	0%						
	PEAK HR FACTOR		0.000			0.915			0.957			0.910		0.953					
	APP/DEPART	0	/	0	483	/	1,080	1,259	/	986	961	/	637	0					
PM	4:00 PM				101	3	59		159	41	218	177		758					0
	4:15 PM				90	2	78		145	57	205	178		755					0
	4:30 PM				115	1	82		166	68	215	207		854					0
	4:45 PM				109	0	75		160	56	221	199		820					0
	5:00 PM				107	0	83		160	48	221	232		851					0
	5:15 PM				100	0	98		157	57	223	208		843					0
	5:30 PM				108	0	79		200	63	209	208		867					0
	5:45 PM				103	5	75		155	52	207	245		842					0
	VOLUMES	0	0	0	833	11	629	0	1,302	442	1,719	1,654	0	6,590	0	0	0	0	0
	APPROACH %	0%	0%	0%	57%	1%	43%	0%	75%	25%	51%	49%	0%						
	APP/DEPART	0	/	0	1,473	/	2,172	1,744	/	2,135	3,373	/	2,283	0					
	BEGIN PEAK HR		5:00 PM																
	VOLUMES	0	0	0	418	5	335	0	672	220	860	893	0	3,403					
	APPROACH %	0%	0%	0%	55%	1%	44%	0%	75%	25%	49%	51%	0%						
	PEAK HR FACTOR		0.000			0.957			0.848			0.967		0.981					
	APP/DEPART	0	/	0	758	/	1,085	892	/	1,090	1,753	/	1,228	0					

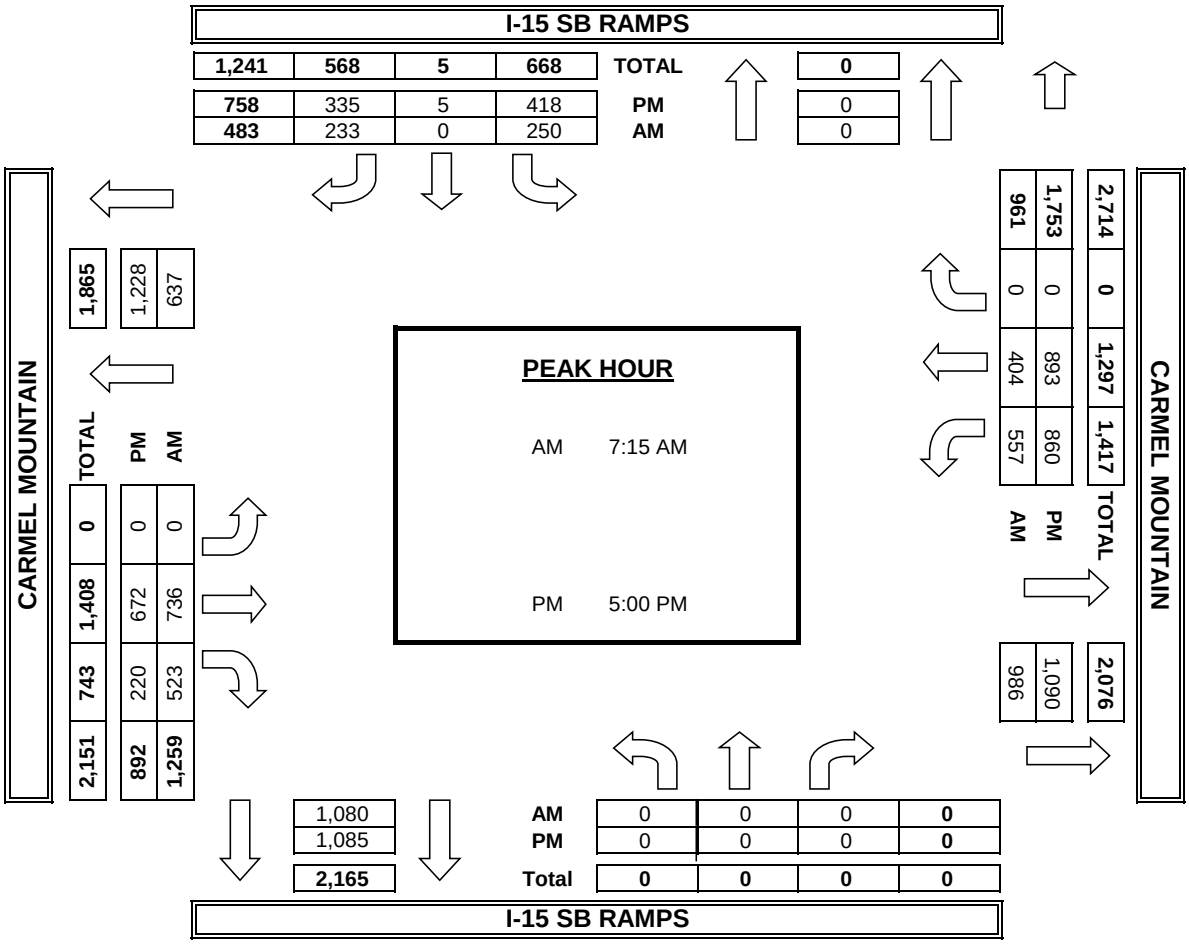


		PEDESTRIAN CROSSINGS					PEDESTRIAN ACTIVATIONS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM					0					0	1				1
	7:15 AM					0					0					0
	7:30 AM	1				1					0					0
	7:45 AM	3				3					0					0
	8:00 AM					0					0		1			1
	8:15 AM					0					0					0
	8:30 AM	1				1					0					0
	8:45 AM					0					0					0
	TOTAL	5	0	0	0	5	0	0	0	0	0	1	1	0	0	2
PM	4:00 PM	2				2					0					0
	4:15 PM	1				1					0	1				1
	4:30 PM					0					0					0
	4:45 PM	1				1					0					0
	5:00 PM		1			1					0					0
	5:15 PM					0					0					0
	5:30 PM	3				3					0					0
	5:45 PM					0					0					0
	TOTAL	7	1	0	0	8	0	0	0	0	0	1	0	0	0	1

PACIFIC TECHNICAL DATA

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: PACIFIC TECHNICAL DATA

DATE:	LOCATION:	SAN DIEGO - RANCHO PENASQUITOS	PROJECT #:	PTD18-0209-01
2/6/18	NORTH & SOUTH:	PENASQUITOS DRIVE	LOCATION #:	4
TUESDAY	EAST & WEST:	CARMEL MOUNTAIN	CONTROL:	SIGNAL

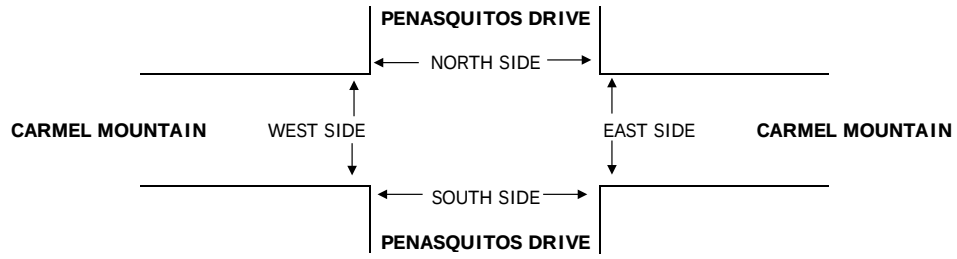
NOTES:

INCLUDE BIKE / PED

AM / PM / MD / OTHER / OTHER

N ▲ ◄ W E ► S ▼

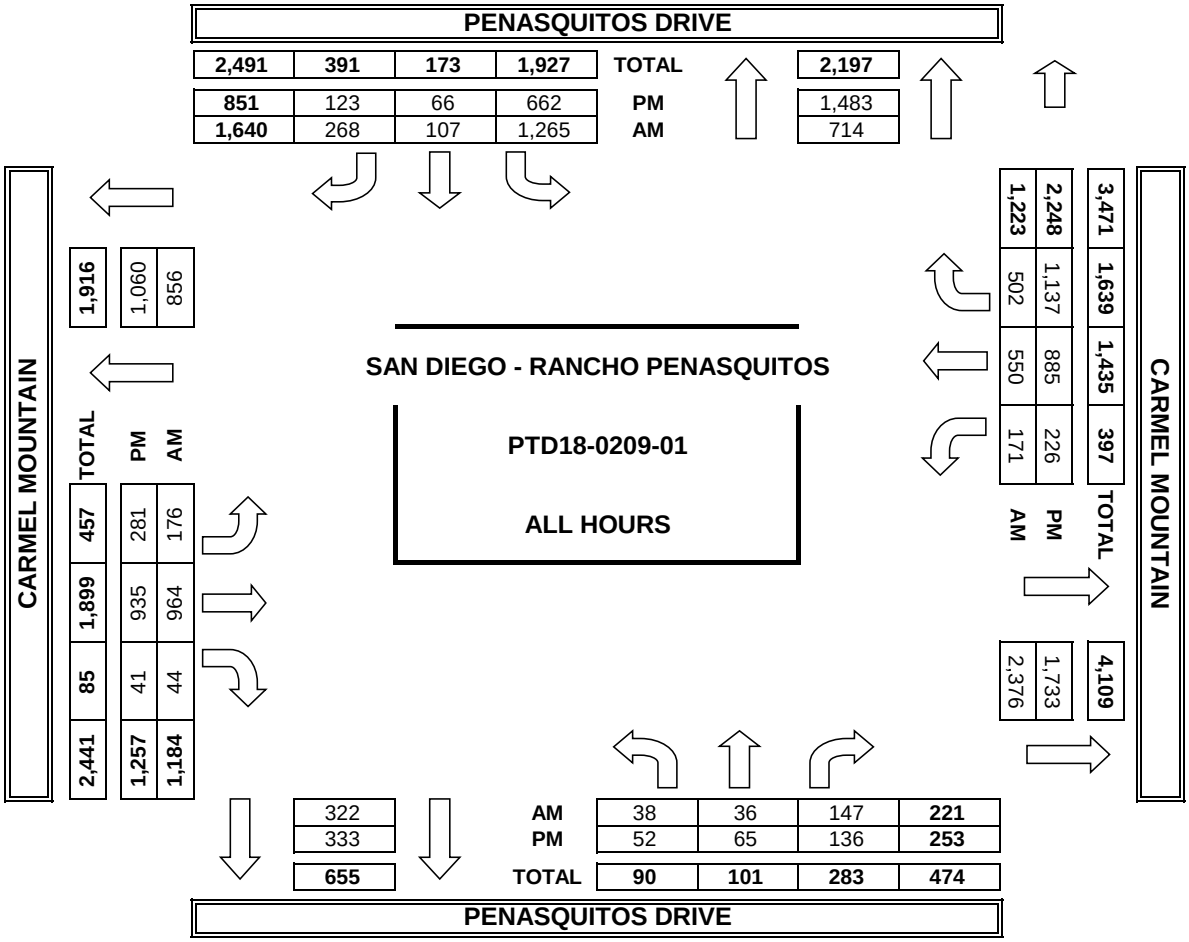
		NORTHBOUND PENASQUITOS DRIVE			SOUTHBOUND PENASQUITOS DRIVE			EASTBOUND CARMEL MOUNTAIN			WESTBOUND CARMEL MOUNTAIN				U-TURNS				
	LANES:	NL 1.5	NT 0.5	NR 1	SL 1.5	ST 0.5	SR 1	EL 1	ET 2.5	ER 0.5	WL 1	WT 2	WR 1	TOTAL	NB X	SB X	EB X	WB X	TTL
AM	7:00 AM	3	2	20	149	9	76	10	122	6	26	92	35	550			2		2
	7:15 AM	4	3	21	144	17	49	30	132	6	25	70	42	543			3		3
	7:30 AM	4	8	19	173	8	19	34	152	4	22	67	65	575				1	1
	7:45 AM	6	6	17	177	16	24	23	117	6	13	84	92	581				1	1
	8:00 AM	6	7	20	180	17	30	20	105	7	21	68	60	541					0
	8:15 AM	1	4	8	147	14	26	32	95	4	18	61	79	489			3	1	4
	8:30 AM	7	3	24	158	18	25	16	108	7	19	54	79	518				1	1
	8:45 AM	7	3	18	137	8	19	11	133	4	27	54	50	471			3	1	4
	VOLUMES	38	36	147	1,265	107	268	176	964	44	171	550	502	4,268	0	0	11	5	16
	APPROACH %	17%	16%	67%	77%	7%	16%	15%	81%	4%	14%	45%	41%						
	APP/DEPART	221	/	714	1,640	/	322	1,184	/	2,376	1,223	/	856	0					
	BEGIN PEAK HR		7:00 AM																
	VOLUMES	17	19	77	643	50	168	97	523	22	86	313	234	2,249					
	APPROACH %	15%	17%	68%	75%	6%	20%	15%	81%	3%	14%	49%	37%						
	PEAK HR FACTOR		0.911			0.920			0.845			0.837		0.968					
	APP/DEPART	113	/	350	861	/	158	642	/	1,243	633	/	498	0					
PM	4:00 PM	6	4	9	79	4	12	31	111	6	27	92	122	503				2	2
	4:15 PM	8	8	17	79	8	15	28	95	9	25	112	112	516			2	6	8
	4:30 PM	7	7	25	105	8	12	40	105	7	25	108	152	601				2	2
	4:45 PM	5	5	22	77	12	19	29	120	3	22	121	131	566			4	4	8
	5:00 PM	4	12	15	71	6	11	33	117	7	35	125	141	577				5	5
	5:15 PM	4	10	20	85	15	24	45	103	3	31	120	147	607			3	3	6
	5:30 PM	9	9	16	102	5	14	38	145	2	25	99	156	620			1		1
	5:45 PM	9	10	12	64	8	16	37	139	4	36	108	176	619			2	1	3
	VOLUMES	52	65	136	662	66	123	281	935	41	226	885	1,137	4,609	0	0	12	23	35
	APPROACH %	21%	26%	54%	78%	8%	14%	22%	74%	3%	10%	39%	51%						
	APP/DEPART	253	/	1,483	851	/	333	1,257	/	1,733	2,248	/	1,060	0					
	BEGIN PEAK HR		5:00 PM																
	VOLUMES	26	41	63	322	34	65	153	504	16	127	452	620	2,423					
	APPROACH %	20%	32%	48%	76%	8%	15%	23%	75%	2%	11%	38%	52%						
	PEAK HR FACTOR		0.956			0.849			0.909			0.937		0.977					
	APP/DEPART	130	/	814	421	/	177	673	/	889	1,199	/	543	0					

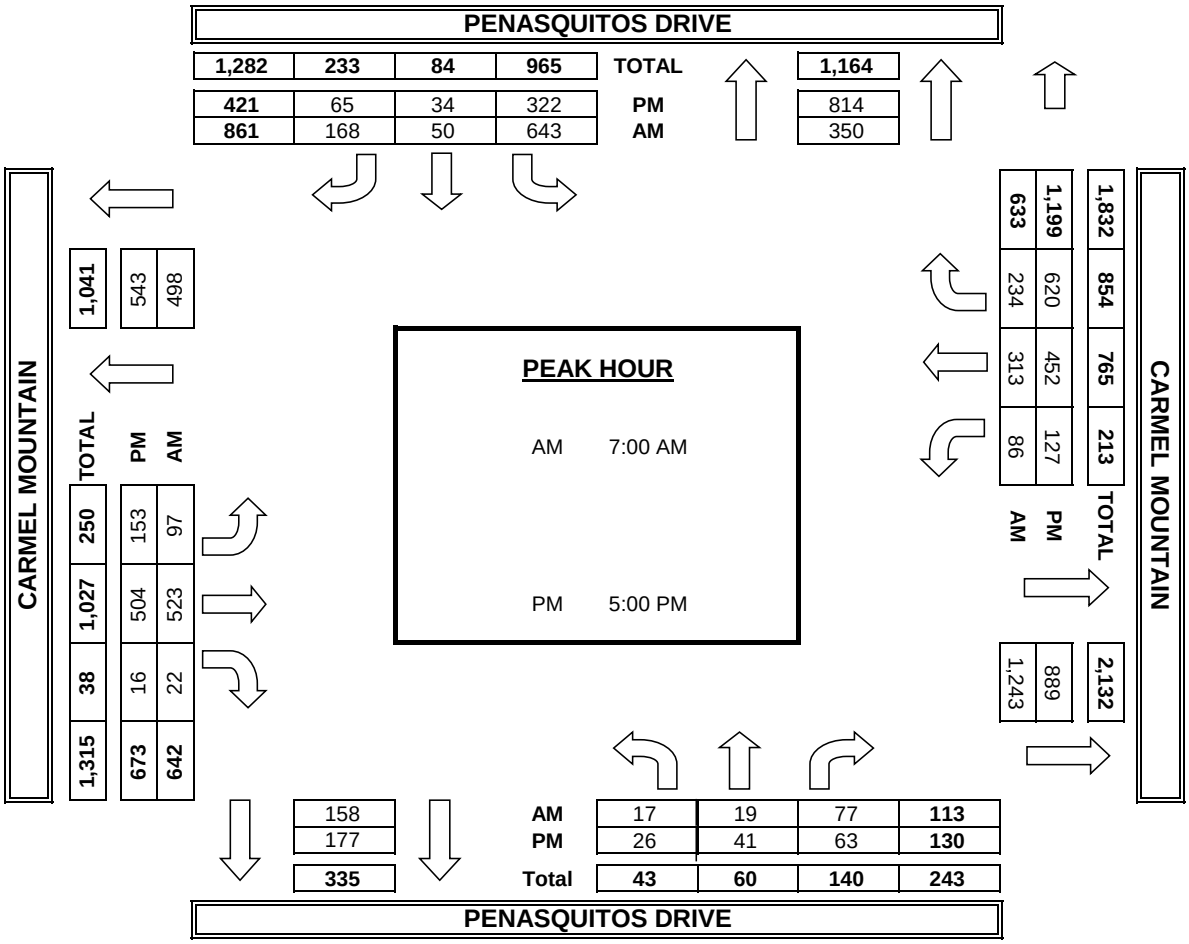


		PEDESTRIAN CROSSINGS					PEDESTRIAN ACTIVATIONS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM		1		1	2					0					0
	7:15 AM		1		1	2					0					0
	7:30 AM	3			3	6					0					0
	7:45 AM	1				1					0					0
	8:00 AM	1				1					0					0
	8:15 AM				3	3					0					0
	8:30 AM		1			1					0					0
	8:45 AM					0					0		1			1
	TOTAL	5	3	0	8	16	0	0	0	0	0	0	1	0	0	1
PM	4:00 PM				2	2					0					0
	4:15 PM				1	1					0					0
	4:30 PM				2	2					0					0
	4:45 PM				2	2					0					0
	5:00 PM		2		2	4					0		1			1
	5:15 PM	1			2	3					0					0
	5:30 PM				3	3					0					0
	5:45 PM		2			2					0					0
	TOTAL	1	4	0	14	19	0	0	0	0	0	0	1	0	0	1

PACIFIC TECHNICAL DATA

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: PACIFIC TECHNICAL DATA

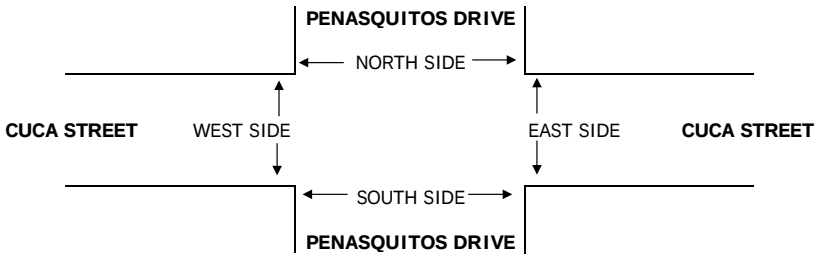
DATE:	LOCATION:	SAN DIEGO - RANCHO PENASQUITOS	PROJECT #:	PTD18-0209-01
2/6/18	NORTH & SOUTH:	PENASQUITOS DRIVE	LOCATION #:	5
TUESDAY	EAST & WEST:	CUCA STREET	CONTROL:	SIGNAL

NOTES:

INCLUDE BIKE / PED

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

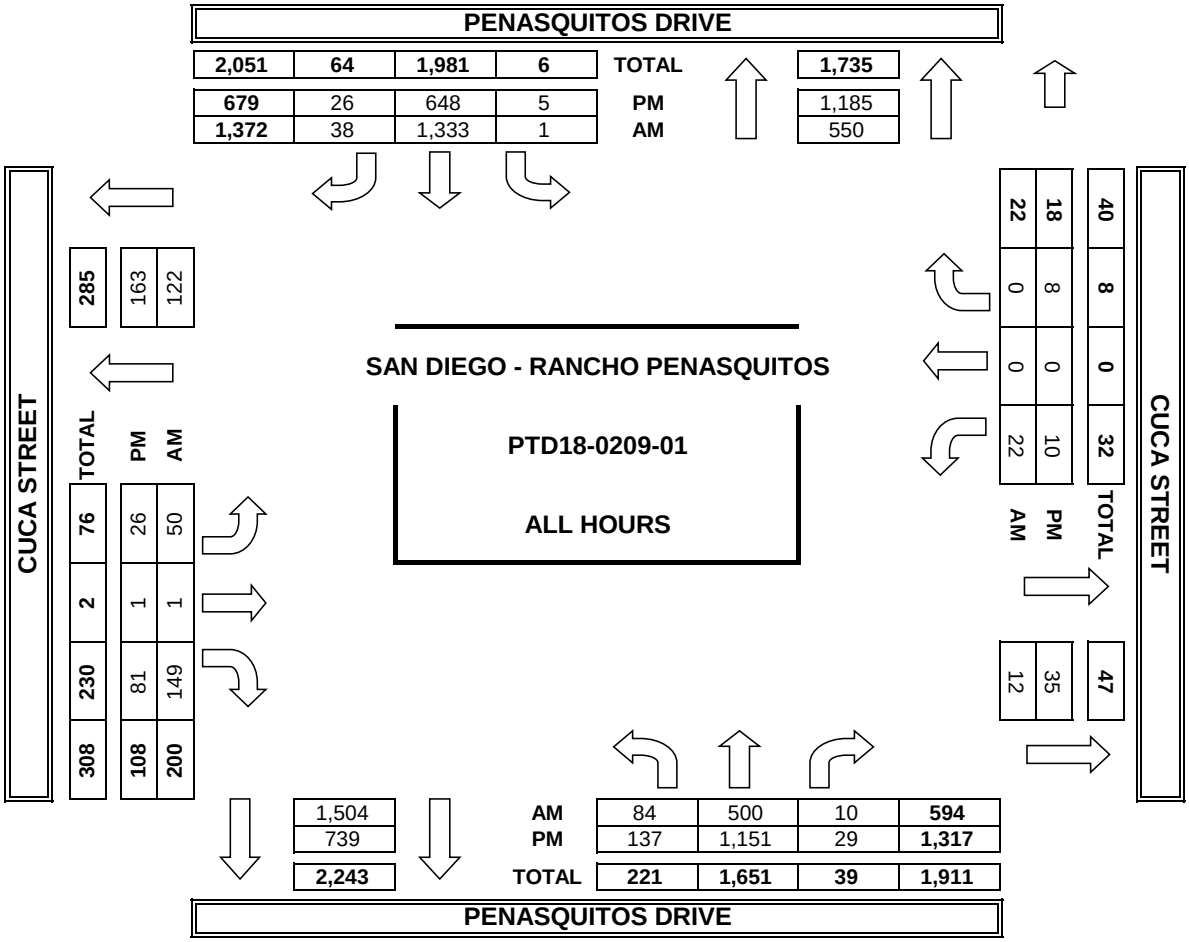
		NORTHBOUND PENASQUITOS DRIVE			SOUTHBOUND PENASQUITOS DRIVE			EASTBOUND CUCA STREET			WESTBOUND CUCA STREET				U-TURNS				
	LANES:	NL 1	NT 1	NR 0	SL 1	ST 1	SR 0	EL 0.33	ET 0.33	ER 0.33	WL 0.33	WT 0.33	WR 0.33	TOTAL	NB X	SB X	EB X	WB X	TTL
AM	7:00 AM	3	39	1	0	198	1	3	0	13	2	0	0	260					0
	7:15 AM	3	56	0	0	174	4	3	0	19	2	0	0	261					0
	7:30 AM	16	81	1	0	173	6	5	1	20	5	0	0	308					0
	7:45 AM	11	103	4	1	169	4	15	0	20	5	0	0	332					0
	8:00 AM	11	65	1	0	207	9	9	0	16	2	0	0	320					0
	8:15 AM	9	60	2	0	159	7	2	0	14	2	0	0	255					0
	8:30 AM	16	59	1	0	140	4	9	0	26	1	0	0	256					0
	8:45 AM	15	37	0	0	113	3	4	0	21	3	0	0	196					0
	VOLUMES	84	500	10	1	1,333	38	50	1	149	22	0	0	2,188	0	0	0	0	0
	APPROACH %	14%	84%	2%	0%	97%	3%	25%	1%	75%	100%	0%	0%						
	APP/DEPART	594	/	550	1,372	/	1,504	200	/	12	22	/	122	0					
	BEGIN PEAK HR		7:15 AM																
	VOLUMES	41	305	6	1	723	23	32	1	75	14	0	0	1,221					
	APPROACH %	12%	87%	2%	0%	97%	3%	30%	1%	69%	100%	0%	0%						
	PEAK HR FACTOR		0.746			0.865			0.771			0.700		0.919					
	APP/DEPART	352	/	337	747	/	812	108	/	8	14	/	64	0					
PM	4:00 PM	14	124	1	0	80	1	3	1	12	0	0	1	237					0
	4:15 PM	10	119	12	0	84	3	6	0	9	0	0	1	244					0
	4:30 PM	23	154	2	0	82	4	3	0	9	1	0	1	279	1				1
	4:45 PM	14	144	2	0	84	3	2	0	10	1	0	0	260					0
	5:00 PM	20	141	1	2	73	1	3	0	9	0	0	1	251					0
	5:15 PM	18	148	3	2	89	4	2	0	11	4	0	2	283					0
	5:30 PM	15	155	5	0	76	9	5	0	14	1	0	0	280					0
	5:45 PM	23	166	3	1	80	1	2	0	7	3	0	2	288					0
	VOLUMES	137	1,151	29	5	648	26	26	1	81	10	0	8	2,122	1	0	0	0	1
	APPROACH %	10%	87%	2%	1%	95%	4%	24%	1%	75%	56%	0%	44%						
	APP/DEPART	1,317	/	1,185	679	/	739	108	/	35	18	/	163	0					
	BEGIN PEAK HR		5:00 PM																
	VOLUMES	76	610	12	5	318	15	12	0	41	8	0	5	1,102					
	APPROACH %	11%	87%	2%	1%	94%	4%	23%	0%	77%	62%	0%	38%						
	PEAK HR FACTOR		0.909			0.889			0.697			0.542		0.957					
	APP/DEPART	698	/	627	338	/	367	53	/	17	13	/	91	0					

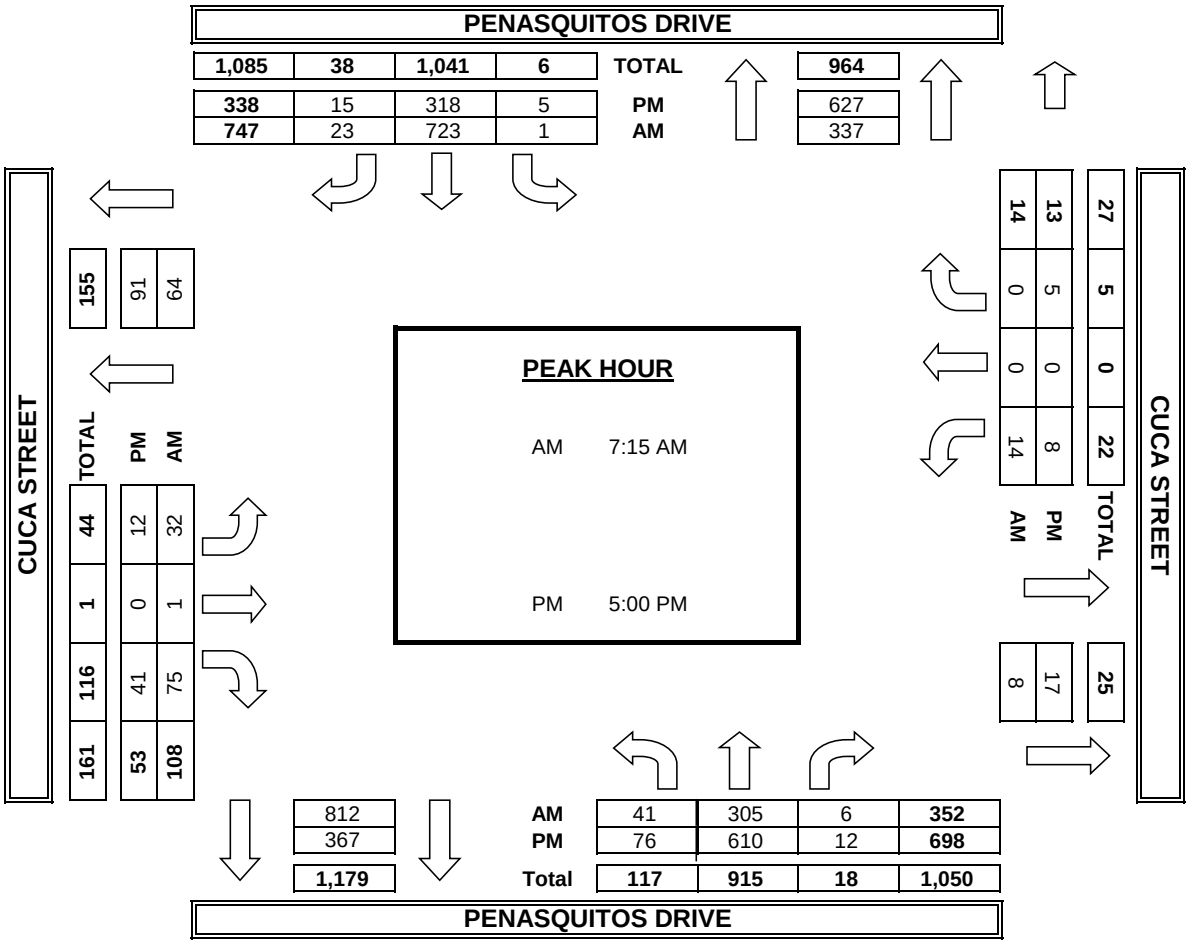


		PEDESTRIAN CROSSINGS					PEDESTRIAN ACTIVATIONS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM				1	1					0					0
	7:15 AM				1	1					0					0
	7:30 AM				2	2					0					0
	7:45 AM				1	1					0					0
	8:00 AM					0					0					0
	8:15 AM				2	2					0					0
	8:30 AM					0					0					0
	8:45 AM				1	1					0					0
	TOTAL	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
PM	4:00 PM				2	2					0					0
	4:15 PM				1	1					0					0
	4:30 PM					0					0					0
	4:45 PM				4	4					0					0
	5:00 PM		1		2	3					0					0
	5:15 PM				4	4					0					0
	5:30 PM				2	2					0			2		2
	5:45 PM			1		1					0					0
	TOTAL	0	1	1	15	17	0	0	0	0	0	0	0	2	0	2

PACIFIC TECHNICAL DATA

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: PACIFIC TECHNICAL DATA

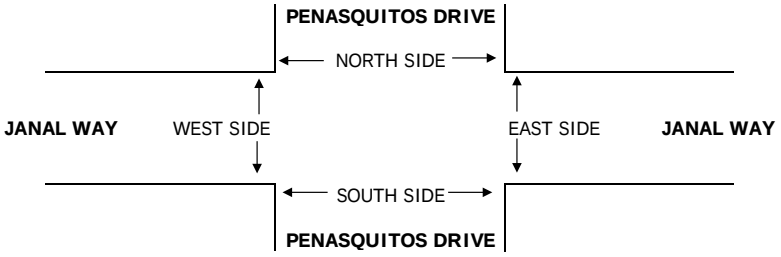
DATE:	LOCATION:	SAN DIEGO - RANCHO PENASQUITOS	PROJECT #:	PTD18-0209-01
2/6/18	NORTH & SOUTH:	PENASQUITOS DRIVE	LOCATION #:	6
TUESDAY	EAST & WEST:	JANAL WAY	CONTROL:	SIGNAL

NOTES:

INCLUDE BIKE / PED

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

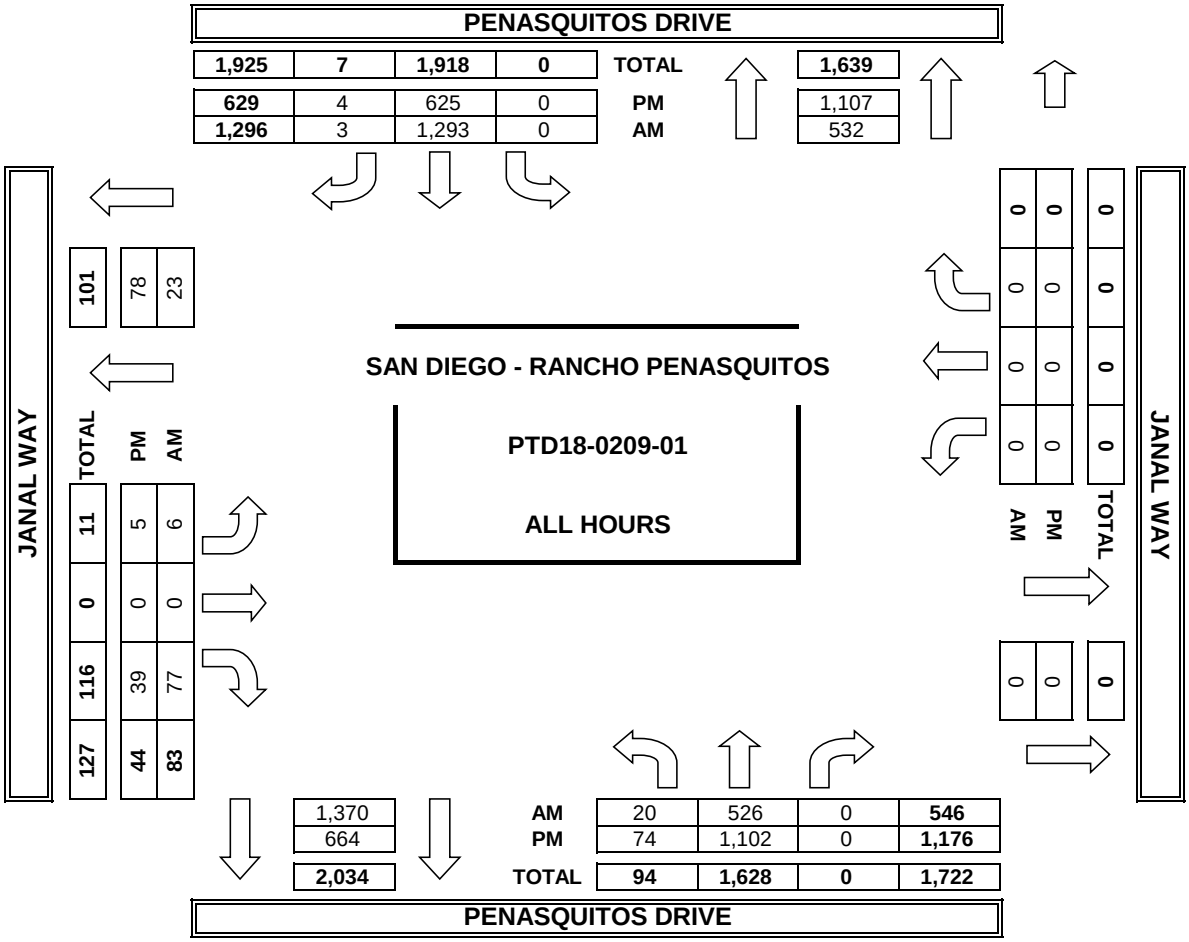
		NORTHBOUND PENASQUITOS DRIVE			SOUTHBOUND PENASQUITOS DRIVE			EASTBOUND JANAL WAY			WESTBOUND JANAL WAY				U-TURNS				
	LANES:	NL 1	NT 1	NR X	SL X	ST 1	SR 0	EL 0.33	ET 0.33	ER 0.33	WL X	WT X	WR X	TOTAL	NB X	SB X	EB X	WB X	TTL
AM	7:00 AM	2	42			194	0	0		6				244					0
	7:15 AM	1	56			161	0	0		14				232					0
	7:30 AM	3	86			175	0	0		6				270					0
	7:45 AM	2	116			161	0	2		11				292					0
	8:00 AM	2	72			208	1	4		9				296					0
	8:15 AM	2	58			149	2	0		12				223					0
	8:30 AM	5	60			137	0	0		9				211					0
	8:45 AM	3	36			108	0	0		10				157					0
	VOLUMES	20	526	0	0	1,293	3	6	0	77	0	0	0	1,925	0	0	0	0	0
	APPROACH %	4%	96%	0%	0%	100%	0%	7%	0%	93%	0%	0%	0%						
	APP/DEPART	546	/	532	1,296	/	1,370	83	/	0	0	/	23	0					
	BEGIN PEAK HR		7:15 AM																
	VOLUMES	8	330	0	0	705	1	6	0	40	0	0	0	1,090					
	APPROACH %	2%	98%	0%	0%	100%	0%	13%	0%	87%	0%	0%	0%						
	PEAK HR FACTOR		0.716			0.844			0.821			0.000		0.921					
	APP/DEPART	338	/	336	706	/	745	46	/	0	0	/	9	0					
PM	4:00 PM	7	122			75	2	1		4				211	2				2
	4:15 PM	6	115			82	0	1		6				210	1				1
	4:30 PM	14	146			79	0	0		0				239	3				3
	4:45 PM	12	134			79	0	0		6				231	0				0
	5:00 PM	10	133			74	0	1		2				220	2				2
	5:15 PM	9	140			93	0	1		0				243	2				2
	5:30 PM	9	150			73	0	1		9				242	2				2
	5:45 PM	7	162			70	2	0		12				253	0				0
	VOLUMES	74	1,102	0	0	625	4	5	0	39	0	0	0	1,849	12	0	0	0	12
	APPROACH %	6%	94%	0%	0%	99%	1%	11%	0%	89%	0%	0%	0%						
	APP/DEPART	1,176	/	1,107	629	/	664	44	/	0	0	/	78	0					
	BEGIN PEAK HR		5:00 PM																
	VOLUMES	35	585	0	0	310	2	3	0	23	0	0	0	958					
	APPROACH %	6%	94%	0%	0%	99%	1%	12%	0%	88%	0%	0%	0%						
	PEAK HR FACTOR		0.917			0.839			0.542			0.000		0.947					
	APP/DEPART	620	/	588	312	/	333	26	/	0	0	/	37	0					

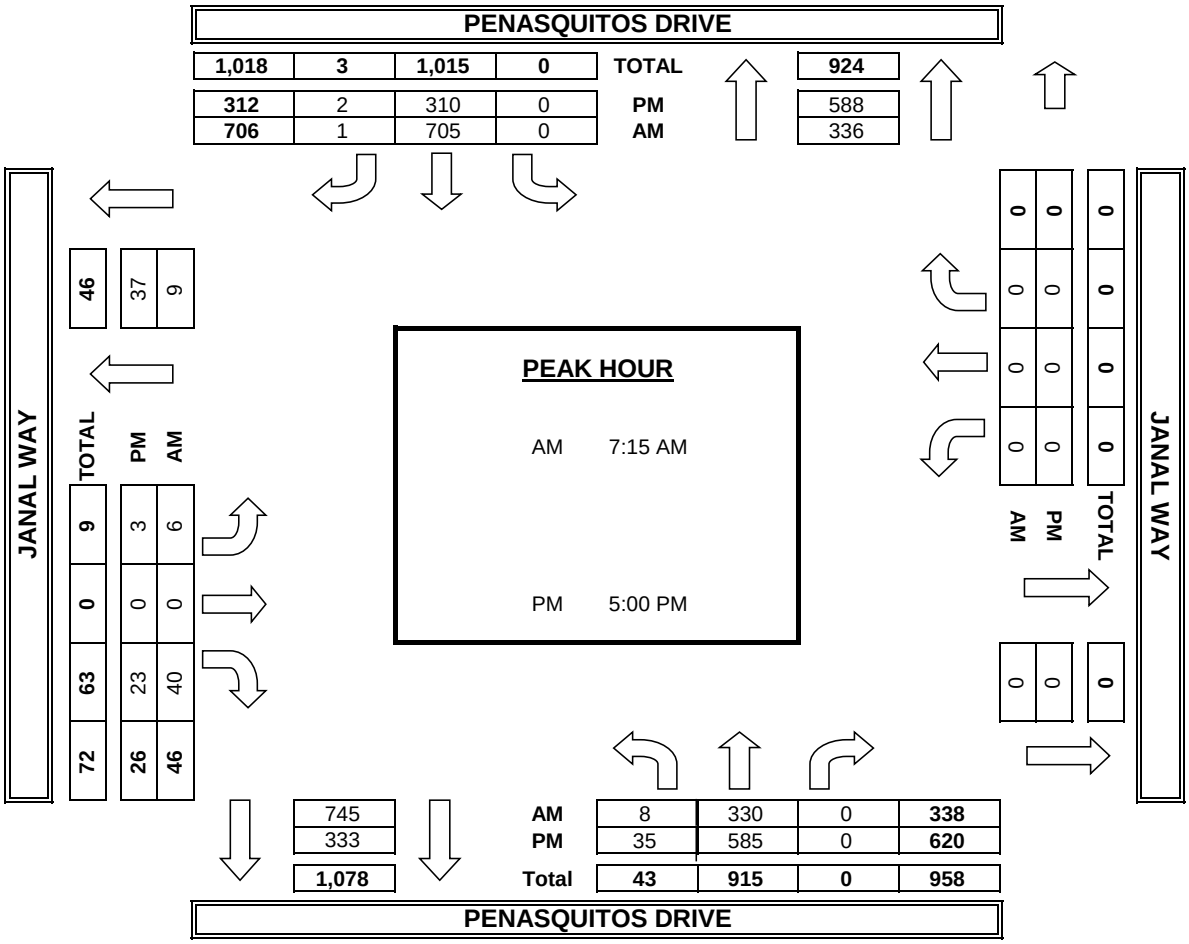


		PEDESTRIAN CROSSINGS					PEDESTRIAN ACTIVATIONS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM				1	1					0					0
	7:15 AM				1	1					0					0
	7:30 AM				1	1					0					0
	7:45 AM				2	2					0					0
	8:00 AM					0					0					0
	8:15 AM				1	1					0					0
	8:30 AM				1	1					0					0
	8:45 AM				1	1					0					0
	TOTAL	0	0	0	8	8	0	0	0	0	0	0	0	0	0	0
PM	4:00 PM				2	2					0				1	1
	4:15 PM				2	2					0					0
	4:30 PM				2	2					0					0
	4:45 PM				5	5					0					0
	5:00 PM				2	2					0					0
	5:15 PM				2	2					0				1	1
	5:30 PM				3	3					0					0
	5:45 PM				2	2					0					0
	TOTAL	0	0	0	20	20	0	0	0	0	0	0	0	0	2	2

PACIFIC TECHNICAL DATA

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: PACIFIC TECHNICAL DATA

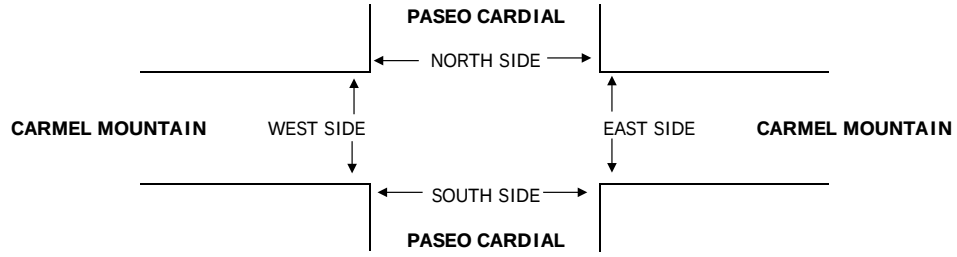
DATE:	LOCATION:	SAN DIEGO - RANCHO PENASQUITOS	PROJECT #:	PTD18-0209-01
2/6/18	NORTH & SOUTH:	PASEO CARDIAL	LOCATION #:	7
TUESDAY	EAST & WEST:	CARMEL MOUNTAIN	CONTROL:	SIGNAL

NOTES:

INCLUDE BIKE / PED

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, ▼ S

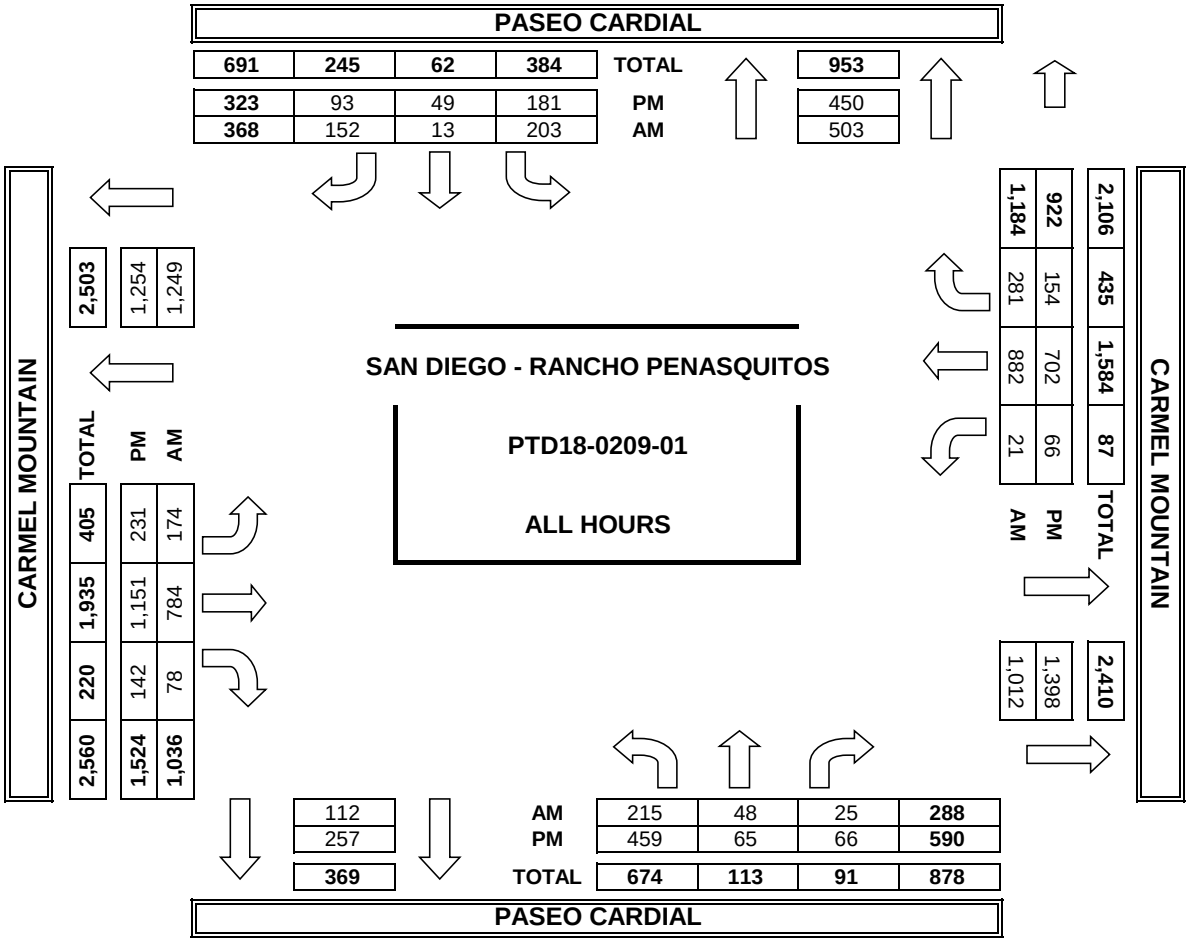
		NORTHBOUND PASEO CARDIAL			SOUTHBOUND PASEO CARDIAL			EASTBOUND CARMEL MOUNTAIN			WESTBOUND CARMEL MOUNTAIN				U-TURNS				
	LANES:	NL 0.33	NT 0.33	NR 0.33	SL 1	ST 1	SR 0	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL	NB X	SB X	EB X	WB X	TTL
AM	7:00 AM	32	14	0	15	1	16	71	81	8	1	143	123	505			4		4
	7:15 AM	26	20	5	30	2	15	47	128	4	1	127	76	481					0
	7:30 AM	19	2	1	60	3	27	11	128	6	4	110	16	387			3		3
	7:45 AM	26	2	3	21	0	24	5	110	9	4	117	13	334			1	1	2
	8:00 AM	33	1	4	16	0	22	9	95	16	0	92	7	295			4		4
	8:15 AM	26	1	5	17	3	12	10	95	14	2	95	12	292			2		2
	8:30 AM	34	4	3	30	3	20	13	68	12	4	108	17	316			4		4
	8:45 AM	19	4	4	14	1	16	8	79	9	5	90	17	266			4		4
	VOLUMES	215	48	25	203	13	152	174	784	78	21	882	281	2,876	0	0	22	1	23
	APPROACH %	75%	17%	9%	55%	4%	41%	17%	76%	8%	2%	74%	24%						
	APP/DEPART	288	/	503	368	/	112	1,036	/	1,012	1,184	/	1,249	0					
	BEGIN PEAK HR		7:00 AM																
	VOLUMES	103	38	9	126	6	82	134	447	27	10	497	228	1,707					
	APPROACH %	69%	25%	6%	59%	3%	38%	22%	74%	4%	1%	68%	31%						
	PEAK HR FACTOR		0.735			0.594			0.849			0.688		0.845					
	APP/DEPART	150	/	400	214	/	43	608	/	582	735	/	682	0					
PM	4:00 PM	53	7	11	21	3	8	26	121	15	9	77	16	367			5	5	10
	4:15 PM	46	6	4	16	2	17	18	126	15	7	69	17	343			10		10
	4:30 PM	47	8	8	16	4	11	28	125	17	9	81	17	371			16		16
	4:45 PM	60	7	8	27	8	12	22	151	25	5	83	22	430			8		8
	5:00 PM	51	7	9	26	9	9	24	142	21	13	75	13	399			9	2	11
	5:15 PM	72	8	6	24	7	12	32	166	19	9	109	26	490			13	1	14
	5:30 PM	62	10	8	32	10	11	33	174	19	7	103	23	492			13	1	14
	5:45 PM	68	12	12	19	6	13	48	146	11	7	105	20	467			21	1	22
	VOLUMES	459	65	66	181	49	93	231	1,151	142	66	702	154	3,359	0	0	95	10	105
	APPROACH %	78%	11%	11%	56%	15%	29%	15%	76%	9%	7%	76%	17%						
	APP/DEPART	590	/	450	323	/	257	1,524	/	1,398	922	/	1,254	0					
	BEGIN PEAK HR		5:00 PM																
	VOLUMES	253	37	35	101	32	45	137	628	70	36	392	82	1,848					
	APPROACH %	78%	11%	11%	57%	18%	25%	16%	75%	8%	7%	77%	16%						
	PEAK HR FACTOR		0.883			0.840			0.924			0.885		0.939					
	APP/DEPART	325	/	256	178	/	138	835	/	764	510	/	690	0					

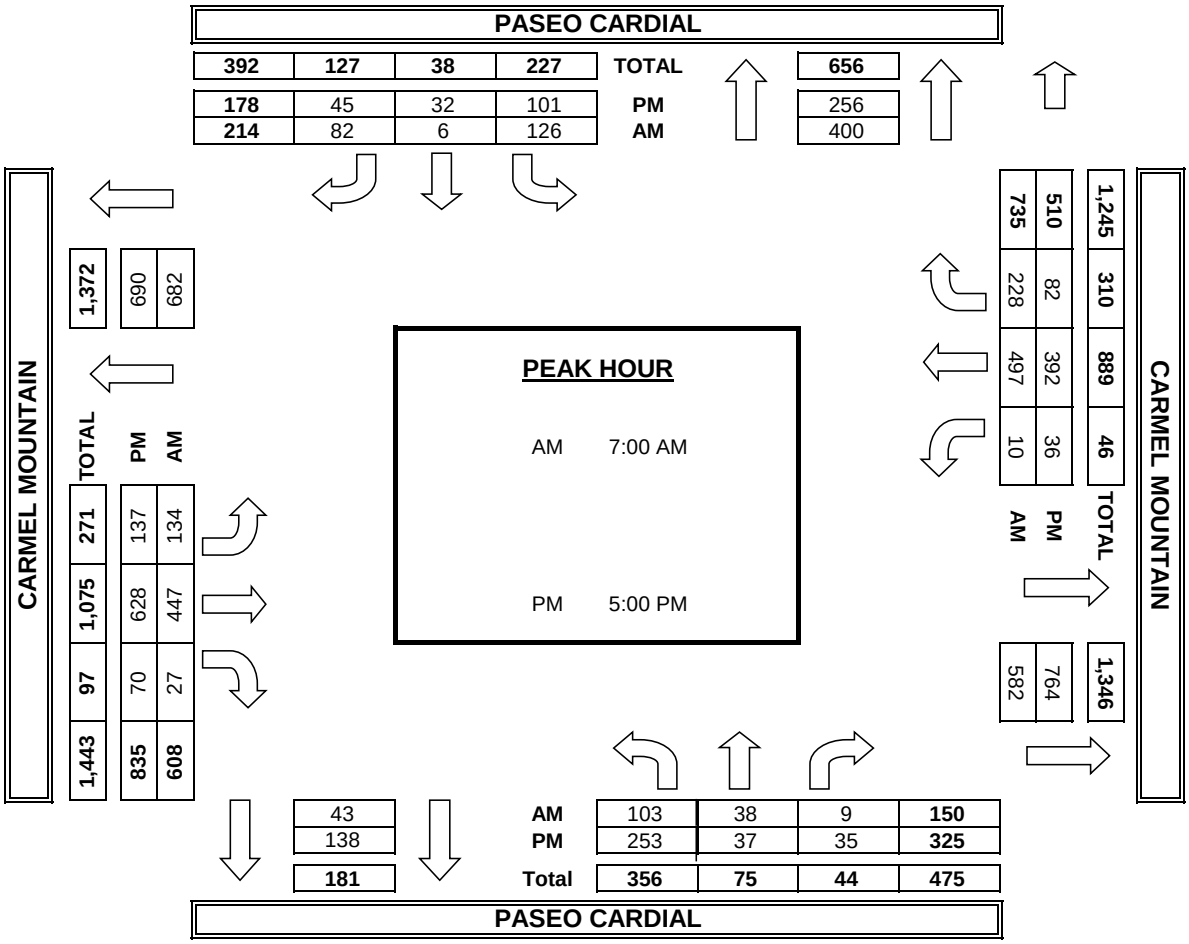


		PEDESTRIAN CROSSINGS					PEDESTRIAN ACTIVATIONS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM			1		1					0					0
	7:15 AM		1		1	2					0					0
	7:30 AM					0					0					0
	7:45 AM					0					0					0
	8:00 AM					0					0				1	1
	8:15 AM				1	1					0					0
	8:30 AM					0					0					0
	8:45 AM	2	3	1		6					0					0
	TOTAL	2	4	2	2	10	0	0	0	0	0	0	0	0	1	1
PM	4:00 PM				2	2					0					0
	4:15 PM				1	1					0					0
	4:30 PM	1			1	2					0					0
	4:45 PM	2				2					0					0
	5:00 PM					0					0					0
	5:15 PM				2	2					0					0
	5:30 PM		2	2	5	9					0		1		1	2
	5:45 PM	1			2	3					0	1			1	2
	TOTAL	4	2	2	13	21	0	0	0	0	0	1	1	0	2	4

PACIFIC TECHNICAL DATA

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: PACIFIC TECHNICAL DATA

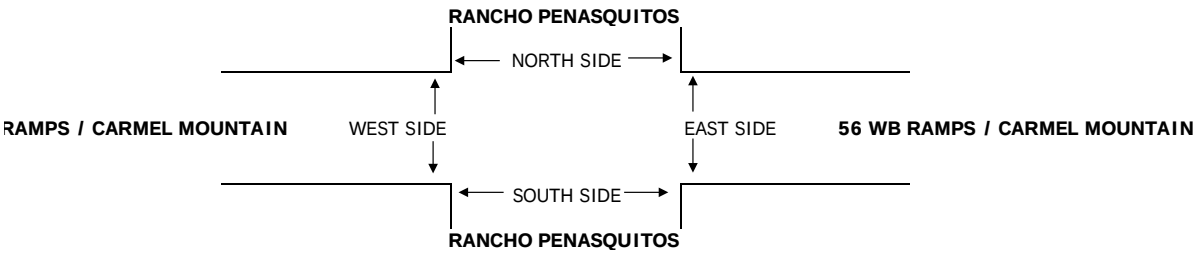
DATE:	LOCATION:	SAN DIEGO - RANCHO PENASQUITOS	PROJECT #:	PTD18-0209-01
2/6/18	NORTH & SOUTH:	RANCHO PENASQUITOS	LOCATION #:	8
TUESDAY	EAST & WEST:	56 WB RAMPS / CARMEL MOUNTAIN	CONTROL:	SIGNAL

NOTES:

INCLUDE BIKE / PED

AM PM MD OTHER OTHER — ▲ N ◄ W E ► S ▼

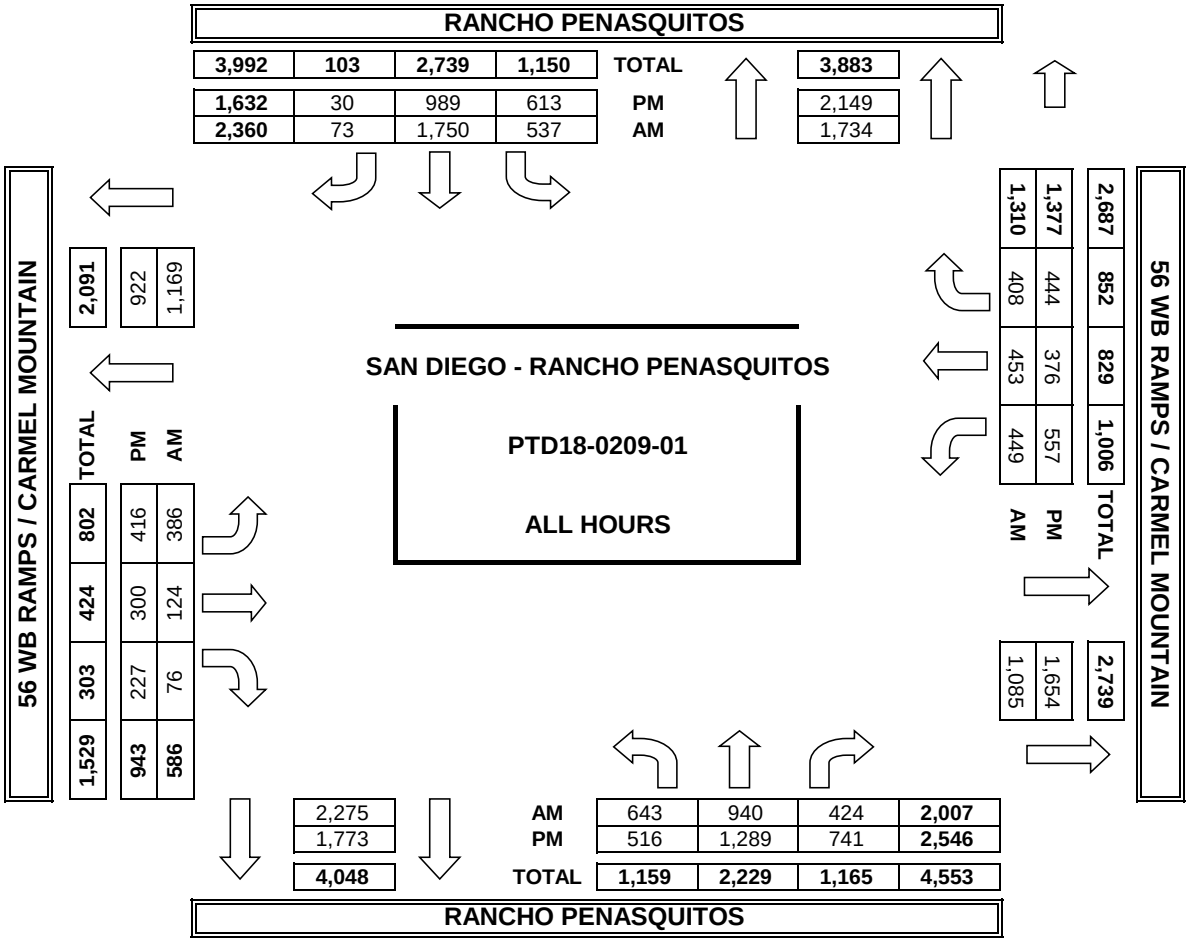
		NORTHBOUND RANCHO PENASQUITOS			SOUTHBOUND RANCHO PENASQUITOS			EASTBOUND 56 WB RAMPS / CARMEL MOUNTAIN			WESTBOUND 56 WB RAMPS / CARMEL MOUNTAIN				U-TURNS				
	LANES:	NL 1	NT 2	NR 0	SL 2	ST 3	SR 1	EL 2	ET 1	ER 1	WL 2	WT 2	WR 0	TOTAL	NB X	SB X	EB X	WB X	TTL
AM	7:00 AM	66	178	89	54	238	12	86	28	10	58	61	77	957					0
	7:15 AM	81	193	53	109	289	10	72	16	8	60	68	70	1,029	1				1
	7:30 AM	89	98	56	82	322	12	49	5	6	48	47	50	864	3				3
	7:45 AM	81	103	52	67	201	13	36	13	10	57	60	49	742	4				4
	8:00 AM	78	112	47	74	188	6	39	14	12	55	58	43	726	1				1
	8:15 AM	92	95	41	63	197	8	34	21	11	62	42	47	713	1				1
	8:30 AM	71	85	46	36	189	7	40	20	10	60	72	44	680	4				4
	8:45 AM	85	76	40	52	126	5	30	7	9	49	45	28	552	2				2
	VOLUMES	643	940	424	537	1,750	73	386	124	76	449	453	408	6,263	16	0	0	0	16
	APPROACH %	32%	47%	21%	23%	74%	3%	66%	21%	13%	34%	35%	31%						
	APP/DEPART	2,007	/	1,734	2,360	/	2,275	586	/	1,085	1,310	/	1,169	0					
	BEGIN PEAK HR		7:00 AM																
	VOLUMES	317	572	250	312	1,050	47	243	62	34	223	236	246	3,592					
	APPROACH %	28%	50%	22%	22%	75%	3%	72%	18%	10%	32%	33%	35%						
	PEAK HR FACTOR		0.855			0.847			0.683			0.890		0.873					
	APP/DEPART	1,139	/	1,061	1,409	/	1,307	339	/	624	705	/	600	0					
PM	4:00 PM	58	131	72	67	112	7	48	31	30	68	52	47	723	4				4
	4:15 PM	71	151	78	62	106	3	55	32	26	54	30	42	710					0
	4:30 PM	64	162	80	75	109	4	20	39	36	51	38	66	744	2				2
	4:45 PM	64	171	100	69	105	4	64	34	30	67	51	53	812	3				3
	5:00 PM	61	163	105	78	152	5	38	27	28	61	52	45	815	5				5
	5:15 PM	73	172	92	96	128	1	74	42	21	93	49	67	908	5				5
	5:30 PM	59	178	118	88	140	1	55	45	23	66	54	65	892	3				3
	5:45 PM	66	161	96	78	137	5	62	50	33	97	50	59	894	1				1
	VOLUMES	516	1,289	741	613	989	30	416	300	227	557	376	444	6,498	23	0	0	0	23
	APPROACH %	20%	51%	29%	38%	61%	2%	44%	32%	24%	40%	27%	32%						
	APP/DEPART	2,546	/	2,149	1,632	/	1,773	943	/	1,654	1,377	/	922	0					
	BEGIN PEAK HR		5:00 PM																
	VOLUMES	259	674	411	340	557	12	229	164	105	317	205	236	3,509					
	APPROACH %	19%	50%	31%	37%	61%	1%	46%	33%	21%	42%	27%	31%						
	PEAK HR FACTOR		0.946			0.967			0.859			0.907		0.966					
	APP/DEPART	1,344	/	1,139	909	/	979	498	/	915	758	/	476	0					

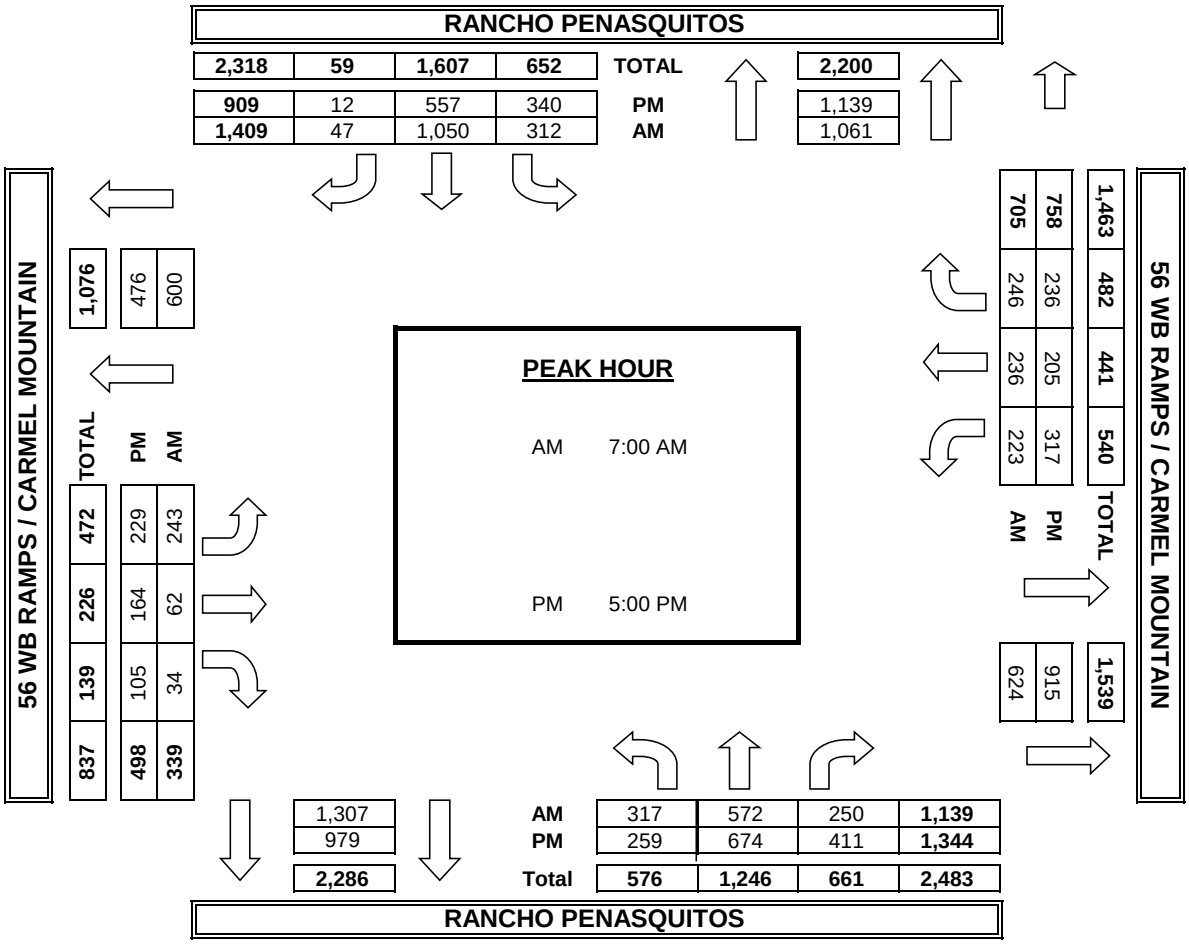


		PEDESTRIAN CROSSINGS					PEDESTRIAN ACTIVATIONS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM				1	1					0					0
	7:15 AM			1	1	2					0					0
	7:30 AM				2	2					0					0
	7:45 AM					0					0					0
	8:00 AM					0					0					0
	8:15 AM				1	1					0					0
	8:30 AM					0					0					0
	8:45 AM					0					0					0
	TOTAL	0	0	1	5	6	0	0	0	0	0	0	0	0	0	0
PM	4:00 PM					0					0					0
	4:15 PM	1		3		4					0					0
	4:30 PM				1	1					0					0
	4:45 PM					0					0					0
	5:00 PM	1			4	5					0					0
	5:15 PM					0					0					0
	5:30 PM					0					0					0
	5:45 PM					0					0					0
	TOTAL	2	0	3	5	10	0	0	0	0	0	0	0	0	0	0

PACIFIC TECHNICAL DATA

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: PACIFIC TECHNICAL DATA

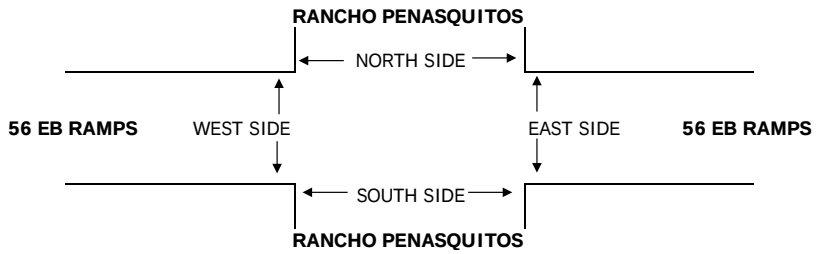
DATE:	LOCATION:	SAN DIEGO - RANCHO PENASQUITOS	PROJECT #:	PTD18-0209-01
2/6/18	NORTH & SOUTH:	RANCHO PENASQUITOS	LOCATION #:	9
TUESDAY	EAST & WEST:	56 EB RAMPS	CONTROL:	SIGNAL

NOTES:

INCLUDE BIKE / PED

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, S ▼

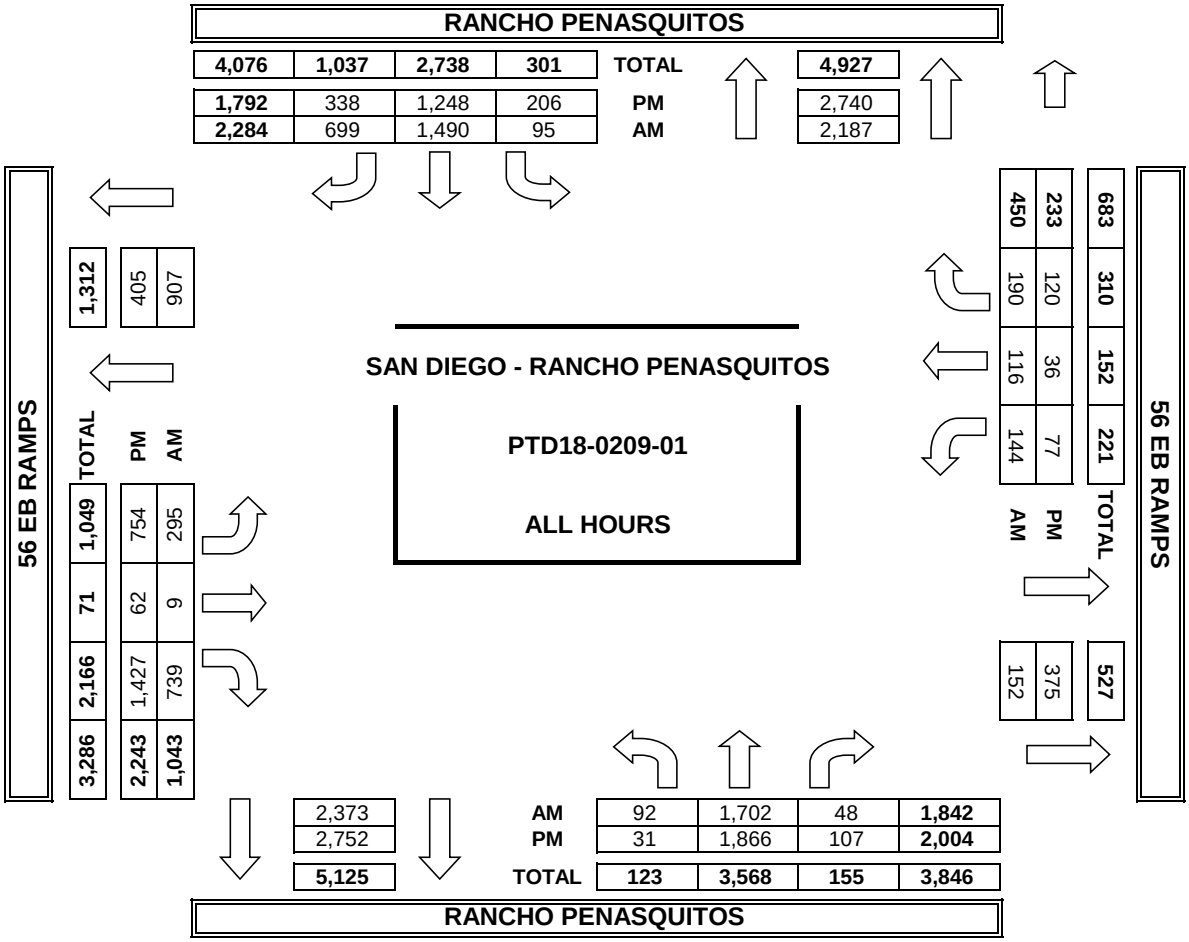
		NORTHBOUND RANCHO PENASQUITOS			SOUTHBOUND RANCHO PENASQUITOS			EASTBOUND 56 EB RAMPS			WESTBOUND 56 EB RAMPS				U-TURNS				
	LANES:	NL 1	NT 2	NR 0	SL 1	ST 2	SR 1	EL 1	ET 1	ER 0	WL 1	WT 1	WR 0	TOTAL	NB X	SB X	EB X	WB X	TTL
AM	7:00 AM	7	309	4	12	211	81	22	0	78	22	11	29	786					0
	7:15 AM	14	302	6	7	240	111	19	2	69	20	15	29	834		1			1
	7:30 AM	20	198	3	17	229	132	34	3	80	21	23	23	783					0
	7:45 AM	14	201	7	13	159	101	30	2	103	10	11	21	672					0
	8:00 AM	7	188	5	11	172	71	58	1	108	17	17	21	676					0
	8:15 AM	10	186	8	13	189	67	46	1	99	19	17	23	678					0
	8:30 AM	16	169	8	7	174	83	40	0	108	14	10	25	654					0
	8:45 AM	4	149	7	15	116	53	46	0	94	21	12	19	536		1			1
	VOLUMES	92	1,702	48	95	1,490	699	295	9	739	144	116	190	5,619	0	2	0	0	2
	APPROACH %	5%	92%	3%	4%	65%	31%	28%	1%	71%	32%	26%	42%						
	APP/DEPART	1,842	/	2,187	2,284	/	2,373	1,043	/	152	450	/	907	0					
	BEGIN PEAK HR		7:00 AM																
	VOLUMES	55	1,010	20	49	839	425	105	7	330	73	60	102	3,075					
	APPROACH %	5%	93%	2%	4%	64%	32%	24%	2%	75%	31%	26%	43%						
	PEAK HR FACTOR		0.842			0.868			0.819			0.877		0.922					
	APP/DEPART	1,085	/	1,217	1,313	/	1,242	442	/	76	235	/	540	0					
PM	4:00 PM	4	198	11	26	155	36	61	0	177	11	6	17	702					0
	4:15 PM	4	229	9	24	127	34	86	0	189	10	1	7	720					0
	4:30 PM	4	203	14	23	148	24	110	10	203	9	5	12	765					0
	4:45 PM	4	241	16	28	135	45	103	5	202	4	3	20	806					0
	5:00 PM	6	237	14	24	166	53	109	11	175	7	6	15	823					0
	5:15 PM	3	259	10	25	171	52	97	13	189	10	10	12	851					0
	5:30 PM	0	241	16	23	164	43	110	9	154	9	2	26	797					0
	5:45 PM	6	258	17	33	182	51	78	14	138	17	3	11	808					0
	VOLUMES	31	1,866	107	206	1,248	338	754	62	1,427	77	36	120	6,272	0	0	0	0	0
	APPROACH %	2%	93%	5%	11%	70%	19%	34%	3%	64%	33%	15%	52%						
	APP/DEPART	2,004	/	2,740	1,792	/	2,752	2,243	/	375	233	/	405	0					
	BEGIN PEAK HR		5:00 PM																
	VOLUMES	15	995	57	105	683	199	394	47	656	43	21	64	3,279					
	APPROACH %	1%	93%	5%	11%	69%	20%	36%	4%	60%	34%	16%	50%						
	PEAK HR FACTOR		0.949			0.928			0.917			0.865		0.963					
	APP/DEPART	1,067	/	1,453	987	/	1,382	1,097	/	209	128	/	235	0					

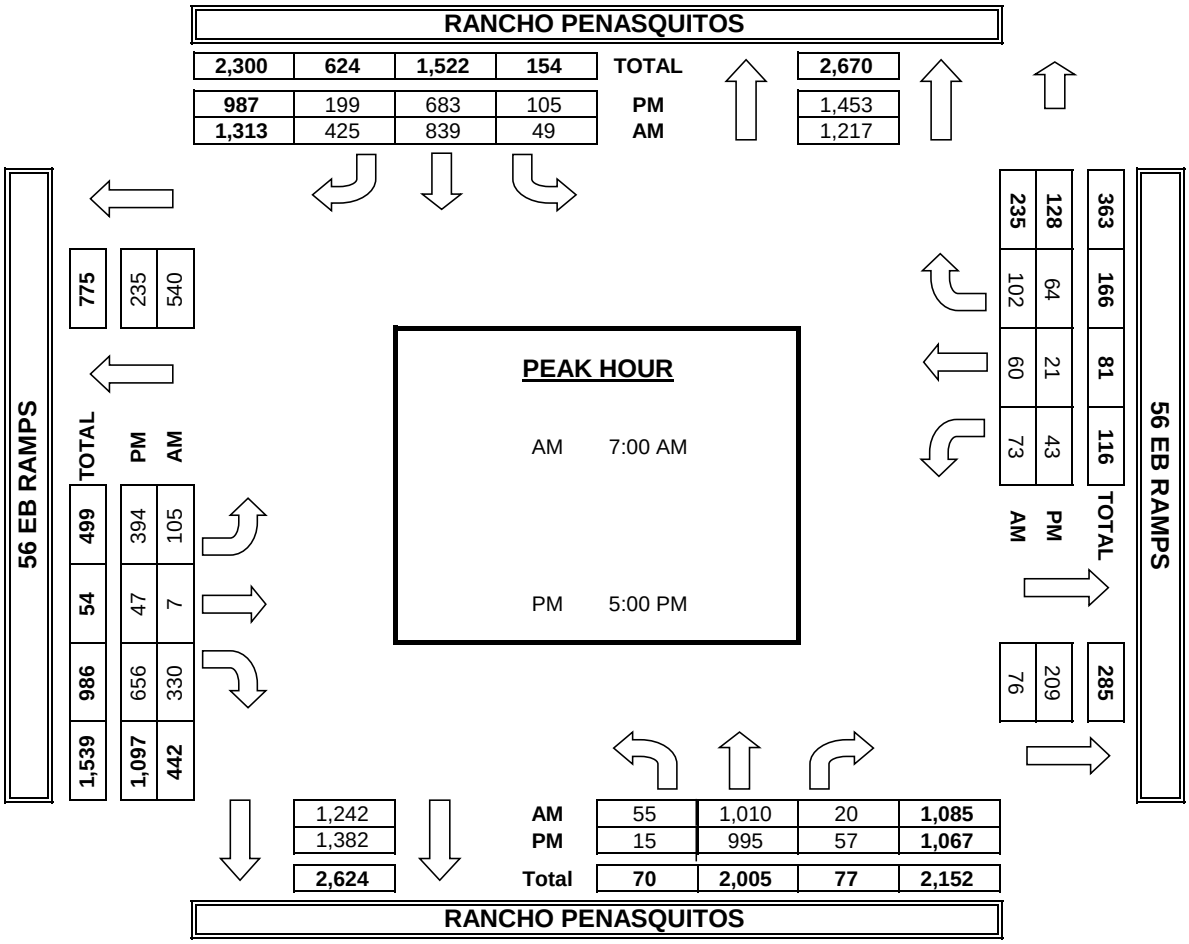


		PEDESTRIAN CROSSINGS					PEDESTRIAN ACTIVATIONS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM					0					0					0
	7:15 AM					0					0					0
	7:30 AM					0					0					0
	7:45 AM					0					0					0
	8:00 AM					0					0					0
	8:15 AM					0					0					0
	8:30 AM					0					0					0
	8:45 AM					0					0					0
	TOTAL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	4:00 PM					0					0					0
	4:15 PM					0					0					0
	4:30 PM					0					0					0
	4:45 PM				1	1					0					0
	5:00 PM		1		3	4					0					0
	5:15 PM				2	2					0					0
	5:30 PM					0					0					0
	5:45 PM					0					0					0
	TOTAL	0	1	0	6	7	0	0	0	0	0	0	0	0	0	0

PACIFIC TECHNICAL DATA

TURNING MOVEMENT COUNTS





INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: PACIFIC TECHNICAL DATA

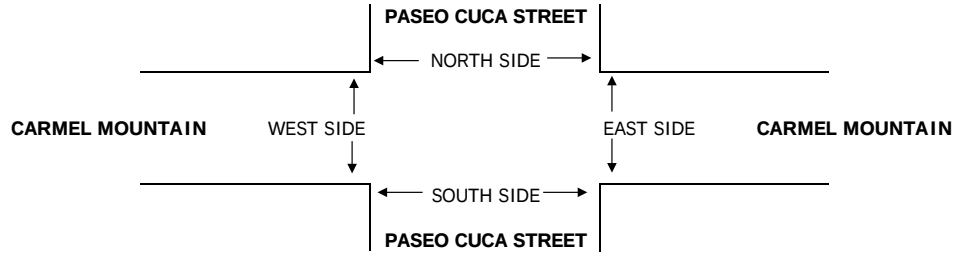
DATE:	LOCATION:	SAN DIEGO - RANCHO PENASQUITOS	PROJECT #:	PTD18-0209-01
2/6/18	NORTH & SOUTH:	PASEO CUCA STREET	LOCATION #:	10
TUESDAY	EAST & WEST:	CARMEL MOUNTAIN	CONTROL:	SIGNAL

NOTES:

INCLUDE BIKE / PED

AM / PM / MD / OTHER / OTHER — ▲ N, ◄ W, E ►, ▼ S

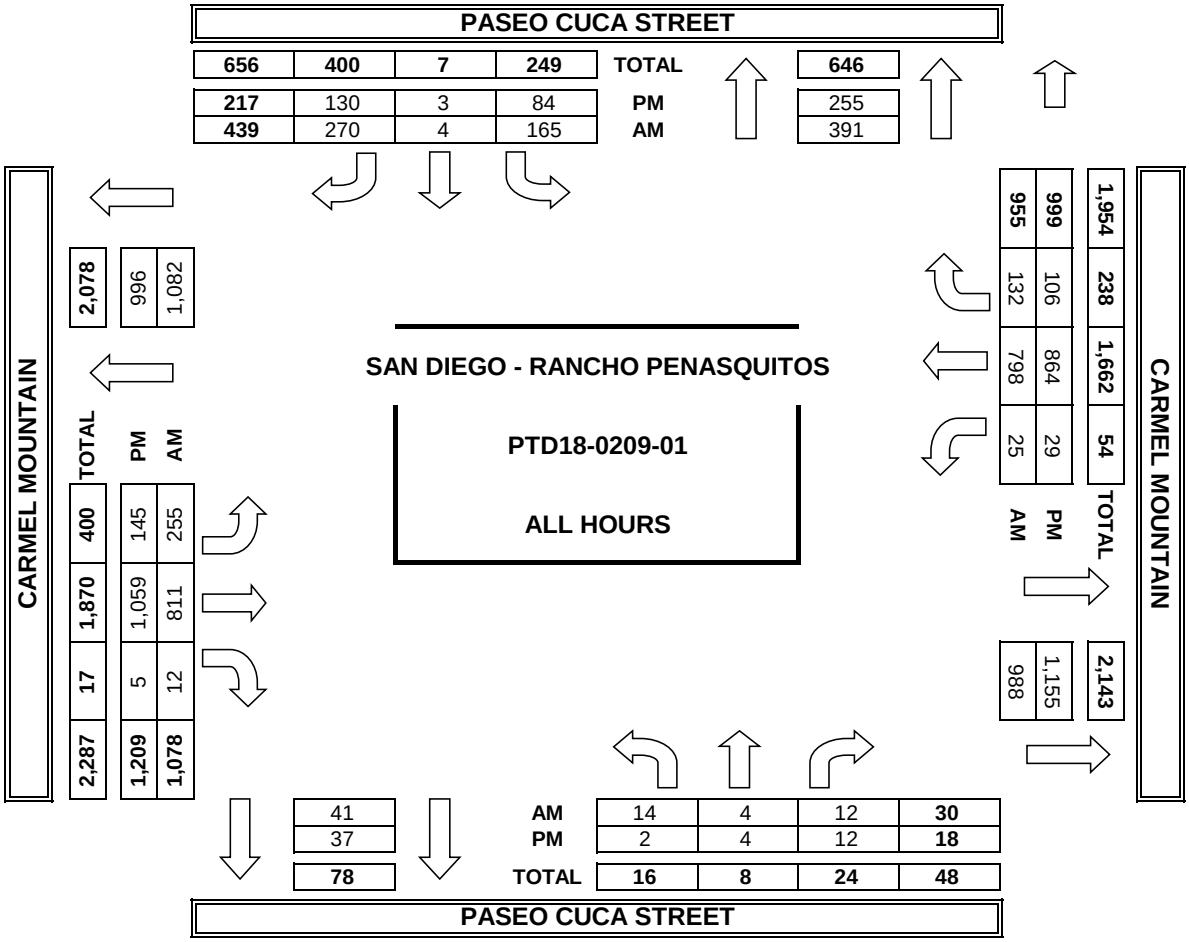
		NORTHBOUND PASEO CUCA STREET			SOUTHBOUND PASEO CUCA STREET			EASTBOUND CARMEL MOUNTAIN			WESTBOUND CARMEL MOUNTAIN				U-TURNS				
	LANES:	NL 0.33	NT 0.33	NR 0.33	SL 0.33	ST 0.33	SR 0.33	EL 1	ET 2	ER 0	WL 1	WT 2	WR 0	TOTAL	NB X	SB X	EB X	WB X	TTL
AM	7:00 AM	7	0	3	10	1	41	9	98	0	1	191	13	374					0
	7:15 AM	2	0	1	16	0	30	28	134	5	7	136	10	369				2	2
	7:30 AM	1	0	4	27	0	32	43	139	2	2	85	18	353				2	2
	7:45 AM	1	0	0	31	0	45	35	96	1	5	90	24	328				5	5
	8:00 AM	0	0	0	8	0	12	9	97	1	2	83	14	226			1	2	3
	8:15 AM	2	1	2	10	0	14	22	94	2	4	79	20	250				3	3
	8:30 AM	1	1	1	29	1	40	67	74	1	1	63	19	298					0
	8:45 AM	0	2	1	34	2	56	42	79	0	3	71	14	304				2	2
	VOLUMES	14	4	12	165	4	270	255	811	12	25	798	132	2,502	0	0	1	16	17
	APPROACH %	47%	13%	40%	38%	1%	62%	24%	75%	1%	3%	84%	14%						
	APP/DEPART	30	/	391	439	/	41	1,078	/	988	955	/	1,082	0					
	BEGIN PEAK HR		7:00 AM																
	VOLUMES	11	0	8	84	1	148	115	467	8	15	502	65	1,424					
	APPROACH %	58%	0%	42%	36%	0%	64%	19%	79%	1%	3%	86%	11%						
	PEAK HR FACTOR		0.475			0.766			0.802			0.710		0.952					
	APP/DEPART	19	/	180	233	/	24	590	/	559	582	/	661	0					
PM	4:00 PM	1	0	1	11	0	17	16	121	0	1	87	7	262			1		1
	4:15 PM	1	0	5	11	0	14	13	107	1	5	111	11	279			2		2
	4:30 PM	0	1	2	11	1	11	16	122	0	3	109	17	293			1	1	2
	4:45 PM	0	0	1	11	1	12	15	128	0	3	121	13	305				1	1
	5:00 PM	0	1	1	8	0	16	22	129	2	6	105	24	314				2	2
	5:15 PM	0	0	1	11	0	25	14	131	1	1	137	15	336			1	5	6
	5:30 PM	0	1	0	10	1	14	27	181	0	6	92	13	345					0
	5:45 PM	0	1	1	11	0	21	22	140	1	4	102	6	309				3	3
	VOLUMES	2	4	12	84	3	130	145	1,059	5	29	864	106	2,443	0	0	5	12	17
	APPROACH %	11%	22%	67%	39%	1%	60%	12%	88%	0%	3%	86%	11%						
	APP/DEPART	18	/	255	217	/	37	1,209	/	1,155	999	/	996	0					
	BEGIN PEAK HR		5:00 PM																
	VOLUMES	0	3	3	40	1	76	85	581	4	17	436	58	1,304					
	APPROACH %	0%	50%	50%	34%	1%	65%	13%	87%	1%	3%	85%	11%						
	PEAK HR FACTOR		0.750			0.813			0.805			0.835		0.945					
	APP/DEPART	6	/	146	117	/	22	670	/	624	511	/	512	0					

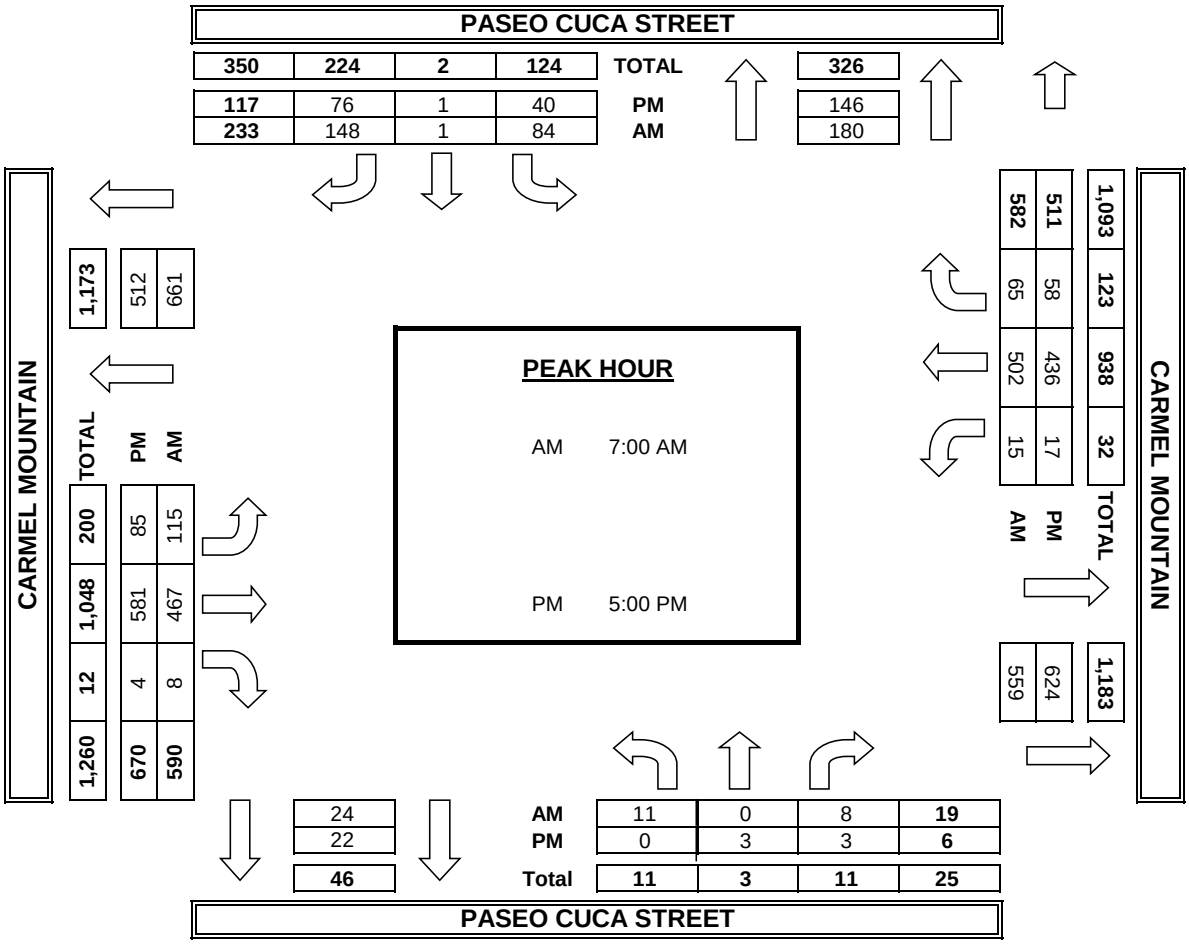


		PEDESTRIAN CROSSINGS					PEDESTRIAN ACTIVATIONS					BICYCLE CROSSINGS				
		N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	N SIDE	S SIDE	E SIDE	W SIDE	TOTAL	NS	SS	ES	WS	TOTAL
AM	7:00 AM			3	1	4					0					0
	7:15 AM		2		2	4					0					0
	7:30 AM		3		7	10					0					0
	7:45 AM					0					0	1				1
	8:00 AM				2	2					0					0
	8:15 AM		1		1	2					0		1		1	2
	8:30 AM				15	15					0					0
	8:45 AM		3		10	13					0		1			1
	TOTAL	0	9	3	38	50	0	0	0	0	0	1	2	0	1	4
PM	4:00 PM		1	1		2					0					0
	4:15 PM		1			1					0					0
	4:30 PM	1	3		1	5					0					0
	4:45 PM		1		1	2					0					0
	5:00 PM		1	1		2					0					0
	5:15 PM	1	1		5	7					0					0
	5:30 PM		2		9	11					0					0
	5:45 PM					0					0					0
	TOTAL	2	10	2	16	30	0	0	0	0	0	0	0	0	0	0

PACIFIC TECHNICAL DATA

TURNING MOVEMENT COUNTS





TUESDAY - FEBRUARY 6, 2018 CITY: SAN DIEGO PROJECT: PTD18-0209-01

PENASQUITOS DRIVE - JANAL WAY TO CUCA STREET

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	11		6					12:00	61		75				
00:15	8		3					12:15	68		60				
00:30	7		1					12:30	66		71				
00:45	5	31	3	13			44	12:45	84	279	77	283			562
01:00	3		2					13:00	75		69				
01:15	3		2					13:15	78		76				
01:30	2		0					13:30	75		73				
01:45	4	12	2	6			18	13:45	94	322	66	284			606
02:00	1		3					14:00	106		88				
02:15	2		3					14:15	124		66				
02:30	5		1					14:30	116		129				
02:45	3	11	2	9			20	14:45	136	482	109	392			874
03:00	1		1					15:00	103		79				
03:15	3		1					15:15	107		75				
03:30	0		5					15:30	111		95				
03:45	1	5	10	17			22	15:45	101	422	89	338			760
04:00	1		10					16:00	130		80				
04:15	1		5					16:15	124		89				
04:30	4		13					16:30	160		84				
04:45	1	7	21	49			56	16:45	147	561	82	335			896
05:00	1		26					17:00	146		79				
05:15	5		30					17:15	150		96				
05:30	6		35					17:30	161		84				
05:45	6	18	73	164			182	17:45	169	626	82	341			967
06:00	6		53					18:00	153		95				
06:15	16		72					18:15	146		58				
06:30	25		100					18:30	148		64				
06:45	32	79	156	381			460	18:45	127	574	65	282			856
07:00	43		199					19:00	115		59				
07:15	58		177					19:15	114		56				
07:30	88		182					19:30	91		60				
07:45	120	309	172	730			1039	19:45	87	407	45	220			627
08:00	75		218					20:00	69		33				
08:15	60		161					20:15	92		33				
08:30	65		146					20:30	61		45				
08:45	40	240	117	642			882	20:45	69	291	27	138			429
09:00	45		109					21:00	62		21				
09:15	45		104					21:15	54		13				
09:30	39		84					21:30	51		18				
09:45	33	162	85	382			544	21:45	43	210	27	79			289
10:00	45		67					22:00	37		9				
10:15	47		66					22:15	27		19				
10:30	55		59					22:30	24		7				
10:45	72	219	66	258			477	22:45	27	115	12	47			162
11:00	50		72					23:00	15		7				
11:15	60		73					23:15	18		9				
11:30	70		94					23:30	10		5				
11:45	73	253	50	289			542	23:45	12	55	3	24			79
Total Vol.		1346		2940			**4286**			4344		2763			**7107**

Daily Totals

NB	SB	EB	WB	**Combined**
5690	5703			**11393**

	AM			PM		
Split %	31.4%	68.6%	**37.6%**	61.1%	38.9%	**62.4%**
Peak Hour	07:30	07:15	**07:15**	17:15	14:00	**17:15**
Volume	343	749	**1090**	633	392	**990**
P.H.F.	0.71	0.86	**0.93**	0.96	0.76	**0.99**

TUESDAY - FEBRUARY 6, 2018 CITY: SAN DIEGO PROJECT: PTD18-0209-01

PENASQUITOS DRIVE - CUCA STREET TO CARMEL MOUNTAIN ROAD

AM Period	NB		SB		EB	WB		PM Period	NB		SB		EB	WB	
00:00	19		9					12:00	84		98				
00:15	11		3					12:15	87		77				
00:30	11		1					12:30	87		87				
00:45	6	47	6	19			66	12:45	102	360	100	362			722
01:00	8		4					13:00	93		91				
01:15	4		2					13:15	93		96				
01:30	3		0					13:30	95		91				
01:45	4	19	2	8			27	13:45	115	396	81	359			755
02:00	4		3					14:00	125		106				
02:15	4		6					14:15	136		88				
02:30	6		1					14:30	145		138				
02:45	3	17	3	13			30	14:45	165	571	123	455			1026
03:00	2		1					15:00	139		114				
03:15	2		2					15:15	124		114				
03:30	0		6					15:30	135		125				
03:45	3	7	11	20			27	15:45	122	520	99	452			972
04:00	2		13					16:00	159		96				
04:15	3		8					16:15	153		103				
04:30	3		17					16:30	201		123				
04:45	1	9	22	60			69	16:45	167	680	110	432			1112
05:00	2		33					17:00	186		90				
05:15	11		37					17:15	200		121				
05:30	9		50					17:30	202		117				
05:45	14	36	87	207			243	17:45	216	804	90	418			1222
06:00	11		69					18:00	178		114				
06:15	24		97					18:15	183		95				
06:30	38		140					18:30	187		91				
06:45	41	114	185	491			605	18:45	186	734	78	378			1112
07:00	47		237					19:00	154		80				
07:15	76		208					19:15	153		69				
07:30	111		204					19:30	117		68				
07:45	123	357	215	864			1221	19:45	116	540	62	279			819
08:00	90		230					20:00	93		62				
08:15	111		187					20:15	116		58				
08:30	101		199					20:30	86		79				
08:45	60	362	163	779			1141	20:45	87	382	32	231			613
09:00	68		136					21:00	83		31				
09:15	65		145					21:15	71		19				
09:30	48		103					21:30	65		20				
09:45	43	224	99	483			707	21:45	51	270	34	104			374
10:00	50		89					22:00	49		13				
10:15	56		85					22:15	39		24				
10:30	73		79					22:30	31		8				
10:45	79	258	92	345			603	22:45	31	150	13	58			208
11:00	68		85					23:00	15		17				
11:15	84		87					23:15	25		11				
11:30	88		151					23:30	9		7				
11:45	86	326	74	397			723	23:45	18	67	5	40			107
Total Vol.		1776		3686			**5462**			5474		3568			**9042**

Daily Totals

NB	SB	EB	WB	**Combined**
7250	7254			**14504**

	AM			PM		
Split %	32.5%	67.5%	**37.7%**	60.5%	39.5%	**62.3%**
Peak Hour	07:30	07:00	**07:30**	17:00	14:30	**17:15**
Volume	435	864	**1271**	804	489	**1238**
P.H.F.	0.88	0.91	**0.94**	0.98	0.89	**0.96**

TUESDAY - FEBRUARY 6, 2018 CITY: SAN DIEGO PROJECT: PTD18-0209-01

CARMEL MOUNTAIN ROAD - STONEY PEAK DR TO RANCHO CARMEL

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			15		33			12:00			302		298		
00:15			10		14			12:15			288		305		
00:30			13		46			12:30			276		296		
00:45			12	50	19	112	162	12:45			288	1154	256	1155	2309
01:00			5		30			13:00			281		251		
01:15			7		15			13:15			288		256		
01:30			7		18			13:30			265		276		
01:45			8	27	10	73	100	13:45			244	1078	290	1073	2151
02:00			7		13			14:00			281		297		
02:15			6		16			14:15			266		291		
02:30			5		37			14:30			286		312		
02:45			8	26	11	77	103	14:45			330	1163	266	1166	2329
03:00			4		20			15:00			281		342		
03:15			11		8			15:15			296		272		
03:30			16		21			15:30			352		289		
03:45			27	58	16	65	123	15:45			314	1243	258	1161	2404
04:00			13		22			16:00			291		289		
04:15			9		26			16:15			313		280		
04:30			33		37			16:30			320		277		
04:45			52	107	28	113	220	16:45			352	1276	293	1139	2415
05:00			43		44			17:00			350		306		
05:15			56		57			17:15			374		320		
05:30			110		68			17:30			343		322		
05:45			131	340	54	223	563	17:45			341	1408	384	1332	2740
06:00			82		86			18:00			341		395		
06:15			119		118			18:15			361		316		
06:30			131		128			18:30			339		330		
06:45			205	537	141	473	1010	18:45			309	1350	322	1363	2713
07:00			200		162			19:00			280		294		
07:15			212		200			19:15			285		270		
07:30			198		213			19:30			222		264		
07:45			242	852	207	782	1634	19:45			185	972	264	1092	2064
08:00			215		186			20:00			193		235		
08:15			231		179			20:15			163		227		
08:30			173		211			20:30			101		202		
08:45			240	859	175	751	1610	20:45			83	540	187	851	1391
09:00			222		188			21:00			77		162		
09:15			236		176			21:15			80		124		
09:30			201		183			21:30			58		102		
09:45			241	900	147	694	1594	21:45			44	259	75	463	722
10:00			201		151			22:00			34		88		
10:15			213		201			22:15			42		67		
10:30			195		205			22:30			29		54		
10:45			242	851	223	780	1631	22:45			33	138	31	240	378
11:00			261		226			23:00			22		40		
11:15			237		222			23:15			24		32		
11:30			266		259			23:30			22		44		
11:45			282	1046	272	979	2025	23:45			16	84	18	134	218
Total Vol.				5653		5122	**10775**					10665		11169	**21834**

Daily Totals

NB	SB	EB	WB	**Combined**
		16318	16291	**32609**

	AM			**PM**		
Split %	52.5%	47.5%	**33.0%**	48.8%	51.2%	**67.0%**
Peak Hour	11:45	11:45	**11:45**	16:45	17:45	**17:15**
Volume	1148	1171	**2319**	1419	1425	**2820**
P.H.F.	0.95	0.96	**0.97**	0.95	0.90	**0.96**

TUESDAY - FEBRUARY 6, 2018 CITY: SAN DIEGO PROJECT: PTD18-0209-01

CARMEL MOUNTAIN ROAD - RANCHO CARMEL DRIVE TO I-15 NB RAMPS

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			26		60			12:00			416		398		
00:15			18		24			12:15			414		433		
00:30			26		76			12:30			372		423		
00:45			20	90	33	193	283	12:45			415	1617	357	1611	3228
01:00			10		46			13:00			375		358		
01:15			12		22			13:15			384		366		
01:30			15		30			13:30			366		394		
01:45			14	51	19	117	168	13:45			336	1461	408	1526	2987
02:00			14		22			14:00			363		424		
02:15			13		24			14:15			333		416		
02:30			7		54			14:30			357		446		
02:45			17	51	19	119	170	14:45			396	1449	373	1659	3108
03:00			6		32			15:00			355		489		
03:15			23		11			15:15			365		410		
03:30			27		27			15:30			424		425		
03:45			48	104	21	91	195	15:45			392	1536	414	1738	3274
04:00			23		28			16:00			388		468		
04:15			23		36			16:15			390		419		
04:30			59		51			16:30			385		449		
04:45			98	203	39	154	357	16:45			425	1588	482	1818	3406
05:00			76		60			17:00			425		498		
05:15			104		75			17:15			420		493		
05:30			178		97			17:30			450		485		
05:45			235	593	68	300	893	17:45			420	1715	452	1928	3643
06:00			159		118			18:00			416		472		
06:15			210		150			18:15			440		407		
06:30			243		179			18:30			408		460		
06:45			332	944	194	641	1585	18:45			377	1641	429	1768	3409
07:00			320		253			19:00			341		397		
07:15			401		265			19:15			347		354		
07:30			408		290			19:30			284		348		
07:45			477	1606	264	1072	2678	19:45			226	1198	344	1443	2641
08:00			432		263			20:00			235		285		
08:15			398		246			20:15			205		268		
08:30			393		276			20:30			159		277		
08:45			424	1647	223	1008	2655	20:45			138	737	236	1066	1803
09:00			366		241			21:00			129		216		
09:15			365		232			21:15			133		145		
09:30			330		242			21:30			97		163		
09:45			370	1431	198	913	2344	21:45			68	427	138	662	1089
10:00			319		210			22:00			56		117		
10:15			338		271			22:15			70		87		
10:30			310		299			22:30			50		72		
10:45			371	1338	302	1082	2420	22:45			53	229	72	348	577
11:00			364		305			23:00			35		81		
11:15			376		305			23:15			42		54		
11:30			391		350			23:30			37		63		
11:45			406	1537	368	1328	2865	23:45			30	144	36	234	378
Total Vol.				9595		7018	**16613**					13742		15801	**29543**

Daily Totals

NB	SB	EB	WB	**Combined**
		23337	22819	**46156**

	AM			**PM**		
Split %	57.8%	42.2%	**36.0%**	46.5%	53.5%	**64.0%**
Peak Hour	07:15	11:45	**11:45**	17:30	16:45	**16:45**
Volume	1718	1622	**3230**	1726	1958	**3678**
P.H.F.	0.90	0.94	**0.95**	0.96	0.98	**0.98**

TUESDAY - FEBRUARY 6, 2018 CITY: SAN DIEGO PROJECT: PTD18-0209-01

CARMEL MOUNTAIN ROAD - I-15 SB RAMPS TO PENASQUITOS DRIVE

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			13		33			12:00			196		181		
00:15			14		30			12:15			170		183		
00:30			11		31			12:30			181		173		
00:45			14	52	19	113	165	12:45			193	740	190	727	1467
01:00			9		11			13:00			194		162		
01:15			6		7			13:15			184		170		
01:30			4		9			13:30			176		169		
01:45			6	25	9	36	61	13:45			165	719	210	711	1430
02:00			8		8			14:00			195		212		
02:15			7		6			14:15			168		218		
02:30			4		14			14:30			191		211		
02:45			7	26	7	35	61	14:45			238	792	219	860	1652
03:00			13		2			15:00			203		238		
03:15			4		8			15:15			241		214		
03:30			15		1			15:30			212		214		
03:45			18	50	8	19	69	15:45			219	875	198	864	1739
04:00			23		8			16:00			199		238		
04:15			17		16			16:15			203		254		
04:30			35		17			16:30			233		286		
04:45			48	123	22	63	186	16:45			219	854	273	1051	1905
05:00			47		14			17:00			209		313		
05:15			68		32			17:15			214		304		
05:30			109		34			17:30			260		285		
05:45			143	367	35	115	482	17:45			212	895	319	1221	2116
06:00			124		47			18:00			198		281		
06:15			160		54			18:15			197		281		
06:30			192		78			18:30			207		292		
06:45			253	729	108	287	1016	18:45			192	794	270	1124	1918
07:00			292		151			19:00			160		226		
07:15			302		139			19:15			143		221		
07:30			338		157			19:30			138		198		
07:45			317	1249	188	635	1884	19:45			113	554	184	829	1383
08:00			304		150			20:00			115		143		
08:15			251		157			20:15			100		179		
08:30			295		151			20:30			115		152		
08:45			291	1141	135	593	1734	20:45			69	399	131	605	1004
09:00			233		130			21:00			59		133		
09:15			226		130			21:15			57		114		
09:30			209		103			21:30			59		108		
09:45			180	848	102	465	1313	21:45			58	233	96	451	684
10:00			169		122			22:00			26		96		
10:15			178		119			22:15			52		58		
10:30			167		124			22:30			28		55		
10:45			176	690	136	501	1191	22:45			25	131	56	265	396
11:00			159		133			23:00			27		43		
11:15			160		161			23:15			33		39		
11:30			228		169			23:30			18		32		
11:45			186	733	171	634	1367	23:45			25	103	23	137	240
Total Vol.				6033		3496	**9529**					7089		8845	**15934**

Daily Totals

NB	SB	EB	WB	**Combined**
		13122	12341	**25463**

	AM			**PM**		
Split %	63.3%	36.7%	**37.4%**	44.5%	55.5%	**62.6%**
Peak Hour	07:15	11:45	**07:15**	16:45	17:00	**17:00**
Volume	1261	708	**1895**	902	1221	**2116**
P.H.F.	0.93	0.97	**0.94**	0.87	0.96	**0.97**

TUESDAY - FEBRUARY 6, 2018 CITY: SAN DIEGO PROJECT: PTD18-0209-01

CARMEL MOUNTAIN ROAD - PENASQUITOS DRIVE TO CUCA STREET

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			10		6			12:00			96		87		
00:15			6		9			12:15			73		75		
00:30			4		10			12:30			80		66		
00:45			9	29	9	34	63	12:45			99	348	89	317	665
01:00			1		3			13:00			106		76		
01:15			1		0			13:15			86		83		
01:30			3		5			13:30			90		77		
01:45			3	8	0	8	16	13:45			73	355	93	329	684
02:00			4		2			14:00			108		95		
02:15			1		2			14:15			106		105		
02:30			1		4			14:30			104		133		
02:45			5	11	2	10	21	14:45			191	509	139	472	981
03:00			4		0			15:00			128		110		
03:15			1		2			15:15			154		123		
03:30			2		1			15:30			118		100		
03:45			5	12	5	8	20	15:45			162	562	117	450	1012
04:00			6		1			16:00			134		97		
04:15			8		9			16:15			123		123		
04:30			8		9			16:30			134		128		
04:45			15	37	10	29	66	16:45			140	531	142	490	1021
05:00			9		12			17:00			141		134		
05:15			26		12			17:15			148		153		
05:30			38		17			17:30			190		114		
05:45			38	111	10	51	162	17:45			155	634	116	517	1151
06:00			33		17			18:00			140		128		
06:15			53		28			18:15			122		116		
06:30			70		41			18:30			135		116		
06:45			79	235	98	184	419	18:45			137	534	107	467	1001
07:00			110		208			19:00			99		86		
07:15			156		154			19:15			87		82		
07:30			173		101			19:30			81		83		
07:45			130	569	122	585	1154	19:45			75	342	84	335	677
08:00			107		96			20:00			73		64		
08:15			112		106			20:15			52		51		
08:30			106		89			20:30			48		72		
08:45			118	443	91	382	825	20:45			40	213	51	238	451
09:00			110		81			21:00			42		43		
09:15			78		69			21:15			54		39		
09:30			86		60			21:30			36		46		
09:45			83	357	54	264	621	21:45			19	151	37	165	316
10:00			74		55			22:00			17		38		
10:15			78		79			22:15			20		17		
10:30			90		58			22:30			22		20		
10:45			87	329	66	258	587	22:45			14	73	15	90	163
11:00			90		56			23:00			10		20		
11:15			68		80			23:15			19		12		
11:30			103		85			23:30			14		16		
11:45			93	354	68	289	643	23:45			10	53	4	52	105
Total Vol.				2495		2102	**4597**					4305		3922	**8227**

Daily Totals

NB	SB	EB	WB	**Combined**
		6800	6024	**12824**

	AM			**PM**		
Split %	54.3%	45.7%	**35.8%**	52.3%	47.7%	**64.2%**
Peak Hour	07:00	07:00	**07:00**	17:00	16:30	**16:45**
Volume	569	585	**1154**	634	557	**1162**
P.H.F.	0.82	0.70	**0.91**	0.83	0.91	**0.96**

TUESDAY - FEBRUARY 6, 2018 CITY: SAN DIEGO PROJECT: PTD18-0209-01

CARMEL MOUNTAIN ROAD - CUCA STREET TO PASEO CARDIEL

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			13		7			12:00			105		77		
00:15			6		8			12:15			92		72		
00:30			4		7			12:30			96		67		
00:45			13	36	5	27	63	12:45			117	410	84	300	710
01:00			1		3			13:00			119		68		
01:15			0		0			13:15			104		78		
01:30			4		4			13:30			102		80		
01:45			4	9	0	7	16	13:45			85	410	89	315	725
02:00			3		1			14:00			126		98		
02:15			2		3			14:15			142		106		
02:30			1		4			14:30			145		126		
02:45			6	12	2	10	22	14:45			271	684	131	461	1145
03:00			4		0			15:00			175		103		
03:15			0		2			15:15			170		177		
03:30			2		1			15:30			132		108		
03:45			4	10	4	7	17	15:45			203	680	115	503	1183
04:00			5		2			16:00			140		104		
04:15			9		9			16:15			126		124		
04:30			5		10			16:30			142		119		
04:45			15	34	8	29	63	16:45			147	555	132	479	1034
05:00			8		12			17:00			153		124		
05:15			27		12			17:15			151		162		
05:30			33		20			17:30			213		107		
05:45			33	101	14	58	159	17:45			168	685	124	517	1202
06:00			35		17			18:00			167		118		
06:15			49		22			18:15			141		111		
06:30			77		44			18:30			174		112		
06:45			82	243	112	195	438	18:45			151	633	107	448	1081
07:00			109		240			19:00			113		82		
07:15			166		168			19:15			103		68		
07:30			180		119			19:30			99		73		
07:45			132	587	139	666	1253	19:45			79	394	68	291	685
08:00			104		96			20:00			78		53		
08:15			121		97			20:15			58		49		
08:30			143		104			20:30			55		68		
08:45			119	487	130	427	914	20:45			43	234	53	223	457
09:00			87		69			21:00			54		44		
09:15			86		55			21:15			69		32		
09:30			82		58			21:30			41		41		
09:45			79	334	54	236	570	21:45			21	185	30	147	332
10:00			66		59			22:00			19		28		
10:15			74		71			22:15			18		13		
10:30			104		58			22:30			21		15		
10:45			99	343	60	248	591	22:45			18	76	12	68	144
11:00			101		63			23:00			5		17		
11:15			66		73			23:15			19		10		
11:30			100		89			23:30			16		11		
11:45			104	371	76	301	672	23:45			9	49	2	40	89
Total Vol.				2567		2211	**4778**					4995		3792	**8787**

Daily Totals

NB	SB	EB	WB	**Combined**
		7562	6003	**13565**

	AM			**PM**		
Split %	53.7%	46.3%	**35.2%**	56.8%	43.2%	**64.8%**
Peak Hour	07:00	07:00	**07:00**	14:30	14:30	**14:30**
Volume	587	666	**1253**	761	537	**1298**
P.H.F.	0.82	0.69	**0.90**	0.70	0.76	**0.81**

TUESDAY - FEBRUARY 6, 2018 CITY: SAN DIEGO PROJECT: PTD18-0209-01

CARMEL MOUNTAIN ROAD - PASEO CARDIEL TO RANCHO PENASQUITOS BLVD

AM Period	NB	SB	EB		WB			PM Period	NB	SB	EB		WB		
00:00			10		13			12:00			112		125		
00:15			7		12			12:15			104		127		
00:30			7		8			12:30			89		127		
00:45			2	26	7	40	66	12:45			107	412	97	476	888
01:00			3		2			13:00			107		99		
01:15			4		6			13:15			85		111		
01:30			3		6			13:30			81		127		
01:45			7	17	7	21	38	13:45			94	367	98	435	802
02:00			5		2			14:00			96		162		
02:15			3		2			14:15			135		136		
02:30			0		1			14:30			133		126		
02:45			5	13	3	8	21	14:45			205	569	157	581	1150
03:00			3		3			15:00			139		167		
03:15			4		1			15:15			158		203		
03:30			4		2			15:30			145		126		
03:45			11	22	8	14	36	15:45			186	628	148	644	1272
04:00			9		6			16:00			165		157		
04:15			13		9			16:15			171		136		
04:30			8		17			16:30			190		154		
04:45			19	49	14	46	95	16:45			202	728	170	617	1345
05:00			28		24			17:00			201		153		
05:15			35		34			17:15			228		205		
05:30			26		44			17:30			241		190		
05:45			38	127	48	150	277	17:45			223	893	203	751	1644
06:00			46		55			18:00			192		159		
06:15			33		66			18:15			190		179		
06:30			44		110			18:30			151		175		
06:45			55	178	123	354	532	18:45			143	676	172	685	1361
07:00			168		209			19:00			118		141		
07:15			178		180			19:15			125		124		
07:30			145		158			19:30			68		143		
07:45			130	621	169	716	1337	19:45			72	383	89	497	880
08:00			130		142			20:00			82		86		
08:15			125		148			20:15			54		75		
08:30			100		165			20:30			57		107		
08:45			101	456	134	589	1045	20:45			55	248	84	352	600
09:00			103		136			21:00			56		63		
09:15			97		111			21:15			60		60		
09:30			94		112			21:30			45		47		
09:45			76	370	102	461	831	21:45			34	195	38	208	403
10:00			86		98			22:00			32		34		
10:15			71		132			22:15			19		34		
10:30			89		128			22:30			30		17		
10:45			102	348	109	467	815	22:45			25	106	27	112	218
11:00			95		97			23:00			21		30		
11:15			87		105			23:15			17		16		
11:30			101		134			23:30			17		13		
11:45			98	381	115	451	832	23:45			7	62	8	67	129
Total Vol.				2608		3317	**5925**					5267		5425	**10692**

Daily Totals

NB	SB	EB	WB	Combined
		7875	8742	**16617**

	AM			PM		
Split %	44.0%	56.0%	**35.7%**	49.3%	50.7%	**64.3%**
Peak Hour	07:00	07:00	**07:00**	17:00	17:15	**17:00**
Volume	621	716	**1337**	893	757	**1644**
P.H.F.	0.87	0.86	**0.89**	0.93	0.92	**0.95**

APPENDIX D

CITY OF SAN DIEGO ROADWAY CLASSIFICATION TABLE, RANCHO PEÑASQUITOS AND CARMEL MOUNTAIN RANCH CIRCULATION ELEMENT EXCERPTS

TABLE 2 (MODIFIED)

City of San Diego Roadway Classifications, Levels of Service (LOS) and Average Daily Traffic (ADT)

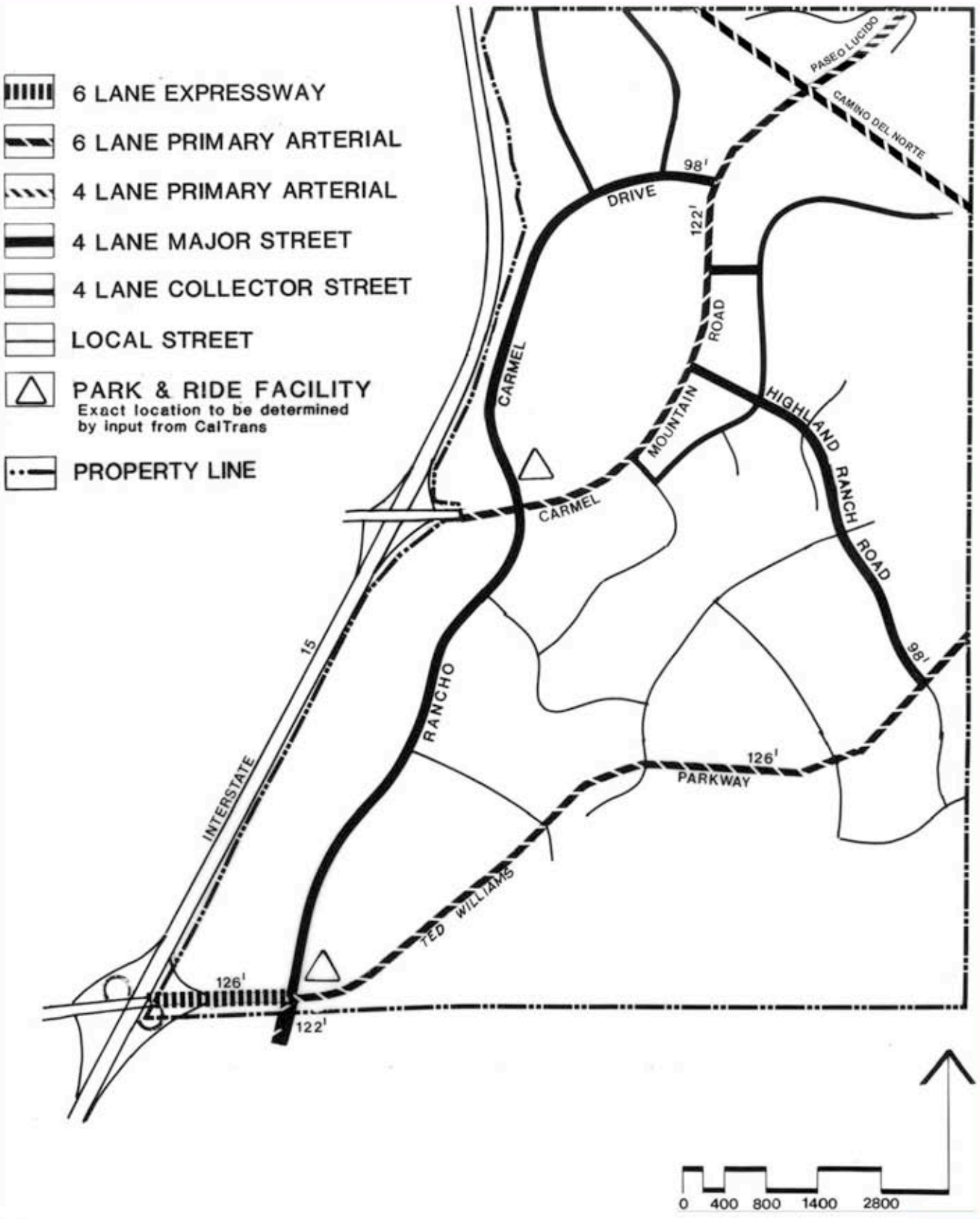
		LEVEL OF SERVICE[a]				
Street Classification	**Lanes**	**A**	**B**	**C**	**D**	**E**
Freeway	8 lanes	60,000	84,000	120,000	140,000	150,000
Freeway	6 lanes	45,000	63,000	90,000	110,000	120,000
Freeway	4 lanes	30,000	42,000	60,000	70,000	80,000
Expressway	6 lanes	30,000	42,000	60,000	70,000	80,000
Prime Arterial	11 lanes	32,000	44,750	63,750	74,500	85,000
Prime Arterial	10 lanes	30,000	42,000	60,000	70,000	80,000
Prime Arterial	9 lanes	28,750	40,250	57,500	66,250	75,000
Prime Arterial	8 lanes	27,500	38,500	55,000	62,500	70,000
Prime Arterial	7 lanes	26,250	36,750	52,500	58,750	65,000
Prime Arterial	6 lanes	25,000	35,000	50,000	55,000	60,000
Prime Arterial	5 lanes	23,000	32,000	45,000	50,000	55,000
Major Arterial	6 lanes	20,000	28,000	40,000	45,000	50,000
Prime Arterial[4]	4 lanes[4]	20,000	28,000	40,000	45,000	50,000
Major Arterial	5 lanes	17,500	24,500	35,000	40,000	45,000
Major Arterial	4 lanes	15,000	21,000	30,000	35,000	40,000
Collector	5 lanes	12,500	17,500	25,000	30,000	35,000
Collector (continuous left-turn lane)	4 lanes	10,000	14,000	20,000	25,000	30,000
Major Arterial (one-way)	4 lanes	11,400	15,600	20,000	27,000	33,400
	3 lanes	8,500	11,750	15,000	20,000	25,000
	2 lanes	5,700	7,800	10,000	13,500	16,700
Collector (no Center lane) (continuous left-turn lane)	4 lanes	5,000	7,000	10,000	13,000	15,000
	3 lanes					
	2 lanes					
Collector (one-way)	2 lanes	4,500	6,250	8,750	11,000	12,500
Collector (no fronting property)	2 lanes	4,000	5,500	7,500	9,000	10,000
Collector (commercial-industrial fronting)	2 lanes	2,500	3,500	5,000	6,500	8,000
Collector (multi-family)	2 lanes	2,500	3,500	5,000	6,500	8,000
Sub-collector (single-family)	2 lanes	—	—	2,200	—	—

Footnotes:

a. Approximate recommended ADT based on City of San Diego Street Design Manual.

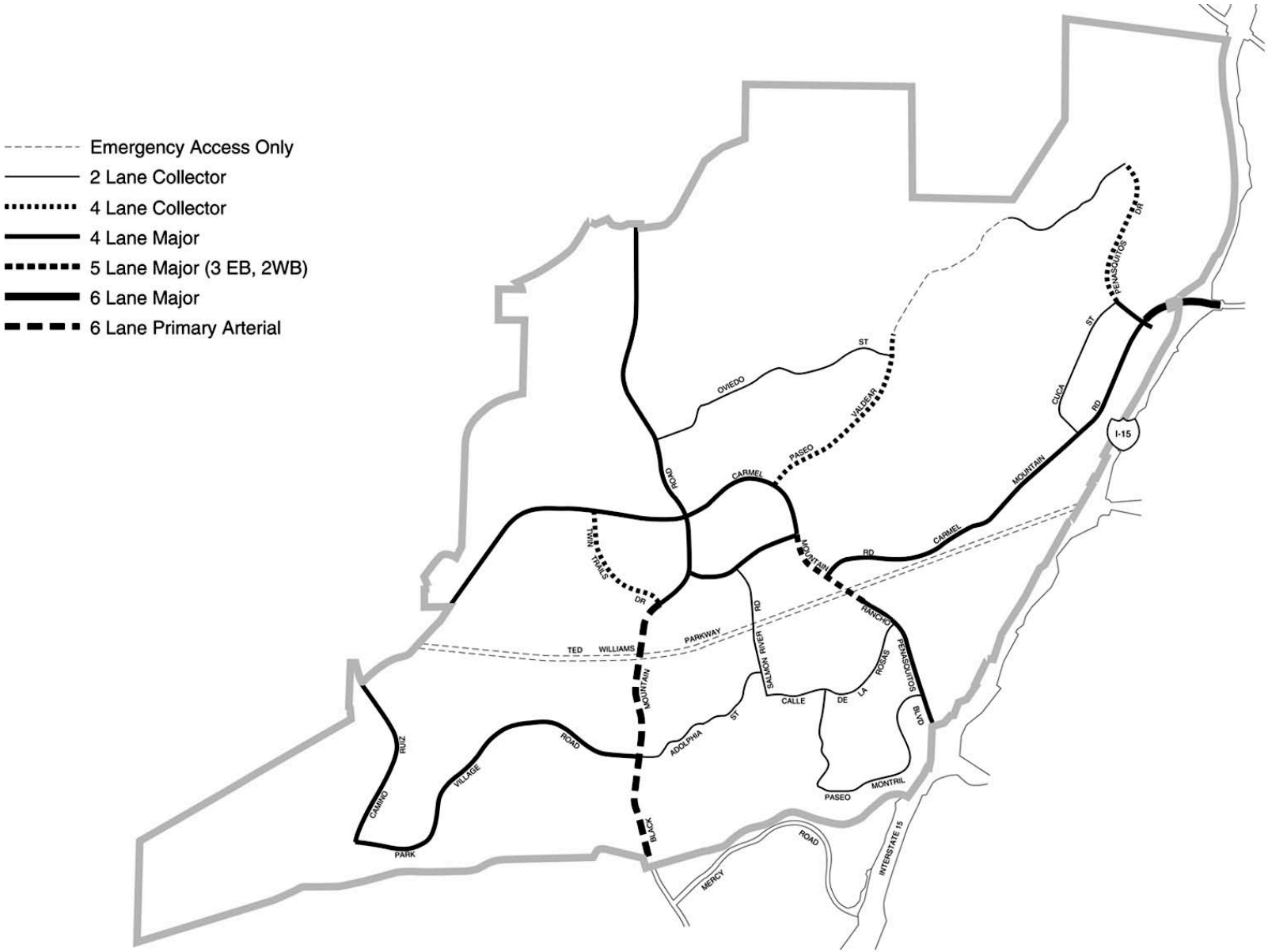
General Notes:

1. The volumes and the average daily level of service listed above are only intended as a general planning guideline.
2. Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.
3. ***Shaded areas indicate LLG-derived ADT capacities.***
4. Classification and capacity derived specifically for Kearny Villa Road in order to reflect the unique characteristics of this roadway.



Traffic Circulation **10** FIGURE

Carmel Mountain Ranch Community Plan



Recommended Street Classifications

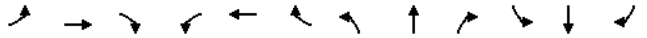
Rancho Peñasquitos Community Plan

28
FIGURE

APPENDIX E

EXISTING INTERSECTION ANALYSIS WORKSHEETS

1: Rancho Carmel Dr & Carmel Mountain Rd — Existing AM
HCM 6th Signalized Intersection Summary — 11/06/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	836	735	105	109	653	22	223	218	74	74	49	211
Future Volume (veh/h)	836	735	105	109	653	22	223	218	74	74	49	211
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		0.99	1.00		0.98	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	939	826	118	122	734	25	251	245	83	83	55	237
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	963	1939	275	178	1025	35	281	809	266	98	735	571
Arrive On Green	0.28	0.43	0.43	0.05	0.20	0.20	0.16	0.31	0.31	0.05	0.21	0.21
Sat Flow, veh/h	3456	4515	641	3456	5070	172	1781	2612	860	1781	3554	2761
Grp Volume(v), veh/h	939	622	322	122	492	267	251	164	164	83	55	237
Grp Sat Flow(s),veh/h/ln	1728	1702	1752	1728	1702	1838	1781	1777	1695	1781	1777	1381
Q Serve(g_s), s	31.4	14.9	15.0	4.0	15.7	15.8	16.1	8.2	8.6	5.4	1.5	8.7
Cycle Q Clear(g_c), s	31.4	14.9	15.0	4.0	15.7	15.8	16.1	8.2	8.6	5.4	1.5	8.7
Prop In Lane	1.00		0.37	1.00		0.09	1.00		0.51	1.00		1.00
Lane Grp Cap(c), veh/h	963	1462	753	178	688	372	281	550	525	98	735	571
V/C Ratio(X)	0.97	0.43	0.43	0.68	0.72	0.72	0.89	0.30	0.31	0.85	0.07	0.41
Avail Cap(c_a), veh/h	963	1627	837	261	934	505	342	550	525	98	735	571
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.6	23.2	23.3	54.3	43.4	43.4	48.1	30.6	30.7	54.6	37.2	40.1
Incr Delay (d2), s/veh	22.9	0.2	0.4	4.6	1.7	3.1	21.5	1.4	1.5	46.7	0.2	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.3	6.0	6.2	1.9	6.8	7.5	8.8	3.7	3.7	3.7	0.7	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.5	23.4	23.6	58.9	45.0	46.5	69.7	32.0	32.3	101.3	37.4	42.3
LnGrp LOS	E	C	C	E	D	D	E	C	C	F	D	D
Approach Vol, veh/h		1883			881			579			375	
Approach Delay, s/veh		44.0			47.4			48.4			54.7	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	40.6	10.5	54.6	22.9	28.6	37.0	28.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.4	36.1	8.8	55.7	22.4	20.1	32.5	32.0
Max Q Clear Time (g_c+I1), s	7.4	10.6	6.0	17.0	18.1	10.7	33.4	17.8
Green Ext Time (p_c), s	0.0	2.0	0.1	7.7	0.3	0.9	0.0	4.3

Intersection Summary	
HCM 6th Ctrl Delay	46.5
HCM 6th LOS	D

2: I-15 NB Ramp & Carmel Mountain Rd — Existing AM
HCM 6th Signalized Intersection Summary — 11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	330	656	0	0	780	306	181	2	1067	0	0	0
Future Volume (veh/h)	330	656	0	0	780	306	181	2	1067	0	0	0
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			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	351	698	0	0	830	326	194	0	1135			
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	1120	3522	0	0	1023	456	1357	0	1207			
Arrive On Green	0.11	0.23	0.00	0.00	0.29	0.29	0.38	0.00	0.38			
Sat Flow, veh/h	3456	5274	0	0	3647	1583	3563	0	3170			
Grp Volume(v), veh/h	351	698	0	0	830	326	194	0	1135			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1777	1583	1781	0	1585			
Q Serve(g_s), s	8.4	10.0	0.0	0.0	19.5	16.6	3.2	0.0	31.1			
Cycle Q Clear(g_c), s	8.4	10.0	0.0	0.0	19.5	16.6	3.2	0.0	31.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	1120	3522	0	0	1023	456	1357	0	1207			
V/C Ratio(X)	0.31	0.20	0.00	0.00	0.81	0.72	0.14	0.00	0.94			
Avail Cap(c_a), veh/h	1120	3522	0	0	1023	456	1385	0	1233			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.80	0.80	0.00	0.00	0.70	0.70	1.00	0.00	1.00			
Uniform Delay (d), s/veh	30.9	14.6	0.0	0.0	29.8	28.7	18.2	0.0	26.9			
Incr Delay (d2), s/veh	0.1	0.1	0.0	0.0	5.0	6.6	0.0	0.0	13.6			
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	8.8	4.3	0.0	0.0	8.8	7.0	1.3	0.0	13.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.1	14.7	0.0	0.0	34.8	35.4	18.3	0.0	40.5			
LnGrp LOS	C	B	A	A	C	D	B	A	D			
Approach Vol, veh/h		1049			1156			1329				
Approach Delay, s/veh		20.2			35.0			37.2				
Approach LOS		C			C			D				

Timer - Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		69.7			36.8	32.9		40.4
Change Period (Y+Rc), s		7.0			7.0	* 7		6.1
Max Green Setting (Gmax), s		41.9			10.3	* 26		35.0
Max Q Clear Time (g_c+I1), s		12.0			10.4	21.5		33.1
Green Ext Time (p_c), s		5.4			0.0	2.6		1.2

Intersection Summary	
HCM 6th Ctrl Delay	31.4
HCM 6th LOS	C

Notes
User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

3: I-15 SB Ramp & Carmel Mountain Rd
HCM 6th Signalized Intersection Summary

Existing AM
11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	736	523	557	404	0	0	0	0	250	0	233
Future Volume (veh/h)	0	736	523	557	404	0	0	0	0	250	0	233
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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	775	551	586	425	0				339	0	163
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1644	733	653	2541	0				497	0	221
Arrive On Green	0.00	0.46	0.46	0.32	1.00	0.00				0.14	0.00	0.14
Sat Flow, veh/h	0	3647	1585	3456	3647	0				3563	0	1585
Grp Volume(v), veh/h	0	775	551	586	425	0				339	0	163
Grp Sat Flow(s),veh/h/ln	0	1777	1585	1728	1777	0				1781	0	1585
Q Serve(g_s), s	0.0	13.5	25.8	14.6	0.0	0.0				8.1	0.0	8.9
Cycle Q Clear(g_c), s	0.0	13.5	25.8	14.6	0.0	0.0				8.1	0.0	8.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1644	733	653	2541	0				497	0	221
V/C Ratio(X)	0.00	0.47	0.75	0.90	0.17	0.00				0.68	0.00	0.74
Avail Cap(c_a), veh/h	0	1644	733	699	2541	0				1148	0	511
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.61	0.61	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	16.6	19.9	30.0	0.0	0.0				36.8	0.0	37.1
Incr Delay (d2), s/veh	0.0	1.0	7.0	9.2	0.1	0.0				1.7	0.0	4.7
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	5.4	10.3	5.8	0.0	0.0				3.6	0.0	3.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	17.6	26.9	39.1	0.1	0.0				38.5	0.0	41.9
LnGrp LOS	A	B	C	D	A	A				D	A	D
Approach Vol, veh/h		1326			1011						502	
Approach Delay, s/veh		21.5			22.7						39.6	
Approach LOS		C			C						D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	12.7	48.6		18.7		71.3
Change Period (Y+Rc), s	5.7	7.0		6.1		7.0
Max Green Setting (Gmax), s	11.3	24.0		29.0		47.9
Max Q Clear Time (g_c+I1), s	10.6	27.8		10.9		2.0
Green Ext Time (p_c), s	0.4	0.0		1.7		3.2

Intersection Summary	
HCM 6th Ctrl Delay	25.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

5: Carmel Mountain Rd & Penasquitos Dr
HCM 6th Signalized Intersection Summary

Existing AM
11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	652	50	168	17	19	77	97	530	22	86	317	234
Future Volume (veh/h)	652	50	168	17	19	77	97	530	22	86	317	234
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		0.98	1.00		0.99	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	709	0	173	18	20	79	100	546	23	89	327	241
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	989	0	438	133	140	117	129	1070	45	115	730	762
Arrive On Green	0.28	0.00	0.28	0.07	0.07	0.07	0.07	0.21	0.21	0.06	0.21	0.21
Sat Flow, veh/h	3563	0	1578	1781	1870	1560	1781	5023	210	1781	3554	1566
Grp Volume(v), veh/h	709	0	173	18	20	79	100	369	200	89	327	241
Grp Sat Flow(s),veh/h/ln	1781	0	1578	1781	1870	1560	1781	1702	1830	1781	1777	1566
Q Serve(g_s), s	10.0	0.0	5.0	0.5	0.6	2.8	3.1	5.3	5.4	2.7	4.5	5.2
Cycle Q Clear(g_c), s	10.0	0.0	5.0	0.5	0.6	2.8	3.1	5.3	5.4	2.7	4.5	5.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	989	0	438	133	140	117	129	725	390	115	730	762
V/C Ratio(X)	0.72	0.00	0.39	0.13	0.14	0.68	0.78	0.51	0.51	0.77	0.45	0.32
Avail Cap(c_a), veh/h	1771	0	784	511	537	448	249	1582	850	329	1779	1224
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.2	0.0	16.3	24.1	24.1	25.1	25.4	19.4	19.4	25.7	19.4	8.8
Incr Delay (d2), s/veh	1.0	0.0	0.6	0.5	0.5	6.6	9.5	0.6	1.0	10.4	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	0.0	1.7	0.2	0.2	1.2	1.6	2.0	2.2	1.4	1.7	2.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.1	0.0	16.9	24.5	24.6	31.8	34.9	19.9	20.4	36.1	19.8	9.0
LnGrp LOS	B	A	B	C	C	C	C	B	C	D	B	A
Approach Vol, veh/h		882			117			669			657	
Approach Delay, s/veh		18.7			29.4			22.3			18.1	
Approach LOS		B			C			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	18.0	17.9		20.8	8.4	17.4		9.1
Change Period (Y+Rc), s	4.4	* 6		5.3	4.4	6.0		4.9
Max Green Setting (Gmax), s	10.3	* 26		27.7	7.8	27.9		16.0
Max Q Clear Time (g_c+I1), s	14.7	7.4		12.0	5.1	7.2		4.8
Green Ext Time (p_c), s	0.1	3.5		3.1	0.0	2.9		0.2

Intersection Summary	
HCM 6th Ctrl Delay	20.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↑			↑	
Traffic Vol, veh/h	32	1	75	14	0	0	41	305	6	1	723	23
Future Vol, veh/h	32	1	75	14	0	0	41	305	6	1	723	23
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	35	1	82	15	0	0	45	332	7	1	786	25

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1231	1234	803	1268	1243	336	815	0	0	339	0	0
Stage 1	805	805	-	426	426	-	-	-	-	-	-	-
Stage 2	426	429	-	842	817	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	154	177	383	145	174	706	812	-	-	1220	-	-
Stage 1	376	395	-	606	586	-	-	-	-	-	-	-
Stage 2	606	584	-	359	390	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	147	166	382	109	164	706	809	-	-	1220	-	-
Mov Cap-2 Maneuver	147	166	-	109	164	-	-	-	-	-	-	-
Stage 1	354	393	-	572	553	-	-	-	-	-	-	-
Stage 2	572	551	-	281	388	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30.3	43.3	1.1	0
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	809	-	-	257	109	1220	-	-
HCM Lane V/C Ratio	0.055	-	-	0.457	0.14	0.001	-	-
HCM Control Delay (s)	9.7	-	-	30.3	43.3	8	-	-
HCM Lane LOS	A	-	-	D	E	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.2	0.5	0	-	-

Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕					↑	↑			↑	
Traffic Vol, veh/h	6	0	40	0	0	0	8	330	0	0	705	1
Future Vol, veh/h	6	0	40	0	0	0	8	330	0	0	705	1
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	65	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	0	43	0	0	0	9	359	0	0	766	1

Major/Minor	Minor2			Major1			Major2		
Conflicting Flow All	1148	1148	771			771	0	-	-	-	0
Stage 1	771	771	-			-	-	-	-	-	-
Stage 2	377	377	-			-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22			4.12	-	-	-	-	-
Critical Hdwy Stg 1	5.42	5.52	-			-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-			-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318			2.218	-	-	-	-	-
Pot Cap-1 Maneuver	220	199	400			844	-	0	0	-	-
Stage 1	456	410	-			-	-	0	0	-	-
Stage 2	694	616	-			-	-	0	0	-	-
Platoon blocked, %							-			-	-
Mov Cap-1 Maneuver	216	0	399			841	-	-	-	-	-
Mov Cap-2 Maneuver	216	0	-			-	-	-	-	-	-
Stage 1	450	0	-			-	-	-	-	-	-
Stage 2	692	0	-			-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.6	0.2	0
HCM LOS	C		

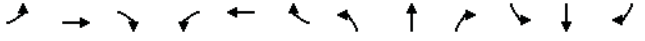
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	841	-	359	-	-
HCM Lane V/C Ratio	0.01	-	0.139	-	-
HCM Control Delay (s)	9.3	-	16.6	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.5	-	-

8: Carmel Mountain Rd & Cuca St/Caminata Deluz

Existing AM

HCM 6th Signalized Intersection Summary

11/06/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	1	148	11	0	8	115	467	8	15	502	65
Future Volume (veh/h)	84	1	148	11	0	8	115	467	8	15	502	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.97	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	88	1	156	12	0	8	121	492	8	16	528	68
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	226	38	254	347	34	160	160	1308	21	29	925	119
Arrive On Green	0.26	0.26	0.26	0.26	0.00	0.26	0.09	0.37	0.37	0.02	0.29	0.29
Sat Flow, veh/h	412	147	980	794	129	616	1781	3577	58	1781	3164	406
Grp Volume(v), veh/h	245	0	0	20	0	0	121	244	256	16	296	300
Grp Sat Flow(s),veh/h/ln	1539	0	0	1539	0	0	1781	1777	1858	1781	1777	1793
Q Serve(g_s), s	3.1	0.0	0.0	0.0	0.0	0.0	2.7	4.1	4.2	0.4	5.8	5.8
Cycle Q Clear(g_c), s	5.6	0.0	0.0	0.4	0.0	0.0	2.7	4.1	4.2	0.4	5.8	5.8
Prop In Lane	0.36		0.64	0.60		0.40	1.00		0.03	1.00		0.23
Lane Grp Cap(c), veh/h	519	0	0	540	0	0	160	650	679	29	519	524
V/C Ratio(X)	0.47	0.00	0.00	0.04	0.00	0.00	0.76	0.38	0.38	0.55	0.57	0.57
Avail Cap(c_a), veh/h	1194	0	0	1143	0	0	634	1807	1889	200	1369	1382
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	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.2	0.0	0.0	11.4	0.0	0.0	18.2	9.6	9.6	20.0	12.3	12.3
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.0	0.0	0.0	7.2	0.4	0.3	15.4	1.0	1.0
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	1.7	0.0	0.0	0.1	0.0	0.0	1.3	1.3	1.4	0.3	2.0	2.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.9	0.0	0.0	11.4	0.0	0.0	25.4	9.9	9.9	35.4	13.3	13.3
LnGrp LOS	B	A	A	B	A	A	C	A	A	D	B	B
Approach Vol, veh/h		245			20			621			612	
Approach Delay, s/veh		13.9			11.4			12.9			13.9	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.1	20.4		15.6	8.1	17.4		15.6				
Change Period (Y+Rc), s	4.4	* 5.4		4.9	4.4	5.4		4.9				
Max Green Setting (Gmax), s	4.6	* 42		29.1	14.6	31.6		29.1				
Max Q Clear Time (g_c+I1), s	2.4	6.2		7.6	4.7	7.8		2.4				
Green Ext Time (p_c), s	0.0	3.3		1.5	0.2	3.8		0.1				

Intersection Summary	
HCM 6th Ctrl Delay	13.5
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

9: Comm Dwy/Paseo Cardiel & Carmel Mountain Rd

Existing AM

HCM 6th Signalized Intersection Summary

11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	447	27	10	497	228	103	38	9	126	6	82
Future Volume (veh/h)	134	447	27	10	497	228	103	38	9	126	6	82
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	158	526	32	12	585	268	121	45	11	148	7	96
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	209	1594	97	22	860	394	275	89	16	442	23	313
Arrive On Green	0.12	0.47	0.47	0.01	0.36	0.36	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1781	3403	207	1781	2367	1083	719	423	76	1346	109	1491
Grp Volume(v), veh/h	158	274	284	12	439	414	177	0	0	148	0	103
Grp Sat Flow(s),veh/h/ln	1781	1777	1833	1781	1777	1674	1218	0	0	1346	0	1600
Q Serve(g_s), s	4.2	4.7	4.8	0.3	10.2	10.2	4.5	0.0	0.0	0.0	0.0	2.7
Cycle Q Clear(g_c), s	4.2	4.7	4.8	0.3	10.2	10.2	7.2	0.0	0.0	4.5	0.0	2.7
Prop In Lane	1.00		0.11	1.00		0.65	0.68		0.06	1.00		0.93
Lane Grp Cap(c), veh/h	209	832	858	22	646	608	380	0	0	442	0	336
V/C Ratio(X)	0.76	0.33	0.33	0.55	0.68	0.68	0.47	0.00	0.00	0.34	0.00	0.31
Avail Cap(c_a), veh/h	606	1590	1640	150	1128	1062	875	0	0	911	0	894
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.9	8.2	8.2	24.0	13.1	13.1	18.4	0.0	0.0	17.0	0.0	16.3
Incr Delay (d2), s/veh	5.5	0.2	0.2	19.6	1.3	1.4	0.9	0.0	0.0	0.4	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	1.5	1.5	0.2	3.6	3.4	1.8	0.0	0.0	1.3	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.4	8.4	8.4	43.6	14.4	14.5	19.3	0.0	0.0	17.4	0.0	16.8
LnGrp LOS	C	A	A	D	B	B	B	A	A	B	A	B
Approach Vol, veh/h		716			865			177			251	
Approach Delay, s/veh		12.4			14.9			19.3			17.2	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.0	28.7		15.2	10.1	23.5		15.2				
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9				
Max Green Setting (Gmax), s	4.6	* 44		27.3	16.6	31.0		27.3				
Max Q Clear Time (g_c+I1), s	2.3	6.8		6.5	6.2	12.2		9.2				
Green Ext Time (p_c), s	0.0	3.7		1.0	0.3	5.5		0.9				

Intersection Summary	
HCM 6th Ctrl Delay	14.7
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

10: Rancho Penasquitos Blvd & SR 56 WB Ramps & Carmel Mountain Rd
HCM 6th Signalized Intersection Summary

Existing AM
11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	243	62	34	223	236	246	317	572	250	312	1056	47
Future Volume (veh/h)	243	62	34	223	236	246	317	572	250	312	1056	47
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		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	279	71	39	256	271	283	364	657	287	359	1214	54
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	297	396	203	323	339	477	384	1719	765	413	1980	612
Arrive On Green	0.09	0.17	0.17	0.09	0.18	0.18	0.22	0.48	0.48	0.12	0.39	0.39
Sat Flow, veh/h	3456	2274	1163	3456	1870	1585	1781	3554	1581	3456	5106	1577
Grp Volume(v), veh/h	279	54	56	256	271	283	364	657	287	359	1214	54
Grp Sat Flow(s),veh/h/ln	1728	1777	1661	1728	1870	1585	1781	1777	1581	1728	1702	1577
Q Serve(g_s), s	12.0	3.9	4.3	10.9	20.8	22.8	30.2	17.6	17.2	15.3	28.6	3.3
Cycle Q Clear(g_c), s	12.0	3.9	4.3	10.9	20.8	22.8	30.2	17.6	17.2	15.3	28.6	3.3
Prop In Lane	1.00		0.70	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	297	309	289	323	339	477	384	1719	765	413	1980	612
V/C Ratio(X)	0.94	0.18	0.19	0.79	0.80	0.59	0.95	0.38	0.38	0.87	0.61	0.09
Avail Cap(c_a), veh/h	297	443	414	424	524	633	390	1719	765	521	1980	612
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.70	0.70	0.70	0.73	0.73	0.73	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.2	52.8	52.9	66.6	58.8	44.6	58.0	24.5	24.4	64.9	36.9	29.1
Incr Delay (d2), s/veh	36.3	0.3	0.3	5.4	3.5	0.8	26.5	0.5	1.0	12.3	1.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	1.8	1.8	5.1	10.2	9.1	16.5	7.6	6.7	7.5	12.3	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	104.4	53.0	53.3	72.0	62.2	45.4	84.5	25.0	25.5	77.1	38.3	29.4
LnGrp LOS	F	D	D	E	E	D	F	C	C	E	D	C
Approach Vol, veh/h		389			810			1308			1627	
Approach Delay, s/veh		89.9			59.4			41.7			46.6	
Approach LOS		F			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	36.5	63.7	17.1	32.7	22.1	78.1	18.2	31.6
Change Period (Y+Rc), s	4.2	5.5	* 4.2	5.5	* 4.2	5.5	* 4.2	* 5.5
Max Green Setting (Gmax), s	33.3	42.9	* 13	42.0	* 23	53.1	* 18	* 37
Max Q Clear Time (g_c+I1), s	32.2	30.6	14.0	24.8	17.3	19.6	12.9	6.3
Green Ext Time (p_c), s	0.1	6.8	0.0	2.4	0.6	6.4	0.4	0.6

Intersection Summary	
HCM 6th Ctrl Delay	51.6
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

11: Rancho Penasquitos Blvd & SR 56 EB Ramps/Azuaga St
HCM 6th Signalized Intersection Summary

Existing AM
11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	105	7	330	73	60	102	55	1010	20	49	839	425
Future Volume (veh/h)	105	7	330	73	60	102	55	1010	20	49	839	425
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	114	8	323	79	65	111	60	1098	22	53	912	462
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	380	27	361	155	54	92	90	1547	31	155	1672	1107
Arrive On Green	0.23	0.23	0.23	0.09	0.09	0.09	0.05	0.43	0.43	0.09	0.47	0.47
Sat Flow, veh/h	1670	117	1585	1781	620	1059	1781	3563	71	1781	3554	1585
Grp Volume(v), veh/h	122	0	323	79	0	176	60	548	572	53	912	462
Grp Sat Flow(s),veh/h/ln	1787	0	1585	1781	0	1680	1781	1777	1858	1781	1777	1585
Q Serve(g_s), s	6.5	0.0	22.7	4.9	0.0	10.0	3.8	29.0	29.0	3.2	21.0	14.3
Cycle Q Clear(g_c), s	6.5	0.0	22.7	4.9	0.0	10.0	3.8	29.0	29.0	3.2	21.0	14.3
Prop In Lane	0.93		1.00	1.00		0.63	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	407	0	361	155	0	146	90	771	806	155	1672	1107
V/C Ratio(X)	0.30	0.00	0.90	0.51	0.00	1.20	0.67	0.71	0.71	0.34	0.55	0.42
Avail Cap(c_a), veh/h	559	0	496	155	0	146	102	771	806	155	1672	1107
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	1.00	0.69	0.69	0.69
Uniform Delay (d), s/veh	36.8	0.0	43.1	50.2	0.0	52.5	53.6	26.6	26.6	49.4	21.7	7.4
Incr Delay (d2), s/veh	0.4	0.0	14.7	2.8	0.0	140.0	13.0	5.5	5.3	0.9	0.9	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	10.3	2.3	0.0	9.9	2.0	13.2	13.7	1.5	8.8	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	0.0	57.8	52.9	0.0	192.5	66.6	32.1	31.9	50.3	22.6	8.2
LnGrp LOS	D	A	E	D	A	F	E	C	C	D	C	A
Approach Vol, veh/h		445			255			1180			1427	
Approach Delay, s/veh		52.2			149.2			33.7			18.9	
Approach LOS		D			F			C			B	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	10.0	59.6	14.6	14.2	55.4	30.8
Change Period (Y+Rc), s	4.2	5.5	4.6	* 4.2	5.5	4.6
Max Green Setting (Gmax), s	5.8	43.5	10.0	* 10	40.1	36.0
Max Q Clear Time (g_c+I1), s	5.8	23.0	12.0	5.2	31.0	24.7
Green Ext Time (p_c), s	0.0	8.6	0.0	0.0	4.8	1.4

Intersection Summary	
HCM 6th Ctrl Delay	38.7
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

1: Rancho Carmel Dr & Carmel Mountain Rd — Existing PM
HCM 6th Signalized Intersection Summary — 11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	462	1050	152	247	946	47	146	164	231	138	364	850
Future Volume (veh/h)	462	1050	152	247	946	47	146	164	231	138	364	850
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		0.99	1.00		0.98	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	471	1071	155	252	965	48	149	167	236	141	371	867
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	546	1419	205	321	1246	62	179	588	513	170	1159	900
Arrive On Green	0.16	0.32	0.32	0.09	0.25	0.25	0.10	0.33	0.33	0.10	0.33	0.33
Sat Flow, veh/h	3456	4503	651	3456	4981	247	1781	1777	1549	1781	3554	2761
Grp Volume(v), veh/h	471	809	417	252	659	354	149	167	236	141	371	867
Grp Sat Flow(s),veh/h/ln	1728	1702	1750	1728	1702	1824	1781	1777	1549	1781	1777	1381
Q Serve(g_s), s	14.5	23.2	23.3	7.8	19.6	19.6	8.9	7.6	13.1	8.5	8.5	33.6
Cycle Q Clear(g_c), s	14.5	23.2	23.3	7.8	19.6	19.6	8.9	7.6	13.1	8.5	8.5	33.6
Prop In Lane	1.00		0.37	1.00		0.14	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	546	1073	551	321	852	456	179	588	513	170	1159	900
V/C Ratio(X)	0.86	0.75	0.76	0.78	0.77	0.78	0.83	0.28	0.46	0.83	0.32	0.96
Avail Cap(c_a), veh/h	651	1189	611	461	1001	536	237	588	513	221	1159	900
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.7	33.5	33.5	48.3	37.9	37.9	48.0	26.9	28.7	48.3	27.6	36.0
Incr Delay (d2), s/veh	10.1	2.5	4.9	5.6	3.3	6.0	17.0	1.2	3.0	17.9	0.7	22.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	9.8	10.5	3.6	8.5	9.4	4.8	3.4	5.3	4.6	3.7	13.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.8	36.0	38.3	53.9	41.2	43.9	65.1	28.1	31.7	66.2	28.3	58.3
LnGrp LOS	D	D	D	D	D	D	E	C	C	E	C	E
Approach Vol, veh/h		1697			1265			552			1379	
Approach Delay, s/veh		41.8			44.5			39.6			51.0	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.9	40.5	14.6	38.8	15.4	40.0	21.7	31.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	36.0	14.5	38.0	14.5	35.0	20.5	32.0
Max Q Clear Time (g_c+I1), s	10.5	15.1	9.8	25.3	10.9	35.6	16.5	21.6
Green Ext Time (p_c), s	0.1	2.5	0.4	6.6	0.1	0.0	0.7	4.8

Intersection Summary	
HCM 6th Ctrl Delay	44.8
HCM 6th LOS	D

2: I-15 NB Ramp & Carmel Mountain Rd — Existing PM
HCM 6th Signalized Intersection Summary — 11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	233	872	0	0	1397	584	356	1	852	0	0	0
Future Volume (veh/h)	233	872	0	0	1397	584	356	1	852	0	0	0
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		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	240	899	0	0	1440	602	368	0	878			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	323	2821	0	0	1382	617	1128	0	991			
Arrive On Green	0.03	0.18	0.00	0.00	0.39	0.39	0.32	0.00	0.32			
Sat Flow, veh/h	3456	5274	0	0	3647	1585	3563	0	3130			
Grp Volume(v), veh/h	240	899	0	0	1440	602	368	0	878			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1777	1585	1781	0	1565			
Q Serve(g_s), s	6.9	15.3	0.0	0.0	38.9	37.4	7.9	0.0	26.6			
Cycle Q Clear(g_c), s	6.9	15.3	0.0	0.0	38.9	37.4	7.9	0.0	26.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	323	2821	0	0	1382	617	1128	0	991			
V/C Ratio(X)	0.74	0.32	0.00	0.00	1.04	0.98	0.33	0.00	0.89			
Avail Cap(c_a), veh/h	323	2821	0	0	1382	617	1247	0	1095			
HCM Platoon Ratio	0.33	0.33	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	0.60	0.60	1.00	0.00	1.00			
Uniform Delay (d), s/veh	47.3	24.5	0.0	0.0	30.5	30.1	26.0	0.0	32.5			
Incr Delay (d2), s/veh	6.2	0.2	0.0	0.0	30.7	22.9	0.2	0.0	8.4			
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	8.4	7.0	0.0	0.0	21.8	17.6	3.3	0.0	11.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.5	24.7	0.0	0.0	61.2	53.0	26.2	0.0	40.8			
LnGrp LOS	D	C	A	A	F	D	C	A	D			
Approach Vol, veh/h		1139			2042			1246				
Approach Delay, s/veh		30.8			58.8			36.5				
Approach LOS		C			E			D				

Timer - Assigned Phs	2	5	6	8
Phs Duration (G+Y+Rc), s	62.2	16.3	45.9	37.8
Change Period (Y+Rc), s	7.0	7.0	* 7	6.1
Max Green Setting (Gmax), s	51.9	7.3	* 39	35.0
Max Q Clear Time (g_c+I1), s	17.3	8.9	40.9	28.6
Green Ext Time (p_c), s	7.5	0.0	0.0	3.0

Intersection Summary	
HCM 6th Ctrl Delay	45.3
HCM 6th LOS	D

Notes
User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

3: I-15 SB Ramp & Carmel Mountain Rd
HCM 6th Signalized Intersection Summary

Existing PM
11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	681	220	860	893	0	0	0	0	424	5	335
Future Volume (veh/h)	0	681	220	860	893	0	0	0	0	424	5	335
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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	695	224	878	911	0				541	0	230
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98				0.98	0.98	0.98
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1235	550	950	2415	0				675	0	300
Arrive On Green	0.00	0.35	0.35	0.18	0.46	0.00				0.19	0.00	0.19
Sat Flow, veh/h	0	3647	1584	3456	3647	0				3563	0	1585
Grp Volume(v), veh/h	0	695	224	878	911	0				541	0	230
Grp Sat Flow(s),veh/h/ln	0	1777	1584	1728	1777	0				1781	0	1585
Q Serve(g_s), s	0.0	15.9	10.7	25.0	16.9	0.0				14.5	0.0	13.8
Cycle Q Clear(g_c), s	0.0	15.9	10.7	25.0	16.9	0.0				14.5	0.0	13.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1235	550	950	2415	0				675	0	300
V/C Ratio(X)	0.00	0.56	0.41	0.92	0.38	0.00				0.80	0.00	0.77
Avail Cap(c_a), veh/h	0	1235	550	975	2415	0				1033	0	460
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	0.29	0.29	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	26.5	24.8	39.8	13.3	0.0				38.7	0.0	38.4
Incr Delay (d2), s/veh	0.0	1.9	2.2	4.9	0.1	0.0				2.7	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	6.9	4.3	11.6	7.3	0.0				6.5	0.0	5.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	28.3	27.0	44.7	13.4	0.0				41.4	0.0	42.5
LnGrp LOS	A	C	C	D	B	A				D	A	D
Approach Vol, veh/h		919			1789						771	
Approach Delay, s/veh		28.0			28.8						41.7	
Approach LOS		C			C						D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	33.2	41.8		25.0		75.0
Change Period (Y+Rc), s	5.7	7.0		6.1		7.0
Max Green Setting (Gmax), s	28.0	24.0		29.0		57.9
Max Q Clear Time (g_c+I1), s	27.6	17.9		16.5		18.9
Green Ext Time (p_c), s	0.5	2.8		2.4		8.0

Intersection Summary	
HCM 6th Ctrl Delay	31.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

5: Carmel Mountain Rd & Penasquitos Dr
HCM 6th Signalized Intersection Summary

Existing PM
11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	327	34	65	26	41	63	153	511	16	130	463	635
Future Volume (veh/h)	327	34	65	26	41	63	153	511	16	130	463	635
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.97	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	362	0	67	27	42	65	158	527	16	134	477	655
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	546	0	241	121	127	106	195	2003	61	170	1350	840
Arrive On Green	0.15	0.00	0.15	0.07	0.07	0.07	0.11	0.39	0.39	0.10	0.38	0.38
Sat Flow, veh/h	3563	0	1573	1781	1870	1557	1781	5087	154	1781	3554	1570
Grp Volume(v), veh/h	362	0	67	27	42	65	158	352	191	134	477	655
Grp Sat Flow(s),veh/h/ln	1781	0	1573	1781	1870	1557	1781	1702	1837	1781	1777	1570
Q Serve(g_s), s	6.8	0.0	2.7	1.0	1.5	2.9	6.2	5.0	5.0	5.2	6.8	23.8
Cycle Q Clear(g_c), s	6.8	0.0	2.7	1.0	1.5	2.9	6.2	5.0	5.0	5.2	6.8	23.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	546	0	241	121	127	106	195	1340	723	170	1350	840
V/C Ratio(X)	0.66	0.00	0.28	0.22	0.33	0.62	0.81	0.26	0.26	0.79	0.35	0.78
Avail Cap(c_a), veh/h	1386	0	612	400	420	350	195	1340	723	258	1393	859
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.4	0.0	26.6	31.4	31.6	32.3	31.0	14.6	14.6	31.5	15.8	13.3
Incr Delay (d2), s/veh	1.4	0.0	0.6	0.9	1.5	5.7	21.9	0.1	0.2	8.8	0.2	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	1.0	0.5	0.7	1.2	3.7	1.8	2.0	2.6	2.6	11.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.8	0.0	27.3	32.3	33.1	38.0	52.8	14.7	14.8	40.3	16.0	17.9
LnGrp LOS	C	A	C	C	C	D	D	B	B	D	B	B
Approach Vol, veh/h		429			134			701			1266	
Approach Delay, s/veh		29.4			35.3			23.3			19.5	
Approach LOS		C			D			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.2	34.0		16.2	12.2	33.0		9.7
Change Period (Y+Rc), s	4.4	* 6		5.3	4.4	6.0		4.9
Max Green Setting (Gmax), s	10.3	* 26		27.7	7.8	27.9		16.0
Max Q Clear Time (g_c+I1), s	7.2	7.0		8.8	8.2	25.8		4.9
Green Ext Time (p_c), s	0.1	3.3		1.4	0.0	1.3		0.3

Intersection Summary	
HCM 6th Ctrl Delay	23.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑↱		↰	↑↱	
Traffic Vol, veh/h	12	0	41	8	0	5	76	610	12	5	318	15
Future Vol, veh/h	12	0	41	8	0	5	76	610	12	5	318	15
Conflicting Peds, #/hr	0	0	1	1	0	0	8	0	0	0	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	80	-	-
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	13	0	43	8	0	5	79	635	13	5	331	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1159	1163	348	1172	1165	642	355	0	0	648	0	0
Stage 1	357	357	-	800	800	-	-	-	-	-	-	-
Stage 2	802	806	-	372	365	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	173	195	695	169	194	474	1204	-	-	938	-	-
Stage 1	661	628	-	379	397	-	-	-	-	-	-	-
Stage 2	378	395	-	648	623	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	161	180	690	150	179	474	1196	-	-	938	-	-
Mov Cap-2 Maneuver	161	180	-	150	179	-	-	-	-	-	-	-
Stage 1	613	620	-	354	371	-	-	-	-	-	-	-
Stage 2	349	369	-	604	616	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.6	23.9	0.9	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1196	-	-	396	204	938	-	-
HCM Lane V/C Ratio	0.066	-	-	0.139	0.066	0.006	-	-
HCM Control Delay (s)	8.2	-	-	15.6	23.9	8.9	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.5	0.2	0	-	-

Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕					↰	↑			↱	
Traffic Vol, veh/h	3	0	23	0	0	0	35	585	0	0	310	2
Future Vol, veh/h	3	0	23	0	0	0	35	585	0	0	310	2
Conflicting Peds, #/hr	0	0	0	0	0	0	9	0	0	0	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	65	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	16979	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	24	0	0	0	37	616	0	0	326	2

Major/Minor	Minor2					Major1			Major2		
Conflicting Flow All	1026	1026	336			337	0	-	-	-	0
Stage 1	336	336	-			-	-	-	-	-	-
Stage 2	690	690	-			-	-	-	-	-	-
Critical Hdwy	6.42	6.52	6.22			4.12	-	-	-	-	-
Critical Hdwy Stg 1	5.42	5.52	-			-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	5.52	-			-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318			2.218	-	-	-	-	-
Pot Cap-1 Maneuver	260	235	706			1222	-	0	0	-	-
Stage 1	724	642	-			-	-	0	0	-	-
Stage 2	498	446	-			-	-	0	0	-	-
Platoon blocked, %							-			-	-
Mov Cap-1 Maneuver	248	0	701			1213	-	-	-	-	-
Mov Cap-2 Maneuver	248	0	-			-	-	-	-	-	-
Stage 1	696	0	-			-	-	-	-	-	-
Stage 2	495	0	-			-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	11.5	0.5	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1213	-	579	-	-
HCM Lane V/C Ratio	0.03	-	0.047	-	-
HCM Control Delay (s)	8.1	-	11.5	-	-
HCM Lane LOS	A	-	B	-	-
HCM 95th %tile Q(veh)	0.1	-	0.1	-	-

8: Carmel Mountain Rd & Cuca St/Caminata Deluz

Existing PM

HCM 6th Signalized Intersection Summary

11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	1	76	0	3	3	85	581	4	17	436	58
Future Volume (veh/h)	40	1	76	0	3	3	85	581	4	17	436	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.98	1.00		0.98	1.00		0.99	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	42	1	80	0	3	3	89	612	4	18	459	61
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	210	49	229	0	193	193	117	1227	8	33	919	121
Arrive On Green	0.23	0.23	0.23	0.00	0.23	0.23	0.07	0.34	0.34	0.02	0.29	0.29
Sat Flow, veh/h	326	217	1009	0	849	849	1781	3619	24	1781	3152	417
Grp Volume(v), veh/h	123	0	0	0	0	6	89	300	316	18	258	262
Grp Sat Flow(s),veh/h/ln	1552	0	0	0	0	1699	1781	1777	1866	1781	1777	1792
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.1	1.7	4.8	4.8	0.4	4.3	4.3
Cycle Q Clear(g_c), s	2.2	0.0	0.0	0.0	0.0	0.1	1.7	4.8	4.8	0.4	4.3	4.3
Prop In Lane	0.34		0.65	0.00		0.50	1.00		0.01	1.00		0.23
Lane Grp Cap(c), veh/h	489	0	0	0	0	386	117	602	633	33	518	522
V/C Ratio(X)	0.25	0.00	0.00	0.00	0.00	0.02	0.76	0.50	0.50	0.55	0.50	0.50
Avail Cap(c_a), veh/h	1379	0	0	0	0	1397	735	2094	2199	232	1587	1600
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	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.4	0.0	0.0	0.0	0.0	10.6	16.2	9.3	9.3	17.2	10.4	10.4
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.0	0.0	0.0	9.5	0.6	0.6	13.7	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.0	0.0	0.0	0.9	1.4	1.5	0.2	1.3	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.7	0.0	0.0	0.0	0.0	10.6	25.8	9.9	9.9	30.9	11.1	11.2
LnGrp LOS	B	A	A	A	A	B	C	A	A	C	B	B
Approach Vol, veh/h		123			6			705			538	
Approach Delay, s/veh		11.7			10.6			11.9			11.8	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.0	17.4		12.9	6.7	15.7		12.9				
Change Period (Y+Rc), s	4.4	* 5.4		4.9	4.4	5.4		4.9				
Max Green Setting (Gmax), s	4.6	* 42		29.1	14.6	31.6		29.1				
Max Q Clear Time (g_c+I1), s	2.4	6.8		4.2	3.7	6.3		2.1				
Green Ext Time (p_c), s	0.0	4.2		0.7	0.1	3.3		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	11.9
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

9: Comm Dwy/Paseo Cardiel & Carmel Mountain Rd

Existing PM

HCM 6th Signalized Intersection Summary

11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	137	628	70	36	392	82	253	37	35	101	32	45
Future Volume (veh/h)	137	628	70	36	392	82	253	37	35	101	32	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.99		0.98	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	146	668	74	38	417	87	269	39	37	107	34	48
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	193	1035	115	58	718	148	464	62	48	635	243	343
Arrive On Green	0.11	0.32	0.32	0.03	0.25	0.25	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1781	3216	356	1781	2917	603	971	179	138	1317	698	986
Grp Volume(v), veh/h	146	369	373	38	252	252	345	0	0	107	0	82
Grp Sat Flow(s),veh/h/ln	1781	1777	1795	1781	1777	1743	1288	0	0	1317	0	1684
Q Serve(g_s), s	4.0	9.0	9.0	1.1	6.3	6.4	10.9	0.0	0.0	0.0	0.0	1.7
Cycle Q Clear(g_c), s	4.0	9.0	9.0	1.1	6.3	6.4	12.6	0.0	0.0	2.6	0.0	1.7
Prop In Lane	1.00		0.20	1.00		0.35	0.78		0.11	1.00		0.59
Lane Grp Cap(c), veh/h	193	572	578	58	438	429	574	0	0	635	0	585
V/C Ratio(X)	0.76	0.64	0.65	0.65	0.58	0.59	0.60	0.00	0.00	0.17	0.00	0.14
Avail Cap(c_a), veh/h	583	1532	1548	144	1087	1066	837	0	0	887	0	907
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.0	14.7	14.7	24.2	16.8	16.8	15.3	0.0	0.0	11.6	0.0	11.3
Incr Delay (d2), s/veh	6.0	1.2	1.2	11.7	1.2	1.3	1.0	0.0	0.0	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	3.3	3.3	0.6	2.4	2.4	3.2	0.0	0.0	0.7	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.9	15.9	15.9	35.9	18.0	18.1	16.4	0.0	0.0	11.8	0.0	11.4
LnGrp LOS	C	B	B	D	B	B	B	A	A	B	A	B
Approach Vol, veh/h		888			542			345			189	
Approach Delay, s/veh		17.9			19.3			16.4			11.6	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.1	22.1		22.5	9.9	18.3		22.5				
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9				
Max Green Setting (Gmax), s	4.6	* 44		27.3	16.6	31.0		27.3				
Max Q Clear Time (g_c+I1), s	3.1	11.0		4.6	6.0	8.4		14.6				
Green Ext Time (p_c), s	0.0	5.3		0.7	0.3	3.1		1.8				

Intersection Summary	
HCM 6th Ctrl Delay	17.4
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

10: Rancho Penasquitos Blvd & SR 56 WB Ramps & Carmel Mountain Rd
HCM 6th Signalized Intersection Summary

Existing PM
11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	229	164	105	317	205	236	259	674	411	340	565	12
Future Volume (veh/h)	229	164	105	317	205	236	259	674	411	340	565	12
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		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	236	169	108	327	211	243	267	695	424	351	582	12
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	283	285	172	382	304	444	292	1807	804	407	2362	729
Arrive On Green	0.08	0.13	0.13	0.11	0.16	0.16	0.16	0.51	0.51	0.12	0.46	0.46
Sat Flow, veh/h	3456	2126	1286	3456	1870	1582	1781	3554	1580	3456	5106	1576
Grp Volume(v), veh/h	236	140	137	327	211	243	267	695	424	351	582	12
Grp Sat Flow(s),veh/h/ln	1728	1777	1635	1728	1870	1582	1781	1777	1580	1728	1702	1576
Q Serve(g_s), s	10.1	11.1	11.9	13.9	16.0	19.6	22.1	17.9	27.0	15.0	10.4	0.6
Cycle Q Clear(g_c), s	10.1	11.1	11.9	13.9	16.0	19.6	22.1	17.9	27.0	15.0	10.4	0.6
Prop In Lane	1.00		0.79	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	283	238	219	382	304	444	292	1807	804	407	2362	729
V/C Ratio(X)	0.83	0.59	0.63	0.86	0.69	0.55	0.92	0.38	0.53	0.86	0.25	0.02
Avail Cap(c_a), veh/h	341	419	386	514	524	630	366	1807	804	546	2362	729
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.81	0.81	0.81	0.32	0.32	0.32	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.8	61.1	61.4	65.5	59.3	45.9	61.7	22.5	24.8	65.0	24.4	21.8
Incr Delay (d2), s/veh	13.8	2.3	2.9	8.6	2.3	0.9	9.8	0.2	0.8	10.4	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	5.0	5.2	5.2	6.6	7.8	7.9	10.8	7.7	10.4	7.2	4.3	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	81.7	63.4	64.4	74.2	61.6	46.8	71.5	22.7	25.6	75.4	24.7	21.9
LnGrp LOS	F	E	E	E	E	D	E	C	C	E	C	C
Approach Vol, veh/h		513			781			1386			945	
Approach Delay, s/veh		72.1			62.3			33.0			43.5	
Approach LOS		E			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	28.8	74.9	16.5	29.9	21.9	81.8	20.8	25.6
Change Period (Y+Rc), s	4.2	5.5	* 4.2	5.5	* 4.2	5.5	* 4.2	* 5.5
Max Green Setting (Gmax), s	31.1	43.0	* 15	42.0	* 24	50.1	* 22	* 35
Max Q Clear Time (g_c+I1), s	24.1	12.4	12.1	21.6	17.0	29.0	15.9	13.9
Green Ext Time (p_c), s	0.4	4.4	0.2	2.0	0.7	6.6	0.6	1.6

Intersection Summary	
HCM 6th Ctrl Delay	47.6
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

11: Rancho Penasquitos Blvd & SR 56 EB Ramps/Azuaga St
HCM 6th Signalized Intersection Summary

Existing PM
11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	394	47	656	43	21	64	15	995	57	105	683	199
Future Volume (veh/h)	394	47	656	43	21	64	15	995	57	105	683	199
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		0.99	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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	410	49	615	45	22	67	16	1036	59	109	711	207
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	528	63	523	153	35	106	77	1136	65	155	1336	1117
Arrive On Green	0.33	0.33	0.33	0.09	0.09	0.09	0.04	0.33	0.33	0.09	0.38	0.38
Sat Flow, veh/h	1599	191	1584	1781	406	1237	1781	3416	195	1781	3554	1579
Grp Volume(v), veh/h	459	0	615	45	0	89	16	539	556	109	711	207
Grp Sat Flow(s),veh/h/ln	1790	0	1584	1781	0	1643	1781	1777	1834	1781	1777	1579
Q Serve(g_s), s	26.5	0.0	38.0	2.7	0.0	6.0	1.0	33.4	33.4	6.8	17.9	5.1
Cycle Q Clear(g_c), s	26.5	0.0	38.0	2.7	0.0	6.0	1.0	33.4	33.4	6.8	17.9	5.1
Prop In Lane	0.89		1.00	1.00		0.75	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	592	0	523	153	0	141	77	591	610	155	1336	1117
V/C Ratio(X)	0.78	0.00	1.18	0.29	0.00	0.63	0.21	0.91	0.91	0.70	0.53	0.19
Avail Cap(c_a), veh/h	592	0	523	177	0	163	77	591	610	160	1336	1117
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	1.00	0.90	0.90	0.90
Uniform Delay (d), s/veh	34.7	0.0	38.5	49.3	0.0	50.8	53.1	36.8	36.8	51.1	28.0	5.7
Incr Delay (d2), s/veh	6.4	0.0	97.5	1.1	0.0	6.1	1.3	20.7	20.3	11.5	1.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	12.5	0.0	28.6	1.3	0.0	2.7	0.5	17.6	18.2	3.5	7.8	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.1	0.0	136.0	50.4	0.0	56.9	54.4	57.5	57.1	62.6	29.4	6.0
LnGrp LOS	D	A	F	D	A	E	D	E	E	E	C	A
Approach Vol, veh/h		1074			134			1111			1027	
Approach Delay, s/veh		95.5			54.7			57.2			28.2	
Approach LOS		F			D			E			C	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	9.2	48.7	14.5	14.2	43.7	42.6
Change Period (Y+Rc), s	4.2	5.5	4.6	* 4.2	5.5	4.6
Max Green Setting (Gmax), s	5.0	41.7	11.4	* 10	36.4	38.0
Max Q Clear Time (g_c+I1), s	3.0	19.9	8.0	8.8	35.4	40.0
Green Ext Time (p_c), s	0.0	5.8	0.2	0.0	0.7	0.0

Intersection Summary	
HCM 6th Ctrl Delay	60.5
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX F

EXISTING + PROJECT INTERSECTION ANALYSIS WORKSHEETS

1: Rancho Carmel Dr & Carmel Mountain Rd
HCM 6th Signalized Intersection Summary

Existing+Project AM
11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	842	747	106	109	661	22	224	218	74	74	49	215
Future Volume (veh/h)	842	747	106	109	661	22	224	218	74	74	49	215
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		0.99	1.00		0.98	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	946	839	119	122	743	25	252	245	83	83	55	242
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	962	1945	274	178	1032	35	282	807	266	98	731	568
Arrive On Green	0.28	0.43	0.43	0.05	0.20	0.20	0.16	0.31	0.31	0.05	0.21	0.21
Sat Flow, veh/h	3456	4520	637	3456	5072	170	1781	2612	860	1781	3554	2761
Grp Volume(v), veh/h	946	631	327	122	498	270	252	164	164	83	55	242
Grp Sat Flow(s),veh/h/ln	1728	1702	1753	1728	1702	1838	1781	1777	1695	1781	1777	1381
Q Serve(g_s), s	31.8	15.1	15.3	4.1	15.9	16.0	16.2	8.2	8.6	5.4	1.5	8.9
Cycle Q Clear(g_c), s	31.8	15.1	15.3	4.1	15.9	16.0	16.2	8.2	8.6	5.4	1.5	8.9
Prop In Lane	1.00		0.36	1.00		0.09	1.00		0.51	1.00		1.00
Lane Grp Cap(c), veh/h	962	1465	754	178	693	374	282	549	524	98	731	568
V/C Ratio(X)	0.98	0.43	0.43	0.69	0.72	0.72	0.89	0.30	0.31	0.85	0.08	0.43
Avail Cap(c_a), veh/h	962	1624	836	260	933	504	342	549	524	98	731	568
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.9	23.3	23.3	54.4	43.4	43.4	48.2	30.7	30.8	54.7	37.4	40.4
Incr Delay (d2), s/veh	24.9	0.2	0.4	4.6	1.8	3.3	21.8	1.4	1.6	47.1	0.2	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.7	6.1	6.4	1.9	6.9	7.6	8.9	3.7	3.8	3.7	0.7	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.8	23.5	23.7	59.1	45.1	46.7	69.9	32.1	32.4	101.8	37.6	42.7
LnGrp LOS	E	C	C	E	D	D	E	C	C	F	D	D
Approach Vol, veh/h		1904			890			580			380	
Approach Delay, s/veh		45.0			47.5			48.6			54.9	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	40.6	10.5	54.8	23.0	28.5	37.0	28.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.4	36.1	8.8	55.7	22.4	20.1	32.5	32.0
Max Q Clear Time (g_c+I1), s	7.4	10.6	6.1	17.3	18.2	10.9	33.8	18.0
Green Ext Time (p_c), s	0.0	2.0	0.1	7.8	0.3	0.9	0.0	4.3

Intersection Summary	
HCM 6th Ctrl Delay	47.2
HCM 6th LOS	D

2: I-15 NB Ramp & Carmel Mountain Rd
HCM 6th Signalized Intersection Summary

Existing+Project AM
11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	343	675	0	0	793	306	192	2	1067	0	0	0
Future Volume (veh/h)	343	675	0	0	793	306	192	2	1067	0	0	0
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			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	365	718	0	0	844	326	205	0	1135			
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	1127	3531	0	0	1023	456	1357	0	1208			
Arrive On Green	0.11	0.23	0.00	0.00	0.29	0.29	0.38	0.00	0.38			
Sat Flow, veh/h	3456	5274	0	0	3647	1583	3563	0	3170			
Grp Volume(v), veh/h	365	718	0	0	844	326	205	0	1135			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1777	1583	1781	0	1585			
Q Serve(g_s), s	8.8	10.2	0.0	0.0	20.0	16.6	3.4	0.0	31.1			
Cycle Q Clear(g_c), s	8.8	10.2	0.0	0.0	20.0	16.6	3.4	0.0	31.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	1127	3531	0	0	1023	456	1357	0	1208			
V/C Ratio(X)	0.32	0.20	0.00	0.00	0.83	0.72	0.15	0.00	0.94			
Avail Cap(c_a), veh/h	1127	3531	0	0	1023	456	1385	0	1233			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.78	0.78	0.00	0.00	0.69	0.69	1.00	0.00	1.00			
Uniform Delay (d), s/veh	31.0	14.7	0.0	0.0	29.9	28.7	18.3	0.0	26.9			
Incr Delay (d2), s/veh	0.1	0.1	0.0	0.0	5.4	6.5	0.1	0.0	13.6			
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	8.9	4.5	0.0	0.0	9.0	6.9	1.4	0.0	13.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.1	14.8	0.0	0.0	35.3	35.3	18.3	0.0	40.4			
LnGrp LOS	C	B	A	A	D	D	B	A	D			
Approach Vol, veh/h		1083			1170			1340				
Approach Delay, s/veh		20.3			35.3			37.1				
Approach LOS		C			D			D				

Timer - Assigned Phs	2	5	6	8
Phs Duration (G+Y+Rc), s	69.8	36.9	32.9	40.4
Change Period (Y+Rc), s	7.0	7.0	* 7	6.1
Max Green Setting (Gmax), s	41.9	10.3	* 26	35.0
Max Q Clear Time (g_c+I1), s	12.2	10.8	22.0	33.1
Green Ext Time (p_c), s	5.6	0.0	2.4	1.2

Intersection Summary	
HCM 6th Ctrl Delay	31.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

3: I-15 SB Ramp & Carmel Mountain Rd
HCM 6th Signalized Intersection Summary

Existing+Project AM
11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	768	539	557	428	0	0	0	0	250	0	241
Future Volume (veh/h)	0	768	539	557	428	0	0	0	0	250	0	241
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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	808	567	586	451	0				342	0	169
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1630	727	653	2527	0				511	0	227
Arrive On Green	0.00	0.46	0.46	0.32	1.00	0.00				0.14	0.00	0.14
Sat Flow, veh/h	0	3647	1585	3456	3647	0				3563	0	1585
Grp Volume(v), veh/h	0	808	567	586	451	0				342	0	169
Grp Sat Flow(s),veh/h/ln	0	1777	1585	1728	1777	0				1781	0	1585
Q Serve(g_s), s	0.0	14.3	27.1	14.6	0.0	0.0				8.2	0.0	9.2
Cycle Q Clear(g_c), s	0.0	14.3	27.1	14.6	0.0	0.0				8.2	0.0	9.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1630	727	653	2527	0				511	0	227
V/C Ratio(X)	0.00	0.50	0.78	0.90	0.18	0.00				0.67	0.00	0.74
Avail Cap(c_a), veh/h	0	1630	727	699	2527	0				1148	0	511
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.59	0.59	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.1	20.5	30.0	0.0	0.0				36.5	0.0	37.0
Incr Delay (d2), s/veh	0.0	1.1	8.1	8.9	0.1	0.0				1.5	0.0	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.8	11.0	5.8	0.0	0.0				3.6	0.0	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	18.1	28.6	38.9	0.1	0.0				38.1	0.0	41.7
LnGrp LOS	A	B	C	D	A	A				D	A	D
Approach Vol, veh/h		1375			1037						511	
Approach Delay, s/veh		22.5			22.0						39.3	
Approach LOS		C			C						D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	12.7	48.3		19.0		71.0
Change Period (Y+Rc), s	5.7	7.0		6.1		7.0
Max Green Setting (Gmax), s	11.3	24.0		29.0		47.9
Max Q Clear Time (g_c+I1), s	16.6	29.1		11.2		2.0
Green Ext Time (p_c), s	0.4	0.0		1.7		3.4

Intersection Summary	
HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

5: Carmel Mountain Rd & Penasquitos Dr
HCM 6th Signalized Intersection Summary

Existing+Project AM
11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	700	51	181	17	20	77	106	530	22	86	317	234
Future Volume (veh/h)	700	51	181	17	20	77	106	530	22	86	317	234
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		0.98	1.00		0.99	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	760	0	187	18	21	79	109	546	23	89	327	241
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1033	0	458	133	140	117	141	1078	45	115	712	773
Arrive On Green	0.29	0.00	0.29	0.07	0.07	0.07	0.08	0.21	0.21	0.06	0.20	0.20
Sat Flow, veh/h	3563	0	1578	1781	1870	1560	1781	5023	210	1781	3554	1565
Grp Volume(v), veh/h	760	0	187	18	21	79	109	369	200	89	327	241
Grp Sat Flow(s),veh/h/ln	1781	0	1578	1781	1870	1560	1781	1702	1830	1781	1777	1565
Q Serve(g_s), s	11.1	0.0	5.5	0.5	0.6	2.9	3.5	5.5	5.6	2.8	4.7	5.4
Cycle Q Clear(g_c), s	11.1	0.0	5.5	0.5	0.6	2.9	3.5	5.5	5.6	2.8	4.7	5.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	1033	0	458	133	140	117	141	731	393	115	712	773
V/C Ratio(X)	0.74	0.00	0.41	0.13	0.15	0.68	0.78	0.51	0.51	0.77	0.46	0.31
Avail Cap(c_a), veh/h	1705	0	755	492	517	431	240	1523	819	317	1713	1214
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.6	0.0	16.6	25.0	25.1	26.1	26.2	20.0	20.0	26.6	20.4	8.9
Incr Delay (d2), s/veh	1.0	0.0	0.6	0.5	0.5	6.6	8.8	0.5	1.0	10.4	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	1.9	0.2	0.3	1.2	1.7	2.1	2.3	1.5	1.8	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.6	0.0	17.1	25.5	25.5	32.7	35.0	20.6	21.1	37.0	20.8	9.1
LnGrp LOS	B	A	B	C	C	C	C	C	C	D	C	A
Approach Vol, veh/h		947			118			678			657	
Approach Delay, s/veh		19.1			30.4			23.0			18.7	
Approach LOS		B			C			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.1	18.4		22.1	9.0	17.6		9.2
Change Period (Y+Rc), s	4.4	* 6		5.3	4.4	6.0		4.9
Max Green Setting (Gmax), s	10.3	* 26		27.7	7.8	27.9		16.0
Max Q Clear Time (g_c+I1), s	4.8	7.6		13.1	5.5	7.4		4.9
Green Ext Time (p_c), s	0.1	3.5		3.3	0.0	2.9		0.2

Intersection Summary	
HCM 6th Ctrl Delay	20.7
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	3.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↱			↱	
Traffic Vol, veh/h	33	1	75	14	0	0	41	315	6	1	785	25
Future Vol, veh/h	33	1	75	14	0	0	41	315	6	1	785	25
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	36	1	82	15	0	0	45	342	7	1	853	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1309	1312	871	1346	1322	346	884	0	0	349	0	0
Stage 1	873	873	-	436	436	-	-	-	-	-	-	-
Stage 2	436	439	-	910	886	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	136	159	350	128	156	697	765	-	-	1210	-	-
Stage 1	345	368	-	599	580	-	-	-	-	-	-	-
Stage 2	599	578	-	329	363	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	129	149	349	93	146	697	762	-	-	1210	-	-
Mov Cap-2 Maneuver	129	149	-	93	146	-	-	-	-	-	-	-
Stage 1	324	367	-	564	546	-	-	-	-	-	-	-
Stage 2	564	544	-	251	362	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	36.7	51.1	1.1	0
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	762	-	-	228	93	1210	-	-
HCM Lane V/C Ratio	0.058	-	-	0.52	0.164	0.001	-	-
HCM Control Delay (s)	10	-	-	36.7	51.1	8	-	-
HCM Lane LOS	B	-	-	E	F	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.7	0.6	0	-	-

Intersection	
Int Delay, s/veh	3.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↱			↕	
Traffic Vol, veh/h	6	0	40	64	0	0	8	330	11	0	705	1
Future Vol, veh/h	6	0	40	64	0	0	8	330	11	0	705	1
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	65	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	0	43	70	0	0	9	359	12	0	766	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1154	1160	771	1171	1154	365	771	0	0	371	0	0
Stage 1	771	771	-	383	383	-	-	-	-	-	-	-
Stage 2	383	389	-	788	771	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	174	195	400	170	197	680	844	-	-	1188	-	-
Stage 1	393	410	-	640	612	-	-	-	-	-	-	-
Stage 2	640	608	-	384	410	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	172	192	399	150	194	680	841	-	-	1188	-	-
Mov Cap-2 Maneuver	172	192	-	150	194	-	-	-	-	-	-	-
Stage 1	387	409	-	633	605	-	-	-	-	-	-	-
Stage 2	633	601	-	342	409	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.4	48.2	0.2	0
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	841	-	-	340	150	1188	-	-
HCM Lane V/C Ratio	0.01	-	-	0.147	0.464	-	-	-
HCM Control Delay (s)	9.3	-	-	17.4	48.2	0	-	-
HCM Lane LOS	A	-	-	C	E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	2.1	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	1	150	11	0	8	116	476	8	15	515	65
Future Volume (veh/h)	84	1	150	11	0	8	116	476	8	15	515	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.97	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	88	1	158	12	0	8	122	501	8	16	542	68
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	224	38	256	344	33	159	161	1323	21	29	938	117
Arrive On Green	0.26	0.26	0.26	0.26	0.00	0.26	0.09	0.37	0.37	0.02	0.30	0.30
Sat Flow, veh/h	409	145	984	791	127	612	1781	3578	57	1781	3175	397
Grp Volume(v), veh/h	247	0	0	20	0	0	122	249	260	16	303	307
Grp Sat Flow(s),veh/h/ln	1539	0	0	1530	0	0	1781	1777	1858	1781	1777	1795
Q Serve(g_s), s	3.2	0.0	0.0	0.0	0.0	0.0	2.8	4.3	4.3	0.4	6.0	6.0
Cycle Q Clear(g_c), s	5.7	0.0	0.0	0.4	0.0	0.0	2.8	4.3	4.3	0.4	6.0	6.0
Prop In Lane	0.36		0.64	0.60		0.40	1.00		0.03	1.00		0.22
Lane Grp Cap(c), veh/h	518	0	0	537	0	0	161	657	687	29	525	531
V/C Ratio(X)	0.48	0.00	0.00	0.04	0.00	0.00	0.76	0.38	0.38	0.55	0.58	0.58
Avail Cap(c_a), veh/h	1178	0	0	1126	0	0	626	1783	1865	197	1351	1365
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	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.4	0.0	0.0	11.5	0.0	0.0	18.5	9.6	9.6	20.3	12.4	12.4
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.0	0.0	0.0	7.1	0.4	0.3	15.5	1.0	1.0
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	1.7	0.0	0.0	0.1	0.0	0.0	1.3	1.3	1.4	0.3	2.1	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.1	0.0	0.0	11.5	0.0	0.0	25.6	10.0	9.9	35.8	13.4	13.4
LnGrp LOS	B	A	A	B	A	A	C	A	A	D	B	B
Approach Vol, veh/h		247			20			631			626	
Approach Delay, s/veh		14.1			11.5			13.0			14.0	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	20.8		15.7	8.2	17.7		15.7
Change Period (Y+Rc), s	4.4	* 5.4		4.9	4.4	5.4		4.9
Max Green Setting (Gmax), s	4.6	* 42		29.1	14.6	31.6		29.1
Max Q Clear Time (g_c+I1), s	2.4	6.3		7.7	4.8	8.0		2.4
Green Ext Time (p_c), s	0.0	3.3		1.5	0.2	3.9		0.1

Intersection Summary	
HCM 6th Ctrl Delay	13.6
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	455	27	13	509	228	103	38	11	126	6	82
Future Volume (veh/h)	134	455	27	13	509	228	103	38	11	126	6	82
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	158	535	32	15	599	268	121	45	13	148	7	96
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	208	1596	95	27	875	391	272	89	19	438	23	314
Arrive On Green	0.12	0.47	0.47	0.02	0.37	0.37	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1781	3407	203	1781	2387	1067	712	422	89	1344	109	1491
Grp Volume(v), veh/h	158	279	288	15	446	421	179	0	0	148	0	103
Grp Sat Flow(s),veh/h/ln	1781	1777	1833	1781	1777	1677	1223	0	0	1344	0	1600
Q Serve(g_s), s	4.2	4.9	4.9	0.4	10.5	10.5	4.6	0.0	0.0	0.0	0.0	2.7
Cycle Q Clear(g_c), s	4.2	4.9	4.9	0.4	10.5	10.5	7.3	0.0	0.0	4.6	0.0	2.7
Prop In Lane	1.00		0.11	1.00		0.64	0.68		0.07	1.00		0.93
Lane Grp Cap(c), veh/h	208	832	859	27	651	615	380	0	0	438	0	337
V/C Ratio(X)	0.76	0.33	0.34	0.56	0.68	0.69	0.47	0.00	0.00	0.34	0.00	0.31
Avail Cap(c_a), veh/h	599	1573	1623	148	1116	1053	866	0	0	899	0	885
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.1	8.3	8.3	24.1	13.2	13.2	18.6	0.0	0.0	17.2	0.0	16.4
Incr Delay (d2), s/veh	5.6	0.2	0.2	16.9	1.3	1.4	0.9	0.0	0.0	0.5	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	1.5	1.6	0.3	3.7	3.5	1.8	0.0	0.0	1.4	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.7	8.5	8.5	41.1	14.5	14.6	19.5	0.0	0.0	17.6	0.0	16.9
LnGrp LOS	C	A	A	D	B	B	B	A	A	B	A	B
Approach Vol, veh/h		725			882			179			251	
Approach Delay, s/veh		12.5			15.0			19.5			17.4	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	28.9		15.3	10.2	23.9		15.3
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9
Max Green Setting (Gmax), s	4.6	* 44		27.3	16.6	31.0		27.3
Max Q Clear Time (g_c+I1), s	2.4	6.9		6.6	6.2	12.5		9.3
Green Ext Time (p_c), s	0.0	3.8		1.0	0.3	5.6		0.9

Intersection Summary	
HCM 6th Ctrl Delay	14.8
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

10: Rancho Penasquitos Blvd & SR 56 WB Ramps & Carmel Mountain Rd Existing+Project AM
HCM 6th Signalized Intersection Summary
11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	243	62	34	226	243	248	317	572	257	313	1056	47
Future Volume (veh/h)	243	62	34	226	243	248	317	572	257	313	1056	47
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		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	279	71	39	260	279	285	364	657	295	360	1214	54
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	297	399	204	323	342	480	384	1713	762	414	1974	610
Arrive On Green	0.09	0.18	0.18	0.09	0.18	0.18	0.22	0.48	0.48	0.12	0.39	0.39
Sat Flow, veh/h	3456	2274	1163	3456	1870	1585	1781	3554	1581	3456	5106	1577
Grp Volume(v), veh/h	279	54	56	260	279	285	364	657	295	360	1214	54
Grp Sat Flow(s),veh/h/ln	1728	1777	1661	1728	1870	1585	1781	1777	1581	1728	1702	1577
Q Serve(g_s), s	12.0	3.9	4.3	11.1	21.5	22.9	30.2	17.6	17.8	15.4	28.7	3.3
Cycle Q Clear(g_c), s	12.0	3.9	4.3	11.1	21.5	22.9	30.2	17.6	17.8	15.4	28.7	3.3
Prop In Lane	1.00		0.70	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	297	312	291	323	342	480	384	1713	762	414	1974	610
V/C Ratio(X)	0.94	0.17	0.19	0.81	0.82	0.59	0.95	0.38	0.39	0.87	0.62	0.09
Avail Cap(c_a), veh/h	297	443	414	424	524	634	390	1713	762	521	1974	610
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.69	0.69	0.69	0.72	0.72	0.72	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.2	52.6	52.8	66.7	58.9	44.5	58.0	24.7	24.7	64.9	37.0	29.2
Incr Delay (d2), s/veh	36.3	0.3	0.3	5.9	4.1	0.8	26.2	0.5	1.1	12.3	1.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	1.8	1.8	5.2	10.6	9.2	16.4	7.6	7.0	7.5	12.3	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	104.4	52.9	53.1	72.6	63.0	45.3	84.3	25.1	25.8	77.2	38.5	29.5
LnGrp LOS	F	D	D	E	E	D	F	C	C	E	D	C
Approach Vol, veh/h		389			824			1316			1628	
Approach Delay, s/veh		89.9			59.9			41.6			46.7	
Approach LOS		F			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	36.5	63.5	17.1	32.9	22.2	77.8	18.2	31.8
Change Period (Y+Rc), s	* 4.2	5.5	* 4.2	5.5	* 4.2	5.5	* 4.2	* 5.5
Max Green Setting (Gmax), s	33.3	42.9	* 13	42.0	* 23	53.1	* 18	* 37
Max Q Clear Time (g_c+I1), s	32.2	30.7	14.0	24.9	17.4	19.8	13.1	6.3
Green Ext Time (p_c), s	0.1	6.7	0.0	2.5	0.6	6.4	0.4	0.6

Intersection Summary	
HCM 6th Ctrl Delay	51.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

11: Rancho Penasquitos Blvd & SR 56 EB Ramps/Azuaga St Existing+Project AM
HCM 6th Signalized Intersection Summary
11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	7	330	73	60	102	55	1012	20	49	842	425
Future Volume (veh/h)	110	7	330	73	60	102	55	1012	20	49	842	425
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	120	8	323	79	65	111	60	1100	22	53	915	462
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	382	25	361	155	54	92	90	1546	31	155	1671	1107
Arrive On Green	0.23	0.23	0.23	0.09	0.09	0.09	0.05	0.43	0.43	0.09	0.47	0.47
Sat Flow, veh/h	1675	112	1585	1781	620	1059	1781	3563	71	1781	3554	1585
Grp Volume(v), veh/h	128	0	323	79	0	176	60	548	574	53	915	462
Grp Sat Flow(s),veh/h/ln	1787	0	1585	1781	0	1680	1781	1777	1858	1781	1777	1585
Q Serve(g_s), s	6.9	0.0	22.7	4.9	0.0	10.0	3.8	29.1	29.1	3.2	21.1	14.3
Cycle Q Clear(g_c), s	6.9	0.0	22.7	4.9	0.0	10.0	3.8	29.1	29.1	3.2	21.1	14.3
Prop In Lane	0.94		1.00	1.00		0.63	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	407	0	361	155	0	146	90	771	806	155	1671	1107
V/C Ratio(X)	0.31	0.00	0.89	0.51	0.00	1.20	0.67	0.71	0.71	0.34	0.55	0.42
Avail Cap(c_a), veh/h	559	0	496	155	0	146	102	771	806	155	1671	1107
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	1.00	0.68	0.68	0.68
Uniform Delay (d), s/veh	36.9	0.0	43.1	50.2	0.0	52.5	53.6	26.7	26.7	49.4	21.7	7.4
Incr Delay (d2), s/veh	0.4	0.0	14.6	2.8	0.0	140.0	13.0	5.5	5.3	0.9	0.9	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	10.3	2.3	0.0	9.9	2.0	13.2	13.8	1.5	8.9	9.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.4	0.0	57.7	52.9	0.0	192.5	66.6	32.2	31.9	50.3	22.6	8.2
LnGrp LOS	D	A	E	D	A	F	E	C	C	D	C	A
Approach Vol, veh/h		451			255			1182			1430	
Approach Delay, s/veh		51.9			149.2			33.8			19.0	
Approach LOS		D			F			C			B	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	10.0	59.6	14.6	14.2	55.4	30.8
Change Period (Y+Rc), s	* 4.2	5.5	4.6	* 4.2	5.5	4.6
Max Green Setting (Gmax), s	5.8	43.5	10.0	* 10	40.1	36.0
Max Q Clear Time (g_c+I1), s	5.8	23.1	12.0	5.2	31.1	24.7
Green Ext Time (p_c), s	0.0	8.6	0.0	0.0	4.8	1.5

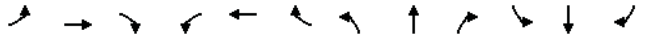
Intersection Summary	
HCM 6th Ctrl Delay	38.7
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

1: Rancho Carmel Dr & Carmel Mountain Rd
HCM 6th Signalized Intersection Summary

Existing+Project PM
11/26/2018



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	468	1061	153	247	962	47	148	164	231	138	364	859
Future Volume (veh/h)	468	1061	153	247	962	47	148	164	231	138	364	859
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		0.99	1.00		0.98	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	478	1083	156	252	982	48	151	167	236	141	371	877
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	551	1435	207	321	1256	61	181	584	509	170	1147	891
Arrive On Green	0.16	0.32	0.32	0.09	0.25	0.25	0.10	0.33	0.33	0.10	0.32	0.32
Sat Flow, veh/h	3456	4506	648	3456	4986	243	1781	1777	1549	1781	3554	2761
Grp Volume(v), veh/h	478	818	421	252	670	360	151	167	236	141	371	877
Grp Sat Flow(s),veh/h/ln	1728	1702	1750	1728	1702	1825	1781	1777	1549	1781	1777	1381
Q Serve(g_s), s	14.8	23.6	23.6	7.8	20.1	20.1	9.1	7.6	13.2	8.5	8.6	34.5
Cycle Q Clear(g_c), s	14.8	23.6	23.6	7.8	20.1	20.1	9.1	7.6	13.2	8.5	8.6	34.5
Prop In Lane	1.00		0.37	1.00		0.13	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	551	1084	557	321	857	460	181	584	509	170	1147	891
V/C Ratio(X)	0.87	0.75	0.76	0.79	0.78	0.78	0.84	0.29	0.46	0.83	0.32	0.98
Avail Cap(c_a), veh/h	647	1181	607	458	995	533	236	584	509	220	1147	891
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.9	33.5	33.5	48.6	38.2	38.2	48.3	27.2	29.1	48.6	28.0	36.8
Incr Delay (d2), s/veh	10.7	2.6	5.0	5.7	3.5	6.5	17.8	1.2	3.0	18.2	0.7	26.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	10.0	10.7	3.6	8.7	9.7	4.9	3.4	5.3	4.6	3.8	14.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.6	36.0	38.4	54.3	41.7	44.7	66.1	28.5	32.1	66.8	28.8	63.3
LnGrp LOS	E	D	D	D	D	D	E	C	C	E	C	E
Approach Vol, veh/h		1717			1282			554			1389	
Approach Delay, s/veh		42.1			45.0			40.3			54.5	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	40.5	14.7	39.4	15.6	39.8	22.0	32.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	36.0	14.5	38.0	14.5	35.0	20.5	32.0
Max Q Clear Time (g_c+I1), s	10.5	15.2	9.8	25.6	11.1	36.5	16.8	22.1
Green Ext Time (p_c), s	0.1	2.5	0.4	6.6	0.1	0.0	0.7	4.7

Intersection Summary	
HCM 6th Ctrl Delay	46.1
HCM 6th LOS	D

2: I-15 NB Ramp & Carmel Mountain Rd
HCM 6th Signalized Intersection Summary

Existing+Project PM
11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	245	890	0	0	1424	584	379	1	852	0	0	0
Future Volume (veh/h)	245	890	0	0	1424	584	379	1	852	0	0	0
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		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	253	918	0	0	1468	602	392	0	878			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	322	2819	0	0	1382	617	1129	0	992			
Arrive On Green	0.03	0.18	0.00	0.00	0.39	0.39	0.32	0.00	0.32			
Sat Flow, veh/h	3456	5274	0	0	3647	1585	3563	0	3130			
Grp Volume(v), veh/h	253	918	0	0	1468	602	392	0	878			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1777	1585	1781	0	1565			
Q Serve(g_s), s	7.3	15.6	0.0	0.0	38.9	37.4	8.4	0.0	26.6			
Cycle Q Clear(g_c), s	7.3	15.6	0.0	0.0	38.9	37.4	8.4	0.0	26.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	322	2819	0	0	1382	617	1129	0	992			
V/C Ratio(X)	0.79	0.33	0.00	0.00	1.06	0.98	0.35	0.00	0.89			
Avail Cap(c_a), veh/h	322	2819	0	0	1382	617	1247	0	1095			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.64	0.64	0.00	0.00	0.58	0.58	1.00	0.00	1.00			
Uniform Delay (d), s/veh	47.5	24.7	0.0	0.0	30.5	30.1	26.2	0.0	32.4			
Incr Delay (d2), s/veh	8.1	0.2	0.0	0.0	37.5	22.5	0.2	0.0	8.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.6	7.1	0.0	0.0	23.1	17.5	3.6	0.0	11.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.6	24.9	0.0	0.0	68.0	52.6	26.4	0.0	40.7			
LnGrp LOS	E	C	A	A	F	D	C	A	D			
Approach Vol, veh/h		1171			2070			1270				
Approach Delay, s/veh		31.5			63.5			36.3				
Approach LOS		C			E			D				

Timer - Assigned Phs	2	5	6	8
Phs Duration (G+Y+Rc), s	62.2	16.3	45.9	37.8
Change Period (Y+Rc), s	7.0	7.0	* 7	6.1
Max Green Setting (Gmax), s	51.9	7.3	* 39	35.0
Max Q Clear Time (g_c+I1), s	17.6	9.3	40.9	28.6
Green Ext Time (p_c), s	7.7	0.0	0.0	3.1

Intersection Summary	
HCM 6th Ctrl Delay	47.6
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	711	235	860	943	0	0	0	0	424	5	353
Future Volume (veh/h)	0	711	235	860	943	0	0	0	0	424	5	353
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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	726	240	878	962	0				547	0	242
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98				0.98	0.98	0.98
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1223	545	955	2408	0				682	0	303
Arrive On Green	0.00	0.34	0.34	0.09	0.22	0.00				0.19	0.00	0.19
Sat Flow, veh/h	0	3647	1584	3456	3647	0				3563	0	1585
Grp Volume(v), veh/h	0	726	240	878	962	0				547	0	242
Grp Sat Flow(s),veh/h/ln	0	1777	1584	1728	1777	0				1781	0	1585
Q Serve(g_s), s	0.0	16.8	11.7	25.2	23.1	0.0				14.7	0.0	14.6
Cycle Q Clear(g_c), s	0.0	16.8	11.7	25.2	23.1	0.0				14.7	0.0	14.6
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1223	545	955	2408	0				682	0	303
V/C Ratio(X)	0.00	0.59	0.44	0.92	0.40	0.00				0.80	0.00	0.80
Avail Cap(c_a), veh/h	0	1223	545	975	2408	0				1033	0	460
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.24	0.24	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	27.0	25.3	44.3	21.5	0.0				38.6	0.0	38.6
Incr Delay (d2), s/veh	0.0	2.1	2.6	3.9	0.1	0.0				2.7	0.0	5.7
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	7.3	4.7	12.2	10.9	0.0				6.6	0.0	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	29.1	27.9	48.3	21.6	0.0				41.3	0.0	44.2
LnGrp LOS	A	C	C	D	C	A				D	A	D
Approach Vol, veh/h		966			1840						789	
Approach Delay, s/veh		28.8			34.3						42.2	
Approach LOS		C			C						D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	33.3	41.4		25.2		74.8
Change Period (Y+Rc), s	5.7	7.0		6.1		7.0
Max Green Setting (Gmax), s	28.0	24.0		29.0		57.9
Max Q Clear Time (g_c+I1), s	27.2	18.8		16.7		25.1
Green Ext Time (p_c), s	0.4	2.6		2.5		8.3

Intersection Summary	
HCM 6th Ctrl Delay	34.6
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	372	35	77	26	42	63	171	511	16	130	463	635
Future Volume (veh/h)	372	35	77	26	42	63	171	511	16	130	463	635
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.97	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	410	0	79	27	43	65	176	527	16	134	477	655
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	596	0	263	121	127	105	192	1961	59	170	1327	851
Arrive On Green	0.17	0.00	0.17	0.07	0.07	0.07	0.11	0.39	0.39	0.10	0.37	0.37
Sat Flow, veh/h	3563	0	1574	1781	1870	1557	1781	5087	154	1781	3554	1570
Grp Volume(v), veh/h	410	0	79	27	43	65	176	352	191	134	477	655
Grp Sat Flow(s),veh/h/ln	1781	0	1574	1781	1870	1557	1781	1702	1837	1781	1777	1570
Q Serve(g_s), s	7.9	0.0	3.2	1.0	1.6	2.9	7.1	5.1	5.2	5.3	7.0	23.8
Cycle Q Clear(g_c), s	7.9	0.0	3.2	1.0	1.6	2.9	7.1	5.1	5.2	5.3	7.0	23.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	596	0	263	121	127	105	192	1312	708	170	1327	851
V/C Ratio(X)	0.69	0.00	0.30	0.22	0.34	0.62	0.92	0.27	0.27	0.79	0.36	0.77
Avail Cap(c_a), veh/h	1361	0	601	393	413	344	192	1312	708	253	1368	869
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.4	0.0	26.5	32.0	32.2	32.9	32.0	15.3	15.3	32.1	16.4	13.1
Incr Delay (d2), s/veh	1.4	0.0	0.6	0.9	1.6	5.7	42.6	0.1	0.2	9.4	0.2	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	1.2	0.5	0.8	1.2	5.2	1.9	2.1	2.7	2.7	11.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.8	0.0	27.1	32.9	33.8	38.6	74.6	15.4	15.5	41.5	16.6	17.3
LnGrp LOS	C	A	C	C	C	D	E	B	B	D	B	B
Approach Vol, veh/h		489			135			719			1266	
Approach Delay, s/veh		29.4			35.9			29.9			19.6	
Approach LOS		C			D			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.3	33.9		17.4	12.2	33.1		9.8
Change Period (Y+Rc), s	4.4	* 6		5.3	4.4	6.0		4.9
Max Green Setting (Gmax), s	10.3	* 26		27.7	7.8	27.9		16.0
Max Q Clear Time (g_c+I1), s	7.3	7.2		9.9	9.1	25.8		4.9
Green Ext Time (p_c), s	0.1	3.3		1.6	0.0	1.2		0.3

Intersection Summary	
HCM 6th Ctrl Delay	25.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	15	0	41	8	0	5	76	629	12	5	376	17
Future Vol, veh/h	15	0	41	8	0	5	76	629	12	5	376	17
Conflicting Peds, #/hr	0	0	1	1	0	0	8	0	0	0	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	80	-	-
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	16	0	43	8	0	5	79	655	13	5	392	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1241	1245	410	1254	1248	662	418	0	0	668	0	0
Stage 1	419	419	-	820	820	-	-	-	-	-	-	-
Stage 2	822	826	-	434	428	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	152	174	642	149	173	462	1141	-	-	922	-	-
Stage 1	612	590	-	369	389	-	-	-	-	-	-	-
Stage 2	368	387	-	600	585	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	141	160	637	131	159	462	1133	-	-	922	-	-
Mov Cap-2 Maneuver	141	160	-	131	159	-	-	-	-	-	-	-
Stage 1	565	583	-	343	362	-	-	-	-	-	-	-
Stage 2	338	360	-	556	578	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.3	26.5	0.9	0.1
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1133	-	-	328	181	922	-	-
HCM Lane V/C Ratio	0.07	-	-	0.178	0.075	0.006	-	-
HCM Control Delay (s)	8.4	-	-	18.3	26.5	8.9	-	-
HCM Lane LOS	A	-	-	C	D	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.6	0.2	0	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	23	60	0	0	35	585	22	0	310	2
Future Vol, veh/h	3	0	23	60	0	0	35	585	22	0	310	2
Conflicting Peds, #/hr	0	0	0	0	0	0	9	0	0	0	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	65	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	24	63	0	0	37	616	23	0	326	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1038	1049	336	1041	1039	628	337	0	0	639	0	0
Stage 1	336	336	-	702	702	-	-	-	-	-	-	-
Stage 2	702	713	-	339	337	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	209	227	706	208	231	483	1222	-	-	945	-	-
Stage 1	678	642	-	429	440	-	-	-	-	-	-	-
Stage 2	429	435	-	676	641	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	203	218	701	196	222	483	1213	-	-	945	-	-
Mov Cap-2 Maneuver	203	218	-	196	222	-	-	-	-	-	-	-
Stage 1	652	638	-	416	426	-	-	-	-	-	-	-
Stage 2	416	422	-	653	637	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.9	31.9	0.4	0
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1213	-	-	546	196	945	-	-
HCM Lane V/C Ratio	0.03	-	-	0.05	0.322	-	-	-
HCM Control Delay (s)	8.1	-	-	11.9	31.9	0	-	-
HCM Lane LOS	A	-	-	B	D	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	1.3	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	1	78	0	3	3	88	599	4	17	448	58
Future Volume (veh/h)	40	1	78	0	3	3	88	599	4	17	448	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.98	1.00		0.98	1.00		0.99	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	42	1	82	0	3	3	93	631	4	18	472	61
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	208	49	232	0	193	193	120	1230	8	33	919	118
Arrive On Green	0.23	0.23	0.23	0.00	0.23	0.23	0.07	0.34	0.34	0.02	0.29	0.29
Sat Flow, veh/h	320	214	1018	0	849	849	1781	3620	23	1781	3164	407
Grp Volume(v), veh/h	125	0	0	0	0	6	93	310	325	18	264	269
Grp Sat Flow(s),veh/h/ln	1552	0	0	0	0	1699	1781	1777	1866	1781	1777	1794
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.1	1.8	4.9	4.9	0.4	4.4	4.4
Cycle Q Clear(g_c), s	2.2	0.0	0.0	0.0	0.0	0.1	1.8	4.9	4.9	0.4	4.4	4.4
Prop In Lane	0.34		0.66	0.00		0.50	1.00		0.01	1.00		0.23
Lane Grp Cap(c), veh/h	489	0	0	0	0	387	120	604	634	33	516	521
V/C Ratio(X)	0.26	0.00	0.00	0.00	0.00	0.02	0.77	0.51	0.51	0.55	0.51	0.52
Avail Cap(c_a), veh/h	1374	0	0	0	0	1392	732	2087	2192	231	1581	1596
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	0.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.5	0.0	0.0	0.0	0.0	10.6	16.3	9.4	9.4	17.3	10.5	10.5
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.0	0.0	0.0	10.0	0.7	0.6	13.7	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.0	0.0	0.0	1.0	1.5	1.5	0.2	1.4	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.7	0.0	0.0	0.0	0.0	10.6	26.2	10.0	10.0	31.0	11.3	11.3
LnGrp LOS	B	A	A	A	A	B	C	B	B	C	B	B
Approach Vol, veh/h		125			6			728			551	
Approach Delay, s/veh		11.7			10.6			12.1			11.9	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.1	17.5		13.0	6.8	15.7		13.0
Change Period (Y+Rc), s	4.4	* 5.4		4.9	4.4	5.4		4.9
Max Green Setting (Gmax), s	4.6	* 42		29.1	14.6	31.6		29.1
Max Q Clear Time (g_c+I1), s	2.4	6.9		4.2	3.8	6.4		2.1
Green Ext Time (p_c), s	0.0	4.3		0.7	0.1	3.4		0.0

Intersection Summary	
HCM 6th Ctrl Delay	12.0
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	137	644	70	39	403	82	253	37	40	101	32	45
Future Volume (veh/h)	137	644	70	39	403	82	253	37	40	101	32	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.99		0.98	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	146	685	74	41	429	87	269	39	43	107	34	48
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	193	1049	113	61	738	148	457	61	55	628	244	344
Arrive On Green	0.11	0.33	0.33	0.03	0.25	0.25	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1781	3226	348	1781	2933	590	957	175	158	1310	698	986
Grp Volume(v), veh/h	146	377	382	41	258	258	351	0	0	107	0	82
Grp Sat Flow(s),veh/h/ln	1781	1777	1797	1781	1777	1746	1290	0	0	1310	0	1684
Q Serve(g_s), s	4.1	9.4	9.4	1.2	6.6	6.7	11.4	0.0	0.0	0.0	0.0	1.7
Cycle Q Clear(g_c), s	4.1	9.4	9.4	1.2	6.6	6.7	13.1	0.0	0.0	2.7	0.0	1.7
Prop In Lane	1.00		0.19	1.00		0.34	0.77		0.12	1.00		0.59
Lane Grp Cap(c), veh/h	193	578	585	61	447	439	573	0	0	628	0	588
V/C Ratio(X)	0.76	0.65	0.65	0.67	0.58	0.59	0.61	0.00	0.00	0.17	0.00	0.14
Avail Cap(c_a), veh/h	570	1497	1514	141	1062	1044	818	0	0	860	0	886
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.5	15.0	15.0	24.7	17.0	17.0	15.7	0.0	0.0	11.9	0.0	11.5
Incr Delay (d2), s/veh	6.0	1.3	1.2	11.9	1.2	1.2	1.1	0.0	0.0	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	3.5	3.5	0.7	2.5	2.5	3.4	0.0	0.0	0.8	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	28.5	16.2	16.2	36.6	18.2	18.3	16.8	0.0	0.0	12.0	0.0	11.7
LnGrp LOS	C	B	B	D	B	B	B	A	A	B	A	B
Approach Vol, veh/h		905			557			351			189	
Approach Delay, s/veh		18.2			19.6			16.8			11.8	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	6.2	22.7		23.0	10.0	18.9		23.0
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9
Max Green Setting (Gmax), s	4.1	* 44		27.3	16.6	31.0		27.3
Max Q Clear Time (g_c+I1), s	3.2	11.4		4.7	6.1	8.7		15.1
Green Ext Time (p_c), s	0.0	5.4		0.7	0.3	3.2		1.8

Intersection Summary	
HCM 6th Ctrl Delay	17.7
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

10: Rancho Penasquitos Blvd & SR 56 WB Ramps & Carmel Mountain Rd Existing+Project PM
HCM 6th Signalized Intersection Summary 11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	229	164	105	320	212	237	259	674	425	342	565	12
Future Volume (veh/h)	229	164	105	320	212	237	259	674	425	342	565	12
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		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	236	169	108	330	219	244	267	695	438	353	582	12
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	283	284	172	385	305	446	292	1802	802	409	2358	728
Arrive On Green	0.08	0.13	0.13	0.11	0.16	0.16	0.16	0.51	0.51	0.12	0.46	0.46
Sat Flow, veh/h	3456	2126	1286	3456	1870	1582	1781	3554	1580	3456	5106	1576
Grp Volume(v), veh/h	236	140	137	330	219	244	267	695	438	353	582	12
Grp Sat Flow(s),veh/h/ln	1728	1777	1635	1728	1870	1582	1781	1777	1580	1728	1702	1576
Q Serve(g_s), s	10.1	11.1	11.9	14.1	16.6	19.7	22.1	18.0	28.3	15.0	10.4	0.6
Cycle Q Clear(g_c), s	10.1	11.1	11.9	14.1	16.6	19.7	22.1	18.0	28.3	15.0	10.4	0.6
Prop In Lane	1.00		0.79	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	283	238	219	385	305	446	292	1802	802	409	2358	728
V/C Ratio(X)	0.83	0.59	0.63	0.86	0.72	0.55	0.92	0.39	0.55	0.86	0.25	0.02
Avail Cap(c_a), veh/h	341	419	386	514	524	631	366	1802	802	546	2358	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	1.00	1.00	0.81	0.81	0.81	0.32	0.32	0.32	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.8	61.1	61.4	65.5	59.5	45.8	61.7	22.6	25.2	64.9	24.5	21.9
Incr Delay (d2), s/veh	13.8	2.3	2.9	8.8	2.6	0.9	9.8	0.2	0.9	10.5	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	5.0	5.2	5.2	6.7	8.2	7.9	10.8	7.7	10.9	7.3	4.3	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	81.7	63.4	64.4	74.3	62.1	46.6	71.5	22.8	26.1	75.5	24.8	21.9
LnGrp LOS	F	E	E	E	E	D	E	C	C	E	C	C
Approach Vol, veh/h		513			793			1400			947	
Approach Delay, s/veh		72.1			62.4			33.1			43.6	
Approach LOS		E			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	38.8	74.8	16.5	30.0	22.0	81.6	20.9	25.6
Change Period (Y+Rc), s	* 4.2	5.5	* 4.2	5.5	* 4.2	5.5	* 4.2	* 5.5
Max Green Setting (Gmax), s	31.1	43.0	* 15	42.0	* 24	50.1	* 22	* 35
Max Q Clear Time (g_c+I1), s	24.1	12.4	12.1	21.7	17.0	30.3	16.1	13.9
Green Ext Time (p_c), s	0.4	4.4	0.2	2.0	0.7	6.5	0.6	1.6

Intersection Summary	
HCM 6th Ctrl Delay	47.7
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

11: Rancho Penasquitos Blvd & SR 56 EB Ramps/Azuaga St Existing+Project PM
HCM 6th Signalized Intersection Summary 11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	404	47	656	43	21	64	15	999	57	105	686	199
Future Volume (veh/h)	404	47	656	43	21	64	15	999	57	105	686	199
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		0.99	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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	421	49	615	45	22	67	16	1041	59	109	715	207
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	530	62	523	153	35	106	77	1136	64	155	1336	1117
Arrive On Green	0.33	0.33	0.33	0.09	0.09	0.09	0.04	0.33	0.33	0.09	0.38	0.38
Sat Flow, veh/h	1604	187	1584	1781	406	1237	1781	3417	194	1781	3554	1579
Grp Volume(v), veh/h	470	0	615	45	0	89	16	541	559	109	715	207
Grp Sat Flow(s),veh/h/ln	1790	0	1584	1781	0	1643	1781	1777	1834	1781	1777	1579
Q Serve(g_s), s	27.4	0.0	38.0	2.7	0.0	6.0	1.0	33.6	33.6	6.8	18.1	5.1
Cycle Q Clear(g_c), s	27.4	0.0	38.0	2.7	0.0	6.0	1.0	33.6	33.6	6.8	18.1	5.1
Prop In Lane	0.90		1.00	1.00		0.75	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	592	0	523	153	0	141	77	591	610	155	1336	1117
V/C Ratio(X)	0.79	0.00	1.18	0.29	0.00	0.63	0.21	0.92	0.92	0.70	0.54	0.19
Avail Cap(c_a), veh/h	592	0	523	177	0	163	77	591	610	160	1336	1117
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	1.00	0.90	0.90	0.90
Uniform Delay (d), s/veh	35.0	0.0	38.5	49.3	0.0	50.8	53.1	36.8	36.8	51.1	28.0	5.7
Incr Delay (d2), s/veh	7.4	0.0	97.5	1.1	0.0	6.1	1.3	21.3	20.8	11.5	1.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.0	0.0	28.6	1.3	0.0	2.7	0.5	17.8	18.3	3.5	7.9	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.3	0.0	136.0	50.4	0.0	56.9	54.4	58.1	57.7	62.6	29.4	6.0
LnGrp LOS	D	A	F	D	A	E	D	E	E	E	C	A
Approach Vol, veh/h		1085			134			1116			1031	
Approach Delay, s/veh		95.4			54.7			57.8			28.2	
Approach LOS		F			D			E			C	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	9.2	48.7	14.5	14.2	43.7	42.6
Change Period (Y+Rc), s	* 4.2	5.5	4.6	* 4.2	5.5	4.6
Max Green Setting (Gmax), s	* 5	41.7	11.4	* 10	36.4	38.0
Max Q Clear Time (g_c+I1), s	3.0	20.1	8.0	8.8	35.6	40.0
Green Ext Time (p_c), s	0.0	5.9	0.2	0.0	0.5	0.0

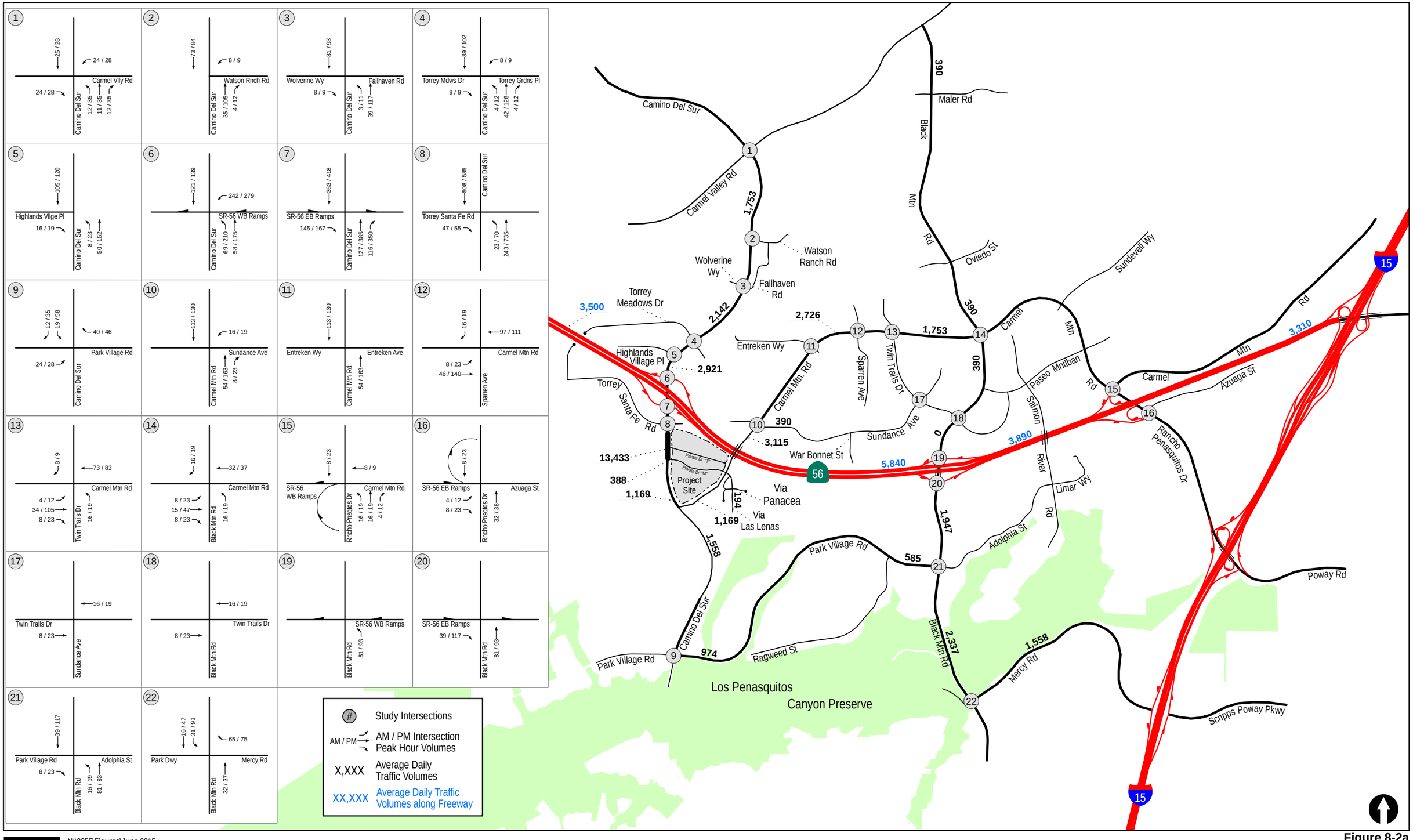
Intersection Summary	
HCM 6th Ctrl Delay	60.8
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX G

CUMULATIVE PROJECTS ASSIGNMENT



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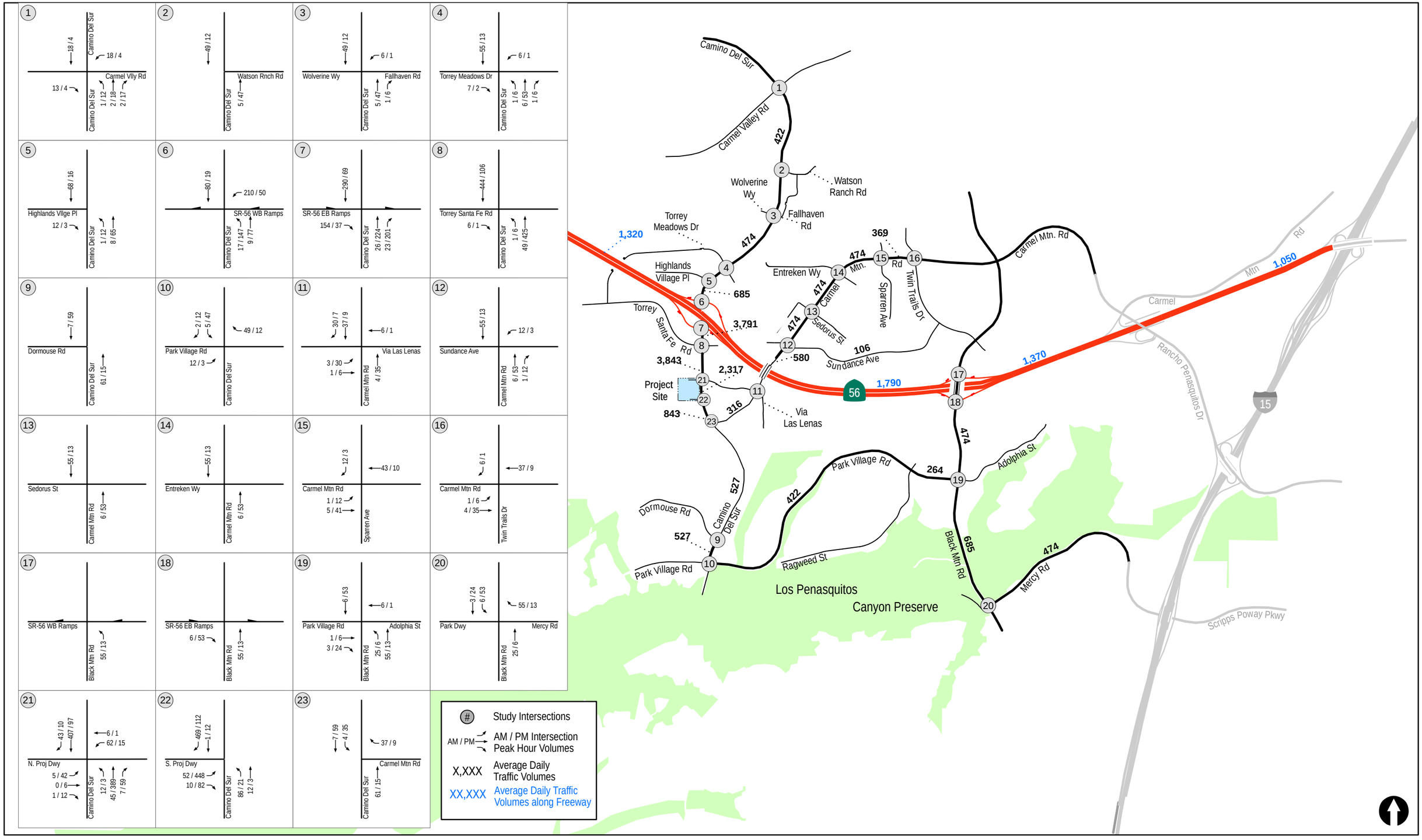
Date: 06/23/15

LINSCOTT LAW & GREENSPAN engineers

Figure 8-2a

Project Traffic Volumes

MERGE 56



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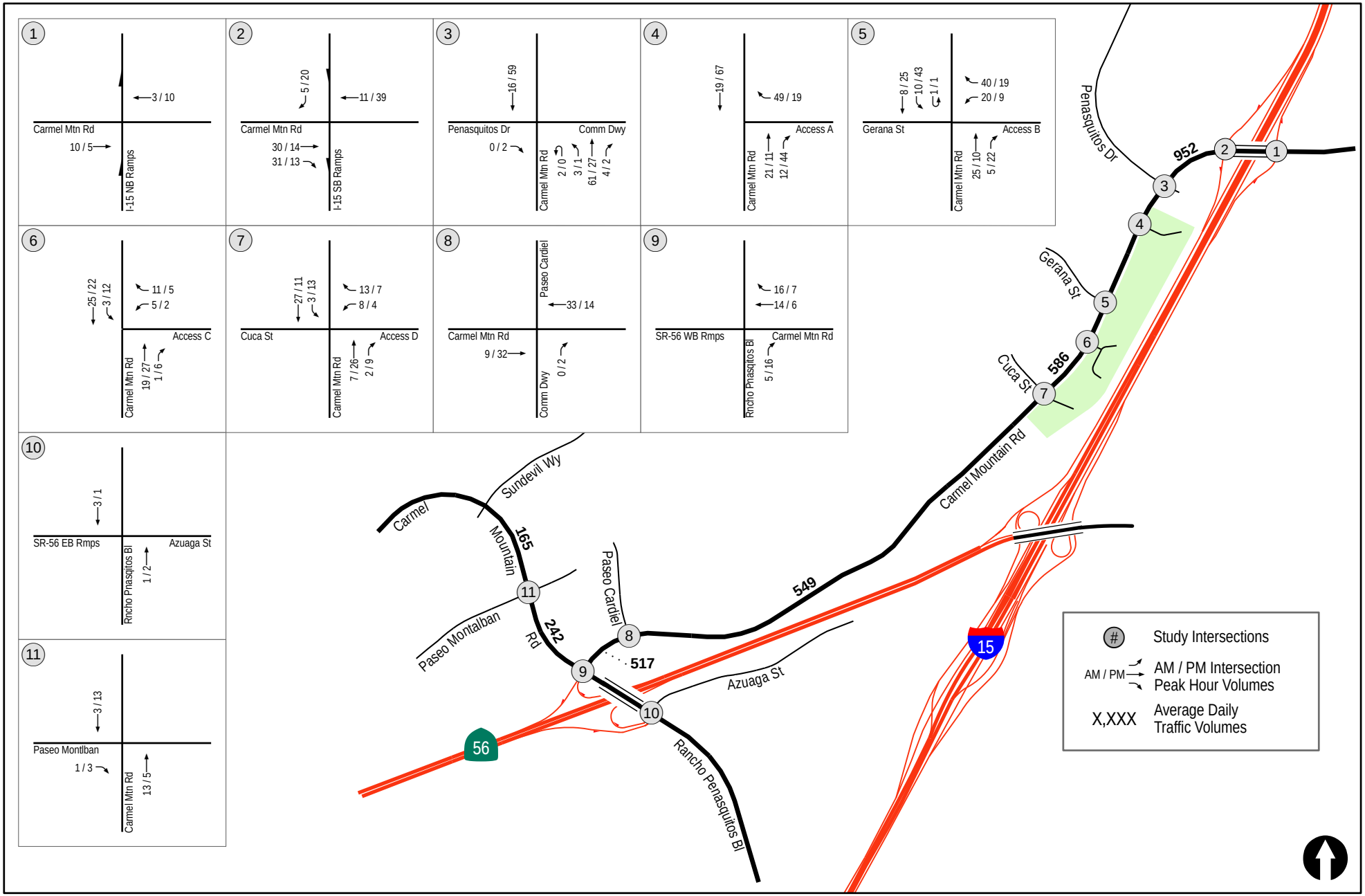
Date: 03/01/16

Figure 8-2

Project Traffic Volumes

Opening Day Network

THE PRESERVE AT TORREY HIGHLANDS



LINSCOTT LAW & GREENSPAN engineers

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Date: 01/06/16

Figure 7-4

Net New Project Traffic Volumes

PACIFIC VILLAGE

INTERSECTION	DIRECTION	TOTAL CUMULATIVE								Merge 56						The Preserve at Torrey Highlands						Lennar PQ (Pacific Highlands)							
		Ram	Rpm	Tam	Tpm	Lam	Lpm	Uam	Upm	Ram	Rpm	Tam	Tpm	Lam	Lpm	Ram	Rpm	Tam	Tpm	Lam	Lpm	Ram	Rpm	Tam	Tpm	Lam	Lpm	Uam	Upm
1. Carmel Mountain Rd/ Rancho Carmel Dr	Sb																												
	Wb			3	12																								
	Nb																												
	Eb			12	5																								
2. Carmel Mountain Rd/ I-15 NB Ramps	Sb	0	0	0	0	0	0	0	0													0	0	0	0	0	0		
	Wb	0	0	3	12	0	0	0	0													0	0	3	12	0	0		
	Nb	0	0	0	0	9	32	0	0													0	0	0	0	9	32		
	Eb	0	0	12	5	25	16	0	0					2	6							0	0	12	5	23	10		
3. Carmel Mountain Rd/ I-15 SB Ramps	Sb	9	27	0	0	0	0	0	0	4	4											5	23	0	0	0	0		
	Wb	0	0	12	44	0	0	0	0													0	0	12	44	0	0		
	Nb	0	0	0	0	0	0	0	0													0	0	0	0	0	0		
	Eb	34	14	37	21	0	0	0	0			2	6									34	14	35	15	0	0		
4. Carmel Mountain Rd/ Future RI-Driveway	Sb																												
	Wb			21	71																								
	Nb																												
	Eb			71	35																								
5. Carmel Mountain Road (N/S)/ PQ Drive (E/W)	Sb	0	0	21	71	0	0	0	0			4	4									0	0	17	67	0	0		
	Wb	0	0	0	0	1	6	0	0													0	0	0	0	1	6		
	Nb	3	2	71	35	4	6	7	2			2	6	1	3					0	2	3	2	69	29	3	1	7	2
	Eb	5	6	0	0	0	0	0	0	2	3					2	1					1	2	0	0	0	0		
6. PQ Drive/ Cuca St	Sb			5	6																								
	Wb																												
	Nb			4	6																								
	Eb																												
7. PQ Drive/ Janal Way/ Future Access	Sb			5	6																								
	Wb																												
	Nb			4	6																								
	Eb																												
8. Carmel Mountain Rd/ Cuca St	Sb	0	0	44	23	3	13	0	0			8	9					4	2			0	0	32	12	3	13		
	Wb	12	5	0	0	8	5	0	0													12	5	0	0	8	5		
	Nb	2	8	13	46	0	2	0	0			4	11					1	4	0	2	2	8	8	31	0	0		
	Eb	2	0	0	0	0	0	0	0							2	0					0	0	0	0	0	0		
9. Carmel Mountain Rd/ Paseo Cardiel	Sb	0	0	0	0	0	0	0	0													0	0	0	0	0	0		
	Wb	0	0	51	26	3	2	0	0			8	9					6	2			0	0	37	15	3	2		
	Nb	0	2	0	0	0	0	0	0													0	2	0	0	0	0		
	Eb	0	0	15	54	0	0	0	0			4	12					1	6			0	0	10	36	0	0		
10. Rancho PQ Blvd/ SR 56 WB Ramps	Sb	0	0	8	23	4	17	0	0			8	23									0	0	0	0	4	17		
	Wb	17	7	25	16	9	3	0	0			8	9							6	2	17	7	17	7	3	1		
	Nb	11	37	16	19	16	19	0	0	4	12	16	19	16	19	1	6					6	19	0	0	0	0		
	Eb	0	0	0	0	0	0	0	0													0	0	0	0	0	0		
11. Rancho PQ Blvd/ SR 56 EB Ramps	Sb	0	0	17	26	0	0	0	0			8	23					6	2			0	0	3	1	0	0		
	Wb	0	0	0	0	0	0	0	0													0	0	0	0	0	0		
	Nb	0	0	34	46	0	0	0	0			32	38						6			0	0	2	2	0	0		
	Eb	8	23	0	0	9	29	0	0	8	23			4	12							0	0	0	0	5	17		

APPENDIX H

NEAR-TERM (OPENING YEAR 2020) INTERSECTION ANALYSIS WORKSHEETS

1: Rancho Carmel Dr & Carmel Mountain Rd — Existing+Cuml Projects AM
HCM 6th Signalized Intersection Summary — 11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	836	747	105	109	656	22	223	218	74	74	49	211
Future Volume (veh/h)	836	747	105	109	656	22	223	218	74	74	49	211
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		0.99	1.00		0.98	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	939	839	118	122	737	25	251	245	83	83	55	237
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	963	1945	272	178	1027	35	281	808	266	98	734	571
Arrive On Green	0.28	0.43	0.43	0.05	0.20	0.20	0.16	0.31	0.31	0.05	0.21	0.21
Sat Flow, veh/h	3456	4525	633	3456	5070	172	1781	2612	860	1781	3554	2761
Grp Volume(v), veh/h	939	630	327	122	494	268	251	164	164	83	55	237
Grp Sat Flow(s),veh/h/ln	1728	1702	1754	1728	1702	1838	1781	1777	1695	1781	1777	1381
Q Serve(g_s), s	31.4	15.1	15.2	4.0	15.8	15.9	16.1	8.2	8.6	5.4	1.5	8.7
Cycle Q Clear(g_c), s	31.4	15.1	15.2	4.0	15.8	15.9	16.1	8.2	8.6	5.4	1.5	8.7
Prop In Lane	1.00		0.36	1.00		0.09	1.00		0.51	1.00		1.00
Lane Grp Cap(c), veh/h	963	1463	754	178	690	372	281	550	525	98	734	571
V/C Ratio(X)	0.98	0.43	0.43	0.69	0.72	0.72	0.89	0.30	0.31	0.85	0.07	0.42
Avail Cap(c_a), veh/h	963	1626	838	261	934	504	342	550	525	98	734	571
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.7	23.3	23.3	54.4	43.4	43.4	48.2	30.6	30.8	54.6	37.3	40.2
Incr Delay (d2), s/veh	23.0	0.2	0.4	4.6	1.7	3.2	21.6	1.4	1.5	46.8	0.2	2.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.3	6.1	6.4	1.9	6.8	7.5	8.8	3.7	3.8	3.7	0.7	3.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.7	23.5	23.7	59.0	45.1	46.6	69.7	32.0	32.3	101.5	37.5	42.4
LnGrp LOS	E	C	C	E	D	D	E	C	C	F	D	D
Approach Vol, veh/h		1896			884			579			375	
Approach Delay, s/veh		43.9			47.5			48.4			54.7	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	40.6	10.5	54.6	22.9	28.6	37.0	28.1
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.4	36.1	8.8	55.7	22.4	20.1	32.5	32.0
Max Q Clear Time (g_c+I1), s	7.4	10.6	6.0	17.2	18.1	10.7	33.4	17.9
Green Ext Time (p_c), s	0.0	2.0	0.1	7.8	0.3	0.9	0.0	4.3

Intersection Summary	
HCM 6th Ctrl Delay	46.6
HCM 6th LOS	D

2: I-15 NB Ramp & Carmel Mountain Rd — Existing+Cuml Projects AM
HCM 6th Signalized Intersection Summary — 11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	355	668	0	0	783	306	190	2	1067	0	0	0
Future Volume (veh/h)	355	668	0	0	783	306	190	2	1067	0	0	0
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			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	378	711	0	0	833	326	203	0	1135			
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	1125	3530	0	0	1023	456	1357	0	1208			
Arrive On Green	0.11	0.23	0.00	0.00	0.29	0.29	0.38	0.00	0.38			
Sat Flow, veh/h	3456	5274	0	0	3647	1583	3563	0	3170			
Grp Volume(v), veh/h	378	711	0	0	833	326	203	0	1135			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1777	1583	1781	0	1585			
Q Serve(g_s), s	9.1	10.1	0.0	0.0	19.6	16.6	3.4	0.0	31.1			
Cycle Q Clear(g_c), s	9.1	10.1	0.0	0.0	19.6	16.6	3.4	0.0	31.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	1125	3530	0	0	1023	456	1357	0	1208			
V/C Ratio(X)	0.34	0.20	0.00	0.00	0.81	0.72	0.15	0.00	0.94			
Avail Cap(c_a), veh/h	1125	3530	0	0	1023	456	1385	0	1233			
HCM Platoon Ratio	0.33	0.33	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	0.70	0.70	1.00	0.00	1.00			
Uniform Delay (d), s/veh	31.2	14.6	0.0	0.0	29.8	28.7	18.3	0.0	26.9			
Incr Delay (d2), s/veh	0.1	0.1	0.0	0.0	5.1	6.6	0.1	0.0	13.6			
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	4.1	4.4	0.0	0.0	8.8	7.0	1.4	0.0	13.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.3	14.7	0.0	0.0	34.9	35.4	18.3	0.0	40.4			
LnGrp LOS	C	B	A	A	C	D	B	A	D			
Approach Vol, veh/h		1089			1159			1338				
Approach Delay, s/veh		20.5			35.0			37.1				
Approach LOS		C			D			D				

Timer - Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		69.8			36.9	32.9		40.4
Change Period (Y+Rc), s		7.0			7.0	* 7		6.1
Max Green Setting (Gmax), s		41.9			10.3	* 26		35.0
Max Q Clear Time (g_c+I1), s		12.1			11.1	21.6		33.1
Green Ext Time (p_c), s		5.5			0.0	2.6		1.2

Intersection Summary	
HCM 6th Ctrl Delay	31.4
HCM 6th LOS	C

Notes
User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	773	557	557	416	0	0	0	0	250	0	242
Future Volume (veh/h)	0	773	557	557	416	0	0	0	0	250	0	242
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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	814	586	586	438	0				342	0	170
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1628	726	653	2525	0				513	0	228
Arrive On Green	0.00	0.46	0.46	0.32	1.00	0.00				0.14	0.00	0.14
Sat Flow, veh/h	0	3647	1585	3456	3647	0				3563	0	1585
Grp Volume(v), veh/h	0	814	586	586	438	0				342	0	170
Grp Sat Flow(s),veh/h/ln	0	1777	1585	1728	1777	0				1781	0	1585
Q Serve(g_s), s	0.0	14.5	28.6	14.6	0.0	0.0				8.2	0.0	9.3
Cycle Q Clear(g_c), s	0.0	14.5	28.6	14.6	0.0	0.0				8.2	0.0	9.3
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1628	726	653	2525	0				513	0	228
V/C Ratio(X)	0.00	0.50	0.81	0.90	0.17	0.00				0.67	0.00	0.74
Avail Cap(c_a), veh/h	0	1628	726	699	2525	0				1148	0	511
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.61	0.61	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.1	21.0	30.0	0.0	0.0				36.5	0.0	36.9
Incr Delay (d2), s/veh	0.0	1.1	9.4	9.2	0.1	0.0				1.5	0.0	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.9	11.8	5.8	0.0	0.0				3.6	0.0	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	18.2	30.3	39.1	0.1	0.0				38.0	0.0	41.7
LnGrp LOS	A	B	C	D	A	A				D	A	D
Approach Vol, veh/h		1400			1024						512	
Approach Delay, s/veh		23.3			22.4						39.2	
Approach LOS		C			C						D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	12.7	48.2		19.1		70.9
Change Period (Y+Rc), s	5.7	7.0		6.1		7.0
Max Green Setting (Gmax), s	11.3	24.0		29.0		47.9
Max Q Clear Time (g_c+I1), s	10.6	30.6		11.3		2.0
Green Ext Time (p_c), s	0.4	0.0		1.7		3.3

Intersection Summary	
HCM 6th Ctrl Delay	25.8
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	652	50	173	18	19	77	101	601	25	86	338	234
Future Volume (veh/h)	652	50	173	18	19	77	101	601	25	86	338	234
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		0.98	1.00		0.99	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	709	0	178	19	20	79	104	620	26	89	348	241
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	981	0	435	134	140	117	134	1136	47	115	766	774
Arrive On Green	0.28	0.00	0.28	0.07	0.07	0.07	0.08	0.23	0.23	0.06	0.22	0.22
Sat Flow, veh/h	3563	0	1578	1781	1870	1560	1781	5024	210	1781	3554	1567
Grp Volume(v), veh/h	709	0	178	19	20	79	104	419	227	89	348	241
Grp Sat Flow(s),veh/h/ln	1781	0	1578	1781	1870	1560	1781	1702	1830	1781	1777	1567
Q Serve(g_s), s	10.3	0.0	5.3	0.6	0.6	2.8	3.3	6.2	6.3	2.8	4.9	5.3
Cycle Q Clear(g_c), s	10.3	0.0	5.3	0.6	0.6	2.8	3.3	6.2	6.3	2.8	4.9	5.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	981	0	435	134	140	117	134	770	414	115	766	774
V/C Ratio(X)	0.72	0.00	0.41	0.14	0.14	0.68	0.78	0.54	0.55	0.77	0.45	0.31
Avail Cap(c_a), veh/h	1719	0	762	497	521	435	242	1536	826	320	1727	1198
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	18.8	0.0	17.0	24.8	24.8	25.9	26.1	19.6	19.6	26.4	19.6	8.8
Incr Delay (d2), s/veh	1.0	0.0	0.6	0.5	0.5	6.6	9.2	0.6	1.1	10.4	0.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.0	1.8	0.2	0.3	1.2	1.7	2.3	2.6	1.5	1.9	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.8	0.0	17.6	25.3	25.3	32.5	35.2	20.2	20.8	36.8	20.0	9.0
LnGrp LOS	B	A	B	C	C	C	D	C	C	D	C	A
Approach Vol, veh/h		887			118			750			678	
Approach Delay, s/veh		19.4			30.1			22.5			18.3	
Approach LOS		B			C			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	8.1	19.0		21.1	8.7	18.4		9.2
Change Period (Y+Rc), s	4.4	* 6		5.3	4.4	6.0		4.9
Max Green Setting (Gmax), s	10.3	* 26		27.7	7.8	27.9		16.0
Max Q Clear Time (g_c+I1), s	4.8	8.3		12.3	5.3	7.3		4.8
Green Ext Time (p_c), s	0.1	3.9		3.1	0.0	3.1		0.2

Intersection Summary	
HCM 6th Ctrl Delay	20.6
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↑			↑	
Traffic Vol, veh/h	32	1	75	14	0	0	41	309	6	1	728	23
Future Vol, veh/h	32	1	75	14	0	0	41	309	6	1	728	23
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	35	1	82	15	0	0	45	336	7	1	791	25

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1240	1243	808	1277	1252	340	820	0	0	343	0	0
Stage 1	810	810	-	430	430	-	-	-	-	-	-	-
Stage 2	430	433	-	847	822	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	152	174	381	143	172	702	809	-	-	1216	-	-
Stage 1	374	393	-	603	583	-	-	-	-	-	-	-
Stage 2	603	582	-	357	388	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	145	164	380	107	162	702	806	-	-	1216	-	-
Mov Cap-2 Maneuver	145	164	-	107	162	-	-	-	-	-	-	-
Stage 1	352	391	-	569	550	-	-	-	-	-	-	-
Stage 2	569	549	-	279	386	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	30.6	44.1	1.1	0
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	806	-	-	255	107	1216	-	-
HCM Lane V/C Ratio	0.055	-	-	0.46	0.142	0.001	-	-
HCM Control Delay (s)	9.7	-	-	30.6	44.1	8	-	-
HCM Lane LOS	A	-	-	D	E	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.3	0.5	0	-	-

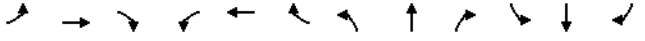
Intersection	
Int Delay, s/veh	0.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↑			↕	
Traffic Vol, veh/h	6	0	40	0	0	0	8	334	0	0	710	1
Future Vol, veh/h	6	0	40	0	0	0	8	334	0	0	710	1
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	65	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	0	43	0	0	0	9	363	0	0	772	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1158	1158	777	1175	1158	363	777	0	0	363	0	0
Stage 1	777	777	-	381	381	-	-	-	-	-	-	-
Stage 2	381	381	-	794	777	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	173	196	397	168	196	682	839	-	-	1196	-	-
Stage 1	390	407	-	641	613	-	-	-	-	-	-	-
Stage 2	641	613	-	381	407	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	171	193	396	148	193	682	836	-	-	1196	-	-
Mov Cap-2 Maneuver	171	193	-	148	193	-	-	-	-	-	-	-
Stage 1	385	406	-	634	606	-	-	-	-	-	-	-
Stage 2	634	606	-	339	406	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.5	0	0.2	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	836	-	-	338	-	1196	-	-
HCM Lane V/C Ratio	0.01	-	-	0.148	-	-	-	-
HCM Control Delay (s)	9.4	-	-	17.5	0	0	-	-
HCM Lane LOS	A	-	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	-	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	1	150	19	0	20	115	480	10	18	546	65
Future Volume (veh/h)	84	1	150	19	0	20	115	480	10	18	546	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.97	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	88	1	158	20	0	21	121	505	11	19	575	68
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	221	38	256	288	40	212	160	1332	29	34	973	115
Arrive On Green	0.26	0.26	0.26	0.26	0.00	0.26	0.09	0.37	0.37	0.02	0.30	0.30
Sat Flow, veh/h	408	145	981	622	153	814	1781	3553	77	1781	3198	377
Grp Volume(v), veh/h	247	0	0	41	0	0	121	252	264	19	319	324
Grp Sat Flow(s),veh/h/ln	1534	0	0	1589	0	0	1781	1777	1854	1781	1777	1799
Q Serve(g_s), s	3.3	0.0	0.0	0.0	0.0	0.0	2.8	4.4	4.4	0.5	6.5	6.5
Cycle Q Clear(g_c), s	5.9	0.0	0.0	0.8	0.0	0.0	2.8	4.4	4.4	0.5	6.5	6.5
Prop In Lane	0.36		0.64	0.49		0.51	1.00		0.04	1.00		0.21
Lane Grp Cap(c), veh/h	515	0	0	540	0	0	160	666	695	34	540	547
V/C Ratio(X)	0.48	0.00	0.00	0.08	0.00	0.00	0.76	0.38	0.38	0.56	0.59	0.59
Avail Cap(c_a), veh/h	1147	0	0	1122	0	0	611	1742	1817	193	1320	1336
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	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.7	0.0	0.0	11.9	0.0	0.0	18.9	9.7	9.7	20.7	12.6	12.6
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.1	0.0	0.0	7.2	0.4	0.3	13.9	1.0	1.0
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	1.8	0.0	0.0	0.3	0.0	0.0	1.3	1.4	1.5	0.3	2.2	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.4	0.0	0.0	12.0	0.0	0.0	26.1	10.0	10.0	34.6	13.6	13.6
LnGrp LOS	B	A	A	B	A	A	C	B	B	C	B	B
Approach Vol, veh/h		247			41			637			662	
Approach Delay, s/veh		14.4			12.0			13.1			14.2	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.2	21.3		16.0	8.2	18.3		16.0				
Change Period (Y+Rc), s	4.4	* 5.4		4.9	4.4	5.4		4.9				
Max Green Setting (Gmax), s	4.6	* 42		29.1	14.6	31.6		29.1				
Max Q Clear Time (g_c+I1), s	2.5	6.4		7.9	4.8	8.5		2.8				
Green Ext Time (p_c), s	0.0	3.4		1.5	0.2	4.1		0.2				

Intersection Summary	
HCM 6th Ctrl Delay	13.7
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	462	27	13	548	228	103	38	9	126	6	82
Future Volume (veh/h)	134	462	27	13	548	228	103	38	9	126	6	82
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	158	544	32	15	645	268	121	45	11	148	7	96
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	208	1633	96	27	923	383	269	87	16	432	23	312
Arrive On Green	0.12	0.48	0.48	0.02	0.38	0.38	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1781	3411	200	1781	2446	1016	717	417	75	1346	109	1491
Grp Volume(v), veh/h	158	283	293	15	468	445	177	0	0	148	0	103
Grp Sat Flow(s),veh/h/ln	1781	1777	1834	1781	1777	1686	1210	0	0	1346	0	1599
Q Serve(g_s), s	4.4	5.0	5.0	0.4	11.3	11.3	4.8	0.0	0.0	0.0	0.0	2.8
Cycle Q Clear(g_c), s	4.4	5.0	5.0	0.4	11.3	11.3	7.5	0.0	0.0	4.7	0.0	2.8
Prop In Lane	1.00		0.11	1.00		0.60	0.68		0.06	1.00		0.93
Lane Grp Cap(c), veh/h	208	851	878	27	670	636	372	0	0	432	0	334
V/C Ratio(X)	0.76	0.33	0.33	0.56	0.70	0.70	0.48	0.00	0.00	0.34	0.00	0.31
Avail Cap(c_a), veh/h	582	1528	1577	144	1084	1028	837	0	0	873	0	859
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	21.8	8.2	8.2	24.9	13.4	13.4	19.3	0.0	0.0	17.8	0.0	17.0
Incr Delay (d2), s/veh	5.6	0.2	0.2	17.1	1.3	1.4	0.9	0.0	0.0	0.5	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	1.6	1.6	0.3	4.0	3.8	1.9	0.0	0.0	1.4	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.4	8.4	8.4	41.9	14.7	14.8	20.2	0.0	0.0	18.2	0.0	17.5
LnGrp LOS	C	A	A	D	B	B	C	A	A	B	A	B
Approach Vol, veh/h		734			928			177			251	
Approach Delay, s/veh		12.5			15.2			20.2			17.9	
Approach LOS		B			B			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.2	30.1		15.5	10.3	25.0		15.5				
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9				
Max Green Setting (Gmax), s	4.6	* 44		27.3	16.6	31.0		27.3				
Max Q Clear Time (g_c+I1), s	2.4	7.0		6.7	6.4	13.3		9.5				
Green Ext Time (p_c), s	0.0	3.9		1.0	0.3	5.8		0.9				

Intersection Summary	
HCM 6th Ctrl Delay	15.0
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	243	62	34	232	261	263	333	588	261	316	1064	47
Future Volume (veh/h)	243	62	34	232	261	263	333	588	261	316	1064	47
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		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	279	71	39	267	300	302	383	676	300	363	1223	54
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	297	421	215	323	360	496	390	1676	746	417	1908	589
Arrive On Green	0.09	0.19	0.19	0.09	0.19	0.19	0.22	0.47	0.47	0.12	0.37	0.37
Sat Flow, veh/h	3456	2274	1163	3456	1870	1585	1781	3554	1581	3456	5106	1577
Grp Volume(v), veh/h	279	54	56	267	300	302	383	676	300	363	1223	54
Grp Sat Flow(s),veh/h/ln	1728	1777	1661	1728	1870	1585	1781	1777	1581	1728	1702	1577
Q Serve(g_s), s	12.0	3.9	4.2	11.4	23.1	24.3	32.1	18.6	18.6	15.5	29.6	3.3
Cycle Q Clear(g_c), s	12.0	3.9	4.2	11.4	23.1	24.3	32.1	18.6	18.6	15.5	29.6	3.3
Prop In Lane	1.00		0.70	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	297	329	307	323	360	496	390	1676	746	417	1908	589
V/C Ratio(X)	0.94	0.17	0.18	0.83	0.83	0.61	0.98	0.40	0.40	0.87	0.64	0.09
Avail Cap(c_a), veh/h	297	443	414	424	524	635	390	1676	746	521	1908	589
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.63	0.63	0.63	0.69	0.69	0.69	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.2	51.4	51.5	66.8	58.3	43.7	58.3	25.9	25.8	64.8	38.7	30.5
Incr Delay (d2), s/veh	36.3	0.2	0.3	6.5	4.9	0.8	33.5	0.5	1.1	12.5	1.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	1.8	1.8	5.3	11.5	9.7	18.1	8.1	7.3	7.6	12.7	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	104.4	51.6	51.8	73.4	63.2	44.5	91.8	26.4	27.0	77.3	40.4	30.8
LnGrp LOS	F	D	D	E	E	D	F	C	C	E	D	C
Approach Vol, veh/h		389			869			1359			1640	
Approach Delay, s/veh		89.5			59.8			44.9			48.2	
Approach LOS		F			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	37.0	61.5	17.1	34.4	22.3	76.2	18.2	33.3
Change Period (Y+Rc), s	4.2	5.5	* 4.2	5.5	* 4.2	5.5	* 4.2	* 5.5
Max Green Setting (Gmax), s	33.1	42.9	* 13	42.0	* 23	53.1	* 18	* 37
Max Q Clear Time (g_c+I1), s	34.1	31.6	14.0	26.3	17.5	20.6	13.4	6.2
Green Ext Time (p_c), s	0.0	6.4	0.0	2.6	0.6	6.6	0.4	0.6

Intersection Summary	
HCM 6th Ctrl Delay	53.3
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

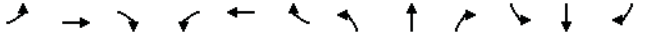
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	114	7	338	73	60	102	55	1044	20	49	856	425
Future Volume (veh/h)	114	7	338	73	60	102	55	1044	20	49	856	425
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	124	8	330	79	65	111	60	1135	22	53	930	462
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	390	25	368	155	54	92	90	1532	30	155	1656	1107
Arrive On Green	0.23	0.23	0.23	0.09	0.09	0.09	0.05	0.43	0.43	0.09	0.47	0.47
Sat Flow, veh/h	1678	108	1585	1781	620	1059	1781	3566	69	1781	3554	1585
Grp Volume(v), veh/h	132	0	330	79	0	176	60	566	591	53	930	462
Grp Sat Flow(s),veh/h/ln	1786	0	1585	1781	0	1680	1781	1777	1858	1781	1777	1585
Q Serve(g_s), s	7.0	0.0	23.2	4.9	0.0	10.0	3.8	30.6	30.6	3.2	21.8	14.3
Cycle Q Clear(g_c), s	7.0	0.0	23.2	4.9	0.0	10.0	3.8	30.6	30.6	3.2	21.8	14.3
Prop In Lane	0.94		1.00	1.00		0.63	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	415	0	368	155	0	146	90	763	798	155	1656	1107
V/C Ratio(X)	0.32	0.00	0.90	0.51	0.00	1.20	0.67	0.74	0.74	0.34	0.56	0.42
Avail Cap(c_a), veh/h	559	0	496	155	0	146	102	763	798	155	1656	1107
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	1.00	0.61	0.61	0.61
Uniform Delay (d), s/veh	36.6	0.0	42.8	50.2	0.0	52.5	53.6	27.4	27.5	49.4	22.2	7.4
Incr Delay (d2), s/veh	0.4	0.0	15.2	2.8	0.0	140.0	13.0	6.4	6.1	0.8	0.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	0.0	10.6	2.3	0.0	9.9	2.0	14.1	14.7	1.5	9.1	9.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.0	0.0	58.0	52.9	0.0	192.5	66.6	33.8	33.6	50.2	23.1	8.1
LnGrp LOS	D	A	E	D	A	F	E	C	C	D	C	A
Approach Vol, veh/h		462			255			1217			1445	
Approach Delay, s/veh		52.0			149.2			35.3			19.3	
Approach LOS		D			F			D			B	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	10.0	59.1	14.6	14.2	54.9	31.3
Change Period (Y+Rc), s	4.2	5.5	4.6	* 4.2	5.5	4.6
Max Green Setting (Gmax), s	5.8	43.5	10.0	* 10	40.1	36.0
Max Q Clear Time (g_c+I1), s	5.8	23.8	12.0	5.2	32.6	25.2
Green Ext Time (p_c), s	0.0	8.6	0.0	0.0	4.3	1.5

Intersection Summary	
HCM 6th Ctrl Delay	39.3
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	462	1055	152	247	958	47	146	164	231	138	364	850
Future Volume (veh/h)	462	1055	152	247	958	47	146	164	231	138	364	850
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		0.99	1.00		0.98	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	471	1077	155	252	978	48	149	167	236	141	371	867
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	545	1427	205	321	1255	61	179	586	511	170	1155	898
Arrive On Green	0.16	0.32	0.32	0.09	0.25	0.25	0.10	0.33	0.33	0.10	0.33	0.33
Sat Flow, veh/h	3456	4506	648	3456	4984	244	1781	1777	1549	1781	3554	2761
Grp Volume(v), veh/h	471	813	419	252	667	359	149	167	236	141	371	867
Grp Sat Flow(s),veh/h/ln	1728	1702	1750	1728	1702	1825	1781	1777	1549	1781	1777	1381
Q Serve(g_s), s	14.5	23.4	23.5	7.8	19.9	20.0	9.0	7.6	13.1	8.5	8.6	33.7
Cycle Q Clear(g_c), s	14.5	23.4	23.5	7.8	19.9	20.0	9.0	7.6	13.1	8.5	8.6	33.7
Prop In Lane	1.00		0.37	1.00		0.13	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	545	1078	554	321	857	459	179	586	511	170	1155	898
V/C Ratio(X)	0.86	0.75	0.76	0.78	0.78	0.78	0.83	0.28	0.46	0.83	0.32	0.97
Avail Cap(c_a), veh/h	649	1185	609	459	998	535	237	586	511	220	1155	898
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.8	33.5	33.5	48.4	38.0	38.0	48.2	27.0	28.9	48.5	27.7	36.2
Incr Delay (d2), s/veh	10.2	2.5	4.9	5.6	3.4	6.3	17.1	1.2	3.0	18.0	0.7	22.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.9	9.9	10.6	3.6	8.6	9.6	4.8	3.4	5.3	4.6	3.8	13.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.0	36.0	38.4	54.1	41.4	44.3	65.3	28.3	31.9	66.5	28.5	59.0
LnGrp LOS	E	D	D	D	D	D	E	C	C	E	C	E
Approach Vol, veh/h		1703			1278			552			1379	
Approach Delay, s/veh		41.9			44.7			39.8			51.6	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.9	40.5	14.6	39.0	15.5	40.0	21.7	32.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	36.0	14.5	38.0	14.5	35.0	20.5	32.0
Max Q Clear Time (g_c+I1), s	10.5	15.1	9.8	25.5	11.0	35.7	16.5	22.0
Green Ext Time (p_c), s	0.1	2.5	0.4	6.6	0.1	0.0	0.7	4.7

Intersection Summary	
HCM 6th Ctrl Delay	45.1
HCM 6th LOS	D

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	249	877	0	0	1409	584	388	1	852	0	0	0
Future Volume (veh/h)	249	877	0	0	1409	584	388	1	852	0	0	0
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		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	257	904	0	0	1453	602	401	0	878			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	321	2818	0	0	1382	617	1130	0	992			
Arrive On Green	0.03	0.18	0.00	0.00	0.39	0.39	0.32	0.00	0.32			
Sat Flow, veh/h	3456	5274	0	0	3647	1585	3563	0	3130			
Grp Volume(v), veh/h	257	904	0	0	1453	602	401	0	878			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1777	1585	1781	0	1565			
Q Serve(g_s), s	7.4	15.4	0.0	0.0	38.9	37.4	8.7	0.0	26.6			
Cycle Q Clear(g_c), s	7.4	15.4	0.0	0.0	38.9	37.4	8.7	0.0	26.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	321	2818	0	0	1382	617	1130	0	992			
V/C Ratio(X)	0.80	0.32	0.00	0.00	1.05	0.98	0.36	0.00	0.88			
Avail Cap(c_a), veh/h	321	2818	0	0	1382	617	1247	0	1095			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.65	0.65	0.00	0.00	0.59	0.59	1.00	0.00	1.00			
Uniform Delay (d), s/veh	47.5	24.6	0.0	0.0	30.5	30.1	26.3	0.0	32.4			
Incr Delay (d2), s/veh	9.1	0.2	0.0	0.0	33.8	22.7	0.2	0.0	8.3			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	8.7	7.0	0.0	0.0	22.4	17.5	3.7	0.0	10.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.6	24.8	0.0	0.0	64.3	52.8	26.5	0.0	40.7			
LnGrp LOS	E	C	A	A	F	D	C	A	D			
Approach Vol, veh/h		1161			2055			1279				
Approach Delay, s/veh		31.9			60.9			36.2				
Approach LOS		C			E			D				

Timer - Assigned Phs	2	5	6	8
Phs Duration (G+Y+Rc), s	62.2	16.3	45.9	37.8
Change Period (Y+Rc), s	7.0	7.0	* 7	6.1
Max Green Setting (Gmax), s	51.9	7.3	* 39	35.0
Max Q Clear Time (g_c+I1), s	17.4	9.4	40.9	28.6
Green Ext Time (p_c), s	7.6	0.0	0.0	3.1

Intersection Summary	
HCM 6th Ctrl Delay	46.4
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	702	234	860	937	0	0	0	0	424	5	362
Future Volume (veh/h)	0	702	234	860	937	0	0	0	0	424	5	362
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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	716	239	878	956	0				550	0	248
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98				0.98	0.98	0.98
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1213	541	955	2398	0				692	0	308
Arrive On Green	0.00	0.34	0.34	0.09	0.22	0.00				0.19	0.00	0.19
Sat Flow, veh/h	0	3647	1584	3456	3647	0				3563	0	1585
Grp Volume(v), veh/h	0	716	239	878	956	0				550	0	248
Grp Sat Flow(s),veh/h/ln	0	1777	1584	1728	1777	0				1781	0	1585
Q Serve(g_s), s	0.0	16.6	11.7	25.2	22.9	0.0				14.7	0.0	14.9
Cycle Q Clear(g_c), s	0.0	16.6	11.7	25.2	22.9	0.0				14.7	0.0	14.9
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1213	541	955	2398	0				692	0	308
V/C Ratio(X)	0.00	0.59	0.44	0.92	0.40	0.00				0.79	0.00	0.81
Avail Cap(c_a), veh/h	0	1213	541	975	2398	0				1033	0	460
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.27	0.27	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	27.2	25.5	44.3	21.6	0.0				38.4	0.0	38.5
Incr Delay (d2), s/veh	0.0	2.1	2.6	4.4	0.1	0.0				2.6	0.0	6.3
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	7.3	4.7	12.2	10.9	0.0				6.6	0.0	6.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	29.3	28.2	48.7	21.7	0.0				41.0	0.0	44.8
LnGrp LOS	A	C	C	D	C	A				D	A	D
Approach Vol, veh/h		955			1834						798	
Approach Delay, s/veh		29.0			34.6						42.2	
Approach LOS		C			C						D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	33.3	41.1		25.5		74.5
Change Period (Y+Rc), s	5.7	7.0		6.1		7.0
Max Green Setting (Gmax), s	28.0	24.0		29.0		57.9
Max Q Clear Time (g_c+I1), s	27.2	18.6		16.9		24.9
Green Ext Time (p_c), s	0.4	2.6		2.5		8.2

Intersection Summary	
HCM 6th Ctrl Delay	34.8
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	327	34	71	32	41	63	159	546	18	130	534	635
Future Volume (veh/h)	327	34	71	32	41	63	159	546	18	130	534	635
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.97	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	362	0	73	33	42	65	164	563	19	134	551	655
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	547	0	241	122	128	107	195	1995	67	170	1351	840
Arrive On Green	0.15	0.00	0.15	0.07	0.07	0.07	0.11	0.39	0.39	0.10	0.38	0.38
Sat Flow, veh/h	3563	0	1573	1781	1870	1557	1781	5067	170	1781	3554	1570
Grp Volume(v), veh/h	362	0	73	33	42	65	164	377	205	134	551	655
Grp Sat Flow(s),veh/h/ln	1781	0	1573	1781	1870	1557	1781	1702	1834	1781	1777	1570
Q Serve(g_s), s	6.8	0.0	2.9	1.3	1.5	2.9	6.4	5.4	5.4	5.3	8.1	23.8
Cycle Q Clear(g_c), s	6.8	0.0	2.9	1.3	1.5	2.9	6.4	5.4	5.4	5.3	8.1	23.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	547	0	241	122	128	107	195	1340	722	170	1351	840
V/C Ratio(X)	0.66	0.00	0.30	0.27	0.33	0.61	0.84	0.28	0.28	0.79	0.41	0.78
Avail Cap(c_a), veh/h	1383	0	610	399	419	349	195	1340	722	257	1389	857
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.5	0.0	26.8	31.5	31.7	32.3	31.2	14.8	14.8	31.6	16.2	13.3
Incr Delay (d2), s/veh	1.4	0.0	0.7	1.2	1.5	5.5	27.0	0.1	0.2	8.9	0.2	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	1.1	0.6	0.7	1.2	4.1	2.0	2.1	2.6	3.1	11.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.8	0.0	27.5	32.7	33.1	37.8	58.2	14.9	15.0	40.5	16.4	17.9
LnGrp LOS	C	A	C	C	C	D	E	B	B	D	B	B
Approach Vol, veh/h		435			140			746			1340	
Approach Delay, s/veh		29.5			35.2			24.4			19.5	
Approach LOS		C			D			C			B	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	11.2	34.1		16.3	12.2	33.1		9.8
Change Period (Y+Rc), s	4.4	* 6		5.3	4.4	6.0		4.9
Max Green Setting (Gmax), s	10.3	* 26		27.7	7.8	27.9		16.0
Max Q Clear Time (g_c+I1), s	7.3	7.4		8.8	8.4	25.8		4.9
Green Ext Time (p_c), s	0.1	3.6		1.5	0.0	1.3		0.3

Intersection Summary	
HCM 6th Ctrl Delay	23.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	12	0	41	8	0	5	76	616	12	5	324	15
Future Vol, veh/h	12	0	41	8	0	5	76	616	12	5	324	15
Conflicting Peds, #/hr	0	0	1	1	0	0	8	0	0	0	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	80	-	-
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	13	0	43	8	0	5	79	642	13	5	338	16

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1173	1177	355	1186	1179	649	362	0	0	655	0	0
Stage 1	364	364	-	807	807	-	-	-	-	-	-	-
Stage 2	809	813	-	379	372	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	169	191	689	166	190	470	1197	-	-	932	-	-
Stage 1	655	624	-	375	394	-	-	-	-	-	-	-
Stage 2	374	392	-	643	619	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	157	176	684	147	175	470	1189	-	-	932	-	-
Mov Cap-2 Maneuver	157	176	-	147	175	-	-	-	-	-	-	-
Stage 1	607	617	-	350	368	-	-	-	-	-	-	-
Stage 2	345	366	-	599	612	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.8	24.3	0.9	0.1
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1189	-	-	389	200	932	-	-
HCM Lane V/C Ratio	0.067	-	-	0.142	0.068	0.006	-	-
HCM Control Delay (s)	8.2	-	-	15.8	24.3	8.9	-	-
HCM Lane LOS	A	-	-	C	C	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.5	0.2	0	-	-

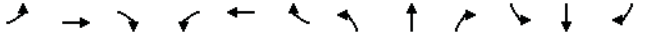
Intersection	
Int Delay, s/veh	0.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	0	23	0	0	0	35	591	0	0	316	2
Future Vol, veh/h	3	0	23	0	0	0	35	591	0	0	316	2
Conflicting Peds, #/hr	0	0	0	0	0	0	9	0	0	0	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	65	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	24	0	0	0	37	622	0	0	333	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1039	1039	343	1042	1040	622	344	0	0	622	0	0
Stage 1	343	343	-	696	696	-	-	-	-	-	-	-
Stage 2	696	696	-	346	344	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	209	231	700	208	230	487	1215	-	-	959	-	-
Stage 1	672	637	-	432	443	-	-	-	-	-	-	-
Stage 2	432	443	-	670	637	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	203	222	695	196	221	487	1206	-	-	959	-	-
Mov Cap-2 Maneuver	203	222	-	196	221	-	-	-	-	-	-	-
Stage 1	646	633	-	419	429	-	-	-	-	-	-	-
Stage 2	419	429	-	647	633	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12	0	0.5	0
HCM LOS	B	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1206	-	-	543	-	959	-	-
HCM Lane V/C Ratio	0.031	-	-	0.05	-	-	-	-
HCM Control Delay (s)	8.1	-	-	12	0	0	-	-
HCM Lane LOS	A	-	-	B	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	-	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	1	76	5	3	8	87	627	12	30	459	58
Future Volume (veh/h)	40	1	76	5	3	8	87	627	12	30	459	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.98	0.99		0.98	1.00		0.99	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	42	1	80	5	3	8	92	660	13	32	483	61
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	207	50	232	193	119	182	119	1192	23	54	947	119
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.07	0.33	0.33	0.03	0.30	0.30
Sat Flow, veh/h	323	219	1009	275	520	794	1781	3564	70	1781	3173	399
Grp Volume(v), veh/h	123	0	0	16	0	0	92	329	344	32	270	274
Grp Sat Flow(s),veh/h/ln	1551	0	0	1589	0	0	1781	1777	1857	1781	1777	1795
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	1.8	5.5	5.5	0.6	4.5	4.6
Cycle Q Clear(g_c), s	2.2	0.0	0.0	0.3	0.0	0.0	1.8	5.5	5.5	0.6	4.5	4.6
Prop In Lane	0.34		0.65	0.31		0.50	1.00		0.04	1.00		0.22
Lane Grp Cap(c), veh/h	489	0	0	495	0	0	119	594	621	54	530	536
V/C Ratio(X)	0.25	0.00	0.00	0.03	0.00	0.00	0.77	0.55	0.55	0.59	0.51	0.51
Avail Cap(c_a), veh/h	1345	0	0	1361	0	0	718	2044	2137	226	1549	1565
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	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.6	0.0	0.0	10.9	0.0	0.0	16.6	9.8	9.8	17.3	10.5	10.5
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.0	0.0	0.0	10.2	0.8	0.8	9.9	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.1	0.0	0.0	1.0	1.7	1.7	0.4	1.4	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	11.9	0.0	0.0	10.9	0.0	0.0	26.9	10.7	10.6	27.2	11.3	11.3
LnGrp LOS	B	A	A	B	A	A	C	B	B	C	B	B
Approach Vol, veh/h		123			16			765			576	
Approach Delay, s/veh		11.9			10.9			12.6			12.2	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.5	17.5		13.2	6.8	16.2		13.2				
Change Period (Y+Rc), s	4.4	* 5.4		4.9	4.4	5.4		4.9				
Max Green Setting (Gmax), s	4.6	* 42		29.1	14.6	31.6		29.1				
Max Q Clear Time (g_c+I1), s	2.6	7.5		4.2	3.8	6.6		2.3				
Green Ext Time (p_c), s	0.0	4.6		0.7	0.1	3.4		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	12.4
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	137	682	70	38	418	82	253	37	37	101	32	45
Future Volume (veh/h)	137	682	70	38	418	82	253	37	37	101	32	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.99		0.98	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	146	726	74	40	445	87	269	39	39	107	34	48
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	192	1095	112	60	776	151	454	60	50	624	241	341
Arrive On Green	0.11	0.34	0.34	0.03	0.26	0.26	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1781	3247	331	1781	2954	573	965	173	144	1315	698	986
Grp Volume(v), veh/h	146	397	403	40	266	266	347	0	0	107	0	82
Grp Sat Flow(s),veh/h/ln	1781	1777	1801	1781	1777	1750	1282	0	0	1315	0	1684
Q Serve(g_s), s	4.2	10.2	10.2	1.2	6.9	7.0	11.7	0.0	0.0	0.0	0.0	1.8
Cycle Q Clear(g_c), s	4.2	10.2	10.2	1.2	6.9	7.0	13.4	0.0	0.0	2.8	0.0	1.8
Prop In Lane	1.00		0.18	1.00		0.33	0.78		0.11	1.00		0.59
Lane Grp Cap(c), veh/h	192	599	607	60	467	460	563	0	0	624	0	582
V/C Ratio(X)	0.76	0.66	0.66	0.67	0.57	0.58	0.62	0.00	0.00	0.17	0.00	0.14
Avail Cap(c_a), veh/h	555	1459	1478	137	1035	1019	794	0	0	844	0	864
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.1	15.1	15.1	25.4	17.0	17.1	16.3	0.0	0.0	12.3	0.0	12.0
Incr Delay (d2), s/veh	6.1	1.3	1.3	12.2	1.1	1.2	1.1	0.0	0.0	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	3.7	3.8	0.7	2.6	2.7	3.5	0.0	0.0	0.8	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.1	16.3	16.3	37.6	18.1	18.2	17.4	0.0	0.0	12.4	0.0	12.1
LnGrp LOS	C	B	B	D	B	B	B	A	A	B	A	B
Approach Vol, veh/h		946			572			347			189	
Approach Delay, s/veh		18.3			19.5			17.4			12.3	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.2	23.7		23.3	10.1	19.8		23.3				
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9				
Max Green Setting (Gmax), s	1.8	* 44		27.3	16.6	31.0		27.3				
Max Q Clear Time (g_c+I1), s	3.2	12.2		4.8	6.2	9.0		15.4				
Green Ext Time (p_c), s	0.0	5.8		0.7	0.3	3.3		1.7				

Intersection Summary	
HCM 6th Ctrl Delay	17.9
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	229	164	105	320	221	243	278	693	448	357	588	12
Future Volume (veh/h)	229	164	105	320	221	243	278	693	448	357	588	12
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		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	236	169	108	330	228	251	287	714	462	368	606	12
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	283	292	176	385	311	458	311	1775	790	424	2286	706
Arrive On Green	0.08	0.14	0.14	0.11	0.17	0.17	0.17	0.50	0.50	0.12	0.45	0.45
Sat Flow, veh/h	3456	2126	1286	3456	1870	1582	1781	3554	1580	3456	5106	1576
Grp Volume(v), veh/h	236	140	137	330	228	251	287	714	462	368	606	12
Grp Sat Flow(s),veh/h/ln	1728	1777	1636	1728	1870	1582	1781	1777	1580	1728	1702	1576
Q Serve(g_s), s	10.1	11.0	11.9	14.1	17.4	20.1	23.8	18.9	31.0	15.7	11.2	0.6
Cycle Q Clear(g_c), s	10.1	11.0	11.9	14.1	17.4	20.1	23.8	18.9	31.0	15.7	11.2	0.6
Prop In Lane	1.00		0.79	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	283	244	224	385	311	458	311	1775	790	424	2286	706
V/C Ratio(X)	0.83	0.57	0.61	0.86	0.73	0.55	0.92	0.40	0.59	0.87	0.27	0.02
Avail Cap(c_a), veh/h	341	419	386	514	524	637	366	1775	790	546	2286	706
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.80	0.80	0.80	0.12	0.12	0.12	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.8	60.6	61.0	65.5	59.3	45.1	60.9	23.5	26.5	64.6	26.0	23.1
Incr Delay (d2), s/veh	13.8	2.1	2.7	8.7	2.7	0.8	4.9	0.1	0.4	11.5	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	5.2	5.1	6.7	8.5	8.1	11.2	8.0	11.8	7.6	4.7	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	81.7	62.7	63.7	74.2	62.0	45.9	65.8	23.6	26.9	76.1	26.2	23.1
LnGrp LOS	F	E	E	E	E	D	E	C	C	E	C	C
Approach Vol, veh/h		513			809			1463			986	
Approach Delay, s/veh		71.7			62.0			32.9			44.8	
Approach LOS		E			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.4	72.7	16.5	30.5	22.6	80.4	20.9	26.1
Change Period (Y+Rc), s	4.2	5.5	* 4.2	5.5	* 4.2	5.5	* 4.2	* 5.5
Max Green Setting (Gmax), s	31.1	43.0	* 15	42.0	* 24	50.1	* 22	* 35
Max Q Clear Time (g_c+I1), s	25.8	13.2	12.1	22.1	17.7	33.0	16.1	13.9
Green Ext Time (p_c), s	0.4	4.6	0.2	2.1	0.7	6.4	0.6	1.6

Intersection Summary	
HCM 6th Ctrl Delay	47.5
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	423	47	679	43	21	64	15	1041	57	105	709	199
Future Volume (veh/h)	423	47	679	43	21	64	15	1041	57	105	709	199
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		0.99	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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	441	49	636	45	22	67	16	1084	59	109	739	207
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	546	61	537	153	35	106	77	1109	60	155	1305	1117
Arrive On Green	0.34	0.34	0.34	0.09	0.09	0.09	0.04	0.32	0.32	0.09	0.37	0.37
Sat Flow, veh/h	1611	179	1584	1781	406	1237	1781	3426	186	1781	3554	1579
Grp Volume(v), veh/h	490	0	636	45	0	89	16	562	581	109	739	207
Grp Sat Flow(s),veh/h/ln	1790	0	1584	1781	0	1643	1781	1777	1835	1781	1777	1579
Q Serve(g_s), s	28.7	0.0	39.0	2.7	0.0	6.0	1.0	36.0	36.0	6.8	19.1	5.1
Cycle Q Clear(g_c), s	28.7	0.0	39.0	2.7	0.0	6.0	1.0	36.0	36.0	6.8	19.1	5.1
Prop In Lane	0.90		1.00	1.00		0.75	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	607	0	537	153	0	141	77	575	594	155	1305	1117
V/C Ratio(X)	0.81	0.00	1.18	0.29	0.00	0.63	0.21	0.98	0.98	0.70	0.57	0.19
Avail Cap(c_a), veh/h	607	0	537	161	0	149	77	575	594	160	1305	1117
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	1.00	0.89	0.89	0.89
Uniform Delay (d), s/veh	34.6	0.0	38.0	49.3	0.0	50.8	53.1	38.5	38.5	51.1	29.1	5.7
Incr Delay (d2), s/veh	7.9	0.0	100.6	1.1	0.0	7.8	1.3	32.3	31.8	11.4	1.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.6	0.0	29.8	1.3	0.0	2.8	0.5	20.5	21.2	3.5	8.4	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.5	0.0	138.6	50.4	0.0	58.6	54.4	70.7	70.3	62.4	30.7	6.0
LnGrp LOS	D	A	F	D	A	E	D	E	E	E	C	A
Approach Vol, veh/h		1126			134			1159			1055	
Approach Delay, s/veh		96.8			55.8			70.3			29.1	
Approach LOS		F			E			E			C	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	9.2	47.7	14.5	14.2	42.7	43.6
Change Period (Y+Rc), s	4.2	5.5	4.6	* 4.2	5.5	4.6
Max Green Setting (Gmax), s	5.0	41.7	10.4	* 10	36.4	39.0
Max Q Clear Time (g_c+I1), s	3.0	21.1	8.0	8.8	38.0	41.0
Green Ext Time (p_c), s	0.0	6.0	0.1	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	65.8
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX I

NEAR-TERM (OPENING YEAR 2020) + PROJECT INTERSECTION ANALYSIS WORKSHEETS

1: Rancho Carmel Dr & Carmel Mountain Rd
HCM 6th Signalized Intersection Summary

Near-Term+Project AM
11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	842	759	106	109	664	22	224	218	74	74	49	215
Future Volume (veh/h)	842	759	106	109	664	22	224	218	74	74	49	215
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		0.99	1.00		0.98	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	946	853	119	122	746	25	252	245	83	83	55	242
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	961	1951	271	178	1035	35	282	807	266	98	730	567
Arrive On Green	0.28	0.43	0.43	0.05	0.20	0.20	0.16	0.31	0.31	0.05	0.21	0.21
Sat Flow, veh/h	3456	4530	629	3456	5073	170	1781	2612	860	1781	3554	2761
Grp Volume(v), veh/h	946	640	332	122	500	271	252	164	164	83	55	242
Grp Sat Flow(s),veh/h/ln	1728	1702	1755	1728	1702	1838	1781	1777	1695	1781	1777	1381
Q Serve(g_s), s	31.8	15.4	15.5	4.1	16.0	16.1	16.2	8.2	8.6	5.4	1.5	8.9
Cycle Q Clear(g_c), s	31.8	15.4	15.5	4.1	16.0	16.1	16.2	8.2	8.6	5.4	1.5	8.9
Prop In Lane	1.00		0.36	1.00		0.09	1.00		0.51	1.00		1.00
Lane Grp Cap(c), veh/h	961	1466	756	178	695	375	282	549	524	98	730	567
V/C Ratio(X)	0.98	0.44	0.44	0.69	0.72	0.72	0.89	0.30	0.31	0.85	0.08	0.43
Avail Cap(c_a), veh/h	961	1623	836	260	932	503	342	549	524	98	730	567
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.9	23.3	23.4	54.5	43.4	43.4	48.2	30.7	30.9	54.7	37.5	40.4
Incr Delay (d2), s/veh	25.1	0.2	0.4	4.6	1.8	3.4	21.8	1.4	1.6	47.2	0.2	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	16.7	6.2	6.5	1.9	6.9	7.7	8.9	3.8	3.8	3.7	0.7	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	67.0	23.5	23.8	59.1	45.2	46.8	70.0	32.1	32.4	102.0	37.7	42.8
LnGrp LOS	E	C	C	E	D	D	E	C	C	F	D	D
Approach Vol, veh/h		1918			893			580			380	
Approach Delay, s/veh		45.0			47.6			48.7			55.0	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	10.9	40.6	10.5	54.8	23.0	28.5	37.0	28.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	6.4	36.1	8.8	55.7	22.4	20.1	32.5	32.0
Max Q Clear Time (g_c+I1), s	7.4	10.6	6.1	17.5	18.2	10.9	33.8	18.1
Green Ext Time (p_c), s	0.0	2.0	0.1	8.0	0.3	0.9	0.0	4.3

Intersection Summary	
HCM 6th Ctrl Delay	47.2
HCM 6th LOS	D

2: I-15 NB Ramp & Carmel Mountain Rd
HCM 6th Signalized Intersection Summary

Near-Term+Project AM
11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	368	687	0	0	796	306	201	2	1067	0	0	0
Future Volume (veh/h)	368	687	0	0	796	306	201	2	1067	0	0	0
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			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	391	731	0	0	847	326	215	0	1135			
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	1133	3540	0	0	1023	456	1357	0	1208			
Arrive On Green	0.11	0.23	0.00	0.00	0.29	0.29	0.38	0.00	0.38			
Sat Flow, veh/h	3456	5274	0	0	3647	1583	3563	0	3170			
Grp Volume(v), veh/h	391	731	0	0	847	326	215	0	1135			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1777	1583	1781	0	1585			
Q Serve(g_s), s	9.4	10.4	0.0	0.0	20.1	16.6	3.6	0.0	31.1			
Cycle Q Clear(g_c), s	9.4	10.4	0.0	0.0	20.1	16.6	3.6	0.0	31.1			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	1133	3540	0	0	1023	456	1357	0	1208			
V/C Ratio(X)	0.35	0.21	0.00	0.00	0.83	0.72	0.16	0.00	0.94			
Avail Cap(c_a), veh/h	1133	3540	0	0	1023	456	1385	0	1233			
HCM Platoon Ratio	0.33	0.33	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	0.69	0.69	1.00	0.00	1.00			
Uniform Delay (d), s/veh	31.2	14.7	0.0	0.0	30.0	28.7	18.3	0.0	26.9			
Incr Delay (d2), s/veh	0.1	0.1	0.0	0.0	5.5	6.5	0.1	0.0	13.6			
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	4.3	4.6	0.0	0.0	9.1	6.9	1.5	0.0	13.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.3	14.8	0.0	0.0	35.4	35.3	18.4	0.0	40.4			
LnGrp LOS	C	B	A	A	D	D	B	A	D			
Approach Vol, veh/h		1122			1173			1350				
Approach Delay, s/veh		20.5			35.4			36.9				
Approach LOS		C			D			D				

Timer - Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		70.0			37.1	32.9		40.4
Change Period (Y+Rc), s		7.0			7.0	* 7		6.1
Max Green Setting (Gmax), s		41.9			10.3	* 26		35.0
Max Q Clear Time (g_c+I1), s		12.4			11.4	22.1		33.1
Green Ext Time (p_c), s		5.7			0.0	2.4		1.2

Intersection Summary	
HCM 6th Ctrl Delay	31.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

3: I-15 SB Ramp & Carmel Mountain Rd
HCM 6th Signalized Intersection Summary

Near-Term+Project AM
11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	805	573	557	440	0	0	0	0	250	0	250
Future Volume (veh/h)	0	805	573	557	440	0	0	0	0	250	0	250
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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	847	603	586	463	0				345	0	175
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1617	721	653	2513	0				524	0	233
Arrive On Green	0.00	0.45	0.45	0.32	1.00	0.00				0.15	0.00	0.15
Sat Flow, veh/h	0	3647	1585	3456	3647	0				3563	0	1585
Grp Volume(v), veh/h	0	847	603	586	463	0				345	0	175
Grp Sat Flow(s),veh/h/ln	0	1777	1585	1728	1777	0				1781	0	1585
Q Serve(g_s), s	0.0	15.4	30.1	14.6	0.0	0.0				8.2	0.0	9.5
Cycle Q Clear(g_c), s	0.0	15.4	30.1	14.6	0.0	0.0				8.2	0.0	9.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1617	721	653	2513	0				524	0	233
V/C Ratio(X)	0.00	0.52	0.84	0.90	0.18	0.00				0.66	0.00	0.75
Avail Cap(c_a), veh/h	0	1617	721	699	2513	0				1148	0	511
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.59	0.59	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	17.6	21.6	30.0	0.0	0.0				36.2	0.0	36.8
Incr Delay (d2), s/veh	0.0	1.2	11.1	8.9	0.1	0.0				1.4	0.0	4.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.2	12.7	5.8	0.0	0.0				3.6	0.0	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	18.8	32.7	38.9	0.1	0.0				37.6	0.0	41.6
LnGrp LOS	A	B	C	D	A	A				D	A	D
Approach Vol, veh/h		1450			1049						520	
Approach Delay, s/veh		24.6			21.8						39.0	
Approach LOS		C			C						D	

Timer - Assigned Phs	1	2		4		6			
Phs Duration (G+Y+Rc), s	22.7	47.9		19.4		70.6			
Change Period (Y+Rc), s	* 5.7	7.0		6.1		7.0			
Max Green Setting (Gmax), s	* 18	24.0		29.0		47.9			
Max Q Clear Time (g_c+I1), s	16.6	32.1		11.5		2.0			
Green Ext Time (p_c), s	0.4	0.0		1.7		3.5			

Intersection Summary	
HCM 6th Ctrl Delay	26.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

5: Carmel Mountain Rd & Penasquitos Dr
HCM 6th Signalized Intersection Summary

Near-Term+Project AM
11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	700	51	186	18	20	77	110	601	25	86	338	234
Future Volume (veh/h)	700	51	186	18	20	77	110	601	25	86	338	234
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		0.98	1.00		0.99	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	760	0	192	19	21	79	113	620	26	89	348	241
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1027	0	455	134	140	117	146	1121	47	115	732	780
Arrive On Green	0.29	0.00	0.29	0.07	0.07	0.07	0.08	0.22	0.22	0.06	0.21	0.21
Sat Flow, veh/h	3563	0	1578	1781	1870	1560	1781	5024	210	1781	3554	1566
Grp Volume(v), veh/h	760	0	192	19	21	79	113	419	227	89	348	241
Grp Sat Flow(s),veh/h/ln	1781	0	1578	1781	1870	1560	1781	1702	1830	1781	1777	1566
Q Serve(g_s), s	11.4	0.0	5.8	0.6	0.6	2.9	3.7	6.4	6.5	2.9	5.1	5.4
Cycle Q Clear(g_c), s	11.4	0.0	5.8	0.6	0.6	2.9	3.7	6.4	6.5	2.9	5.1	5.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.11	1.00		1.00
Lane Grp Cap(c), veh/h	1027	0	455	134	140	117	146	759	408	115	732	780
V/C Ratio(X)	0.74	0.00	0.42	0.14	0.15	0.68	0.78	0.55	0.56	0.77	0.48	0.31
Avail Cap(c_a), veh/h	1671	0	741	483	507	423	235	1493	803	311	1679	1197
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.0	0.0	17.0	25.5	25.5	26.6	26.6	20.3	20.3	27.2	20.6	8.9
Incr Delay (d2), s/veh	1.1	0.0	0.6	0.5	0.5	6.6	8.6	0.6	1.2	10.4	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	0.0	2.0	0.3	0.3	1.2	1.8	2.4	2.7	1.5	2.0	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	20.1	0.0	17.6	26.0	26.0	33.2	35.1	21.0	21.5	37.5	21.1	9.1
LnGrp LOS	C	A	B	C	C	C	D	C	C	D	C	A
Approach Vol, veh/h		952			119			759			678	
Approach Delay, s/veh		19.6			30.8			23.2			19.0	
Approach LOS		B			C			C			B	

Timer - Assigned Phs	1	2		4	5	6		8		
Phs Duration (G+Y+Rc), s	8.2	19.2		22.3	9.2	18.2		9.3		
Change Period (Y+Rc), s	4.4	* 6		5.3	4.4	6.0		4.9		
Max Green Setting (Gmax), s	10.3	* 26		27.7	7.8	27.9		16.0		
Max Q Clear Time (g_c+I1), s	4.9	8.5		13.4	5.7	7.4		4.9		
Green Ext Time (p_c), s	0.1	3.9		3.3	0.0	3.1		0.2		

Intersection Summary	
HCM 6th Ctrl Delay	21.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	33	1	75	14	0	0	41	319	6	1	790	25
Future Vol, veh/h	33	1	75	14	0	0	41	319	6	1	790	25
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	36	1	82	15	0	0	45	347	7	1	859	27

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1320	1323	877	1357	1333	351	890	0	0	354	0	0
Stage 1	879	879	-	441	441	-	-	-	-	-	-	-
Stage 2	441	444	-	916	892	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	134	156	348	126	154	692	761	-	-	1205	-	-
Stage 1	342	365	-	595	577	-	-	-	-	-	-	-
Stage 2	595	575	-	326	360	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	127	146	347	91	144	692	758	-	-	1205	-	-
Mov Cap-2 Maneuver	127	146	-	91	144	-	-	-	-	-	-	-
Stage 1	320	364	-	560	543	-	-	-	-	-	-	-
Stage 2	560	541	-	248	359	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	37.2	52.3	1.1	0
HCM LOS	E	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	758	-	-	226	91	1205	-	-
HCM Lane V/C Ratio	0.059	-	-	0.524	0.167	0.001	-	-
HCM Control Delay (s)	10	-	-	37.2	52.3	8	-	-
HCM Lane LOS	B	-	-	E	F	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.7	0.6	0	-	-

Intersection	
Int Delay, s/veh	3.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	0	40	64	0	0	8	334	11	0	710	1
Future Vol, veh/h	6	0	40	64	0	0	8	334	11	0	710	1
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	65	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	0	43	70	0	0	9	363	12	0	772	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1164	1170	777	1181	1164	369	777	0	0	375	0	0
Stage 1	777	777	-	387	387	-	-	-	-	-	-	-
Stage 2	387	393	-	794	777	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	171	193	397	167	194	677	839	-	-	1183	-	-
Stage 1	390	407	-	637	610	-	-	-	-	-	-	-
Stage 2	637	606	-	381	407	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	169	190	396	147	191	677	836	-	-	1183	-	-
Mov Cap-2 Maneuver	169	190	-	147	191	-	-	-	-	-	-	-
Stage 1	385	406	-	630	603	-	-	-	-	-	-	-
Stage 2	630	599	-	339	406	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.5	49.8	0.2	0
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	836	-	-	337	147	1183	-	-
HCM Lane V/C Ratio	0.01	-	-	0.148	0.473	-	-	-
HCM Control Delay (s)	9.4	-	-	17.5	49.8	0	-	-
HCM Lane LOS	A	-	-	C	E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	2.2	0	-	-

8: Carmel Mountain Rd & Cuca St/Caminata Deluz

Near-Term+Project AM

HCM 6th Signalized Intersection Summary

11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	84	1	152	19	0	20	116	489	10	18	559	65
Future Volume (veh/h)	84	1	152	19	0	20	116	489	10	18	559	65
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.97	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	88	1	160	20	0	21	122	515	11	19	588	68
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	219	38	258	287	40	212	161	1345	29	34	984	114
Arrive On Green	0.26	0.26	0.26	0.26	0.00	0.26	0.09	0.38	0.38	0.02	0.31	0.31
Sat Flow, veh/h	405	144	986	621	151	810	1781	3555	76	1781	3207	370
Grp Volume(v), veh/h	249	0	0	41	0	0	122	257	269	19	325	331
Grp Sat Flow(s),veh/h/ln	1534	0	0	1582	0	0	1781	1777	1854	1781	1777	1800
Q Serve(g_s), s	3.4	0.0	0.0	0.0	0.0	0.0	2.9	4.5	4.5	0.5	6.7	6.7
Cycle Q Clear(g_c), s	6.0	0.0	0.0	0.8	0.0	0.0	2.9	4.5	4.5	0.5	6.7	6.7
Prop In Lane	0.35		0.64	0.49		0.51	1.00		0.04	1.00		0.21
Lane Grp Cap(c), veh/h	514	0	0	538	0	0	161	672	702	34	545	553
V/C Ratio(X)	0.48	0.00	0.00	0.08	0.00	0.00	0.76	0.38	0.38	0.56	0.60	0.60
Avail Cap(c_a), veh/h	1133	0	0	1107	0	0	604	1720	1795	190	1304	1321
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	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.9	0.0	0.0	12.0	0.0	0.0	19.1	9.7	9.7	21.0	12.7	12.7
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.1	0.0	0.0	7.1	0.4	0.3	14.0	1.0	1.0
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	1.9	0.0	0.0	0.3	0.0	0.0	1.4	1.4	1.5	0.3	2.3	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.6	0.0	0.0	12.1	0.0	0.0	26.2	10.1	10.1	35.0	13.7	13.7
LnGrp LOS	B	A	A	B	A	A	C	B	B	C	B	B
Approach Vol, veh/h		249			41			648			675	
Approach Delay, s/veh		14.6			12.1			13.1			14.3	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.2	21.7		16.2	8.3	18.6		16.2				
Change Period (Y+Rc), s	4.4	* 5.4		4.9	4.4	5.4		4.9				
Max Green Setting (Gmax), s	4.6	* 42		29.1	14.6	31.6		29.1				
Max Q Clear Time (g_c+I1), s	2.5	6.5		8.0	4.9	8.7		2.8				
Green Ext Time (p_c), s	0.0	3.5		1.5	0.2	4.2		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			13.8									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

9: Comm Dwy/Paseo Cardiel & Carmel Mountain Rd

Near-Term+Project AM

HCM 6th Signalized Intersection Summary

11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	134	470	27	16	560	228	103	38	11	126	6	82
Future Volume (veh/h)	134	470	27	16	560	228	103	38	11	126	6	82
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	158	553	32	19	659	268	121	45	13	148	7	96
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	208	1632	94	33	936	381	266	87	18	429	23	312
Arrive On Green	0.12	0.48	0.48	0.02	0.38	0.38	0.21	0.21	0.21	0.21	0.21	0.21
Sat Flow, veh/h	1781	3414	197	1781	2464	1002	710	416	88	1344	109	1491
Grp Volume(v), veh/h	158	287	298	19	475	452	179	0	0	148	0	103
Grp Sat Flow(s),veh/h/ln	1781	1777	1835	1781	1777	1688	1215	0	0	1344	0	1599
Q Serve(g_s), s	4.4	5.2	5.2	0.5	11.6	11.6	4.8	0.0	0.0	0.0	0.0	2.8
Cycle Q Clear(g_c), s	4.4	5.2	5.2	0.5	11.6	11.6	7.6	0.0	0.0	4.8	0.0	2.8
Prop In Lane	1.00		0.11	1.00		0.59	0.68		0.07	1.00		0.93
Lane Grp Cap(c), veh/h	208	850	877	33	675	642	372	0	0	429	0	335
V/C Ratio(X)	0.76	0.34	0.34	0.58	0.70	0.70	0.48	0.00	0.00	0.35	0.00	0.31
Avail Cap(c_a), veh/h	576	1512	1561	142	1072	1019	829	0	0	861	0	850
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	22.0	8.3	8.3	25.0	13.5	13.5	19.5	0.0	0.0	18.0	0.0	17.2
Incr Delay (d2), s/veh	5.6	0.2	0.2	14.9	1.4	1.4	1.0	0.0	0.0	0.5	0.0	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	1.6	1.7	0.4	4.1	3.9	1.9	0.0	0.0	1.5	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.6	8.6	8.6	39.9	14.8	14.9	20.4	0.0	0.0	18.4	0.0	17.7
LnGrp LOS	C	A	A	D	B	B	C	A	A	B	A	B
Approach Vol, veh/h		743			946			179			251	
Approach Delay, s/veh		12.6			15.4			20.4			18.1	
Approach LOS		B			B			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.3	30.4		15.7	10.4	25.3		15.7				
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9				
Max Green Setting (Gmax), s	4.1	* 44		27.3	16.6	31.0		27.3				
Max Q Clear Time (g_c+I1), s	2.5	7.2		6.8	6.4	13.6		9.6				
Green Ext Time (p_c), s	0.0	4.0		1.0	0.3	5.9		0.9				
Intersection Summary												
HCM 6th Ctrl Delay			15.2									
HCM 6th LOS			B									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	243	62	34	235	268	265	333	588	268	317	1064	47
Future Volume (veh/h)	243	62	34	235	268	265	333	588	268	317	1064	47
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		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	279	71	39	270	308	305	383	676	308	364	1223	54
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	297	425	217	323	363	500	390	1669	742	418	1898	586
Arrive On Green	0.09	0.19	0.19	0.09	0.19	0.19	0.22	0.47	0.47	0.12	0.37	0.37
Sat Flow, veh/h	3456	2274	1163	3456	1870	1585	1781	3554	1581	3456	5106	1577
Grp Volume(v), veh/h	279	54	56	270	308	305	383	676	308	364	1223	54
Grp Sat Flow(s),veh/h/ln	1728	1777	1661	1728	1870	1585	1781	1777	1581	1728	1702	1577
Q Serve(g_s), s	12.0	3.8	4.2	11.5	23.8	24.5	32.1	18.7	19.3	15.5	29.7	3.3
Cycle Q Clear(g_c), s	12.0	3.8	4.2	11.5	23.8	24.5	32.1	18.7	19.3	15.5	29.7	3.3
Prop In Lane	1.00		0.70	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	297	332	310	323	363	500	390	1669	742	418	1898	586
V/C Ratio(X)	0.94	0.16	0.18	0.84	0.85	0.61	0.98	0.41	0.41	0.87	0.64	0.09
Avail Cap(c_a), veh/h	297	443	414	424	524	636	390	1669	742	521	1898	586
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.62	0.62	0.62	0.69	0.69	0.69	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.2	51.2	51.3	66.9	58.3	43.6	58.3	26.1	26.2	64.8	38.9	30.6
Incr Delay (d2), s/veh	36.3	0.2	0.3	7.0	5.6	0.8	33.5	0.5	1.2	12.6	1.7	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	1.8	1.8	5.4	11.9	9.8	18.1	8.1	7.6	7.6	12.8	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	104.4	51.4	51.6	73.9	63.9	44.3	91.8	26.6	27.4	77.4	40.6	31.0
LnGrp LOS	F	D	D	E	E	D	F	C	C	E	D	C
Approach Vol, veh/h		389			883			1367			1641	
Approach Delay, s/veh		89.4			60.2			45.0			48.5	
Approach LOS		F			E			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	37.0	61.3	17.1	34.6	22.3	75.9	18.2	33.5				
Change Period (Y+Rc), s	* 4.2	5.5	* 4.2	5.5	* 4.2	5.5	* 4.2	* 5.5				
Max Green Setting (Gmax), s	* 33	42.9	* 13	42.0	* 23	53.1	* 18	* 37				
Max Q Clear Time (g_c+I1), s	34.1	31.7	14.0	26.5	17.5	21.3	13.5	6.2				
Green Ext Time (p_c), s	0.0	6.4	0.0	2.7	0.6	6.6	0.4	0.6				
Intersection Summary												
HCM 6th Ctrl Delay			53.5									
HCM 6th LOS			D									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	119	7	338	73	60	102	55	1046	20	49	859	425
Future Volume (veh/h)	119	7	338	73	60	102	55	1046	20	49	859	425
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	129	8	330	79	65	111	60	1137	22	53	934	462
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	391	24	368	155	54	92	90	1531	30	155	1655	1107
Arrive On Green	0.23	0.23	0.23	0.09	0.09	0.09	0.05	0.43	0.43	0.09	0.47	0.47
Sat Flow, veh/h	1682	104	1585	1781	620	1059	1781	3566	69	1781	3554	1585
Grp Volume(v), veh/h	137	0	330	79	0	176	60	566	593	53	934	462
Grp Sat Flow(s),veh/h/ln	1786	0	1585	1781	0	1680	1781	1777	1858	1781	1777	1585
Q Serve(g_s), s	7.3	0.0	23.2	4.9	0.0	10.0	3.8	30.7	30.7	3.2	21.9	14.3
Cycle Q Clear(g_c), s	7.3	0.0	23.2	4.9	0.0	10.0	3.8	30.7	30.7	3.2	21.9	14.3
Prop In Lane	0.94		1.00	1.00		0.63	1.00		0.04	1.00		1.00
Lane Grp Cap(c), veh/h	415	0	368	155	0	146	90	763	798	155	1655	1107
V/C Ratio(X)	0.33	0.00	0.90	0.51	0.00	1.20	0.67	0.74	0.74	0.34	0.56	0.42
Avail Cap(c_a), veh/h	559	0	496	155	0	146	102	763	798	155	1655	1107
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	1.00	0.60	0.60	0.60
Uniform Delay (d), s/veh	36.7	0.0	42.8	50.2	0.0	52.5	53.6	27.5	27.5	49.4	22.3	7.4
Incr Delay (d2), s/veh	0.5	0.0	15.1	2.8	0.0	140.0	13.0	6.4	6.2	0.8	0.8	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	10.6	2.3	0.0	9.9	2.0	14.1	14.7	1.5	9.2	9.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.2	0.0	57.9	52.9	0.0	192.5	66.6	33.9	33.7	50.2	23.1	8.1
LnGrp LOS	D	A	E	D	A	F	E	C	C	D	C	A
Approach Vol, veh/h		467			255			1219			1449	
Approach Delay, s/veh		51.8			149.2			35.4			19.3	
Approach LOS		D			F			D			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	10.0	59.1		14.6	14.2	54.9		31.3				
Change Period (Y+Rc), s	* 4.2	5.5		4.6	* 4.2	5.5		4.6				
Max Green Setting (Gmax), s	* 6.6	43.5		10.0	* 10	40.1		36.0				
Max Q Clear Time (g_c+I1), s	5.8	23.9		12.0	5.2	32.7		25.2				
Green Ext Time (p_c), s	0.0	8.6		0.0	0.0	4.2		1.5				
Intersection Summary												
HCM 6th Ctrl Delay			39.4									
HCM 6th LOS			D									

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

1: Rancho Carmel Dr & Carmel Mountain Rd
HCM 6th Signalized Intersection Summary

Near-Term+Project PM
11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	468	1066	153	247	974	47	148	164	231	138	364	859
Future Volume (veh/h)	468	1066	153	247	974	47	148	164	231	138	364	859
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		0.99	1.00		0.98	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	478	1088	156	252	994	48	151	167	236	141	371	877
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	551	1442	207	321	1263	61	181	583	508	170	1144	889
Arrive On Green	0.16	0.32	0.32	0.09	0.25	0.25	0.10	0.33	0.33	0.10	0.32	0.32
Sat Flow, veh/h	3456	4509	646	3456	4989	241	1781	1777	1549	1781	3554	2761
Grp Volume(v), veh/h	478	821	423	252	678	364	151	167	236	141	371	877
Grp Sat Flow(s),veh/h/ln	1728	1702	1751	1728	1702	1825	1781	1777	1549	1781	1777	1381
Q Serve(g_s), s	14.8	23.7	23.8	7.8	20.4	20.4	9.1	7.7	13.3	8.5	8.7	34.6
Cycle Q Clear(g_c), s	14.8	23.7	23.8	7.8	20.4	20.4	9.1	7.7	13.3	8.5	8.7	34.6
Prop In Lane	1.00		0.37	1.00		0.13	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	551	1089	560	321	862	462	181	583	508	170	1144	889
V/C Ratio(X)	0.87	0.75	0.76	0.79	0.79	0.79	0.84	0.29	0.46	0.83	0.32	0.99
Avail Cap(c_a), veh/h	645	1178	606	456	992	532	235	583	508	219	1144	889
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	45.0	33.5	33.5	48.7	38.2	38.2	48.4	27.4	29.2	48.8	28.2	37.0
Incr Delay (d2), s/veh	10.8	2.6	5.0	5.8	3.7	6.8	17.9	1.2	3.0	18.3	0.8	27.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	10.1	10.7	3.6	8.9	9.9	4.9	3.4	5.3	4.6	3.8	14.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.8	36.1	38.5	54.5	41.9	45.1	66.3	28.6	32.3	67.1	28.9	64.1
LnGrp LOS	E	D	D	D	D	D	E	C	C	E	C	E
Approach Vol, veh/h		1722			1294			554			1389	
Approach Delay, s/veh		42.1			45.3			40.4			55.0	
Approach LOS		D			D			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	40.5	14.7	39.6	15.6	39.8	22.0	32.3
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	13.5	36.0	14.5	38.0	14.5	35.0	20.5	32.0
Max Q Clear Time (g_c+I1), s	10.5	15.3	9.8	25.8	11.1	36.6	16.8	22.4
Green Ext Time (p_c), s	0.1	2.5	0.4	6.6	0.1	0.0	0.7	4.7

Intersection Summary	
HCM 6th Ctrl Delay	46.4
HCM 6th LOS	D

2: I-15 NB Ramp & Carmel Mountain Rd
HCM 6th Signalized Intersection Summary

Near-Term+Project PM
11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	261	895	0	0	1436	584	411	1	852	0	0	0
Future Volume (veh/h)	261	895	0	0	1436	584	411	1	852	0	0	0
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		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	269	923	0	0	1480	602	425	0	878			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	320	2816	0	0	1382	617	1131	0	994			
Arrive On Green	0.03	0.18	0.00	0.00	0.39	0.39	0.32	0.00	0.32			
Sat Flow, veh/h	3456	5274	0	0	3647	1585	3563	0	3130			
Grp Volume(v), veh/h	269	923	0	0	1480	602	425	0	878			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1777	1585	1781	0	1565			
Q Serve(g_s), s	7.7	15.7	0.0	0.0	38.9	37.4	9.2	0.0	26.6			
Cycle Q Clear(g_c), s	7.7	15.7	0.0	0.0	38.9	37.4	9.2	0.0	26.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	320	2816	0	0	1382	617	1131	0	994			
V/C Ratio(X)	0.84	0.33	0.00	0.00	1.07	0.98	0.38	0.00	0.88			
Avail Cap(c_a), veh/h	320	2816	0	0	1382	617	1247	0	1095			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.61	0.61	0.00	0.00	0.58	0.58	1.00	0.00	1.00			
Uniform Delay (d), s/veh	47.7	24.8	0.0	0.0	30.5	30.1	26.4	0.0	32.4			
Incr Delay (d2), s/veh	11.7	0.2	0.0	0.0	40.7	22.5	0.2	0.0	8.2			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	4.0	7.2	0.0	0.0	23.7	17.5	3.9	0.0	10.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.5	25.0	0.0	0.0	71.3	52.6	26.7	0.0	40.6			
LnGrp LOS	E	C	A	A	F	D	C	A	D			
Approach Vol, veh/h		1192			2082			1303				
Approach Delay, s/veh		32.7			65.9			36.0				
Approach LOS		C			E			D				

Timer - Assigned Phs	2	5	6	8
Phs Duration (G+Y+Rc), s	62.2	16.3	45.9	37.8
Change Period (Y+Rc), s	7.0	7.0	* 7	6.1
Max Green Setting (Gmax), s	51.9	7.3	* 39	35.0
Max Q Clear Time (g_c+I1), s	17.7	9.7	40.9	28.6
Green Ext Time (p_c), s	7.8	0.0	0.0	3.1

Intersection Summary	
HCM 6th Ctrl Delay	48.7
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

3: I-15 SB Ramp & Carmel Mountain Rd
HCM 6th Signalized Intersection Summary

Near-Term+Project PM
11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	732	249	860	987	0	0	0	0	424	5	380
Future Volume (veh/h)	0	732	249	860	987	0	0	0	0	424	5	380
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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	747	254	878	1007	0				556	0	260
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98				0.98	0.98	0.98
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1187	529	955	2372	0				718	0	319
Arrive On Green	0.00	0.33	0.33	0.09	0.22	0.00				0.20	0.00	0.20
Sat Flow, veh/h	0	3647	1584	3456	3647	0				3563	0	1585
Grp Volume(v), veh/h	0	747	254	878	1007	0				556	0	260
Grp Sat Flow(s),veh/h/ln	0	1777	1584	1728	1777	0				1781	0	1585
Q Serve(g_s), s	0.0	17.7	12.7	25.2	24.4	0.0				14.8	0.0	15.7
Cycle Q Clear(g_c), s	0.0	17.7	12.7	25.2	24.4	0.0				14.8	0.0	15.7
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1187	529	955	2372	0				718	0	319
V/C Ratio(X)	0.00	0.63	0.48	0.92	0.42	0.00				0.77	0.00	0.81
Avail Cap(c_a), veh/h	0	1187	529	975	2372	0				1033	0	460
HCM Platoon Ratio	1.00	1.00	1.00	0.33	0.33	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.23	0.23	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	28.1	26.4	44.3	22.5	0.0				37.8	0.0	38.1
Incr Delay (d2), s/veh	0.0	2.5	3.1	3.8	0.1	0.0				2.3	0.0	7.2
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	0.0	7.8	5.2	12.1	11.6	0.0				6.6	0.0	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	30.6	29.5	48.1	22.6	0.0				40.1	0.0	45.4
LnGrp LOS	A	C	C	D	C	A				D	A	D
Approach Vol, veh/h		1001			1885						816	
Approach Delay, s/veh		30.3			34.5						41.8	
Approach LOS		C			C						D	

Timer - Assigned Phs	1	2		4		6						
Phs Duration (G+Y+Rc), s	33.3	40.4		26.2		73.8						
Change Period (Y+Rc), s	* 5.7	7.0		6.1		7.0						
Max Green Setting (Gmax), s	* 28	24.0		29.0		57.9						
Max Q Clear Time (g_c+I1), s	27.2	19.7		17.7		26.4						
Green Ext Time (p_c), s	0.4	2.3		2.5		8.7						

Intersection Summary	
HCM 6th Ctrl Delay	35.0
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

5: Carmel Mountain Rd & Penasquitos Dr
HCM 6th Signalized Intersection Summary

Near-Term+Project PM
11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	372	35	83	32	42	63	177	546	18	130	534	635
Future Volume (veh/h)	372	35	83	32	42	63	177	546	18	130	534	635
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.98	1.00		0.97	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	410	0	86	33	43	65	182	563	19	134	551	655
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	596	0	263	122	128	106	191	1953	66	170	1328	852
Arrive On Green	0.17	0.00	0.17	0.07	0.07	0.07	0.11	0.39	0.39	0.10	0.37	0.37
Sat Flow, veh/h	3563	0	1574	1781	1870	1557	1781	5067	170	1781	3554	1570
Grp Volume(v), veh/h	410	0	86	33	43	65	182	377	205	134	551	655
Grp Sat Flow(s),veh/h/ln	1781	0	1574	1781	1870	1557	1781	1702	1834	1781	1777	1570
Q Serve(g_s), s	7.9	0.0	3.5	1.3	1.6	2.9	7.4	5.6	5.6	5.3	8.4	23.9
Cycle Q Clear(g_c), s	7.9	0.0	3.5	1.3	1.6	2.9	7.4	5.6	5.6	5.3	8.4	23.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	596	0	263	122	128	106	191	1312	707	170	1328	852
V/C Ratio(X)	0.69	0.00	0.33	0.27	0.34	0.61	0.95	0.29	0.29	0.79	0.42	0.77
Avail Cap(c_a), veh/h	1358	0	600	392	412	343	191	1312	707	252	1364	868
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	28.5	0.0	26.7	32.1	32.3	32.9	32.3	15.4	15.5	32.2	16.9	13.1
Incr Delay (d2), s/veh	1.4	0.0	0.7	1.2	1.5	5.5	51.3	0.1	0.2	9.5	0.2	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	0.0	1.3	0.6	0.8	1.2	5.8	2.0	2.2	2.7	3.2	12.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.9	0.0	27.4	33.3	33.8	38.5	83.5	15.6	15.7	41.6	17.1	17.3
LnGrp LOS	C	A	C	C	C	D	F	B	B	D	B	B
Approach Vol, veh/h		496			141			764			1340	
Approach Delay, s/veh		29.5			35.8			31.8			19.6	
Approach LOS		C			D			C			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.3	34.0		17.5	12.2	33.2		9.9				
Change Period (Y+Rc), s	4.4	* 6		5.3	4.4	6.0		4.9				
Max Green Setting (Gmax), s	10.3	* 26		27.7	7.8	27.9		16.0				
Max Q Clear Time (g_c+I1), s	7.3	7.6		9.9	9.4	25.9		4.9				
Green Ext Time (p_c), s	0.1	3.5		1.7	0.0	1.3		0.3				

Intersection Summary	
HCM 6th Ctrl Delay	25.6
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	15	0	41	8	0	5	76	635	12	5	382	17
Future Vol, veh/h	15	0	41	8	0	5	76	635	12	5	382	17
Conflicting Peds, #/hr	0	0	1	1	0	0	8	0	0	0	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	80	-	-
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	16	0	43	8	0	5	79	661	13	5	398	18

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1253	1257	416	1266	1260	668	424	0	0	674	0	0
Stage 1	425	425	-	826	826	-	-	-	-	-	-	-
Stage 2	828	832	-	440	434	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	149	171	637	146	170	458	1135	-	-	917	-	-
Stage 1	607	586	-	366	387	-	-	-	-	-	-	-
Stage 2	365	384	-	596	581	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	138	157	632	128	156	458	1127	-	-	917	-	-
Mov Cap-2 Maneuver	138	157	-	128	156	-	-	-	-	-	-	-
Stage 1	561	579	-	340	360	-	-	-	-	-	-	-
Stage 2	336	357	-	552	574	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	18.6	27	0.9	0.1
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1127	-	-	323	177	917	-	-
HCM Lane V/C Ratio	0.07	-	-	0.181	0.077	0.006	-	-
HCM Control Delay (s)	8.4	-	-	18.6	27	8.9	-	-
HCM Lane LOS	A	-	-	C	D	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	0.6	0.2	0	-	-

Intersection	
Int Delay, s/veh	2.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑			↕	
Traffic Vol, veh/h	3	0	23	60	0	0	35	591	22	0	316	2
Future Vol, veh/h	3	0	23	60	0	0	35	591	22	0	316	2
Conflicting Peds, #/hr	0	0	0	0	0	0	9	0	0	0	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	65	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	3	0	24	63	0	0	37	622	23	0	333	2

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1051	1062	343	1054	1052	634	344	0	0	645	0	0
Stage 1	343	343	-	708	708	-	-	-	-	-	-	-
Stage 2	708	719	-	346	344	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	205	223	700	204	227	479	1215	-	-	940	-	-
Stage 1	672	637	-	426	438	-	-	-	-	-	-	-
Stage 2	426	433	-	670	637	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	199	215	695	192	218	479	1206	-	-	940	-	-
Mov Cap-2 Maneuver	199	215	-	192	218	-	-	-	-	-	-	-
Stage 1	646	633	-	413	424	-	-	-	-	-	-	-
Stage 2	413	420	-	647	633	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12	32.7	0.4	0
HCM LOS	B	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1206	-	-	540	192	940	-	-
HCM Lane V/C Ratio	0.031	-	-	0.051	0.329	-	-	-
HCM Control Delay (s)	8.1	-	-	12	32.7	0	-	-
HCM Lane LOS	A	-	-	B	D	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.2	1.4	0	-	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	1	78	5	3	8	90	645	12	30	471	58
Future Volume (veh/h)	40	1	78	5	3	8	90	645	12	30	471	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.98	0.99		0.98	1.00		0.99	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	42	1	82	5	3	8	95	679	13	32	496	61
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	204	49	233	192	119	182	122	1214	23	54	961	118
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.07	0.34	0.34	0.03	0.30	0.30
Sat Flow, veh/h	318	215	1018	276	518	794	1781	3566	68	1781	3184	390
Grp Volume(v), veh/h	125	0	0	16	0	0	95	338	354	32	276	281
Grp Sat Flow(s),veh/h/ln	1551	0	0	1588	0	0	1781	1777	1858	1781	1777	1797
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	1.9	5.7	5.7	0.7	4.7	4.8
Cycle Q Clear(g_c), s	2.3	0.0	0.0	0.3	0.0	0.0	1.9	5.7	5.7	0.7	4.7	4.8
Prop In Lane	0.34		0.66	0.31		0.50	1.00		0.04	1.00		0.22
Lane Grp Cap(c), veh/h	486	0	0	492	0	0	122	605	632	54	537	543
V/C Ratio(X)	0.26	0.00	0.00	0.03	0.00	0.00	0.78	0.56	0.56	0.59	0.51	0.52
Avail Cap(c_a), veh/h	1328	0	0	1343	0	0	708	2018	2109	223	1529	1546
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	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.8	0.0	0.0	11.0	0.0	0.0	16.8	9.9	9.9	17.6	10.6	10.6
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.0	0.0	0.0	10.0	0.8	0.8	9.9	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.1	0.0	0.0	1.0	1.7	1.8	0.4	1.5	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.1	0.0	0.0	11.0	0.0	0.0	26.8	10.7	10.6	27.5	11.4	11.4
LnGrp LOS	B	A	A	B	A	A	C	B	B	C	B	B
Approach Vol, veh/h		125			16			787			589	
Approach Delay, s/veh		12.1			11.0			12.6			12.2	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.5	17.9		13.3	6.9	16.5		13.3				
Change Period (Y+Rc), s	4.4	* 5.4		4.9	4.4	5.4		4.9				
Max Green Setting (Gmax), s	4.6	* 42		29.1	14.6	31.6		29.1				
Max Q Clear Time (g_c+I1), s	2.7	7.7		4.3	3.9	6.8		2.3				
Green Ext Time (p_c), s	0.0	4.8		0.7	0.1	3.5		0.0				

Intersection Summary			
HCM 6th Ctrl Delay			12.4
HCM 6th LOS			B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	137	698	70	41	429	82	253	37	42	101	32	45
Future Volume (veh/h)	137	698	70	41	429	82	253	37	42	101	32	45
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	0.99		0.98	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	146	743	74	44	456	87	269	39	45	107	34	48
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	192	1108	110	64	796	151	446	58	57	616	242	342
Arrive On Green	0.11	0.34	0.34	0.04	0.27	0.27	0.35	0.35	0.35	0.35	0.35	0.35
Sat Flow, veh/h	1781	3255	324	1781	2967	562	951	168	164	1308	698	986
Grp Volume(v), veh/h	146	405	412	44	272	271	353	0	0	107	0	82
Grp Sat Flow(s),veh/h/ln	1781	1777	1802	1781	1777	1752	1283	0	0	1308	0	1684
Q Serve(g_s), s	4.3	10.6	10.6	1.3	7.2	7.3	12.2	0.0	0.0	0.0	0.0	1.8
Cycle Q Clear(g_c), s	4.3	10.6	10.6	1.3	7.2	7.3	14.0	0.0	0.0	2.9	0.0	1.8
Prop In Lane	1.00		0.18	1.00		0.32	0.76		0.13	1.00		0.59
Lane Grp Cap(c), veh/h	192	605	614	64	477	470	562	0	0	616	0	584
V/C Ratio(X)	0.76	0.67	0.67	0.69	0.57	0.58	0.63	0.00	0.00	0.17	0.00	0.14
Avail Cap(c_a), veh/h	542	1424	1444	134	1010	996	774	0	0	817	0	843
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	23.7	15.4	15.4	26.0	17.2	17.3	16.8	0.0	0.0	12.6	0.0	12.2
Incr Delay (d2), s/veh	6.1	1.3	1.3	12.6	1.1	1.1	1.2	0.0	0.0	0.1	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.0	3.9	4.0	0.8	2.8	2.8	3.7	0.0	0.0	0.8	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.8	16.7	16.7	38.6	18.3	18.4	17.9	0.0	0.0	12.7	0.0	12.3
LnGrp LOS	C	B	B	D	B	B	B	A	A	B	A	B
Approach Vol, veh/h		963			587			353			189	
Approach Delay, s/veh		18.6			19.9			17.9			12.5	
Approach LOS		B			B			B			B	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.3	24.4		23.8	10.3	20.4		23.8				
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9				
Max Green Setting (Gmax), s	4.1	* 44		27.3	16.6	31.0		27.3				
Max Q Clear Time (g_c+I1), s	3.3	12.6		4.9	6.3	9.3		16.0				
Green Ext Time (p_c), s	0.0	5.9		0.7	0.3	3.3		1.7				

Intersection Summary			
HCM 6th Ctrl Delay			18.3
HCM 6th LOS			B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

10: Rancho Penasquitos Blvd & SR 56 WB Ramps & Carmel Mountain Rd Near-Term+Project PM
HCM 6th Signalized Intersection Summary 11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	229	164	105	323	228	244	278	693	462	359	588	12
Future Volume (veh/h)	229	164	105	323	228	244	278	693	462	359	588	12
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		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	236	169	108	333	235	252	287	714	476	370	606	12
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	283	291	176	388	313	460	311	1771	788	426	2283	705
Arrive On Green	0.08	0.14	0.14	0.11	0.17	0.17	0.17	0.50	0.50	0.12	0.45	0.45
Sat Flow, veh/h	3456	2126	1286	3456	1870	1582	1781	3554	1580	3456	5106	1576
Grp Volume(v), veh/h	236	140	137	333	235	252	287	714	476	370	606	12
Grp Sat Flow(s),veh/h/ln	1728	1777	1636	1728	1870	1582	1781	1777	1580	1728	1702	1576
Q Serve(g_s), s	10.1	11.0	11.9	14.2	18.0	20.2	23.8	18.9	32.4	15.8	11.2	0.6
Cycle Q Clear(g_c), s	10.1	11.0	11.9	14.2	18.0	20.2	23.8	18.9	32.4	15.8	11.2	0.6
Prop In Lane	1.00		0.79	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	283	243	224	388	313	460	311	1771	788	426	2283	705
V/C Ratio(X)	0.83	0.57	0.61	0.86	0.75	0.55	0.92	0.40	0.60	0.87	0.27	0.02
Avail Cap(c_a), veh/h	341	419	386	514	524	638	366	1771	788	546	2283	705
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.79	0.79	0.79	0.11	0.11	0.11	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.8	60.6	61.0	65.4	59.5	44.9	60.9	23.6	27.0	64.6	26.0	23.1
Incr Delay (d2), s/veh	13.8	2.1	2.7	8.8	2.9	0.8	4.5	0.1	0.4	11.6	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	5.2	5.1	6.8	8.8	8.1	11.2	8.1	12.3	7.7	4.7	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	81.7	62.8	63.7	74.2	62.4	45.7	65.4	23.7	27.4	76.2	26.3	23.2
LnGrp LOS	F	E	E	E	E	D	E	C	C	E	C	C
Approach Vol, veh/h		513			820			1477			988	
Approach Delay, s/veh		71.7			62.1			33.0			45.0	
Approach LOS		E			E			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	30.4	72.6	16.5	30.6	22.7	80.3	21.0	26.0
Change Period (Y+Rc), s	* 4.2	5.5	* 4.2	5.5	* 4.2	5.5	* 4.2	* 5.5
Max Green Setting (Gmax), s	* 31	43.0	* 15	42.0	* 24	50.1	* 22	* 35
Max Q Clear Time (g_c+I1), s	25.8	13.2	12.1	22.2	17.8	34.4	16.2	13.9
Green Ext Time (p_c), s	0.4	4.6	0.2	2.2	0.7	6.2	0.6	1.6

Intersection Summary	
HCM 6th Ctrl Delay	47.6
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

11: Rancho Penasquitos Blvd & SR 56 EB Ramps/Azuaga St Near-Term+Project PM
HCM 6th Signalized Intersection Summary 11/26/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	433	47	679	43	21	64	15	1045	57	105	712	199
Future Volume (veh/h)	433	47	679	43	21	64	15	1045	57	105	712	199
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		0.99	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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	451	49	636	45	22	67	16	1089	59	109	742	207
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	547	59	537	153	35	106	77	1110	60	155	1305	1117
Arrive On Green	0.34	0.34	0.34	0.09	0.09	0.09	0.04	0.32	0.32	0.09	0.37	0.37
Sat Flow, veh/h	1614	175	1584	1781	406	1237	1781	3427	186	1781	3554	1579
Grp Volume(v), veh/h	500	0	636	45	0	89	16	565	583	109	742	207
Grp Sat Flow(s),veh/h/ln	1790	0	1584	1781	0	1643	1781	1777	1835	1781	1777	1579
Q Serve(g_s), s	29.5	0.0	39.0	2.7	0.0	6.0	1.0	36.2	36.2	6.8	19.2	5.1
Cycle Q Clear(g_c), s	29.5	0.0	39.0	2.7	0.0	6.0	1.0	36.2	36.2	6.8	19.2	5.1
Prop In Lane	0.90		1.00	1.00		0.75	1.00		0.10	1.00		1.00
Lane Grp Cap(c), veh/h	607	0	537	153	0	141	77	575	594	155	1305	1117
V/C Ratio(X)	0.82	0.00	1.18	0.29	0.00	0.63	0.21	0.98	0.98	0.70	0.57	0.19
Avail Cap(c_a), veh/h	607	0	537	161	0	149	77	575	594	160	1305	1117
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	1.00	0.89	0.89	0.89
Uniform Delay (d), s/veh	34.8	0.0	38.0	49.3	0.0	50.8	53.1	38.5	38.5	51.1	29.1	5.7
Incr Delay (d2), s/veh	9.0	0.0	100.6	1.1	0.0	7.8	1.3	33.2	32.7	11.4	1.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.2	0.0	29.8	1.3	0.0	2.8	0.5	20.8	21.4	3.5	8.4	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.9	0.0	138.6	50.4	0.0	58.6	54.4	71.7	71.3	62.4	30.7	6.0
LnGrp LOS	D	A	F	D	A	E	D	E	E	E	C	A
Approach Vol, veh/h		1136			134			1164			1058	
Approach Delay, s/veh		96.9			55.8			71.2			29.1	
Approach LOS		F			E			E			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.2	47.7		14.5	14.2	42.7		43.6
Change Period (Y+Rc), s	* 4.2	5.5		4.6	* 4.2	5.5		4.6
Max Green Setting (Gmax), s	* 5	41.7		10.4	* 10	36.4		39.0
Max Q Clear Time (g_c+I1), s	3.0	21.2		8.0	8.8	38.2		41.0
Green Ext Time (p_c), s	0.0	6.0		0.1	0.0	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	66.3
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX J

HORIZON YEAR 2050 WITHOUT PROJECT R
INTERSECTION ANALYSIS WORKSHEETS

1: Rancho Carmel Dr & Carmel Mountain Rd — Year 2050 AM
HCM 6th Signalized Intersection Summary — 11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	940	850	120	180	810	40	270	290	100	110	90	260
Future Volume (veh/h)	940	850	120	180	810	40	270	290	100	110	90	260
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		0.99	1.00		0.98	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1056	955	135	202	910	45	303	326	112	124	101	292
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1033	2011	283	257	1097	54	325	707	238	128	576	446
Arrive On Green	0.30	0.44	0.44	0.07	0.22	0.22	0.18	0.27	0.27	0.07	0.16	0.16
Sat Flow, veh/h	3456	4520	637	3456	4982	246	1781	2594	874	1781	3554	2754
Grp Volume(v), veh/h	1056	718	372	202	621	334	303	221	217	124	101	292
Grp Sat Flow(s),veh/h/ln	1728	1702	1753	1728	1702	1824	1781	1777	1691	1781	1777	1377
Q Serve(g_s), s	39.5	19.6	19.7	7.6	23.0	23.1	22.1	13.7	14.1	9.2	3.2	13.1
Cycle Q Clear(g_c), s	39.5	19.6	19.7	7.6	23.0	23.1	22.1	13.7	14.1	9.2	3.2	13.1
Prop In Lane	1.00		0.36	1.00		0.13	1.00		0.52	1.00		1.00
Lane Grp Cap(c), veh/h	1033	1515	780	257	750	402	325	484	461	128	576	446
V/C Ratio(X)	1.02	0.47	0.48	0.79	0.83	0.83	0.93	0.46	0.47	0.97	0.18	0.65
Avail Cap(c_a), veh/h	1033	1515	780	356	825	442	325	484	461	128	576	446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.3	25.8	25.8	60.1	49.1	49.2	53.2	39.9	40.1	61.1	47.7	51.9
Incr Delay (d2), s/veh	33.6	0.2	0.5	7.7	6.6	11.8	32.8	3.1	3.4	69.3	0.7	7.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.6	8.0	8.3	3.6	10.4	11.8	12.9	6.4	6.4	6.6	1.5	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.9	26.0	26.3	67.8	55.7	60.9	86.0	43.0	43.5	130.5	48.4	59.2
LnGrp LOS	F	C	C	E	E	E	F	D	D	F	D	E
Approach Vol, veh/h		2146			1157			741			517	
Approach Delay, s/veh		52.6			59.3			60.7			74.2	
Approach LOS		D			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	40.5	14.3	63.3	28.6	25.9	44.0	33.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	36.0	13.6	57.9	24.1	21.4	39.5	32.0
Max Q Clear Time (g_c+I1), s	11.2	16.1	9.6	21.7	24.1	15.1	41.5	25.1
Green Ext Time (p_c), s	0.0	2.6	0.2	9.2	0.0	1.0	0.0	3.4

Intersection Summary	
HCM 6th Ctrl Delay	58.1
HCM 6th LOS	E

2: I-15 NB Ramp & Carmel Mountain Rd — Year 2050 AM
HCM 6th Signalized Intersection Summary — 11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	400	760	0	0	980	360	240	10	1190	0	0	0
Future Volume (veh/h)	400	760	0	0	980	360	240	10	1190	0	0	0
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			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	426	809	0	0	1043	383	263	0	1266			
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	2043	4885	0	0	1023	456	1385	0	1233			
Arrive On Green	0.20	0.32	0.00	0.00	0.29	0.29	0.39	0.00	0.39			
Sat Flow, veh/h	3456	5274	0	0	3647	1583	3563	0	3170			
Grp Volume(v), veh/h	426	809	0	0	1043	383	263	0	1266			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1777	1583	1781	0	1585			
Q Serve(g_s), s	9.3	10.3	0.0	0.0	25.9	20.5	4.4	0.0	35.0			
Cycle Q Clear(g_c), s	9.3	10.3	0.0	0.0	25.9	20.5	4.4	0.0	35.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	2043	4885	0	0	1023	456	1385	0	1233			
V/C Ratio(X)	0.21	0.17	0.00	0.00	1.02	0.84	0.19	0.00	1.03			
Avail Cap(c_a), veh/h	2043	4885	0	0	1023	456	1385	0	1233			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.54	0.54	0.00	0.00	0.54	0.54	1.00	0.00	1.00			
Uniform Delay (d), s/veh	18.6	4.9	0.0	0.0	32.0	30.1	18.1	0.0	27.5			
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	25.8	9.9	0.1	0.0	32.7			
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	4.1	0.0	0.0	0.0	14.4	8.8	1.8	0.0	18.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.6	4.9	0.0	0.0	57.9	40.0	18.2	0.0	60.2			
LnGrp LOS	B	A	A	A	F	D	B	A	F			
Approach Vol, veh/h		1235			1426			1529				
Approach Delay, s/veh		9.6			53.1			53.0				
Approach LOS		A			D			D				

Timer - Assigned Phs	2	5	6	8
Phs Duration (G+Y+Rc), s	94.4	61.5	32.9	41.1
Change Period (Y+Rc), s	7.0	7.0	* 7	6.1
Max Green Setting (Gmax), s	41.9	10.3	* 26	35.0
Max Q Clear Time (g_c+I1), s	12.3	11.3	27.9	37.0
Green Ext Time (p_c), s	6.4	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	40.2
HCM 6th LOS	D

Notes
User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

3: I-15 SB Ramp & Carmel Mountain Rd
HCM 6th Signalized Intersection Summary

Year 2050 AM
11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	850	610	670	550	0	0	0	0	310	0	320
Future Volume (veh/h)	0	850	610	670	550	0	0	0	0	310	0	320
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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	895	642	705	579	0				433	0	223
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1452	648	699	2396	0				642	0	286
Arrive On Green	0.00	0.41	0.41	0.34	1.00	0.00				0.18	0.00	0.18
Sat Flow, veh/h	0	3647	1585	3456	3647	0				3563	0	1585
Grp Volume(v), veh/h	0	895	642	705	579	0				433	0	223
Grp Sat Flow(s),veh/h/ln	0	1777	1585	1728	1777	0				1781	0	1585
Q Serve(g_s), s	0.0	17.9	36.2	18.2	0.0	0.0				10.2	0.0	12.1
Cycle Q Clear(g_c), s	0.0	17.9	36.2	18.2	0.0	0.0				10.2	0.0	12.1
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1452	648	699	2396	0				642	0	286
V/C Ratio(X)	0.00	0.62	0.99	1.01	0.24	0.00				0.67	0.00	0.78
Avail Cap(c_a), veh/h	0	1452	648	699	2396	0				1148	0	511
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.25	0.25	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	21.0	26.5	29.8	0.0	0.0				34.4	0.0	35.2
Incr Delay (d2), s/veh	0.0	2.0	33.3	19.2	0.1	0.0				1.2	0.0	4.6
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	7.5	18.8	8.0	0.0	0.0				4.4	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	23.0	59.7	49.0	0.1	0.0				35.7	0.0	39.8
LnGrp LOS	A	C	E	F	A	A				D	A	D
Approach Vol, veh/h		1537			1284						656	
Approach Delay, s/veh		38.3			26.9						37.1	
Approach LOS		D			C						D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	23.9	43.8		22.3		67.7
Change Period (Y+Rc), s	5.7	7.0		6.1		7.0
Max Green Setting (Gmax), s	18.3	24.0		29.0		47.9
Max Q Clear Time (g_c+I1), s	20.2	38.2		14.1		2.0
Green Ext Time (p_c), s	0.0	0.0		2.1		4.5

Intersection Summary	
HCM 6th Ctrl Delay	33.9
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

5: Carmel Mountain Rd & Penasquitos Dr
HCM 6th Signalized Intersection Summary

Year 2050 AM
11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	720	50	190	20	20	90	130	660	30	100	510	270
Future Volume (veh/h)	720	50	190	20	20	90	130	660	30	100	510	270
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		0.99	1.00		0.99	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	779	0	196	21	21	93	134	680	31	103	526	278
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1000	0	443	150	157	131	169	1298	59	133	850	820
Arrive On Green	0.28	0.00	0.28	0.08	0.08	0.08	0.10	0.26	0.26	0.07	0.24	0.24
Sat Flow, veh/h	3563	0	1578	1781	1870	1562	1781	5004	227	1781	3554	1568
Grp Volume(v), veh/h	779	0	196	21	21	93	134	462	249	103	526	278
Grp Sat Flow(s),veh/h/ln	1781	0	1578	1781	1870	1562	1781	1702	1827	1781	1777	1568
Q Serve(g_s), s	13.8	0.0	7.0	0.7	0.7	4.0	5.0	8.0	8.0	3.9	9.1	7.1
Cycle Q Clear(g_c), s	13.8	0.0	7.0	0.7	0.7	4.0	5.0	8.0	8.0	3.9	9.1	7.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	1000	0	443	150	157	131	169	883	474	133	850	820
V/C Ratio(X)	0.78	0.00	0.44	0.14	0.13	0.71	0.79	0.52	0.53	0.77	0.62	0.34
Avail Cap(c_a), veh/h	1441	0	638	416	437	365	203	1287	691	268	1448	1084
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	22.7	0.0	20.2	29.1	29.0	30.5	30.3	21.7	21.7	31.1	23.3	9.6
Incr Delay (d2), s/veh	1.7	0.0	0.7	0.4	0.4	6.8	16.1	0.5	0.9	9.1	0.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	0.0	2.5	0.3	0.3	1.7	2.8	3.1	3.4	1.9	3.7	4.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.4	0.0	20.9	29.5	29.4	37.3	46.4	22.2	22.7	40.2	24.0	9.8
LnGrp LOS	C	A	C	C	C	D	D	C	C	D	C	A
Approach Vol, veh/h		975			135			845			907	
Approach Delay, s/veh		23.7			34.9			26.2			21.5	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.5	23.8		24.5	10.9	22.4		10.7
Change Period (Y+Rc), s	4.4	* 6		5.3	4.4	6.0		4.9
Max Green Setting (Gmax), s	10.3	* 26		27.7	7.8	27.9		16.0
Max Q Clear Time (g_c+I1), s	5.9	10.0		15.8	7.0	11.1		6.0
Green Ext Time (p_c), s	0.1	4.2		3.1	0.0	4.2		0.3

Intersection Summary	
HCM 6th Ctrl Delay	24.3
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	6.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	1	90	20	0	10	50	340	10	1	790	30
Future Vol, veh/h	40	1	90	20	0	10	50	340	10	1	790	30
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	43	1	98	22	0	11	54	370	11	1	859	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1371	1371	880	1411	1382	376	896	0	0	381	0	0
Stage 1	882	882	-	484	484	-	-	-	-	-	-	-
Stage 2	489	489	-	927	898	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	123	146	346	116	144	670	757	-	-	1177	-	-
Stage 1	341	364	-	564	552	-	-	-	-	-	-	-
Stage 2	561	549	-	322	358	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	114	135	345	78	133	670	754	-	-	1177	-	-
Mov Cap-2 Maneuver	114	135	-	78	133	-	-	-	-	-	-	-
Stage 1	315	363	-	523	512	-	-	-	-	-	-	-
Stage 2	512	509	-	230	357	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	51	50.4	1.3	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	754	-	-	212	111	1177	-	-
HCM Lane V/C Ratio	0.072	-	-	0.672	0.294	0.001	-	-
HCM Control Delay (s)	10.1	-	-	51	50.4	8.1	-	-
HCM Lane LOS	B	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	4.2	1.1	0	-	-

Intersection	
Int Delay, s/veh	1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	40	0	0	0	10	370	0	0	770	1
Future Vol, veh/h	10	0	40	0	0	0	10	370	0	0	770	1
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	65	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	0	43	0	0	0	11	402	0	0	837	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1266	1266	842	1283	1266	402	842	0	0	402	0	0
Stage 1	842	842	-	424	424	-	-	-	-	-	-	-
Stage 2	424	424	-	859	842	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	146	169	364	142	169	648	794	-	-	1157	-	-
Stage 1	359	380	-	608	587	-	-	-	-	-	-	-
Stage 2	608	587	-	351	380	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	144	166	363	124	166	648	791	-	-	1157	-	-
Mov Cap-2 Maneuver	144	166	-	124	166	-	-	-	-	-	-	-
Stage 1	353	379	-	599	579	-	-	-	-	-	-	-
Stage 2	600	579	-	309	379	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.1	0	0.3	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	791	-	-	278	-	1157	-	-
HCM Lane V/C Ratio	0.014	-	-	0.195	-	-	-	-
HCM Control Delay (s)	9.6	-	-	21.1	0	0	-	-
HCM Lane LOS	A	-	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	-	0	-	-

8: Carmel Mountain Rd & Cuca St/Caminata Deluz

Year 2050 AM

HCM 6th Signalized Intersection Summary

11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	0	170	20	0	20	140	550	10	20	690	70
Future Volume (veh/h)	110	0	170	20	0	20	140	550	10	20	690	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.97	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	116	0	179	21	0	21	147	579	11	21	726	74
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	233	31	257	274	33	202	193	1490	28	36	1073	109
Arrive On Green	0.28	0.00	0.28	0.28	0.00	0.28	0.11	0.42	0.42	0.02	0.33	0.33
Sat Flow, veh/h	487	110	921	608	117	725	1781	3565	68	1781	3253	331
Grp Volume(v), veh/h	295	0	0	42	0	0	147	288	302	21	396	404
Grp Sat Flow(s),veh/h/ln	1518	0	0	1450	0	0	1781	1777	1856	1781	1777	1808
Q Serve(g_s), s	6.5	0.0	0.0	0.0	0.0	0.0	4.2	5.9	5.9	0.6	10.0	10.0
Cycle Q Clear(g_c), s	8.9	0.0	0.0	0.9	0.0	0.0	4.2	5.9	5.9	0.6	10.0	10.0
Prop In Lane	0.39		0.61	0.50		0.50	1.00		0.04	1.00		0.18
Lane Grp Cap(c), veh/h	520	0	0	509	0	0	193	743	776	36	586	596
V/C Ratio(X)	0.57	0.00	0.00	0.08	0.00	0.00	0.76	0.39	0.39	0.59	0.68	0.68
Avail Cap(c_a), veh/h	937	0	0	890	0	0	500	1425	1488	158	1080	1099
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	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.6	0.0	0.0	13.8	0.0	0.0	22.5	10.5	10.5	25.3	15.0	15.0
Incr Delay (d2), s/veh	1.0	0.0	0.0	0.1	0.0	0.0	6.1	0.3	0.3	14.2	1.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.0	0.0	0.3	0.0	0.0	1.9	2.0	2.1	0.4	3.7	3.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.6	0.0	0.0	13.9	0.0	0.0	28.7	10.8	10.8	39.5	16.4	16.4
LnGrp LOS	B	A	A	B	A	A	C	B	B	D	B	B
Approach Vol, veh/h		295			42			737			821	
Approach Delay, s/veh		17.6			13.9			14.4			17.0	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.4	27.1		19.4	10.0	22.5		19.4				
Change Period (Y+Rc), s	4.4	* 5.4		4.9	4.4	5.4		4.9				
Max Green Setting (Gmax), s	4.6	* 42		29.1	14.6	31.6		29.1				
Max Q Clear Time (g_c+I1), s	2.6	7.9		10.9	6.2	12.0		2.9				
Green Ext Time (p_c), s	0.0	3.9		1.7	0.2	5.1		0.2				

Intersection Summary	
HCM 6th Ctrl Delay	16.0
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

9: Comm Dwy/Paseo Cardiel & Carmel Mountain Rd

Year 2050 AM

HCM 6th Signalized Intersection Summary

11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	560	30	20	640	250	120	40	10	160	20	120
Future Volume (veh/h)	170	560	30	20	640	250	120	40	10	160	20	120
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	200	659	35	24	753	294	141	47	12	188	24	141
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	249	1704	90	38	944	368	254	76	15	448	60	352
Arrive On Green	0.14	0.50	0.50	0.02	0.38	0.38	0.25	0.25	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1781	3432	182	1781	2496	974	635	298	60	1343	236	1384
Grp Volume(v), veh/h	200	341	353	24	536	511	200	0	0	188	0	165
Grp Sat Flow(s),veh/h/ln	1781	1777	1837	1781	1777	1693	992	0	0	1343	0	1619
Q Serve(g_s), s	7.2	7.9	8.0	0.9	17.8	17.9	8.3	0.0	0.0	0.0	0.0	5.6
Cycle Q Clear(g_c), s	7.2	7.9	8.0	0.9	17.8	17.9	13.9	0.0	0.0	8.2	0.0	5.6
Prop In Lane	1.00		0.10	1.00		0.58	0.70		0.06	1.00		0.85
Lane Grp Cap(c), veh/h	249	882	912	38	672	640	345	0	0	448	0	412
V/C Ratio(X)	0.80	0.39	0.39	0.63	0.80	0.80	0.58	0.00	0.00	0.42	0.00	0.40
Avail Cap(c_a), veh/h	445	1169	1209	110	829	790	556	0	0	657	0	665
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.7	10.4	10.4	32.2	18.4	18.4	25.2	0.0	0.0	21.5	0.0	20.5
Incr Delay (d2), s/veh	5.9	0.3	0.3	15.5	4.5	4.7	1.5	0.0	0.0	0.6	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	2.8	2.9	0.5	7.4	7.1	3.0	0.0	0.0	2.5	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.6	10.7	10.7	47.7	22.9	23.1	26.8	0.0	0.0	22.1	0.0	21.2
LnGrp LOS	C	B	B	D	C	C	C	A	A	C	A	C
Approach Vol, veh/h		894			1071			200			353	
Approach Delay, s/veh		15.8			23.6			26.8			21.7	
Approach LOS		B			C			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.8	38.8		21.8	13.7	30.9		21.8				
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9				
Max Green Setting (Gmax), s	4.1	* 44		27.3	16.6	31.0		27.3				
Max Q Clear Time (g_c+I1), s	2.9	10.0		10.2	9.2	19.9		15.9				
Green Ext Time (p_c), s	0.0	4.8		1.4	0.3	5.3		0.9				

Intersection Summary	
HCM 6th Ctrl Delay	20.8
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	320	120	60	280	320	320	430	780	320	430	1240	90
Future Volume (veh/h)	320	120	60	280	320	320	430	780	320	430	1240	90
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		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	368	138	69	322	368	368	494	897	368	494	1425	103
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	297	471	224	370	417	592	390	1461	650	521	1752	541
Arrive On Green	0.09	0.20	0.20	0.11	0.22	0.22	0.22	0.41	0.41	0.15	0.34	0.34
Sat Flow, veh/h	3456	2337	1110	3456	1870	1585	1781	3554	1580	3456	5106	1576
Grp Volume(v), veh/h	368	103	104	322	368	368	494	897	368	494	1425	103
Grp Sat Flow(s),veh/h/ln	1728	1777	1671	1728	1870	1585	1781	1777	1580	1728	1702	1576
Q Serve(g_s), s	12.9	7.4	7.9	13.8	28.6	28.4	32.8	29.8	26.8	21.2	38.1	6.9
Cycle Q Clear(g_c), s	12.9	7.4	7.9	13.8	28.6	28.4	32.8	29.8	26.8	21.2	38.1	6.9
Prop In Lane	1.00		0.66	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	297	358	337	370	417	592	390	1461	650	521	1752	541
V/C Ratio(X)	1.24	0.29	0.31	0.87	0.88	0.62	1.27	0.61	0.57	0.95	0.81	0.19
Avail Cap(c_a), veh/h	297	443	417	424	524	683	390	1461	650	521	1752	541
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.51	0.51	0.51	0.22	0.22	0.22	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.6	50.7	51.0	65.9	56.4	38.3	58.6	34.8	33.9	63.1	44.9	34.6
Incr Delay (d2), s/veh	132.7	0.4	0.5	8.9	7.7	0.7	125.3	0.4	0.8	27.1	4.3	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.2	3.4	3.4	6.6	14.4	11.2	28.3	13.1	10.5	11.3	16.8	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	201.2	51.2	51.5	74.9	64.1	39.0	183.9	35.2	34.7	90.2	49.1	35.4
LnGrp LOS	F	D	D	E	E	D	F	D	C	F	D	D
Approach Vol, veh/h		575			1058			1759			2022	
Approach Delay, s/veh		147.3			58.7			76.9			58.5	
Approach LOS		F			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	37.0	57.0	17.1	38.9	26.8	67.2	20.3	35.8
Change Period (Y+Rc), s	4.2	5.5	* 4.2	5.5	* 4.2	5.5	* 4.2	* 5.5
Max Green Setting (Gmax), s	33.1	42.9	* 13	42.0	* 23	53.1	* 18	* 37
Max Q Clear Time (g_c+I1), s	34.8	40.1	14.9	30.6	23.2	31.8	15.8	9.9
Green Ext Time (p_c), s	0.0	2.2	0.0	2.9	0.0	8.1	0.3	1.2

Intersection Summary	
HCM 6th Ctrl Delay	73.9
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	190	10	390	90	60	110	80	1330	20	50	1020	510
Future Volume (veh/h)	190	10	390	90	60	110	80	1330	20	50	1020	510
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	207	11	382	98	65	120	87	1446	22	54	1109	554
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	450	24	420	155	51	94	102	1421	22	155	1514	1096
Arrive On Green	0.27	0.27	0.27	0.09	0.09	0.09	0.06	0.40	0.40	0.09	0.43	0.43
Sat Flow, veh/h	1695	90	1585	1781	588	1086	1781	3583	54	1781	3554	1585
Grp Volume(v), veh/h	218	0	382	98	0	185	87	717	751	54	1109	554
Grp Sat Flow(s),veh/h/ln	1786	0	1585	1781	0	1675	1781	1777	1861	1781	1777	1585
Q Serve(g_s), s	11.8	0.0	26.8	6.1	0.0	10.0	5.6	45.6	45.6	3.3	29.9	19.1
Cycle Q Clear(g_c), s	11.8	0.0	26.8	6.1	0.0	10.0	5.6	45.6	45.6	3.3	29.9	19.1
Prop In Lane	0.95		1.00	1.00		0.65	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	473	0	420	155	0	146	102	705	738	155	1514	1096
V/C Ratio(X)	0.46	0.00	0.91	0.63	0.00	1.27	0.85	1.02	1.02	0.35	0.73	0.51
Avail Cap(c_a), veh/h	559	0	496	155	0	146	102	705	738	155	1514	1096
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	1.00	0.21	0.21	0.21
Uniform Delay (d), s/veh	35.4	0.0	40.9	50.7	0.0	52.5	53.7	34.7	34.7	49.4	27.5	8.4
Incr Delay (d2), s/veh	0.7	0.0	18.7	8.1	0.0	164.6	45.8	38.2	37.8	0.3	0.7	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.2	0.0	12.5	3.1	0.0	10.8	3.8	26.6	27.8	1.5	12.6	13.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.1	0.0	59.7	58.8	0.0	217.1	99.5	72.9	72.5	49.7	28.2	8.8
LnGrp LOS	D	A	E	E	A	F	F	F	F	D	C	A
Approach Vol, veh/h		600			283			1555			1717	
Approach Delay, s/veh		51.1			162.3			74.2			22.6	
Approach LOS		D			F			E			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.8	54.5		14.6	14.2	51.1		35.1
Change Period (Y+Rc), s	4.2	5.5		4.6	* 4.2	5.5		4.6
Max Green Setting (Gmax), s	6.6	43.5		10.0	* 10	40.1		36.0
Max Q Clear Time (g_c+I1), s	7.6	31.9		12.0	5.3	47.6		28.8
Green Ext Time (p_c), s	0.0	7.4		0.0	0.0	0.0		1.7

Intersection Summary	
HCM 6th Ctrl Delay	55.5
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

1: Rancho Carmel Dr & Carmel Mountain Rd — Year 2050 PM
HCM 6th Signalized Intersection Summary — 11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	580	1290	180	310	1160	60	160	190	270	160	420	1030
Future Volume (veh/h)	580	1290	180	310	1160	60	160	190	270	160	420	1030
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		0.99	1.00		0.98	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	592	1316	184	316	1184	61	163	194	276	163	429	999
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	628	1546	216	356	1307	67	187	533	464	187	1066	827
Arrive On Green	0.18	0.34	0.34	0.10	0.26	0.26	0.10	0.30	0.30	0.10	0.30	0.30
Sat Flow, veh/h	3456	4525	633	3456	4971	256	1781	1777	1548	1781	3554	2759
Grp Volume(v), veh/h	592	990	510	316	811	434	163	194	276	163	429	999
Grp Sat Flow(s),veh/h/ln	1728	1702	1753	1728	1702	1823	1781	1777	1548	1781	1777	1379
Q Serve(g_s), s	20.2	32.2	32.2	10.8	27.5	27.5	10.8	10.2	18.1	10.8	11.5	35.8
Cycle Q Clear(g_c), s	20.2	32.2	32.2	10.8	27.5	27.5	10.8	10.2	18.1	10.8	11.5	35.8
Prop In Lane	1.00		0.36	1.00		0.14	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	628	1163	599	356	895	479	187	533	464	187	1066	827
V/C Ratio(X)	0.94	0.85	0.85	0.89	0.91	0.91	0.87	0.36	0.59	0.87	0.40	1.21
Avail Cap(c_a), veh/h	628	1180	608	356	912	489	187	533	464	187	1066	827
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.2	36.5	36.5	52.9	42.6	42.6	52.7	32.8	35.6	52.7	33.3	41.8
Incr Delay (d2), s/veh	22.7	6.1	11.0	22.7	12.4	20.3	33.7	0.4	2.1	33.7	0.2	104.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.6	14.2	15.4	5.8	13.0	15.0	6.6	4.5	7.1	6.6	5.0	24.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	71.0	42.6	47.5	75.6	54.9	62.9	86.4	33.3	37.7	86.4	33.5	146.5
LnGrp LOS	E	D	D	E	D	E	F	C	D	F	C	F
Approach Vol, veh/h		2092			1561			633			1591	
Approach Delay, s/veh		51.8			61.3			48.9			109.9	
Approach LOS		D			E			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	40.3	16.8	45.3	17.0	40.3	26.2	35.9
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	35.8	12.3	41.4	12.5	35.8	21.7	32.0
Max Q Clear Time (g_c+I1), s	12.8	20.1	12.8	34.2	12.8	37.8	22.2	29.5
Green Ext Time (p_c), s	0.0	2.7	0.0	5.1	0.0	0.0	0.0	1.7

Intersection Summary	
HCM 6th Ctrl Delay	69.7
HCM 6th LOS	E

2: I-15 NB Ramp & Carmel Mountain Rd — Year 2050 PM
HCM 6th Signalized Intersection Summary — 11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	300	1130	0	0	1730	650	480	10	970	0	0	0
Future Volume (veh/h)	300	1130	0	0	1730	650	480	10	970	0	0	0
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		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	309	1165	0	0	1784	670	502	0	1000			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	824	3894	0	0	1655	738	1039	0	913			
Arrive On Green	0.48	1.00	0.00	0.00	0.47	0.47	0.29	0.00	0.29			
Sat Flow, veh/h	3456	5274	0	0	3647	1585	3563	0	3130			
Grp Volume(v), veh/h	309	1165	0	0	1784	670	502	0	1000			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1777	1585	1781	0	1565			
Q Serve(g_s), s	6.8	0.0	0.0	0.0	55.9	46.9	13.9	0.0	35.0			
Cycle Q Clear(g_c), s	6.8	0.0	0.0	0.0	55.9	46.9	13.9	0.0	35.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	824	3894	0	0	1655	738	1039	0	913			
V/C Ratio(X)	0.37	0.30	0.00	0.00	1.08	0.91	0.48	0.00	1.10			
Avail Cap(c_a), veh/h	824	3894	0	0	1655	738	1039	0	913			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.36	0.36	0.00	0.00	0.34	0.34	1.00	0.00	1.00			
Uniform Delay (d), s/veh	25.7	0.0	0.0	0.0	32.0	29.7	35.0	0.0	42.5			
Incr Delay (d2), s/veh	0.1	0.1	0.0	0.0	39.5	7.0	0.3	0.0	59.4			
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	2.6	0.0	0.0	0.0	32.2	18.7	6.1	0.0	20.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.8	0.1	0.0	0.0	71.5	36.6	35.4	0.0	101.9			
LnGrp LOS	C	A	A	A	F	D	D	A	F			
Approach Vol, veh/h		1474			2454			1502				
Approach Delay, s/veh		5.5			62.0			79.6				
Approach LOS		A			E			E				

Timer - Assigned Phs	2	5	6	8
Phs Duration (G+Y+Rc), s	98.5	35.6	62.9	41.1
Change Period (Y+Rc), s	7.0	7.0	* 7	6.1
Max Green Setting (Gmax), s	71.9	10.3	* 56	35.0
Max Q Clear Time (g_c+I1), s	2.0	8.8	57.9	37.0
Green Ext Time (p_c), s	11.8	0.2	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	51.5
HCM 6th LOS	D

Notes
User approved volume balancing among the lanes for turning movement.
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	850	280	1060	1150	0	0	0	0	580	10	410
Future Volume (veh/h)	0	850	280	1060	1150	0	0	0	0	580	10	410
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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	867	286	1082	1173	0				726	0	282
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98				0.98	0.98	0.98
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	974	434	1148	2362	0				806	0	358
Arrive On Green	0.00	0.27	0.27	0.66	1.00	0.00				0.23	0.00	0.23
Sat Flow, veh/h	0	3647	1583	3456	3647	0				3563	0	1585
Grp Volume(v), veh/h	0	867	286	1082	1173	0				726	0	282
Grp Sat Flow(s),veh/h/ln	0	1777	1583	1728	1777	0				1781	0	1585
Q Serve(g_s), s	0.0	28.1	19.2	33.7	0.0	0.0				23.8	0.0	20.1
Cycle Q Clear(g_c), s	0.0	28.1	19.2	33.7	0.0	0.0				23.8	0.0	20.1
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	974	434	1148	2362	0				806	0	358
V/C Ratio(X)	0.00	0.89	0.66	0.94	0.50	0.00				0.90	0.00	0.79
Avail Cap(c_a), veh/h	0	974	434	1148	2362	0				861	0	383
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	41.8	38.6	19.1	0.0	0.0				45.1	0.0	43.7
Incr Delay (d2), s/veh	0.0	12.0	7.6	2.0	0.1	0.0				12.1	0.0	9.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.8	8.4	8.1	0.0	0.0				11.8	0.0	8.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	53.8	46.2	21.1	0.1	0.0				57.2	0.0	53.5
LnGrp LOS	A	D	D	C	A	A				E	A	D
Approach Vol, veh/h		1153			2255						1008	
Approach Delay, s/veh		51.9			10.1						56.2	
Approach LOS		D			B						E	

Timer - Assigned Phs	1	2		4		6			
Phs Duration (G+Y+Rc), s	6.9	39.9		33.2		86.8			
Change Period (Y+Rc), s	7.0	* 7		6.1		7.0			
Max Green Setting (Gmax), s	33.3	* 33		29.0		77.9			
Max Q Clear Time (g_c+I1), s	5.7	30.1		25.8		2.0			
Green Ext Time (p_c), s	1.7	1.8		1.4		12.5			

Intersection Summary	
HCM 6th Ctrl Delay	31.6
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	370	40	80	40	50	80	170	690	20	150	710	700
Future Volume (veh/h)	370	40	80	40	50	80	170	690	20	150	710	700
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.97	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	410	0	82	41	52	82	175	711	21	155	732	722
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	588	0	260	144	151	126	203	1899	56	194	1307	839
Arrive On Green	0.17	0.00	0.17	0.08	0.08	0.08	0.11	0.37	0.37	0.11	0.37	0.37
Sat Flow, veh/h	3563	0	1574	1781	1870	1561	1781	5092	150	1781	3554	1570
Grp Volume(v), veh/h	410	0	82	41	52	82	175	475	257	155	732	722
Grp Sat Flow(s),veh/h/ln	1781	0	1574	1781	1870	1561	1781	1702	1838	1781	1777	1570
Q Serve(g_s), s	8.2	0.0	3.5	1.6	2.0	3.9	7.3	7.7	7.7	6.4	12.4	27.8
Cycle Q Clear(g_c), s	8.2	0.0	3.5	1.6	2.0	3.9	7.3	7.7	7.7	6.4	12.4	27.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	588	0	260	144	151	126	203	1269	685	194	1307	839
V/C Ratio(X)	0.70	0.00	0.32	0.29	0.34	0.65	0.86	0.37	0.38	0.80	0.56	0.86
Avail Cap(c_a), veh/h	1273	0	562	377	396	331	203	1269	685	288	1307	839
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.8	0.0	27.8	32.7	32.8	33.7	32.9	17.3	17.3	32.9	19.0	14.7
Incr Delay (d2), s/veh	1.5	0.0	0.7	1.1	1.3	5.5	29.7	0.2	0.3	9.3	0.5	9.0
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	8.5	0.0	1.3	0.7	0.9	1.6	4.7	2.9	3.1	3.2	4.9	15.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.3	0.0	28.5	33.8	34.2	39.2	62.6	17.5	17.6	42.2	19.6	23.8
LnGrp LOS	C	A	C	C	C	D	E	B	B	D	B	C
Approach Vol, veh/h		492			175			907			1609	
Approach Delay, s/veh		30.8			36.5			26.2			23.6	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8			
Phs Duration (G+Y+Rc), s	12.6	34.2		17.8	13.0	33.8		11.0			
Change Period (Y+Rc), s	4.4	* 6		5.3	4.4	6.0		4.9			
Max Green Setting (Gmax), s	12.3	* 25		27.0	8.6	27.8		16.0			
Max Q Clear Time (g_c+I1), s	13.4	9.7		10.2	9.3	29.8		5.9			
Green Ext Time (p_c), s	0.1	4.2		1.6	0.0	0.0		0.4			

Intersection Summary	
HCM 6th Ctrl Delay	26.2
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	2.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑		↰	↑	
Traffic Vol, veh/h	20	0	50	10	0	10	90	670	20	5	360	20
Future Vol, veh/h	20	0	50	10	0	10	90	670	20	5	360	20
Conflicting Peds, #/hr	0	0	1	1	0	0	8	0	0	0	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	80	-	-
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	21	0	52	10	0	10	94	698	21	5	375	21

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1306	1311	395	1320	1311	709	404	0	0	719	0	0
Stage 1	404	404	-	897	897	-	-	-	-	-	-	-
Stage 2	902	907	-	423	414	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	137	159	654	134	159	434	1155	-	-	882	-	-
Stage 1	623	599	-	334	358	-	-	-	-	-	-	-
Stage 2	332	355	-	609	593	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	124	144	649	115	144	434	1147	-	-	882	-	-
Mov Cap-2 Maneuver	124	144	-	115	144	-	-	-	-	-	-	-
Stage 1	568	591	-	307	329	-	-	-	-	-	-	-
Stage 2	297	326	-	556	585	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.2	27.3	1	0.1
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1147	-	-	294	182	882	-	-
HCM Lane V/C Ratio	0.082	-	-	0.248	0.114	0.006	-	-
HCM Control Delay (s)	8.4	-	-	21.2	27.3	9.1	-	-
HCM Lane LOS	A	-	-	C	D	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	1	0.4	0	-	-

Intersection	
Int Delay, s/veh	0.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↑			↕	
Traffic Vol, veh/h	10	0	30	0	0	0	40	650	0	0	350	5
Future Vol, veh/h	10	0	30	0	0	0	40	650	0	0	350	5
Conflicting Peds, #/hr	0	0	0	0	0	0	9	0	0	0	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	65	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	0	32	0	0	0	42	684	0	0	368	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1148	1148	380	1155	1150	684	382	0	0	684	0	0
Stage 1	380	380	-	768	768	-	-	-	-	-	-	-
Stage 2	768	768	-	387	382	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	176	199	667	174	198	449	1176	-	-	909	-	-
Stage 1	642	614	-	394	411	-	-	-	-	-	-	-
Stage 2	394	411	-	637	613	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	170	190	662	161	189	449	1167	-	-	909	-	-
Mov Cap-2 Maneuver	170	190	-	161	189	-	-	-	-	-	-	-
Stage 1	614	610	-	380	396	-	-	-	-	-	-	-
Stage 2	380	396	-	607	609	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.5	0	0.5	0
HCM LOS	C	A		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1167	-	-	384	-	909	-	-
HCM Lane V/C Ratio	0.036	-	-	0.11	-	-	-	-
HCM Control Delay (s)	8.2	-	-	15.5	0	0	-	-
HCM Lane LOS	A	-	-	C	A	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	-	0	-	-

8: Carmel Mountain Rd & Cuca St/Caminata Deluz

Year 2050 PM

HCM 6th Signalized Intersection Summary

11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	0	90	20	0	20	100	760	30	40	600	60
Future Volume (veh/h)	40	0	90	20	0	20	100	760	30	40	600	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.98	0.99		0.98	1.00		0.99	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	42	0	95	21	0	21	105	800	32	42	632	63
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	180	42	244	263	40	172	137	1322	53	66	1108	110
Arrive On Green	0.23	0.00	0.23	0.23	0.00	0.23	0.08	0.38	0.38	0.04	0.34	0.34
Sat Flow, veh/h	289	185	1073	581	174	754	1781	3482	139	1781	3262	325
Grp Volume(v), veh/h	137	0	0	42	0	0	105	408	424	42	344	351
Grp Sat Flow(s),veh/h/ln	1547	0	0	1508	0	0	1781	1777	1844	1781	1777	1810
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	2.4	7.6	7.7	1.0	6.6	6.6
Cycle Q Clear(g_c), s	2.9	0.0	0.0	0.8	0.0	0.0	2.4	7.6	7.7	1.0	6.6	6.6
Prop In Lane	0.31		0.69	0.50		0.50	1.00		0.08	1.00		0.18
Lane Grp Cap(c), veh/h	466	0	0	474	0	0	137	674	700	66	603	614
V/C Ratio(X)	0.29	0.00	0.00	0.09	0.00	0.00	0.76	0.61	0.61	0.64	0.57	0.57
Avail Cap(c_a), veh/h	1177	0	0	1144	0	0	629	1792	1861	198	1358	1383
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	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.4	0.0	0.0	12.6	0.0	0.0	18.7	10.3	10.3	19.6	11.2	11.2
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.1	0.0	0.0	8.5	0.9	0.8	9.8	0.9	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	0.3	0.0	0.0	1.2	2.4	2.5	0.5	2.1	2.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.8	0.0	0.0	12.7	0.0	0.0	27.2	11.2	11.2	29.4	12.0	12.0
LnGrp LOS	B	A	A	B	A	A	C	B	B	C	B	B
Approach Vol, veh/h		137			42			937			737	
Approach Delay, s/veh		13.8			12.7			13.0			13.0	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.9	21.1		14.3	7.6	19.4		14.3				
Change Period (Y+Rc), s	4.4	* 5.4		4.9	4.4	5.4		4.9				
Max Green Setting (Gmax), s	4.6	* 42		29.1	14.6	31.6		29.1				
Max Q Clear Time (g_c+I1), s	3.0	9.7		4.9	4.4	8.6		2.8				
Green Ext Time (p_c), s	0.0	6.0		0.8	0.2	4.5		0.2				

Intersection Summary	
HCM 6th Ctrl Delay	13.1
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

9: Comm Dwy/Paseo Cardiel & Carmel Mountain Rd

Year 2050 PM

HCM 6th Signalized Intersection Summary

11/06/2018

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	810	90	40	560	100	280	40	40	120	40	50
Future Volume (veh/h)	150	810	90	40	560	100	280	40	40	120	40	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.98	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	160	862	96	43	596	106	298	43	43	128	43	53
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	206	1192	133	59	867	154	442	50	50	627	275	339
Arrive On Green	0.12	0.37	0.37	0.03	0.29	0.29	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1781	3214	358	1781	3003	533	947	137	137	1306	759	935
Grp Volume(v), veh/h	160	477	481	43	352	350	384	0	0	128	0	96
Grp Sat Flow(s),veh/h/ln	1781	1777	1795	1781	1777	1759	1220	0	0	1306	0	1694
Q Serve(g_s), s	5.6	14.9	14.9	1.5	11.4	11.4	17.1	0.0	0.0	0.0	0.0	2.5
Cycle Q Clear(g_c), s	5.6	14.9	14.9	1.5	11.4	11.4	19.6	0.0	0.0	4.0	0.0	2.5
Prop In Lane	1.00		0.20	1.00		0.30	0.78		0.11	1.00		0.55
Lane Grp Cap(c), veh/h	206	659	666	59	513	508	541	0	0	627	0	614
V/C Ratio(X)	0.78	0.72	0.72	0.73	0.69	0.69	0.71	0.00	0.00	0.20	0.00	0.16
Avail Cap(c_a), veh/h	457	1201	1214	113	852	843	623	0	0	705	0	715
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.8	17.5	17.5	31.0	20.4	20.4	20.6	0.0	0.0	14.4	0.0	13.9
Incr Delay (d2), s/veh	6.3	1.5	1.5	15.4	1.6	1.7	3.2	0.0	0.0	0.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	5.8	5.8	0.9	4.6	4.6	5.4	0.0	0.0	1.2	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.0	19.0	19.0	46.3	22.0	22.1	23.7	0.0	0.0	14.6	0.0	14.0
LnGrp LOS	C	B	B	D	C	C	C	A	A	B	A	B
Approach Vol, veh/h		1118			745			384			224	
Approach Delay, s/veh		21.2			23.5			23.7			14.4	
Approach LOS		C			C			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.6	29.8		28.3	11.9	24.5		28.3				
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9				
Max Green Setting (Gmax), s	4.1	* 44		27.3	16.6	31.0		27.3				
Max Q Clear Time (g_c+I1), s	3.5	16.9		6.0	7.6	13.4		21.6				
Green Ext Time (p_c), s	0.0	7.1		0.9	0.3	4.2		1.2				

Intersection Summary	
HCM 6th Ctrl Delay	21.6
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	190	130	410	280	280	320	860	520	390	690	40
Future Volume (veh/h)	270	190	130	410	280	280	320	860	520	390	690	40
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		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	278	196	134	423	289	289	330	887	536	402	711	41
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	322	296	193	471	349	505	351	1630	725	456	2010	620
Arrive On Green	0.09	0.14	0.14	0.14	0.19	0.19	0.20	0.46	0.46	0.13	0.39	0.39
Sat Flow, veh/h	3456	2062	1340	3456	1870	1583	1781	3554	1580	3456	5106	1575
Grp Volume(v), veh/h	278	167	163	423	289	289	330	887	536	402	711	41
Grp Sat Flow(s),veh/h/ln	1728	1777	1626	1728	1870	1583	1781	1777	1580	1728	1702	1575
Q Serve(g_s), s	11.9	13.4	14.3	18.1	22.3	22.8	27.4	27.0	41.7	17.1	14.7	2.4
Cycle Q Clear(g_c), s	11.9	13.4	14.3	18.1	22.3	22.8	27.4	27.0	41.7	17.1	14.7	2.4
Prop In Lane	1.00		0.82	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	322	255	234	471	349	505	351	1630	725	456	2010	620
V/C Ratio(X)	0.86	0.66	0.70	0.90	0.83	0.57	0.94	0.54	0.74	0.88	0.35	0.07
Avail Cap(c_a), veh/h	341	419	384	514	524	652	366	1630	725	546	2010	620
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.66	0.66	0.66	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.1	60.7	61.1	63.7	58.7	42.6	59.4	29.3	33.3	64.0	32.0	28.3
Incr Delay (d2), s/veh	19.0	2.9	3.7	12.6	4.6	0.7	5.2	0.1	0.6	13.7	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	6.3	6.2	8.8	11.0	9.1	12.9	11.6	16.1	8.4	6.3	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	86.1	63.6	64.8	76.3	63.3	43.3	64.5	29.4	33.9	77.7	32.5	28.5
LnGrp LOS	F	E	E	E	E	D	E	C	C	E	C	C
Approach Vol, veh/h		608			1001			1753			1154	
Approach Delay, s/veh		74.2			63.0			37.4			48.1	
Approach LOS		E			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	33.8	64.5	18.2	33.5	24.0	74.3	24.7	27.0
Change Period (Y+Rc), s	4.2	5.5	* 4.2	5.5	* 4.2	5.5	* 4.2	* 5.5
Max Green Setting (Gmax), s	31.1	43.0	* 15	42.0	* 24	50.1	* 22	* 35
Max Q Clear Time (g_c+I1), s	29.4	16.7	13.9	24.8	19.1	43.7	20.1	16.3
Green Ext Time (p_c), s	0.2	5.5	0.1	2.6	0.6	4.1	0.4	1.9

Intersection Summary	
HCM 6th Ctrl Delay	50.8
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	490	50	790	50	30	70	30	1250	60	110	880	240
Future Volume (veh/h)	490	50	790	50	30	70	30	1250	60	110	880	240
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		0.99	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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	510	52	741	52	31	73	31	1302	62	115	917	250
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	542	55	529	154	43	100	77	1134	54	155	1322	1116
Arrive On Green	0.33	0.33	0.33	0.09	0.09	0.09	0.04	0.33	0.33	0.09	0.37	0.37
Sat Flow, veh/h	1624	166	1584	1781	494	1163	1781	3452	164	1781	3554	1579
Grp Volume(v), veh/h	562	0	741	52	0	104	31	669	695	115	917	250
Grp Sat Flow(s),veh/h/ln	1789	0	1584	1781	0	1656	1781	1777	1839	1781	1777	1579
Q Serve(g_s), s	35.1	0.0	38.4	3.2	0.0	7.0	1.9	37.8	37.8	7.2	25.1	6.4
Cycle Q Clear(g_c), s	35.1	0.0	38.4	3.2	0.0	7.0	1.9	37.8	37.8	7.2	25.1	6.4
Prop In Lane	0.91		1.00	1.00		0.70	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	597	0	529	154	0	143	77	584	604	155	1322	1116
V/C Ratio(X)	0.94	0.00	1.40	0.34	0.00	0.73	0.40	1.15	1.15	0.74	0.69	0.22
Avail Cap(c_a), veh/h	597	0	529	155	0	144	77	584	604	155	1322	1116
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	1.00	0.80	0.80	0.80
Uniform Delay (d), s/veh	37.2	0.0	38.3	49.4	0.0	51.2	53.5	38.6	38.6	51.2	30.6	5.9
Incr Delay (d2), s/veh	23.2	0.0	191.8	1.3	0.0	16.7	3.3	84.9	85.5	14.2	2.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	18.9	0.0	42.8	1.5	0.0	3.6	0.9	29.9	31.1	3.8	11.1	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.4	0.0	230.1	50.7	0.0	67.9	56.9	123.5	124.2	65.5	33.0	6.3
LnGrp LOS	E	A	F	D	A	E	E	F	F	E	C	A
Approach Vol, veh/h		1303			156			1395			1282	
Approach Delay, s/veh		156.9			62.2			122.3			30.7	
Approach LOS		F			E			F			C	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	39.2	48.3	14.5	14.2	43.3	43.0
Change Period (Y+Rc), s	4.2	5.5	4.6	* 4.2	5.5	4.6
Max Green Setting (Gmax), s	35.1	42.7	10.0	* 10	37.7	38.4
Max Q Clear Time (g_c+I1), s	37.8	27.1	9.0	9.2	39.8	40.4
Green Ext Time (p_c), s	0.0	6.7	0.1	0.0	0.0	0.0

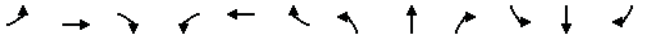
Intersection Summary	
HCM 6th Ctrl Delay	102.6
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX K

HORIZON YEAR 2050 WITH PROJECT INTERSECTION ANALYSIS WORKSHEETS



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	946	862	121	180	818	40	271	290	100	110	90	264
Future Volume (veh/h)	946	862	121	180	818	40	271	290	100	110	90	264
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		0.99	1.00		0.98	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1063	969	136	202	919	45	304	326	112	124	101	297
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1032	2016	282	257	1102	54	325	706	238	128	575	446
Arrive On Green	0.30	0.45	0.45	0.07	0.22	0.22	0.18	0.27	0.27	0.07	0.16	0.16
Sat Flow, veh/h	3456	4525	633	3456	4985	244	1781	2594	874	1781	3554	2753
Grp Volume(v), veh/h	1063	728	377	202	627	337	304	221	217	124	101	297
Grp Sat Flow(s),veh/h/ln	1728	1702	1754	1728	1702	1825	1781	1777	1691	1781	1777	1377
Q Serve(g_s), s	39.5	20.0	20.1	7.6	23.3	23.3	22.3	13.7	14.2	9.2	3.2	13.4
Cycle Q Clear(g_c), s	39.5	20.0	20.1	7.6	23.3	23.3	22.3	13.7	14.2	9.2	3.2	13.4
Prop In Lane	1.00		0.36	1.00		0.13	1.00		0.52	1.00		1.00
Lane Grp Cap(c), veh/h	1032	1517	781	257	753	403	325	484	460	128	575	446
V/C Ratio(X)	1.03	0.48	0.48	0.79	0.83	0.84	0.94	0.46	0.47	0.97	0.18	0.67
Avail Cap(c_a), veh/h	1032	1517	781	355	824	442	325	484	460	128	575	446
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	46.4	25.9	25.9	60.2	49.2	49.2	53.3	40.0	40.2	61.2	47.8	52.1
Incr Delay (d2), s/veh	35.9	0.2	0.5	7.7	6.8	12.2	33.7	3.1	3.4	69.7	0.7	7.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	22.0	8.2	8.5	3.6	10.6	12.0	13.0	6.4	6.4	6.6	1.5	5.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.3	26.1	26.4	67.9	56.0	61.4	87.1	43.1	43.6	131.0	48.5	59.8
LnGrp LOS	F	C	C	E	E	E	F	D	D	F	D	E
Approach Vol, veh/h		2168			1166			742			522	
Approach Delay, s/veh		53.7			59.6			61.3			74.5	
Approach LOS		D			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	14.0	40.5	14.3	63.4	28.6	25.9	44.0	33.7
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	9.5	36.0	13.6	57.9	24.1	21.4	39.5	32.0
Max Q Clear Time (g_c+I1), s	11.2	16.2	9.6	22.1	24.3	15.4	41.5	25.3
Green Ext Time (p_c), s	0.0	2.6	0.2	9.4	0.0	1.0	0.0	3.3

Intersection Summary	
HCM 6th Ctrl Delay	58.8
HCM 6th LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	413	779	0	0	993	360	251	10	1190	0	0	0
Future Volume (veh/h)	413	779	0	0	993	360	251	10	1190	0	0	0
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			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	439	829	0	0	1056	383	275	0	1266			
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	2043	4885	0	0	1023	456	1385	0	1233			
Arrive On Green	0.20	0.32	0.00	0.00	0.29	0.29	0.39	0.00	0.39			
Sat Flow, veh/h	3456	5274	0	0	3647	1583	3563	0	3170			
Grp Volume(v), veh/h	439	829	0	0	1056	383	275	0	1266			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1777	1583	1781	0	1585			
Q Serve(g_s), s	9.6	10.6	0.0	0.0	25.9	20.5	4.6	0.0	35.0			
Cycle Q Clear(g_c), s	9.6	10.6	0.0	0.0	25.9	20.5	4.6	0.0	35.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	2043	4885	0	0	1023	456	1385	0	1233			
V/C Ratio(X)	0.21	0.17	0.00	0.00	1.03	0.84	0.20	0.00	1.03			
Avail Cap(c_a), veh/h	2043	4885	0	0	1023	456	1385	0	1233			
HCM Platoon Ratio	0.33	0.33	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.50	0.50	0.00	0.00	0.53	0.53	1.00	0.00	1.00			
Uniform Delay (d), s/veh	18.7	4.9	0.0	0.0	32.0	30.1	18.2	0.0	27.5			
Incr Delay (d2), s/veh	0.0	0.0	0.0	0.0	29.4	9.7	0.1	0.0	32.7			
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	4.2	0.0	0.0	0.0	14.9	8.8	1.9	0.0	18.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	18.7	5.0	0.0	0.0	61.5	39.8	18.3	0.0	60.2			
LnGrp LOS	B	A	A	A	F	D	B	A	F			
Approach Vol, veh/h		1268			1439			1541				
Approach Delay, s/veh		9.7			55.7			52.7				
Approach LOS		A			E			D				

Timer - Assigned Phs	2	5	6	8
Phs Duration (G+Y+Rc), s	94.4	61.5	32.9	41.1
Change Period (Y+Rc), s	7.0	7.0	* 7	6.1
Max Green Setting (Gmax), s	41.9	10.3	* 26	35.0
Max Q Clear Time (g_c+I1), s	12.6	11.6	27.9	37.0
Green Ext Time (p_c), s	6.6	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	40.9
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	882	626	670	574	0	0	0	0	310	0	328
Future Volume (veh/h)	0	882	626	670	574	0	0	0	0	310	0	328
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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	928	659	705	604	0				436	0	227
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95				0.95	0.95	0.95
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	1443	644	699	2387	0				651	0	290
Arrive On Green	0.00	0.41	0.41	0.34	1.00	0.00				0.18	0.00	0.18
Sat Flow, veh/h	0	3647	1585	3456	3647	0				3563	0	1585
Grp Volume(v), veh/h	0	928	659	705	604	0				436	0	227
Grp Sat Flow(s),veh/h/ln	0	1777	1585	1728	1777	0				1781	0	1585
Q Serve(g_s), s	0.0	18.9	36.5	18.2	0.0	0.0				10.3	0.0	12.3
Cycle Q Clear(g_c), s	0.0	18.9	36.5	18.2	0.0	0.0				10.3	0.0	12.3
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	1443	644	699	2387	0				651	0	290
V/C Ratio(X)	0.00	0.64	1.02	1.01	0.25	0.00				0.67	0.00	0.78
Avail Cap(c_a), veh/h	0	1443	644	699	2387	0				1148	0	511
HCM Platoon Ratio	1.00	1.00	1.00	1.67	1.67	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.23	0.23	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	21.5	26.7	29.8	0.0	0.0				34.2	0.0	35.1
Incr Delay (d2), s/veh	0.0	2.2	41.7	18.5	0.1	0.0				1.2	0.0	4.6
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	8.0	20.4	8.0	0.0	0.0				4.5	0.0	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	23.7	68.4	48.3	0.1	0.0				35.4	0.0	39.7
LnGrp LOS	A	C	F	F	A	A				D	A	D
Approach Vol, veh/h		1587			1309						663	
Approach Delay, s/veh		42.3			26.0						36.9	
Approach LOS		D			C						D	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	13.9	43.5		22.6		67.4
Change Period (Y+Rc), s	5.7	7.0		6.1		7.0
Max Green Setting (Gmax), s	11.3	24.0		29.0		47.9
Max Q Clear Time (g_c+I1), s	20.2	38.5		14.3		2.0
Green Ext Time (p_c), s	0.0	0.0		2.2		4.8

Intersection Summary	
HCM 6th Ctrl Delay	35.3
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	768	51	203	20	21	90	139	660	30	100	510	270
Future Volume (veh/h)	768	51	203	20	21	90	139	660	30	100	510	270
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		0.99	1.00		0.99	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	830	0	209	21	22	93	143	680	31	103	526	278
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1038	0	460	149	157	131	179	1306	59	133	836	831
Arrive On Green	0.29	0.00	0.29	0.08	0.08	0.08	0.10	0.26	0.26	0.07	0.24	0.24
Sat Flow, veh/h	3563	0	1579	1781	1870	1562	1781	5004	227	1781	3554	1568
Grp Volume(v), veh/h	830	0	209	21	22	93	143	462	249	103	526	278
Grp Sat Flow(s),veh/h/ln	1781	0	1579	1781	1870	1562	1781	1702	1827	1781	1777	1568
Q Serve(g_s), s	15.3	0.0	7.7	0.8	0.8	4.1	5.6	8.3	8.3	4.0	9.5	7.3
Cycle Q Clear(g_c), s	15.3	0.0	7.7	0.8	0.8	4.1	5.6	8.3	8.3	4.0	9.5	7.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.12	1.00		1.00
Lane Grp Cap(c), veh/h	1038	0	460	149	157	131	179	888	477	133	836	831
V/C Ratio(X)	0.80	0.00	0.45	0.14	0.14	0.71	0.80	0.52	0.52	0.77	0.63	0.33
Avail Cap(c_a), veh/h	1386	0	614	400	420	351	195	1238	664	258	1392	1076
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.3	0.0	20.6	30.2	30.2	31.8	31.3	22.5	22.5	32.4	24.4	9.7
Incr Delay (d2), s/veh	2.5	0.0	0.7	0.4	0.4	6.9	19.2	0.5	0.9	9.2	0.8	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.4	0.0	2.8	0.3	0.4	1.8	3.3	3.2	3.5	2.0	3.9	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	25.8	0.0	21.3	30.7	30.7	38.7	50.6	23.0	23.4	41.5	25.2	9.9
LnGrp LOS	C	A	C	C	C	D	D	C	C	D	C	A
Approach Vol, veh/h		1039			136			854			907	
Approach Delay, s/veh		24.9			36.2			27.7			22.4	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	9.7	24.6		26.0	11.6	22.8		10.9
Change Period (Y+Rc), s	4.4	* 6		5.3	4.4	6.0		4.9
Max Green Setting (Gmax), s	10.3	* 26		27.7	7.8	27.9		16.0
Max Q Clear Time (g_c+I1), s	10.3	10.3		17.3	7.6	11.5		6.1
Green Ext Time (p_c), s	0.1	4.1		3.2	0.0	4.2		0.3

Intersection Summary	
HCM 6th Ctrl Delay	25.5
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	7.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↱		↰	↱	
Traffic Vol, veh/h	41	1	90	20	0	10	50	350	10	1	852	32
Future Vol, veh/h	41	1	90	20	0	10	50	350	10	1	852	32
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	45	1	98	22	0	11	54	380	11	1	926	35

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1449	1449	948	1489	1461	386	965	0	0	391	0	0
Stage 1	950	950	-	494	494	-	-	-	-	-	-	-
Stage 2	499	499	-	995	967	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	109	131	316	102	129	662	714	-	-	1168	-	-
Stage 1	312	339	-	557	546	-	-	-	-	-	-	-
Stage 2	554	544	-	295	333	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	101	121	315	66	119	662	712	-	-	1168	-	-
Mov Cap-2 Maneuver	101	121	-	66	119	-	-	-	-	-	-	-
Stage 1	287	338	-	515	505	-	-	-	-	-	-	-
Stage 2	504	503	-	203	332	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	67	62.4	1.3	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	712	-	-	189	94	1168	-	-
HCM Lane V/C Ratio	0.076	-	-	0.759	0.347	0.001	-	-
HCM Control Delay (s)	10.5	-	-	67	62.4	8.1	-	-
HCM Lane LOS	B	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	5	1.4	0	-	-

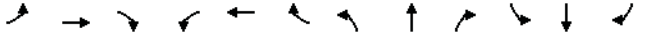
Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↰	↱			↕	
Traffic Vol, veh/h	10	0	40	64	0	0	10	370	11	0	770	1
Future Vol, veh/h	10	0	40	64	0	0	10	370	11	0	770	1
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	65	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	0	43	70	0	0	11	402	12	0	837	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1272	1278	842	1289	1272	408	842	0	0	414	0	0
Stage 1	842	842	-	430	430	-	-	-	-	-	-	-
Stage 2	430	436	-	859	842	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	144	166	364	141	168	643	794	-	-	1145	-	-
Stage 1	359	380	-	603	583	-	-	-	-	-	-	-
Stage 2	603	580	-	351	380	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	142	163	363	123	165	643	791	-	-	1145	-	-
Mov Cap-2 Maneuver	142	163	-	123	165	-	-	-	-	-	-	-
Stage 1	353	379	-	595	575	-	-	-	-	-	-	-
Stage 2	595	572	-	309	379	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.1	66.9	0.2	0
HCM LOS	C	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	791	-	-	277	123	1145	-	-
HCM Lane V/C Ratio	0.014	-	-	0.196	0.566	-	-	-
HCM Control Delay (s)	9.6	-	-	21.1	66.9	0	-	-
HCM Lane LOS	A	-	-	C	F	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	2.8	0	-	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	0	172	20	0	20	141	559	10	20	703	70
Future Volume (veh/h)	110	0	172	20	0	20	141	559	10	20	703	70
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.99	0.99		0.99	1.00		0.97	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	116	0	181	21	0	21	148	588	11	21	740	74
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	231	30	259	272	32	202	194	1502	28	36	1084	108
Arrive On Green	0.28	0.00	0.28	0.28	0.00	0.28	0.11	0.42	0.42	0.02	0.33	0.33
Sat Flow, veh/h	485	108	925	606	115	721	1781	3566	67	1781	3260	326
Grp Volume(v), veh/h	297	0	0	42	0	0	148	293	306	21	403	411
Grp Sat Flow(s),veh/h/ln	1518	0	0	1442	0	0	1781	1777	1856	1781	1777	1809
Q Serve(g_s), s	6.6	0.0	0.0	0.0	0.0	0.0	4.3	6.0	6.0	0.6	10.3	10.3
Cycle Q Clear(g_c), s	9.1	0.0	0.0	1.0	0.0	0.0	4.3	6.0	6.0	0.6	10.3	10.3
Prop In Lane	0.39		0.61	0.50		0.50	1.00		0.04	1.00		0.18
Lane Grp Cap(c), veh/h	519	0	0	506	0	0	194	748	782	36	591	601
V/C Ratio(X)	0.57	0.00	0.00	0.08	0.00	0.00	0.76	0.39	0.39	0.59	0.68	0.68
Avail Cap(c_a), veh/h	926	0	0	876	0	0	494	1407	1470	156	1066	1085
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	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.8	0.0	0.0	14.0	0.0	0.0	22.8	10.6	10.6	25.6	15.2	15.2
Incr Delay (d2), s/veh	1.0	0.0	0.0	0.1	0.0	0.0	6.1	0.3	0.3	14.3	1.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	0.0	0.0	0.3	0.0	0.0	2.0	2.0	2.1	0.4	3.8	3.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	17.8	0.0	0.0	14.1	0.0	0.0	28.9	10.9	10.9	39.9	16.6	16.6
LnGrp LOS	B	A	A	B	A	A	C	B	B	D	B	B
Approach Vol, veh/h		297			42			747			835	
Approach Delay, s/veh		17.8			14.1			14.5			17.2	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.5	27.6		19.6	10.1	22.9		19.6				
Change Period (Y+Rc), s	4.4	* 5.4		4.9	4.4	5.4		4.9				
Max Green Setting (Gmax), s	4.6	* 42		29.1	14.6	31.6		29.1				
Max Q Clear Time (g_c+I1), s	2.6	8.0		11.1	6.3	12.3		3.0				
Green Ext Time (p_c), s	0.0	4.0		1.8	0.2	5.1		0.2				

Intersection Summary	
HCM 6th Ctrl Delay	16.1
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	568	30	23	652	250	120	40	12	160	20	120
Future Volume (veh/h)	170	568	30	23	652	250	120	40	12	160	20	120
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	200	668	35	27	767	294	141	47	14	188	24	141
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	249	1705	89	42	954	366	252	76	18	444	60	353
Arrive On Green	0.14	0.50	0.50	0.02	0.38	0.38	0.26	0.26	0.26	0.26	0.26	0.26
Sat Flow, veh/h	1781	3435	180	1781	2511	962	630	297	69	1341	236	1384
Grp Volume(v), veh/h	200	345	358	27	543	518	202	0	0	188	0	165
Grp Sat Flow(s),veh/h/ln	1781	1777	1838	1781	1777	1696	996	0	0	1341	0	1619
Q Serve(g_s), s	7.3	8.2	8.2	1.0	18.3	18.3	8.4	0.0	0.0	0.0	0.0	5.7
Cycle Q Clear(g_c), s	7.3	8.2	8.2	1.0	18.3	18.3	14.1	0.0	0.0	8.3	0.0	5.7
Prop In Lane	1.00		0.10	1.00		0.57	0.70		0.07	1.00		0.85
Lane Grp Cap(c), veh/h	249	882	912	42	675	644	345	0	0	444	0	413
V/C Ratio(X)	0.80	0.39	0.39	0.64	0.80	0.80	0.59	0.00	0.00	0.42	0.00	0.40
Avail Cap(c_a), veh/h	441	1157	1197	109	821	784	550	0	0	648	0	659
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.0	10.6	10.6	32.5	18.6	18.6	25.4	0.0	0.0	21.7	0.0	20.7
Incr Delay (d2), s/veh	6.0	0.3	0.3	15.2	4.8	5.1	1.6	0.0	0.0	0.6	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	2.9	3.0	0.6	7.7	7.4	3.1	0.0	0.0	2.5	0.0	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.9	10.8	10.8	47.7	23.4	23.7	27.0	0.0	0.0	22.4	0.0	21.4
LnGrp LOS	C	B	B	D	C	C	C	A	A	C	A	C
Approach Vol, veh/h		903			1088			202			353	
Approach Delay, s/veh		16.0			24.1			27.0			21.9	
Approach LOS		B			C			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.0	39.1		22.0	13.8	31.3		22.0				
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9				
Max Green Setting (Gmax), s	4.6	* 44		27.3	16.6	31.0		27.3				
Max Q Clear Time (g_c+I1), s	3.0	10.2		10.3	9.3	20.3		16.1				
Green Ext Time (p_c), s	0.0	4.9		1.4	0.3	5.2		0.9				

Intersection Summary	
HCM 6th Ctrl Delay	21.1
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	320	120	60	283	327	322	430	780	327	431	1240	90
Future Volume (veh/h)	320	120	60	283	327	322	430	780	327	431	1240	90
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		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	368	138	69	325	376	370	494	897	376	495	1425	103
Peak Hour Factor	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	297	479	227	373	424	598	390	1447	644	521	1732	534
Arrive On Green	0.09	0.20	0.20	0.11	0.23	0.23	0.22	0.41	0.41	0.15	0.34	0.34
Sat Flow, veh/h	3456	2337	1110	3456	1870	1585	1781	3554	1580	3456	5106	1576
Grp Volume(v), veh/h	368	103	104	325	376	370	494	897	376	495	1425	103
Grp Sat Flow(s),veh/h/ln	1728	1777	1671	1728	1870	1585	1781	1777	1580	1728	1702	1576
Q Serve(g_s), s	12.9	7.4	7.9	13.9	29.2	28.4	32.8	30.0	27.8	21.3	38.4	6.9
Cycle Q Clear(g_c), s	12.9	7.4	7.9	13.9	29.2	28.4	32.8	30.0	27.8	21.3	38.4	6.9
Prop In Lane	1.00		0.66	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	297	364	342	373	424	598	390	1447	644	521	1732	534
V/C Ratio(X)	1.24	0.28	0.30	0.87	0.89	0.62	1.27	0.62	0.58	0.95	0.82	0.19
Avail Cap(c_a), veh/h	297	443	417	424	524	683	390	1447	644	521	1732	534
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.49	0.49	0.49	0.21	0.21	0.21	1.00	1.00	1.00
Uniform Delay (d), s/veh	68.6	50.3	50.6	65.9	56.1	37.9	58.6	35.3	34.6	63.1	45.4	35.0
Incr Delay (d2), s/veh	132.7	0.4	0.5	8.8	7.8	0.7	125.1	0.4	0.8	27.5	4.6	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.2	3.4	3.4	6.6	14.7	11.2	28.3	13.2	10.9	11.4	17.0	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	201.2	50.8	51.1	74.7	64.0	38.6	183.7	35.7	35.4	90.6	50.0	35.8
LnGrp LOS	F	D	D	E	E	D	F	D	D	F	D	D
Approach Vol, veh/h		575			1071			1767			2023	
Approach Delay, s/veh		147.1			58.4			77.0			59.2	
Approach LOS		F			E			E			E	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	37.0	56.4	17.1	39.5	26.8	66.6	20.4	36.2
Change Period (Y+Rc), s	* 4.2	5.5	* 4.2	5.5	* 4.2	5.5	* 4.2	* 5.5
Max Green Setting (Gmax), s	33.1	42.9	* 13	42.0	* 23	53.1	* 18	* 37
Max Q Clear Time (g_c+I1), s	34.8	40.4	14.9	31.2	23.3	32.0	15.9	9.9
Green Ext Time (p_c), s	0.0	2.0	0.0	2.8	0.0	8.1	0.3	1.2

Intersection Summary	
HCM 6th Ctrl Delay	74.1
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

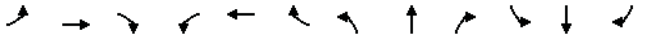
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	195	10	390	90	60	110	80	1332	20	50	1023	510
Future Volume (veh/h)	195	10	390	90	60	110	80	1332	20	50	1023	510
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	212	11	382	98	65	120	87	1448	22	54	1112	554
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	450	23	420	155	51	94	102	1420	22	155	1514	1096
Arrive On Green	0.27	0.27	0.27	0.09	0.09	0.09	0.06	0.40	0.40	0.09	0.43	0.43
Sat Flow, veh/h	1697	88	1585	1781	588	1086	1781	3583	54	1781	3554	1585
Grp Volume(v), veh/h	223	0	382	98	0	185	87	718	752	54	1112	554
Grp Sat Flow(s),veh/h/ln	1785	0	1585	1781	0	1675	1781	1777	1861	1781	1777	1585
Q Serve(g_s), s	12.1	0.0	26.8	6.1	0.0	10.0	5.6	45.6	45.6	3.3	30.1	19.1
Cycle Q Clear(g_c), s	12.1	0.0	26.8	6.1	0.0	10.0	5.6	45.6	45.6	3.3	30.1	19.1
Prop In Lane	0.95		1.00	1.00		0.65	1.00		0.03	1.00		1.00
Lane Grp Cap(c), veh/h	474	0	420	155	0	146	102	704	738	155	1514	1096
V/C Ratio(X)	0.47	0.00	0.91	0.63	0.00	1.27	0.85	1.02	1.02	0.35	0.73	0.51
Avail Cap(c_a), veh/h	559	0	496	155	0	146	102	704	738	155	1514	1096
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	1.00	0.21	0.21	0.21
Uniform Delay (d), s/veh	35.5	0.0	40.9	50.7	0.0	52.5	53.7	34.7	34.7	49.4	27.6	8.4
Incr Delay (d2), s/veh	0.7	0.0	18.7	8.1	0.0	164.6	45.8	38.7	38.3	0.3	0.7	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	0.0	12.5	3.1	0.0	10.8	3.8	26.7	27.9	1.5	12.7	13.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.2	0.0	59.6	58.8	0.0	217.1	99.5	73.4	73.0	49.7	28.3	8.8
LnGrp LOS	D	A	E	E	A	F	F	F	F	D	C	A
Approach Vol, veh/h		605			283			1557			1720	
Approach Delay, s/veh		51.0			162.3			74.7			22.7	
Approach LOS		D			F			E			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	10.8	54.5		14.6	14.2	51.1		35.1
Change Period (Y+Rc), s	* 4.2	5.5		4.6	* 4.2	5.5		4.6
Max Green Setting (Gmax), s	6.6	43.5		10.0	* 10	40.1		36.0
Max Q Clear Time (g_c+I1), s	7.6	32.1		12.0	5.3	47.6		28.8
Green Ext Time (p_c), s	0.0	7.4		0.0	0.0	0.0		1.7

Intersection Summary	
HCM 6th Ctrl Delay	55.7
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	586	1301	181	310	1176	60	162	190	270	160	420	1039
Future Volume (veh/h)	586	1301	181	310	1176	60	162	190	270	160	420	1039
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		0.99	1.00		0.98	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	598	1328	185	316	1200	61	165	194	276	163	429	1008
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	627	1550	216	356	1312	67	186	532	464	186	1064	826
Arrive On Green	0.18	0.34	0.34	0.10	0.26	0.26	0.10	0.30	0.30	0.10	0.30	0.30
Sat Flow, veh/h	3456	4527	631	3456	4974	253	1781	1777	1548	1781	3554	2759
Grp Volume(v), veh/h	598	999	514	316	821	440	165	194	276	163	429	1008
Grp Sat Flow(s),veh/h/ln	1728	1702	1754	1728	1702	1823	1781	1777	1548	1781	1777	1379
Q Serve(g_s), s	20.5	32.6	32.6	10.8	28.0	28.0	10.9	10.3	18.2	10.8	11.5	35.8
Cycle Q Clear(g_c), s	20.5	32.6	32.6	10.8	28.0	28.0	10.9	10.3	18.2	10.8	11.5	35.8
Prop In Lane	1.00		0.36	1.00		0.14	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	627	1166	600	356	898	481	186	532	464	186	1064	826
V/C Ratio(X)	0.95	0.86	0.86	0.89	0.91	0.91	0.89	0.36	0.60	0.88	0.40	1.22
Avail Cap(c_a), veh/h	627	1179	607	356	911	488	186	532	464	186	1064	826
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	48.4	36.6	36.6	52.9	42.7	42.7	52.8	32.9	35.7	52.7	33.4	41.9
Incr Delay (d2), s/veh	24.8	6.4	11.6	22.9	13.4	21.7	36.1	0.4	2.1	33.9	0.2	109.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.0	14.4	15.7	5.8	13.3	15.4	6.8	4.5	7.1	6.6	5.0	24.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.3	43.0	48.1	75.8	56.1	64.4	88.9	33.3	37.8	86.7	33.6	151.7
LnGrp LOS	E	D	D	E	E	E	F	C	D	F	C	F
Approach Vol, veh/h		2111			1577			635			1600	
Approach Delay, s/veh		52.8			62.4			49.7			113.4	
Approach LOS		D			E			D			F	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	17.0	40.3	16.8	45.4	17.0	40.3	26.2	36.0
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	12.5	35.8	12.3	41.4	12.5	35.8	21.7	32.0
Max Q Clear Time (g_c+I1), s	12.8	20.2	12.8	34.6	12.9	37.8	22.5	30.0
Green Ext Time (p_c), s	0.0	2.7	0.0	4.9	0.0	0.0	0.0	1.5

Intersection Summary	
HCM 6th Ctrl Delay	71.4
HCM 6th LOS	E

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	312	1148	0	0	1757	650	503	10	970	0	0	0
Future Volume (veh/h)	312	1148	0	0	1757	650	503	10	970	0	0	0
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		0.99			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	1870	1870			
Adj Flow Rate, veh/h	322	1184	0	0	1811	670	526	0	1000			
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97			
Percent Heavy Veh, %	2	2	0	0	2	2	2	2	2			
Cap, veh/h	870	3962	0	0	1655	738	1039	0	913			
Arrive On Green	0.50	1.00	0.00	0.00	0.47	0.47	0.29	0.00	0.29			
Sat Flow, veh/h	3456	5274	0	0	3647	1585	3563	0	3130			
Grp Volume(v), veh/h	322	1184	0	0	1811	670	526	0	1000			
Grp Sat Flow(s),veh/h/ln	1728	1702	0	0	1777	1585	1781	0	1565			
Q Serve(g_s), s	6.8	0.0	0.0	0.0	55.9	46.9	14.7	0.0	35.0			
Cycle Q Clear(g_c), s	6.8	0.0	0.0	0.0	55.9	46.9	14.7	0.0	35.0			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	870	3962	0	0	1655	738	1039	0	913			
V/C Ratio(X)	0.37	0.30	0.00	0.00	1.09	0.91	0.51	0.00	1.10			
Avail Cap(c_a), veh/h	870	3962	0	0	1655	738	1039	0	913			
HCM Platoon Ratio	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	0.30	0.30	0.00	0.00	0.32	0.32	1.00	0.00	1.00			
Uniform Delay (d), s/veh	24.0	0.0	0.0	0.0	32.0	29.7	35.3	0.0	42.5			
Incr Delay (d2), s/veh	0.1	0.1	0.0	0.0	46.0	6.6	0.4	0.0	59.4			
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	2.5	0.0	0.0	0.0	33.7	18.7	6.5	0.0	20.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	24.1	0.1	0.0	0.0	78.1	36.3	35.7	0.0	101.9			
LnGrp LOS	C	A	A	A	F	D	D	A	F			
Approach Vol, veh/h		1506			2481			1526				
Approach Delay, s/veh		5.2			66.8			79.1				
Approach LOS		A			E			E				

Timer - Assigned Phs		2			5	6		8
Phs Duration (G+Y+Rc), s		100.1			37.2	62.9		41.1
Change Period (Y+Rc), s		7.0			7.0	* 7		6.1
Max Green Setting (Gmax), s		71.9			10.3	* 56		35.0
Max Q Clear Time (g_c+I1), s		2.0			8.8	57.9		37.0
Green Ext Time (p_c), s		12.1			0.2	0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	53.4
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	880	295	1060	1200	0	0	0	0	580	10	428
Future Volume (veh/h)	0	880	295	1060	1200	0	0	0	0	580	10	428
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
Work Zone On Approach		No			No						No	
Adj Sat Flow, veh/h/ln	0	1870	1870	1870	1870	0				1870	1870	1870
Adj Flow Rate, veh/h	0	898	301	1082	1224	0				732	0	295
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98				0.98	0.98	0.98
Percent Heavy Veh, %	0	2	2	2	2	0				2	2	2
Cap, veh/h	0	974	434	1143	2357	0				810	0	361
Arrive On Green	0.00	0.27	0.27	0.66	1.00	0.00				0.23	0.00	0.23
Sat Flow, veh/h	0	3647	1583	3456	3647	0				3563	0	1585
Grp Volume(v), veh/h	0	898	301	1082	1224	0				732	0	295
Grp Sat Flow(s),veh/h/ln	0	1777	1583	1728	1777	0				1781	0	1585
Q Serve(g_s), s	0.0	29.5	20.4	34.0	0.0	0.0				24.0	0.0	21.2
Cycle Q Clear(g_c), s	0.0	29.5	20.4	34.0	0.0	0.0				24.0	0.0	21.2
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	974	434	1143	2357	0				810	0	361
V/C Ratio(X)	0.00	0.92	0.69	0.95	0.52	0.00				0.90	0.00	0.82
Avail Cap(c_a), veh/h	0	974	434	1143	2357	0				861	0	383
HCM Platoon Ratio	1.00	1.00	1.00	2.00	2.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.09	0.09	0.00				1.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	42.3	39.0	19.3	0.0	0.0				45.1	0.0	44.0
Incr Delay (d2), s/veh	0.0	15.2	8.8	2.1	0.1	0.0				12.4	0.0	12.5
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	14.9	9.0	8.3	0.0	0.0				11.9	0.0	9.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	57.5	47.8	21.4	0.1	0.0				57.4	0.0	56.5
LnGrp LOS	A	E	D	C	A	A				E	A	E
Approach Vol, veh/h		1199			2306						1027	
Approach Delay, s/veh		55.1			10.1						57.1	
Approach LOS		E			B						E	

Timer - Assigned Phs	1	2		4		6
Phs Duration (G+Y+Rc), s	6.7	39.9		33.4		86.6
Change Period (Y+Rc), s	7.0	* 7		6.1		7.0
Max Green Setting (Gmax), s	33.3	* 33		29.0		77.9
Max Q Clear Time (g_c+I1), s	36.0	31.5		26.0		2.0
Green Ext Time (p_c), s	1.6	1.0		1.3		13.4

Intersection Summary	
HCM 6th Ctrl Delay	32.7
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	415	41	92	40	51	80	188	690	20	150	710	700
Future Volume (veh/h)	415	41	92	40	51	80	188	690	20	150	710	700
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.97	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	458	0	95	41	53	82	194	711	21	155	732	722
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	636	0	281	143	150	126	199	1857	55	193	1284	850
Arrive On Green	0.18	0.00	0.18	0.08	0.08	0.08	0.11	0.36	0.36	0.11	0.36	0.36
Sat Flow, veh/h	3563	0	1574	1781	1870	1561	1781	5092	150	1781	3554	1570
Grp Volume(v), veh/h	458	0	95	41	53	82	194	475	257	155	732	722
Grp Sat Flow(s),veh/h/ln	1781	0	1574	1781	1870	1561	1781	1702	1838	1781	1777	1570
Q Serve(g_s), s	9.3	0.0	4.1	1.7	2.1	3.9	8.4	7.9	8.0	6.5	12.7	27.8
Cycle Q Clear(g_c), s	9.3	0.0	4.1	1.7	2.1	3.9	8.4	7.9	8.0	6.5	12.7	27.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		0.08	1.00		1.00
Lane Grp Cap(c), veh/h	636	0	281	143	150	126	199	1241	670	193	1284	850
V/C Ratio(X)	0.72	0.00	0.34	0.29	0.35	0.65	0.97	0.38	0.38	0.80	0.57	0.85
Avail Cap(c_a), veh/h	1251	0	553	371	389	325	199	1241	670	283	1284	850
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	29.8	0.0	27.6	33.3	33.5	34.3	34.0	18.0	18.1	33.5	19.8	14.5
Incr Delay (d2), s/veh	1.6	0.0	0.7	1.1	1.4	5.6	56.1	0.2	0.4	9.9	0.6	8.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	0.0	1.5	0.7	1.0	1.6	6.6	3.0	3.3	3.3	5.1	15.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.3	0.0	28.3	34.4	34.9	40.0	90.2	18.2	18.4	43.4	20.4	22.7
LnGrp LOS	C	A	C	C	C	D	F	B	B	D	C	C
Approach Vol, veh/h		553			176			926			1609	
Approach Delay, s/veh		30.8			37.1			33.3			23.6	
Approach LOS		C			D			C			C	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	12.7	34.1		19.0	13.0	33.8		11.1
Change Period (Y+Rc), s	4.4	* 6		5.3	4.4	6.0		4.9
Max Green Setting (Gmax), s	12.3	* 25		27.0	8.6	27.8		16.0
Max Q Clear Time (g_c+I1), s	13.5	10.0		11.3	10.4	29.8		5.9
Green Ext Time (p_c), s	0.1	4.2		1.8	0.0	0.0		0.4

Intersection Summary	
HCM 6th Ctrl Delay	28.3
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	2.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	23	0	50	10	0	10	90	689	20	5	418	22
Future Vol, veh/h	23	0	50	10	0	10	90	689	20	5	418	22
Conflicting Peds, #/hr	0	0	1	1	0	0	8	0	0	0	0	8
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	80	-	-
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	24	0	52	10	0	10	94	718	21	5	435	23

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1387	1392	456	1401	1393	729	466	0	0	739	0	0
Stage 1	465	465	-	917	917	-	-	-	-	-	-	-
Stage 2	922	927	-	484	476	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	120	142	604	118	142	423	1095	-	-	867	-	-
Stage 1	578	563	-	326	351	-	-	-	-	-	-	-
Stage 2	324	347	-	564	557	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	108	128	599	100	128	423	1088	-	-	867	-	-
Mov Cap-2 Maneuver	108	128	-	100	128	-	-	-	-	-	-	-
Stage 1	525	556	-	298	321	-	-	-	-	-	-	-
Stage 2	289	317	-	512	550	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	26	30.5	1	0.1
HCM LOS	D	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1088	-	-	246	162	867	-	-
HCM Lane V/C Ratio	0.086	-	-	0.309	0.129	0.006	-	-
HCM Control Delay (s)	8.6	-	-	26	30.5	9.2	-	-
HCM Lane LOS	A	-	-	D	D	A	-	-
HCM 95th %tile Q(veh)	0.3	-	-	1.3	0.4	0	-	-

Intersection	
Int Delay, s/veh	3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	30	60	0	0	40	650	22	0	350	5
Future Vol, veh/h	10	0	30	60	0	0	40	650	22	0	350	5
Conflicting Peds, #/hr	0	0	0	0	0	0	9	0	0	0	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	65	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	0	32	63	0	0	42	684	23	0	368	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1160	1171	380	1167	1162	696	382	0	0	707	0	0
Stage 1	380	380	-	780	780	-	-	-	-	-	-	-
Stage 2	780	791	-	387	382	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	172	193	667	171	195	442	1176	-	-	891	-	-
Stage 1	642	614	-	388	406	-	-	-	-	-	-	-
Stage 2	388	401	-	637	613	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	166	185	662	158	187	442	1167	-	-	891	-	-
Mov Cap-2 Maneuver	166	185	-	158	187	-	-	-	-	-	-	-
Stage 1	614	610	-	374	391	-	-	-	-	-	-	-
Stage 2	374	387	-	607	609	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.7	42.2	0.5	0
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1167	-	-	379	158	891	-	-
HCM Lane V/C Ratio	0.036	-	-	0.111	0.4	-	-	-
HCM Control Delay (s)	8.2	-	-	15.7	42.2	0	-	-
HCM Lane LOS	A	-	-	C	E	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	1.7	0	-	-

Year 2050 + Project PM
8: Carmel Mountain Rd & Cuca St/Caminata Deluz

The Junipers
02/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	0	92	20	0	20	103	778	30	40	612	60
Future Volume (veh/h)	40	0	92	20	0	20	103	778	30	40	612	60
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.98		0.98	0.99		0.98	1.00		0.99	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	42	0	97	21	0	21	108	819	32	42	644	63
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	177	41	245	261	39	171	142	1342	52	66	1120	109
Arrive On Green	0.23	0.00	0.23	0.23	0.00	0.23	0.08	0.39	0.39	0.04	0.34	0.34
Sat Flow, veh/h	285	182	1079	583	172	755	1781	3486	136	1781	3268	319
Grp Volume(v), veh/h	139	0	0	42	0	0	108	417	434	42	350	357
Grp Sat Flow(s),veh/h/ln	1547	0	0	1511	0	0	1781	1777	1845	1781	1777	1811
Q Serve(g_s), s	0.0	0.0	0.0	0.0	0.0	0.0	2.5	7.9	7.9	1.0	6.7	6.8
Cycle Q Clear(g_c), s	3.0	0.0	0.0	0.8	0.0	0.0	2.5	7.9	7.9	1.0	6.7	6.8
Prop In Lane	0.30		0.70	0.50		0.50	1.00		0.07	1.00		0.18
Lane Grp Cap(c), veh/h	463	0	0	472	0	0	142	684	711	66	609	620
V/C Ratio(X)	0.30	0.00	0.00	0.09	0.00	0.00	0.76	0.61	0.61	0.64	0.57	0.58
Avail Cap(c_a), veh/h	1162	0	0	1130	0	0	621	1770	1838	196	1342	1367
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	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.7	0.0	0.0	12.8	0.0	0.0	18.9	10.3	10.3	19.9	11.3	11.3
Incr Delay (d2), s/veh	0.4	0.0	0.0	0.1	0.0	0.0	8.2	0.9	0.9	9.9	0.9	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	0.3	0.0	0.0	1.2	2.5	2.6	0.5	2.2	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.0	0.0	0.0	12.9	0.0	0.0	27.1	11.2	11.2	29.7	12.1	12.1
LnGrp LOS	B	A	A	B	A	A	C	B	B	C	B	B
Approach Vol, veh/h		139			42			959			749	
Approach Delay, s/veh		14.0			12.9			13.0			13.1	
Approach LOS		B			B			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.9	21.5		14.4	7.7	19.7		14.4				
Change Period (Y+Rc), s	4.4	* 5.4		4.9	4.4	5.4		4.9				
Max Green Setting (Gmax), s	4.6	* 42		29.1	14.6	31.6		29.1				
Max Q Clear Time (g_c+I1), s	3.0	9.9		5.0	4.5	8.8		2.8				
Green Ext Time (p_c), s	0.0	6.2		0.8	0.2	4.6		0.2				

Intersection Summary	
HCM 6th Ctrl Delay	13.1
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Year 2050 + Project PM
9: Comm Dwy/Paseo Cardiel & Carmel Mountain Rd

The Junipers
02/25/2019

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	150	826	90	43	571	100	280	40	45	120	40	50
Future Volume (veh/h)	150	826	90	43	571	100	280	40	45	120	40	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	0.99		0.98	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	160	879	96	46	607	106	298	43	48	128	43	53
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	205	1205	132	62	884	154	436	49	55	620	275	339
Arrive On Green	0.12	0.37	0.37	0.03	0.29	0.29	0.36	0.36	0.36	0.36	0.36	0.36
Sat Flow, veh/h	1781	3222	352	1781	3012	525	936	135	151	1301	759	935
Grp Volume(v), veh/h	160	485	490	46	357	356	389	0	0	128	0	96
Grp Sat Flow(s),veh/h/ln	1781	1777	1797	1781	1777	1760	1222	0	0	1301	0	1694
Q Serve(g_s), s	5.8	15.5	15.5	1.7	11.7	11.8	17.7	0.0	0.0	0.0	0.0	2.5
Cycle Q Clear(g_c), s	5.8	15.5	15.5	1.7	11.7	11.8	20.3	0.0	0.0	4.1	0.0	2.5
Prop In Lane	1.00		0.20	1.00		0.30	0.77		0.12	1.00		0.55
Lane Grp Cap(c), veh/h	205	664	672	62	521	516	540	0	0	620	0	614
V/C Ratio(X)	0.78	0.73	0.73	0.75	0.69	0.69	0.72	0.00	0.00	0.21	0.00	0.16
Avail Cap(c_a), veh/h	448	1177	1190	111	835	827	609	0	0	686	0	701
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	28.4	17.8	17.8	31.6	20.6	20.6	21.1	0.0	0.0	14.7	0.0	14.2
Incr Delay (d2), s/veh	6.3	1.6	1.5	16.4	1.6	1.6	3.6	0.0	0.0	0.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	6.0	6.1	1.0	4.7	4.7	5.7	0.0	0.0	1.3	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.7	19.3	19.3	48.0	22.2	22.3	24.7	0.0	0.0	14.9	0.0	14.3
LnGrp LOS	C	B	B	D	C	C	C	A	A	B	A	B
Approach Vol, veh/h		1135			759			389			224	
Approach Delay, s/veh		21.5			23.8			24.7			14.6	
Approach LOS		C			C			C			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.7	30.5		28.8	12.0	25.2		28.8				
Change Period (Y+Rc), s	4.4	* 5.8		4.9	4.4	5.8		4.9				
Max Green Setting (Gmax), s	4.1	* 44		27.3	16.6	31.0		27.3				
Max Q Clear Time (g_c+I1), s	3.7	17.5		6.1	7.8	13.8		22.3				
Green Ext Time (p_c), s	0.0	7.2		0.9	0.3	4.2		1.1				

Intersection Summary	
HCM 6th Ctrl Delay	22.1
HCM 6th LOS	C

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	270	190	130	413	287	281	320	860	534	392	690	40
Future Volume (veh/h)	270	190	130	413	287	281	320	860	534	392	690	40
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		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	278	196	134	426	296	290	330	887	551	404	711	41
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	322	296	193	474	351	507	351	1626	723	458	2006	619
Arrive On Green	0.09	0.14	0.14	0.14	0.19	0.19	0.20	0.46	0.46	0.13	0.39	0.39
Sat Flow, veh/h	3456	2062	1340	3456	1870	1583	1781	3554	1580	3456	5106	1575
Grp Volume(v), veh/h	278	167	163	426	296	290	330	887	551	404	711	41
Grp Sat Flow(s),veh/h/ln	1728	1777	1626	1728	1870	1583	1781	1777	1580	1728	1702	1575
Q Serve(g_s), s	11.9	13.4	14.3	18.2	22.9	22.9	27.4	27.1	43.6	17.2	14.7	2.4
Cycle Q Clear(g_c), s	11.9	13.4	14.3	18.2	22.9	22.9	27.4	27.1	43.6	17.2	14.7	2.4
Prop In Lane	1.00		0.82	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	322	255	234	474	351	507	351	1626	723	458	2006	619
V/C Ratio(X)	0.86	0.66	0.70	0.90	0.84	0.57	0.94	0.55	0.76	0.88	0.35	0.07
Avail Cap(c_a), veh/h	341	419	384	514	524	653	366	1626	723	546	2006	619
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	0.64	0.64	0.64	0.09	0.09	0.09	1.00	1.00	1.00
Uniform Delay (d), s/veh	67.1	60.7	61.1	63.7	58.8	42.5	59.4	29.4	33.9	63.9	32.1	28.4
Incr Delay (d2), s/veh	19.0	2.9	3.7	12.4	5.3	0.7	5.2	0.1	0.7	13.9	0.5	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	6.3	6.2	8.9	11.4	9.1	12.9	11.7	16.8	8.5	6.3	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	86.1	63.6	64.8	76.1	64.1	43.1	64.5	29.5	34.6	77.8	32.6	28.6
LnGrp LOS	F	E	E	E	E	D	E	C	C	E	C	C
Approach Vol, veh/h		608			1012			1768			1156	
Approach Delay, s/veh		74.2			63.2			37.7			48.3	
Approach LOS		E			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	33.8	64.4	18.2	33.6	24.1	74.1	24.8	27.0
Change Period (Y+Rc), s	4.2	5.5	* 4.2	5.5	* 4.2	5.5	* 4.2	* 5.5
Max Green Setting (Gmax), s	31.1	43.0	* 15	42.0	* 24	50.1	* 22	* 35
Max Q Clear Time (g_c+I1), s	29.4	16.7	13.9	24.9	19.2	45.6	20.2	16.3
Green Ext Time (p_c), s	0.2	5.5	0.1	2.6	0.6	3.1	0.4	1.9

Intersection Summary	
HCM 6th Ctrl Delay	50.9
HCM 6th LOS	D

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	500	50	790	50	30	70	30	1254	60	110	883	240
Future Volume (veh/h)	500	50	790	50	30	70	30	1254	60	110	883	240
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		0.99	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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	521	52	741	52	31	73	31	1306	62	115	920	250
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	543	54	529	154	43	100	77	1134	54	155	1322	1116
Arrive On Green	0.33	0.33	0.33	0.09	0.09	0.09	0.04	0.33	0.33	0.09	0.37	0.37
Sat Flow, veh/h	1627	162	1584	1781	494	1163	1781	3453	164	1781	3554	1579
Grp Volume(v), veh/h	573	0	741	52	0	104	31	671	697	115	920	250
Grp Sat Flow(s),veh/h/ln	1789	0	1584	1781	0	1656	1781	1777	1839	1781	1777	1579
Q Serve(g_s), s	36.1	0.0	38.4	3.2	0.0	7.0	1.9	37.8	37.8	7.2	25.2	6.4
Cycle Q Clear(g_c), s	36.1	0.0	38.4	3.2	0.0	7.0	1.9	37.8	37.8	7.2	25.2	6.4
Prop In Lane	0.91		1.00	1.00		0.70	1.00		0.09	1.00		1.00
Lane Grp Cap(c), veh/h	597	0	529	154	0	143	77	584	604	155	1322	1116
V/C Ratio(X)	0.96	0.00	1.40	0.34	0.00	0.73	0.40	1.15	1.15	0.74	0.70	0.22
Avail Cap(c_a), veh/h	597	0	529	155	0	144	77	584	604	155	1322	1116
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	1.00	0.80	0.80	0.80
Uniform Delay (d), s/veh	37.5	0.0	38.3	49.4	0.0	51.2	53.5	38.6	38.6	51.2	30.6	5.9
Incr Delay (d2), s/veh	26.9	0.0	191.8	1.3	0.0	16.7	3.3	86.1	86.8	14.2	2.5	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.0	0.0	42.8	1.5	0.0	3.6	0.9	30.1	31.3	3.8	11.1	5.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	64.4	0.0	230.1	50.7	0.0	67.9	56.9	124.8	125.5	65.5	33.1	6.3
LnGrp LOS	E	A	F	D	A	E	E	F	F	E	C	A
Approach Vol, veh/h		1314			156			1399			1285	
Approach Delay, s/veh		157.8			62.2			123.6			30.8	
Approach LOS		F			E			F			C	

Timer - Assigned Phs	1	2	4	5	6	8
Phs Duration (G+Y+Rc), s	39.2	48.3	14.5	14.2	43.3	43.0
Change Period (Y+Rc), s	4.2	5.5	4.6	* 4.2	5.5	4.6
Max Green Setting (Gmax), s	35.5	42.7	10.0	* 10	37.7	38.4
Max Q Clear Time (g_c+I1), s	13.9	27.2	9.0	9.2	39.8	40.4
Green Ext Time (p_c), s	0.0	6.7	0.1	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	103.4
HCM 6th LOS	F

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX L

POST-MITIGATION INTERSECTION ANALYSIS WORKSHEETS

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	119	15	45	354	1	886
v/c Ratio	0.32	0.05	0.19	0.29	0.01	0.41
Control Delay	9.8	15.7	24.6	8.0	26.0	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	9.8	15.7	24.6	8.0	26.0	9.6
Queue Length 50th (ft)	7	3	9	29	0	41
Queue Length 95th (ft)	42	15	45	170	5	210
Internal Link Dist (ft)	424	248		152		573
Turn Bay Length (ft)			75		80	
Base Capacity (vph)	849	806	237	1222	172	2120
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	0.14	0.02	0.19	0.29	0.01	0.42

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	33	1	75	14	0	0	41	319	6	1	790	25
Future Volume (veh/h)	33	1	75	14	0	0	41	319	6	1	790	25
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	36	1	82	15	0	0	45	347	7	1	859	27
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	195	5	114	403	0	0	74	849	17	6	1493	47
Arrive On Green	0.11	0.11	0.11	0.11	0.00	0.00	0.04	0.46	0.46	0.00	0.42	0.42
Sat Flow, veh/h	432	48	1062	1639	0	0	1781	1827	37	1781	3516	111
Grp Volume(v), veh/h	119	0	0	15	0	0	45	0	354	1	434	452
Grp Sat Flow(s),veh/h/ln	1542	0	0	1639	0	0	1781	0	1864	1781	1777	1850
Q Serve(g_s), s	2.1	0.0	0.0	0.0	0.0	0.0	0.8	0.0	4.0	0.0	5.9	5.9
Cycle Q Clear(g_c), s	2.4	0.0	0.0	0.2	0.0	0.0	0.8	0.0	4.0	0.0	5.9	5.9
Prop In Lane	0.30		0.69	1.00		0.00	1.00		0.02	1.00		0.06
Lane Grp Cap(c), veh/h	314	0	0	403	0	0	74	0	866	6	754	785
V/C Ratio(X)	0.38	0.00	0.00	0.04	0.00	0.00	0.61	0.00	0.41	0.18	0.58	0.58
Avail Cap(c_a), veh/h	1215	0	0	1177	0	0	310	0	1503	225	1349	1404
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	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.6	0.0	0.0	12.7	0.0	0.0	14.9	0.0	5.6	15.8	6.9	6.9
Incr Delay (d2), s/veh	0.8	0.0	0.0	0.0	0.0	0.0	8.0	0.0	0.3	14.3	0.7	0.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.0	0.0	0.1	0.0	0.0	0.4	0.0	0.9	0.0	1.4	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	14.4	0.0	0.0	12.7	0.0	0.0	22.9	0.0	5.9	30.1	7.6	7.6
LnGrp LOS	B	A	A	B	A	A	C	A	A	C	A	A
Approach Vol, veh/h		119			15			399			887	
Approach Delay, s/veh		14.4			12.7			7.8			7.6	
Approach LOS		B			B			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.5	19.2		7.9	5.8	17.9		7.9				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	4.0	25.5		22.0	5.5	24.0		22.0				
Max Q Clear Time (g_c+I1), s	2.0	6.0		4.4	2.8	7.9		2.2				
Green Ext Time (p_c), s	0.0	2.0		0.5	0.0	5.2		0.0				

Intersection Summary		
HCM 6th Ctrl Delay	8.3	
HCM 6th LOS	A	

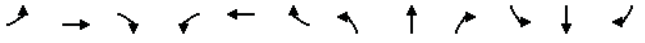
Intersection	
Intersection Delay, s/veh	8.5
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	50	70	384	773
Demand Flow Rate, veh/h	51	71	391	788
Vehicles Circulating, veh/h	858	386	7	80
Vehicles Exiting, veh/h	10	12	902	377
Ped Vol Crossing Leg, #/h	4	0	0	0
Ped Cap Adj	0.999	1.000	1.000	1.000
Approach Delay, s/veh	7.5	4.6	5.2	10.6
Approach LOS	A	A	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	51	71	391	788
Cap Entry Lane, veh/h	575	931	1370	1272
Entry HV Adj Factor	0.980	0.986	0.981	0.980
Flow Entry, veh/h	50	70	384	773
Cap Entry, veh/h	564	918	1345	1247
V/C Ratio	0.089	0.076	0.285	0.620
Control Delay, s/veh	7.5	4.6	5.2	10.6
LOS	A	A	A	B
95th %tile Queue, veh	0	0	1	5

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	59	13	79	674	5	416
v/c Ratio	0.15	0.04	0.23	0.48	0.02	0.19
Control Delay	0.9	0.2	23.3	8.1	28.0	9.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	0.9	0.2	23.3	8.1	28.0	9.5
Queue Length 50th (ft)	0	0	13	62	1	34
Queue Length 95th (ft)	0	0	84	372	14	97
Internal Link Dist (ft)	424	248		152		573
Turn Bay Length (ft)			75		80	
Base Capacity (vph)	942	866	501	1699	215	3165
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	0.06	0.02	0.16	0.40	0.02	0.13

Intersection Summary



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	15	0	41	8	0	5	76	635	12	5	382	17
Future Volume (veh/h)	15	0	41	8	0	5	76	635	12	5	382	17
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	1.00		1.00	1.00		0.99	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	16	0	43	8	0	5	79	661	12	5	398	18
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	167	0	73	244	0	41	112	945	17	10	1588	72
Arrive On Green	0.06	0.00	0.06	0.06	0.00	0.06	0.06	0.52	0.52	0.01	0.46	0.46
Sat Flow, veh/h	419	0	1127	1014	0	634	1781	1831	33	1781	3461	156
Grp Volume(v), veh/h	59	0	0	13	0	0	79	0	673	5	204	212
Grp Sat Flow(s),veh/h/ln	1546	0	0	1648	0	0	1781	0	1864	1781	1777	1841
Q Serve(g_s), s	1.0	0.0	0.0	0.0	0.0	0.0	1.4	0.0	8.9	0.1	2.3	2.3
Cycle Q Clear(g_c), s	1.2	0.0	0.0	0.2	0.0	0.0	1.4	0.0	8.9	0.1	2.3	2.3
Prop In Lane	0.27		0.73	0.62		0.38	1.00		0.02	1.00		0.08
Lane Grp Cap(c), veh/h	240	0	0	285	0	0	112	0	962	10	815	844
V/C Ratio(X)	0.25	0.00	0.00	0.05	0.00	0.00	0.71	0.00	0.70	0.52	0.25	0.25
Avail Cap(c_a), veh/h	1163	0	0	1161	0	0	574	0	2860	246	2399	2485
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	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.8	0.0	0.0	14.4	0.0	0.0	15.0	0.0	6.0	16.2	5.4	5.4
Incr Delay (d2), s/veh	0.5	0.0	0.0	0.1	0.0	0.0	7.9	0.0	0.9	36.8	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.0	0.1	0.0	0.0	0.7	0.0	1.8	0.1	0.5	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.3	0.0	0.0	14.4	0.0	0.0	22.9	0.0	6.9	52.9	5.6	5.6
LnGrp LOS	B	A	A	B	A	A	C	A	A	D	A	A
Approach Vol, veh/h		59			13			752			421	
Approach Delay, s/veh		15.3			14.4			8.6			6.1	
Approach LOS		B			B			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	21.3		6.6	6.5	19.4		6.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	4.5	50.0		22.0	10.5	44.0		22.0				
Max Q Clear Time (g_c+I1), s	2.1	10.9		3.2	3.4	4.3		2.2				
Green Ext Time (p_c), s	0.0	5.5		0.2	0.1	2.7		0.0				

Intersection Summary		
HCM 6th Ctrl Delay		8.1
HCM 6th LOS		A

Intersection	
Intersection Delay, s/veh	7.0
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	27	63	682	335
Demand Flow Rate, veh/h	27	64	695	342
Vehicles Circulating, veh/h	404	675	3	102
Vehicles Exiting, veh/h	40	23	428	637
Ped Vol Crossing Leg, #/h	9	0	0	0
Ped Cap Adj	0.999	1.000	1.000	1.000
Approach Delay, s/veh	4.2	6.3	7.9	5.4
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	27	64	695	342
Cap Entry Lane, veh/h	914	693	1376	1244
Entry HV Adj Factor	1.000	0.984	0.981	0.981
Flow Entry, veh/h	27	63	682	335
Cap Entry, veh/h	913	682	1349	1219
V/C Ratio	0.030	0.092	0.505	0.275
Control Delay, s/veh	4.2	6.3	7.9	5.4
LOS	A	A	A	A
95th %tile Queue, veh	0	0	3	1

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	144	33	54	391	1	961
v/c Ratio	0.38	0.09	0.28	0.32	0.01	0.47
Control Delay	10.4	0.5	28.3	8.3	26.0	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	10.4	0.5	28.3	8.3	26.0	10.8
Queue Length 50th (ft)	10	0	13	34	0	90
Queue Length 95th (ft)	47	0	#58	191	5	226
Internal Link Dist (ft)	424	248		152		573
Turn Bay Length (ft)			75		80	
Base Capacity (vph)	831	794	190	1208	168	2104
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	0.17	0.04	0.28	0.32	0.01	0.46

Intersection Summary

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	1	90	20	0	10	50	350	10	1	852	32
Future Volume (veh/h)	41	1	90	20	0	10	50	350	10	1	852	32
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	45	1	98	22	0	11	54	380	11	1	926	35
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	188	14	142	289	31	74	83	865	25	5	1511	57
Arrive On Green	0.14	0.14	0.14	0.14	0.00	0.14	0.05	0.48	0.48	0.00	0.43	0.43
Sat Flow, veh/h	392	103	1055	870	230	550	1781	1808	52	1781	3491	132
Grp Volume(v), veh/h	144	0	0	33	0	0	54	0	391	1	471	490
Grp Sat Flow(s),veh/h/ln	1550	0	0	1651	0	0	1781	0	1861	1781	1777	1846
Q Serve(g_s), s	2.2	0.0	0.0	0.0	0.0	0.0	1.0	0.0	4.9	0.0	7.2	7.2
Cycle Q Clear(g_c), s	3.1	0.0	0.0	0.6	0.0	0.0	1.0	0.0	4.9	0.0	7.2	7.2
Prop In Lane	0.31		0.68	0.67		0.33	1.00		0.03	1.00		0.07
Lane Grp Cap(c), veh/h	344	0	0	394	0	0	83	0	890	5	769	799
V/C Ratio(X)	0.42	0.00	0.00	0.08	0.00	0.00	0.65	0.00	0.44	0.20	0.61	0.61
Avail Cap(c_a), veh/h	1096	0	0	1075	0	0	229	0	1355	203	1269	1318
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	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.4	0.0	0.0	13.3	0.0	0.0	16.4	0.0	6.0	17.4	7.7	7.7
Incr Delay (d2), s/veh	0.8	0.0	0.0	0.1	0.0	0.0	8.2	0.0	0.3	17.8	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	0.2	0.0	0.0	0.5	0.0	1.2	0.0	1.9	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	15.2	0.0	0.0	13.4	0.0	0.0	24.6	0.0	6.4	35.3	8.5	8.4
LnGrp LOS	B	A	A	B	A	A	C	A	A	D	A	A
Approach Vol, veh/h		144			33			445			962	
Approach Delay, s/veh		15.2			13.4			8.6			8.5	
Approach LOS		B			B			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.5	21.2		9.2	6.1	19.7		9.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	4.0	25.5		22.0	4.5	25.0		22.0				
Max Q Clear Time (g_c+I1), s	2.0	6.9		5.1	3.0	9.2		2.6				
Green Ext Time (p_c), s	0.0	2.3		0.7	0.0	5.7		0.1				

Intersection Summary

HCM 6th Ctrl Delay	9.2
HCM 6th LOS	A

Intersection	
Intersection Delay, s/veh	9.5
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	54	70	425	838
Demand Flow Rate, veh/h	55	71	433	855
Vehicles Circulating, veh/h	925	432	11	82
Vehicles Exiting, veh/h	12	12	969	421
Ped Vol Crossing Leg, #/h	4	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.1	4.9	5.5	12.0
Approach LOS	A	A	A	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	55	71	433	855
Cap Entry Lane, veh/h	537	888	1364	1269
Entry HV Adj Factor	0.982	0.986	0.981	0.980
Flow Entry, veh/h	54	70	425	838
Cap Entry, veh/h	527	876	1339	1244
V/C Ratio	0.102	0.080	0.317	0.674
Control Delay, s/veh	8.1	4.9	5.5	12.0
LOS	A	A	A	B
95th %tile Queue, veh	0	0	1	6

Lane Group	EBT	WBT	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	76	20	94	739	5	458
v/c Ratio	0.21	0.06	0.27	0.52	0.03	0.25
Control Delay	2.7	0.3	24.3	8.4	29.6	10.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	2.7	0.3	24.3	8.4	29.6	10.3
Queue Length 50th (ft)	0	0	16	72	1	39
Queue Length 95th (ft)	10	0	99	425	14	107
Internal Link Dist (ft)	424	248		152		573
Turn Bay Length (ft)			75		80	
Base Capacity (vph)	889	878	490	1692	184	3144
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	0.09	0.02	0.19	0.44	0.03	0.15

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	23	0	50	10	0	10	90	689	20	5	418	22
Future Volume (veh/h)	23	0	50	10	0	10	90	689	20	5	418	22
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.98	1.00		1.00	1.00		0.99	1.00		0.99
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
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	24	0	52	10	0	10	94	718	21	5	435	23
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	169	0	79	210	4	62	121	979	29	10	1645	87
Arrive On Green	0.07	0.00	0.07	0.07	0.00	0.07	0.07	0.54	0.54	0.01	0.48	0.48
Sat Flow, veh/h	489	0	1060	785	55	840	1781	1808	53	1781	3432	181
Grp Volume(v), veh/h	76	0	0	20	0	0	94	0	739	5	225	233
Grp Sat Flow(s),veh/h/ln	1549	0	0	1679	0	0	1781	0	1860	1781	1777	1836
Q Serve(g_s), s	1.3	0.0	0.0	0.0	0.0	0.0	1.9	0.0	10.8	0.1	2.7	2.7
Cycle Q Clear(g_c), s	1.7	0.0	0.0	0.4	0.0	0.0	1.9	0.0	10.8	0.1	2.7	2.7
Prop In Lane	0.32		0.68	0.50		0.50	1.00		0.03	1.00		0.10
Lane Grp Cap(c), veh/h	248	0	0	276	0	0	121	0	1008	10	852	880
V/C Ratio(X)	0.31	0.00	0.00	0.07	0.00	0.00	0.78	0.00	0.73	0.52	0.26	0.27
Avail Cap(c_a), veh/h	1066	0	0	1069	0	0	544	0	2623	205	2167	2239
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	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.0	0.0	0.0	15.5	0.0	0.0	16.4	0.0	6.2	17.7	5.5	5.5
Incr Delay (d2), s/veh	0.7	0.0	0.0	0.1	0.0	0.0	10.1	0.0	1.1	37.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.0	0.0	0.1	0.0	0.0	1.0	0.0	2.3	0.1	0.6	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	16.7	0.0	0.0	15.6	0.0	0.0	26.5	0.0	7.3	54.7	5.7	5.7
LnGrp LOS	B	A	A	B	A	A	C	A	A	D	A	A
Approach Vol, veh/h		76			20			833			463	
Approach Delay, s/veh		16.7			15.6			9.4			6.2	
Approach LOS		B			B			A			A	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	4.7	23.8		7.2	6.9	21.6		7.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	4.1	50.3		22.1	10.9	43.5		22.1				
Max Q Clear Time (g_c+I1), s	2.1	12.8		3.7	3.9	4.7		2.4				
Green Ext Time (p_c), s	0.0	6.3		0.3	0.1	3.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	8.9
HCM 6th LOS	A

Intersection	
Intersection Delay, s/veh	7.7
Intersection LOS	A

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	43	63	749	373
Demand Flow Rate, veh/h	44	64	764	380
Vehicles Circulating, veh/h	439	752	11	107
Vehicles Exiting, veh/h	48	23	472	709
Ped Vol Crossing Leg, #/h	9	0	0	0
Ped Cap Adj	0.999	1.000	1.000	1.000
Approach Delay, s/veh	4.7	6.8	8.9	5.8
Approach LOS	A	A	A	A

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	44	64	764	380
Cap Entry Lane, veh/h	882	641	1364	1237
Entry HV Adj Factor	0.977	0.984	0.981	0.981
Flow Entry, veh/h	43	63	749	373
Cap Entry, veh/h	861	631	1338	1213
V/C Ratio	0.050	0.100	0.560	0.307
Control Delay, s/veh	4.7	6.8	8.9	5.8
LOS	A	A	A	A
95th %tile Queue, veh	0	0	4	1

APPENDIX M

SIGNAL WARRANT ANALYSIS

PEÑASQUITOS DRIVE SIGNAL WARRANTS

Based on analysis of the Intersection #6. Peñasquitos Drive/ Cuca Street/Hotel Karlan Driveway and Intersection #7. Peñasquitos Drive/ Janal Way/ Project Driveway, LOS E or worse operations are forecasted if the intersections are unsignalized. The Project proposes to install a traffic signal at Intersection #6 and a roundabout at Intersection #7 as mitigation measures. If the roundabout at Intersection #7 is not installed, the improvements needed to improve LOS operations to acceptable levels would be to install a traffic signal at each location.

A traffic signal warrant analysis has been completed for each intersection to determine if a signal would meet warrants under "with Project" conditions. As outlined in Chapter 4C, "Traffic Control Signal Needs Studies," of the *2012 California Manual on Uniform Traffic Control Devices* (California MUTCD), the peak hour warrant (Warrant 3) was analyzed for the subject intersections to determine if a traffic signal would be warranted under near-term and horizon year conditions.

The lane configurations at the intersections are the following:

Intersection #6. Peñasquitos Drive/ Cuca Street/Hotel Karlan Driveway

- Peñasquitos Drive (southbound): 1 left-turn, 1 shared thru/right-turn lane
- Peñasquitos Drive (northbound): 1 left-turn, 1 shared thru/right-turn lane
- Cuca Street (eastbound): 1 shared left-turn/thru/right-turn lane
- Hotel Karlan Driveway (westbound): 1 shared left-turn/thru/right-turn lane

Intersection #7. Peñasquitos Drive/ Janal Way/ Project Driveway

- Peñasquitos Drive (southbound): 1 shared thru/right-turn lane (1 proposed left-turn lane)
- Peñasquitos Drive (northbound): 1 left-turn, 1 thru lane (1 proposed shared thru/right-turn lane
- Janal Way (eastbound): 1 shared left-turn/thru/right-turn lane
- Future Project Driveway (westbound): 1 left-turn lane; 1 shared thru/right-turn lane

Table A below provides an overview of the geometric conditions at the intersections.

TABLE A
LANE CONDITIONS

Intersection	Major Street	Number of Lanes per Approach	
		Major Street	Minor Street
Intersection #6. Peñasquitos Drive/ Cuca Street/Hotel Karlan Driveway	Peñasquitos Drive	1	1
Intersection #7. Peñasquitos Drive/ Janal Way/ Project Driveway	Peñasquitos Drive	1	1

Note:

1. Per the MUTCD Section 4C.01(09), "site-specific traffic characteristics should dictate whether an approach is considered as one lane or two lanes. For example, for an approach with one lane for through and right-turning traffic plus a left-turn lane, if engineering judgment indicates that it should be considered a one-lane approach because the traffic using the left-turn lane is minor, the total traffic volume approaching the intersection should be applied against the signal warrants as a one-lane approach." Thus, a one lane approach was applied to the minor street approach.

Table B provides the hourly traffic volumes used in the analysis.

TABLE B
PEAK HOUR APPROACH TRAFFIC VOLUMES

Scenario	Time of Day	Vehicles per hour on major street (Total of both approaches)	Vehicles per hour on higher-volume minor-street approach (One direction only)
Intersection #6. Peñasquitos Drive/ Cuca Street/Hotel Karlan Driveway			
Existing + Project	7:00-9:00 AM	1,173	109
	4:00-6:00 PM	1,115	56
Near-Term (Opening Year 2020) + Project	7:00-9:00 AM	1,182	109
	4:00-6:00 PM	1,127	56
Horizon Year 2050 + Project	7:00-9:00 AM	1,295	132
	4:00-6:00 PM	1,244	73
Intersection #7. Peñasquitos Drive/ Janal Way/ Project Driveway			
Existing + Project	7:00-9:00 AM	1,055	64
	4:00-6:00 PM	954	60
Near-Term (Opening Year 2020) + Project	7:00-9:00 AM	1,064	64
	4:00-6:00 PM	966	60
Horizon Year 2050 + Project	7:00-9:00 AM	1,162	64
	4:00-6:00 PM	1,067	60

Note:

1. Volumes shown represent peak one-hour timeframe in the AM and PM peak periods.

1.0 WARRANT 3 – PEAK HOUR

1.1 Methodolgy

Warrant 3: Peak-Hour Vehicular Volume—The Peak-Hour Vehicular Volume signal warrant is intended for use at a location where traffic conditions are such that for a minimum one hour of an average day, the minor-street traffic suffers undue delay when entering or crossing the major street. The need for a traffic control signal shall be considered if an engineering study finds that the criteria in either Category A or Category B are met. Category A examines the peak hour volume and delay conditions for the same one hour of an average day. Category B compares the traffic volumes on the major and minor street approaches for one hour of an average day against a set threshold to consider installing a traffic signal. If either Category A or B is met, a signal is warranted.

Category A. If all of the three conditions exist for the same 1 hour (any four consecutive 15-minute periods) of an average day:

1. The total stopped time delay experienced by the traffic on one minor-street approach (one direction only) controlled by a STOP sign equals or exceeds: 4 Vehicles-hours for a one-lane approach; or 5 vehicle-hours for a two-lane approach, and
2. The volume on the same-minor street approach (one direction only) equals or exceeds 100 vehicles per hour for one moving lane of traffic or 150 vehicles per hour for two moving lanes, and
3. The total entering volume serviced during the hour equals or exceeds 650 vehicles per hour for the intersections with three approaches or 800 vehicles per hour for intersections with four or more approaches.

Category B. The plotted point representing the vehicles per hour on the major street (total of both approaches) and the corresponding vehicles per hour on the higher-volume on the minor street approach (one direction only) for 1 hour (or any four consecutive 15-minute periods) of an average day falls above the applicable curve in Figure 4C-3 for the existing combination of approach lanes.

If the posted or statutory speed limit or the 85th-percentile speed on the major street exceeds 40 mph, or if the intersection lies within the built-up area of an isolated community having a population of less than 10,000, Figure 4C-4 may be used in place of Figure 4C-3 to satisfy the criteria in the second category. The posted speed limit on Peñasquitos Drive is 35 mph. Therefore, Figure 4C-3 was used in evaluating Category B.

1.2 Calculations

Table D through ***Table I*** summarize Warrant 3 calculation results for both intersections under all "with Project" scenarios. The following sections describe the calculations done to evaluate Category A and Category B of Warrant 3.

1.2.1 *Category A*

For Category A-1, the total vehicle hours of delay must exceed four hours for a one-lane approach. For Intersection #6. Peñasquitos Drive/ Cuca Street/Hotel Karlan Driveway, the unsignalized peak hour intersection analysis indicates that the highest minor street stop-controlled approach operates at LOS F during the AM peak hour under all "with Project" scenarios.

For Intersection #7. Peñasquitos Drive/ Janal Way/ Project Driveway, the unsignalized peak hour intersection analysis indicates that the highest minor street stop-controlled approach operates at LOS E/F during the AM/PM peak hours under all "with Project" scenarios.

To calculate the total vehicle hours to assess Category A-1, the following formula was used:

AM peak hour = (delay in seconds x number of vehicles/hour) ÷ 3600 sec/hour = total vehicle hours

Table C below provides the calculated vehicle hours for each intersection under each "with Project" scenario.

TABLE C
CATEGORY A-1: VEHICLE HOURS OF DELAY

Scenario	Seconds	Veh/Hr	Sec/Hr	Vehicle Hours
Intersection #6. Peñasquitos Drive/ Cuca Street/Hotel Karlan Driveway				
Existing + Project (AM)	51.1	109	3,600	1.5
Near-Term (Opening Year 2020) + Project (AM)	52.3	109	3,600	1.6
Horizon Year 2050 + Project (AM)	67.0	132	3,600	2.5
Intersection #7. Peñasquitos Drive/ Janal Way/ Project Driveway				
Existing + Project (AM)	48.2	64	3,600	0.9
Near-Term (Opening Year 2020) + Project (AM)	49.8	64	3,600	0.9
Horizon Year 2050 + Project (AM)	66.9	64	3,600	1.2

Notes:

1. Veh/hr = vehicles per hour
2. Sec/hr = seconds per hour (3,600 seconds in one hour)

According to the calculations above, the total vehicle hours of delay do not exceed four hours in in the AM peak hour for either intersection.

For Categories A-2 and A-3, the AM peak hour traffic volumes exceed the thresholds of 100 vehicles/hour on the minor street and total entering volume of 650 vehicles/hour under all "with Project" conditions for Intersection #6. Peñasquitos Drive/ Cuca Street/Hotel Karlan Driveway. However, the minor street volume for Intersection #7. Peñasquitos Drive/ Janal Way/ Project Driveway does not exceed the threshold.

Therefore, **warrants are not met** for either intersection under **Category A**.

1.2.2 *Category B*

As shown in the graphics following each table table below, neither the AM nor PM peak hour volumes are above the threshold for a one-lane approach major and one-lane minor for all "with Project" conditions. Thus, **Category B of Warrant 3 is not satisfied.**

TABLE D
WARRANT 3: PEAK HOUR – EXISTING + PROJECT
INTERSECTION #6. PEÑASQUITOS DRIVE/ CUCA STREET/HOTEL KARLAN DRIVEWAY

Warrant 3 – Peak Hour Category A *or* Category B Satisfied * **Yes** ☐ **No** ☑

Category A Satisfied * **Yes** ☐ **No** ☑

(All Parts 1, 2, and 3 below must be satisfied)

1. The total delay experienced for traffic on one minor-street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — **Yes** ☐ **No** ☑
2. The volume on the same-minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — **Yes** ☑ **No** ☐
3. The entering volume serviced during the hour equals or exceeds 800 vph for the intersections with four or more approaches or 650 vehicles per hour for intersections with three approaches. — **Yes** ☑ **No** ☐

Category B Satisfied * **Yes** ☐ **No** ☑

Approach Lanes	One	Two or More	Warrant Volume	AM	PM
Both Approaches -Major Street	X		See Figure 4C-3 below	1,173	1,115
Highest Approach -Minor Street	X		See Figure 4C-3 below	109	56
The plotted points fall above the applicable curve on Figure 4C-3.				**Yes** ☐	**No** ☑

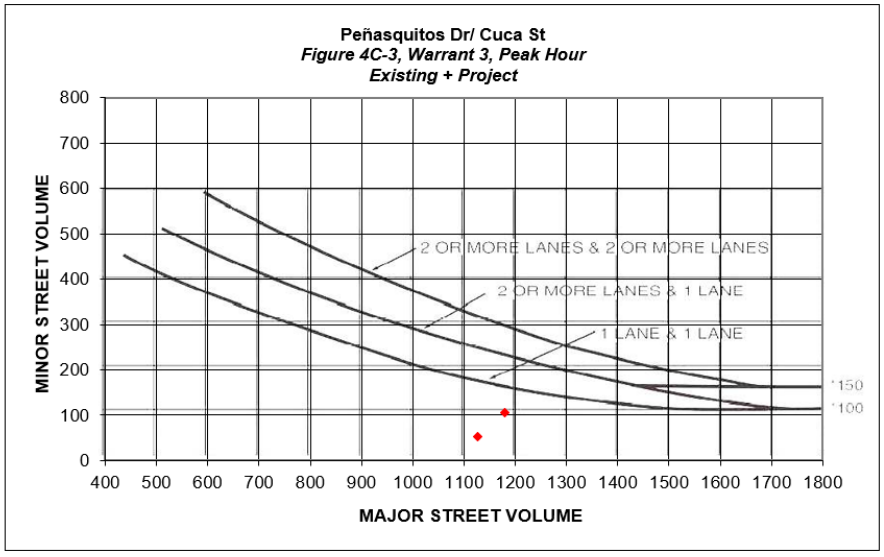


TABLE E
WARRANT 3: PEAK HOUR – NEAR-TERM (OPENING YEAR 2020) + PROJECT
INTERSECTION #6. PEÑASQUITOS DRIVE/ CUCA STREET/HOTEL KARLAN DRIVEWAY

Warrant 3 – Peak Hour	Category A *or* Category B Satisfied *	**Yes** ☐	**No** ☑
Category A	Satisfied *	**Yes** ☐	**No** ☑
(All Parts 1, 2, and 3 below must be satisfied)			
4. The total delay experienced for traffic on one minor-street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND		**Yes** ☐	**No** ☑
5. The volume on the same-minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND		**Yes** ☑	**No** ☐
6. The entering volume serviced during the hour equals or exceeds 800 vph for the intersections with four or more approaches or 650 vehicles per hour for intersections with three approaches.		**Yes** ☑	**No** ☐
Category B	Satisfied *	**Yes** ☐	**No** ☑

Approach Lanes	**One**	**Two or More**	**Warrant Volume**	**AM**	**PM**
Both Approaches -Major Street	X		See Figure 4C-3 below	1,182	1,127
Highest Approach -Minor Street	X		See Figure 4C-3 below	109	56
The plotted points fall above the applicable curve on Figure 4C-3.				**Yes** ☐	**No** ☑

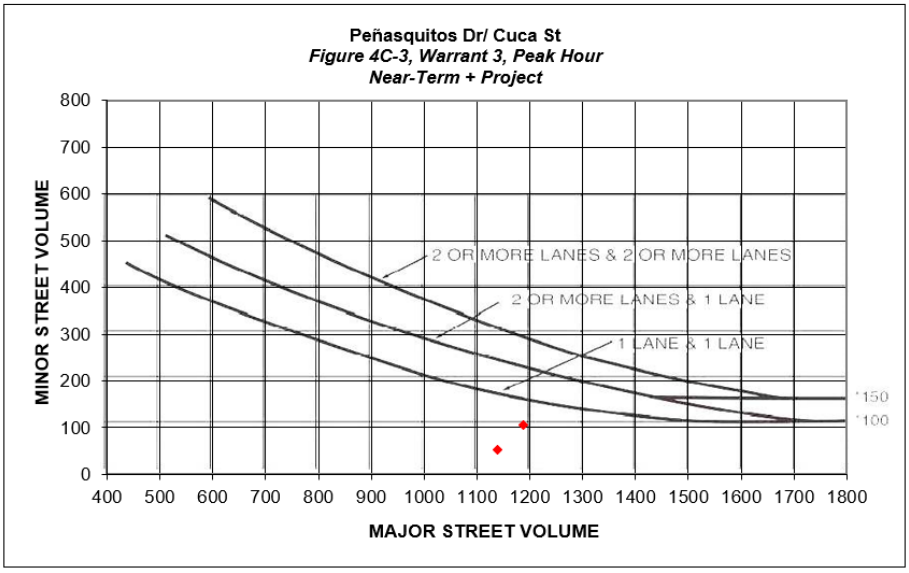


TABLE F
WARRANT 3: PEAK HOUR – HORIZON YEAR 2050 + PROJECT
INTERSECTION #6. PEÑASQUITOS DRIVE/ CUCA STREET/HOTEL KARLAN DRIVEWAY

Warrant 3 – Peak Hour Category A *or* Category B Satisfied * **Yes** ☐ **No** ☑

Category A Satisfied * **Yes** ☐ **No** ☑

(All Parts 1, 2, and 3 below must be satisfied)

7. The total delay experienced for traffic on one minor-street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND — **Yes** ☐ **No** ☑
8. The volume on the same-minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND — **Yes** ☑ **No** ☐
9. The entering volume serviced during the hour equals or exceeds 800 vph for the intersections with four or more approaches or 650 vehicles per hour for intersections with three approaches. — **Yes** ☑ **No** ☐

Category B Satisfied * **Yes** ☐ **No** ☑

Approach Lanes	One	Two or More	Warrant Volume	AM	PM
Both Approaches -Major Street	X		See Figure 4C-3 below	1,295	1,244
Highest Approach -Minor Street	X		See Figure 4C-3 below	132	73
The plotted points fall above the applicable curve on Figure 4C-3.				**Yes** ☐	**No** ☑

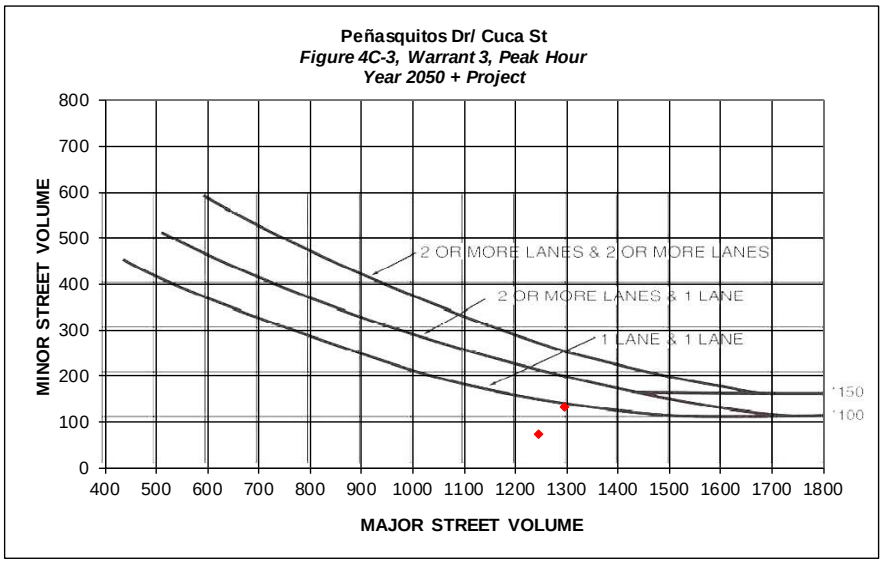


TABLE G
WARRANT 3: PEAK HOUR – EXISTING + PROJECT
INTERSECTION #7. PEÑASQUITOS DRIVE/ JANAL WAY/ PROJECT DRIVEWAY

Warrant 3 – Peak Hour	Category A *or* Category B Satisfied *	**Yes** ☐	**No** ☑
Category A	Satisfied *	**Yes** ☐	**No** ☑
(All Parts 1, 2, and 3 below must be satisfied)			
10. The total delay experienced for traffic on one minor-street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND		**Yes** ☐	**No** ☑
11. The volume on the same-minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND		**Yes** ☐	**No** ☑
12. The entering volume serviced during the hour equals or exceeds 800 vph for the intersections with four or more approaches or 650 vehicles per hour for intersections with three approaches.		**Yes** ☑	**No** ☐
Category B	Satisfied *	**Yes** ☐	**No** ☑

Approach Lanes	**One**	**Two or More**	**Warrant Volume**	**AM**	**PM**
Both Approaches -Major Street	X		See Figure 4C-3 below	1,055	954
Highest Approach -Minor Street	X		See Figure 4C-3 below	64	60
The plotted points fall above the applicable curve on Figure 4C-3.				**Yes** ☐	**No** ☑

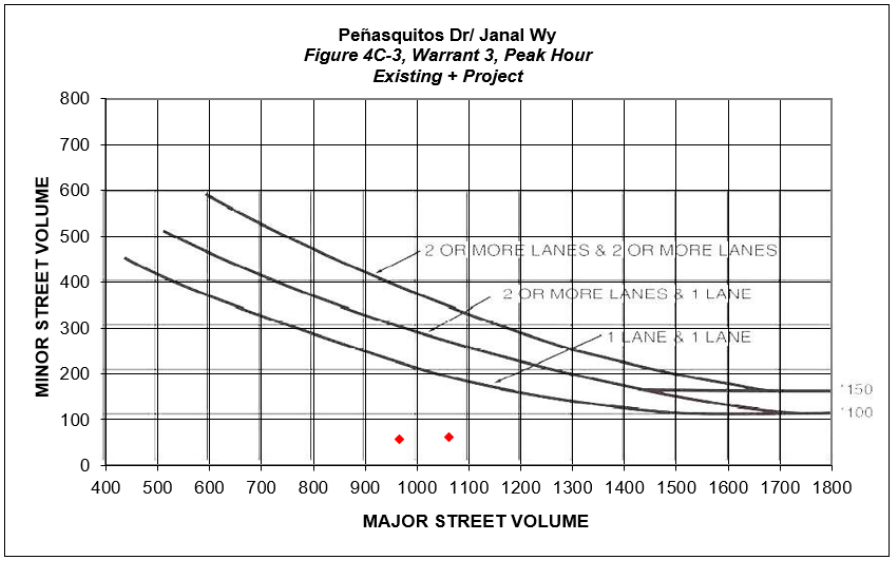


TABLE H
WARRANT 3: PEAK HOUR – NEAR-TERM (OPENING YEAR 2020) + PROJECT
INTERSECTION #7. PEÑASQUITOS DRIVE/ JANAL WAY/ PROJECT DRIVEWAY

Warrant 3 – Peak Hour	Category A *or* Category B Satisfied *	**Yes** ☐	**No** ☑
Category A	Satisfied *	**Yes** ☐	**No** ☑
(All Parts 1, 2, and 3 below must be satisfied)			
13. The total delay experienced for traffic on one minor-street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND		**Yes** ☐	**No** ☑
14. The volume on the same-minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND		**Yes** ☐	**No** ☑
15. The entering volume serviced during the hour equals or exceeds 800 vph for the intersections with four or more approaches or 650 vehicles per hour for intersections with three approaches.		**Yes** ☑	**No** ☐
Category B	Satisfied *	**Yes** ☐	**No** ☑

Approach Lanes	**One**	**Two or More**	**Warrant Volume**	**AM**	**PM**
Both Approaches -Major Street	X		See Figure 4C-3 below	1,064	966
Highest Approach -Minor Street	X		See Figure 4C-3 below	64	60
The plotted points fall above the applicable curve on Figure 4C-3.				**Yes** ☐	**No** ☑

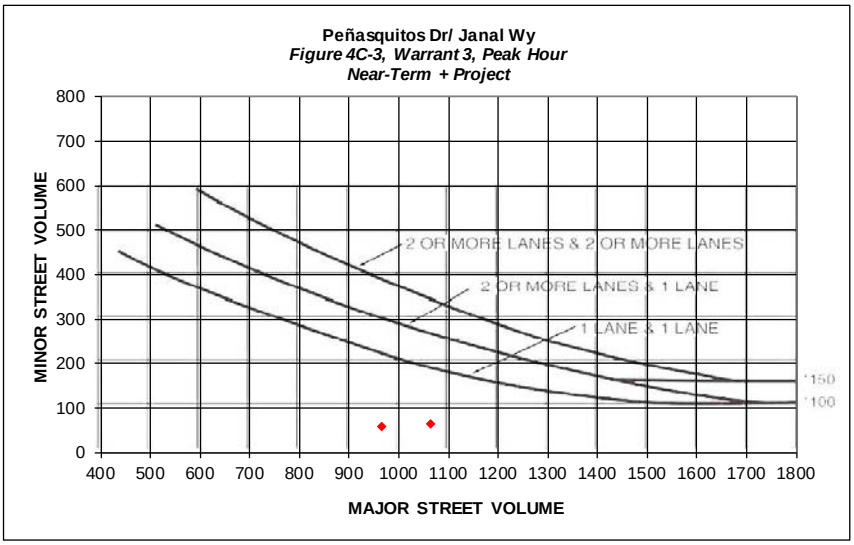
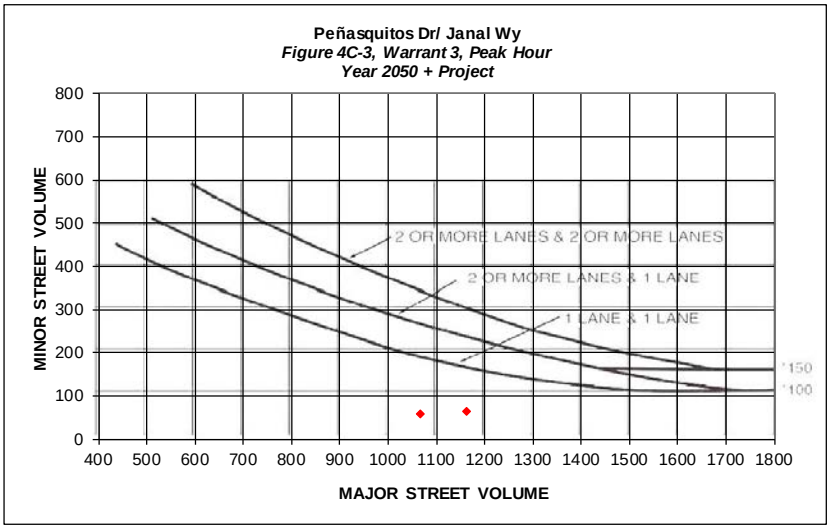


TABLE I
WARRANT 3: PEAK HOUR –HORIZON YEAR 2050 + PROJECT
INTERSECTION #7. PEÑASQUITOS DRIVE/ JANAL WAY/ PROJECT DRIVEWAY

Warrant 3 – Peak Hour	Category A *or* Category B Satisfied *	**Yes** ☐	**No** ☑
Category A	Satisfied *	**Yes** ☐	**No** ☑
(All Parts 1, 2, and 3 below must be satisfied)			
16. The total delay experienced for traffic on one minor-street approach controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach and five vehicle-hours for a two-lane approach; AND		**Yes** ☐	**No** ☑
17. The volume on the same-minor street approach equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND		**Yes** ☐	**No** ☑
18. The entering volume serviced during the hour equals or exceeds 800 vph for the intersections with four or more approaches or 650 vehicles per hour for intersections with three approaches.		**Yes** ☑	**No** ☐
Category B	Satisfied *	**Yes** ☐	**No** ☑

Approach Lanes	**One**	**Two or More**	**Warrant Volume**	**AM**	**PM**
Both Approaches -Major Street	X		See Figure 4C-3 below	1,162	1,067
Highest Approach -Minor Street	X		See Figure 4C-3 below	64	60
The plotted points fall above the applicable curve on Figure 4C-3.				**Yes** ☐	**No** ☑



1.3 Conclusion

Based on the above in *Tables C* through *I* and the graphics depicted in Figure 4C-3 for both intersections, **Warrants are Not Met** under the "with Project" conditions for either intersection.

MEMORANDUM

To:	Tammy Ching HELIX Environmental Planning	Date:	January 6, 2020
From:	John P. Keating, P.E. & Román Lopez, PTP LLG, Engineers	LLG Ref:	3-16-2689
Subject:	Junipers Project Trigger Analysis		

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Linscott, Law & Greenspan, Engineers (LLG) has prepared this memo to summarize the trigger analysis for the transportation impacts identified for the Junipers project. A summary of the project, description of the trigger analysis, and results are presented below.

The project does not intend to use the impact triggers presented here to phase the construction of mitigation measures. Per the latest *Transportation Impact Analysis*, prepared by LLG, mitigation will be assured prior to issuance of the first building permit. This analysis is provided as supporting documentation for the Reduced Project Alternative in the environmental impact report (EIR).

Project Description

The Junipers project is located immediately west of Interstate 15 (I-15), north of Carmel Mountain Road, and east of Peñasquitos Drive within the Rancho Peñasquitos community in the City of San Diego. The project proposes 536 age-restricted residential dwelling units, which are calculated to generate 2,144 ADT, with 107 AM peak hour trips and 150 PM peak hour trips. The proposed project is calculated to generate direct and cumulative impacts at the two intersections listed below.

TRA-1. Intersection #6. Peñasquitos Drive / Cuca Street / Hotel Karlan Driveway *(Direct & Cumulative Impact)*

TRA-2. Intersection #7. Peñasquitos Drive / Janal Way / Project Access *(Direct & Cumulative Impact)*

Trigger Analysis Approach & Methodology

According to City of San Diego significance criteria, for locations calculated to operate at an acceptable level of service (LOS) pre-project, the project would be allowed to increase delay up to the threshold for unacceptable operations (LOS E) before triggering a significant impact. For locations operating at an unacceptable LOS (LOS E or F) pre-project, the project is allowed to add 2.0 seconds of delay at LOS E and 1.0 second of delay at LOS F before triggering a significant impact.

LLG used a trial-and-error approach to identify the level of project traffic at which these direct and cumulative impacts are triggered. LLG reduced the project traffic until it was as close as possible to the location-specific delay threshold, within the limits of the *Synchro* traffic analysis software. The trigger was identified based on the

worst/higher delay of the two peak hours, which for these locations is the AM peak. ***Table A*** presents the direct impact triggers in the Opening Year 2020 scenario. ***Table B*** presents the cumulative impact triggers in the Horizon Year 2050 scenario.

Attachment A contains the Synchro intersection analysis output for the threshold trigger analysis in *Tables A & B.*

As shown in *Table A*, direct impacts occur at approximately 25% and 40% of total project traffic for Intersections #6 and #7, respectively. In *Table B*, cumulative impacts occur at approximately 10% (54 dwelling units) and 5% (27 dwelling units) of project traffic. Thus, to avoid all transportation impacts, the project would be limited to 5% (27 dwelling units) or less of the proposed 536 dwelling units.

cc: File

LINSCOTT LAW & GREENSPAN engineers

TABLE A
OPENING YEAR 2020 SIGNIFICANT IMPACTS

MM#	Intersection	Traffic Control	Peak Hour	Year 2020 Without Project		Year 2020 With Proposed Project			Year 2020 With Project (*Trigger Threshold*)			Trigger		
				Delay	LOS	Delay	LOS	Δ	Delay	LOS	Δ	%	ADT	DU
TRA-1	Intersection #6: Peñasquitos Dr/ Cuca St/ Hotel Karlan Dwy	MSSC	AM	44.1	E	52.3	F	8.2	45.9	E	1.8	25%	536	134
			PM	24.3	C	27.0	D	2.7	—	—	—	—	—	—
TRA-2	Intersection #7: Peñasquitos Dr/ Janal Way/ Project Access	MSSC	AM	17.5	C	49.8	E	32.3	35.0	D	17.5	40%	858	215
			PM	12.0	B	32.7	D	20.7	—	—	—	—	—	—

General Notes:

1. MM# = Mitigation measure number.
2. MSSC = Minor street stop control. Worst movement delay reported.
3. LOS = Level of service.

UNSIGNALIZED

DELAY/LOS THRESHOLDS

Delay	LOS
0.0 ≤ 10.0	A
10.1 to 15.0	B
15.1 to 25.0	C
25.1 to 35.0	D
35.1 to 50.0	E
≥ 50.1	F

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TABLE B
HORIZON YEAR 2050 MITIGATION MEASURES & POST-MITIGATION OPERATIONS

MM#	Intersection	Traffic Control	Peak Hour	Year 2050 Without Project		Year 2050 With Proposed Project			Year 2050 With Project (*Trigger Threshold*)			Trigger		
				Delay	LOS	Delay	LOS	Δ	Delay	LOS	Δ	%	ADT	DU
TRA-1	Intersection #6: Peñasquitos Dr/ Cuca St/ Hotel Karlan Dwy	MSSC	AM	51.0	F	67.0	F	16.0	52.1	F	1.1	10%	214	54
			PM	27.3	D	30.5	D	3.2	—	—	—	—	—	—
TRA-2	Intersection #7: Peñasquitos Dr/ Janal Way/ Project Access	MSSC	AM	21.1	C	66.9	F	45.8	34.8	D	13.8	5%	107	27
			PM	15.5	C	42.2	E	26.7	34.6	D	19.1	60%	1,286	322

General Notes:

1. MM# = Mitigation measure number.
2. MSSC = Minor street stop control. Worst movement delay reported.
3. LOS = Level of service.

UNSIGNALIZED

DELAY/LOS THRESHOLDS

Delay	LOS
0.0 ≤ 10.0	A
10.1 to 15.0	B
15.1 to 25.0	C
25.1 to 35.0	D
35.1 to 50.0	E
≥ 50.1	F

ATTACHMENT A

PEAK HOUR INTERSECTION ANALYSIS – TRIGGER

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	32	1	75	14	0	0	41	312	6	1	744	23
Future Vol, veh/h	32	1	75	14	0	0	41	312	6	1	744	23
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	35	1	82	15	0	0	45	339	7	1	809	25

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1261	1264	826	1298	1273	343	838	0	0	346	0	0
Stage 1	828	828	-	433	433	-	-	-	-	-	-	-
Stage 2	433	436	-	865	840	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	147	169	372	139	167	700	796	-	-	1213	-	-
Stage 1	365	386	-	601	582	-	-	-	-	-	-	-
Stage 2	601	580	-	348	381	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	140	159	371	103	157	700	793	-	-	1213	-	-
Mov Cap-2 Maneuver	140	159	-	103	157	-	-	-	-	-	-	-
Stage 1	343	384	-	567	549	-	-	-	-	-	-	-
Stage 2	567	547	-	271	379	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	32.1	45.9	1.1	0
HCM LOS	D	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	793	-	-	247	103	1213	-	-
HCM Lane V/C Ratio	0.056	-	-	0.475	0.148	0.001	-	-
HCM Control Delay (s)	9.8	-	-	32.1	45.9	8	-	-
HCM Lane LOS	A	-	-	D	E	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	2.4	0.5	0	-	-

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	6	0	40	26	0	0	8	334	4	0	710	1
Future Vol, veh/h	6	0	40	26	0	0	8	334	4	0	710	1
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	65	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	7	0	43	28	0	0	9	363	4	0	772	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1160	1162	777	1177	1160	365	777	0	0	367	0	0
Stage 1	777	777	-	383	383	-	-	-	-	-	-	-
Stage 2	383	385	-	794	777	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	172	195	397	168	195	680	839	-	-	1192	-	-
Stage 1	390	407	-	640	612	-	-	-	-	-	-	-
Stage 2	640	611	-	381	407	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	170	192	396	148	192	680	836	-	-	1192	-	-
Mov Cap-2 Maneuver	170	192	-	148	192	-	-	-	-	-	-	-
Stage 1	385	406	-	633	605	-	-	-	-	-	-	-
Stage 2	633	604	-	339	406	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	17.5	35	0.2	0
HCM LOS	C	E		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	836	-	-	337	148	1192	-	-
HCM Lane V/C Ratio	0.01	-	-	0.148	0.191	-	-	-
HCM Control Delay (s)	9.4	-	-	17.5	35	0	-	-
HCM Lane LOS	A	-	-	C	E	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0.7	0	-	-

Intersection	
Int Delay, s/veh	6.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	40	1	90	20	0	10	50	342	10	1	796	30
Future Vol, veh/h	40	1	90	20	0	10	50	342	10	1	796	30
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	75	-	-	80	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	43	1	98	22	0	11	54	372	11	1	865	33

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1379	1379	886	1419	1390	378	902	0	0	383	0	0
Stage 1	888	888	-	486	486	-	-	-	-	-	-	-
Stage 2	491	491	-	933	904	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	122	144	343	114	142	669	754	-	-	1175	-	-
Stage 1	338	362	-	563	551	-	-	-	-	-	-	-
Stage 2	559	548	-	319	356	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	113	133	342	76	131	669	751	-	-	1175	-	-
Mov Cap-2 Maneuver	113	133	-	76	131	-	-	-	-	-	-	-
Stage 1	313	361	-	522	511	-	-	-	-	-	-	-
Stage 2	510	509	-	227	355	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	52.1	52.1	1.3	0
HCM LOS	F	F		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	751	-	-	210	108	1175	-	-
HCM Lane V/C Ratio	0.072	-	-	0.678	0.302	0.001	-	-
HCM Control Delay (s)	10.2	-	-	52.1	52.1	8.1	-	-
HCM Lane LOS	B	-	-	F	F	A	-	-
HCM 95th %tile Q(veh)	0.2	-	-	4.2	1.2	0	-	-

Intersection	
Int Delay, s/veh	1.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	40	3	0	0	10	370	1	0	770	1
Future Vol, veh/h	10	0	40	3	0	0	10	370	1	0	770	1
Conflicting Peds, #/hr	0	0	0	0	0	0	4	0	0	0	0	4
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	65	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	0	43	3	0	0	11	402	1	0	837	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1267	1267	842	1284	1267	403	842	0	0	403	0	0
Stage 1	842	842	-	425	425	-	-	-	-	-	-	-
Stage 2	425	425	-	859	842	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	146	169	364	142	169	647	794	-	-	1156	-	-
Stage 1	359	380	-	607	586	-	-	-	-	-	-	-
Stage 2	607	586	-	351	380	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	144	166	363	124	166	647	791	-	-	1156	-	-
Mov Cap-2 Maneuver	144	166	-	124	166	-	-	-	-	-	-	-
Stage 1	353	379	-	599	578	-	-	-	-	-	-	-
Stage 2	599	578	-	309	379	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	21.1	34.8	0.3	0
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	791	-	-	278	124	1156	-	-
HCM Lane V/C Ratio	0.014	-	-	0.195	0.026	-	-	-
HCM Control Delay (s)	9.6	-	-	21.1	34.8	0	-	-
HCM Lane LOS	A	-	-	C	D	A	-	-
HCM 95th %tile Q(veh)	0	-	-	0.7	0.1	0	-	-

Intersection	
Int Delay, s/veh	2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	10	0	30	36	0	0	40	650	13	0	350	5
Future Vol, veh/h	10	0	30	36	0	0	40	650	13	0	350	5
Conflicting Peds, #/hr	0	0	0	0	0	0	9	0	0	0	0	9
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	65	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	11	0	32	38	0	0	42	684	14	0	368	5

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	1155	1162	380	1162	1157	691	382	0	0	698	0	0
Stage 1	380	380	-	775	775	-	-	-	-	-	-	-
Stage 2	775	782	-	387	382	-	-	-	-	-	-	-
Critical Hdwy	7.12	6.52	6.22	7.12	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.12	5.52	-	6.12	5.52	-	-	-	-	-	-	-
Follow-up Hdwy	3.518	4.018	3.318	3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver	174	195	667	172	196	445	1176	-	-	898	-	-
Stage 1	642	614	-	391	408	-	-	-	-	-	-	-
Stage 2	391	405	-	637	613	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	168	187	662	159	188	445	1167	-	-	898	-	-
Mov Cap-2 Maneuver	168	187	-	159	188	-	-	-	-	-	-	-
Stage 1	614	610	-	377	393	-	-	-	-	-	-	-
Stage 2	377	390	-	607	609	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.6	34.6	0.5	0
HCM LOS	C	D		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1167	-	-	382	159	898	-	-
HCM Lane V/C Ratio	0.036	-	-	0.11	0.238	-	-	-
HCM Control Delay (s)	8.2	-	-	15.6	34.6	0	-	-
HCM Lane LOS	A	-	-	C	D	A	-	-
HCM 95th %tile Q(veh)	0.1	-	-	0.4	0.9	0	-	-