LINSCOTT LAW & GREENSPAN engineers

LOCAL TRANSPORTATION ANALYSIS

WOODWARD 46 APARTMENT PROJECT

San Marcos, California
March 27, 2024

LLG Ref. 3-22-3703

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EXECUTIVE SUMMARY

Linscott, Law & Greenspan Engineers (LLG) has prepared this Local Transportation Analysis (LTA) to assess the potential impacts to the street system as a result of the proposed Woodward 46 Apartment Project. The Project proposes to construct 46 condominium units east of Woodward Street, north of Mission Road and south of Vineyard Road in the City of San Marcos.

The Project is calculated to generate 368 ADT, with 29 trips during the AM peak hour (6 inbound and 23 outbound), and 37 trips during the PM peak hour (26 inbound and 11 outbound).

While Level of Service (LOS) analysis is not used to determine CEQA significance, the intersection and street segment analysis provided in this study shows that the Project will not have any substantial effects at the study area intersections and street segments.

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LOCAL TRANSPORTATION ANALYSIS

WOODWARD 46 APARTMENT PROJECT

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1.0 INTRODUCTION

Linscott, Law & Greenspan Engineers (LLG) has prepared this Local Transportation Analysis (LTA) to assess the potential impacts to the street system as a result of the proposed Woodward 46 Apartment Project. The Project proposes to construct 46 condominium units east of Woodward Street, north of Mission Road and south of Vineyard Road in the City of San Marcos.

Transportation impact analyses within the City of San Marcos includes two sets of requirements.

- **CEQA Analysis** primarily consisting of Vehicles Miles Traveled (VMT) analysis. This is addressed under a separate cover.
- **Non-CEQA Local Transportation Analysis** to evaluate the effects of a development project on the circulation network.

The traffic analysis presented in this report includes the following:

- Project Description
- Existing Conditions
- Analysis Approach and Methodology
- Analysis of Existing Conditions
- Trip Generation, Distribution, and Assignment
- Analysis of Near-Term (Interim Year 2026) without and with Project Conditions
- Analysis of Long-Term (Horizon Year 2050) without and with Project Conditions
- Site Access, On-Site Circulation and Parking Review
- Active Transportation Review
- Conclusions

2.0 PROJECT DESCRIPTION

The Project proposes to construct 46 condominium units east of Woodward Street, north of Mission Road and south of Vineyard Road in the City of San Marcos. Site access is proposed via one (1) full-access driveway to Woodward Street. The proposed Project would require a General Plan Amendment but is consistent in terms of *Section 3.11* under Threshold #2, General Plan Consistency in the Project's Environmental Impact Report.

Figure 2–1 shows the Project vicinity. ***Figure 2–2*** shows a more detailed project area map. ***Figure 2–3*** shows the Project site plan.

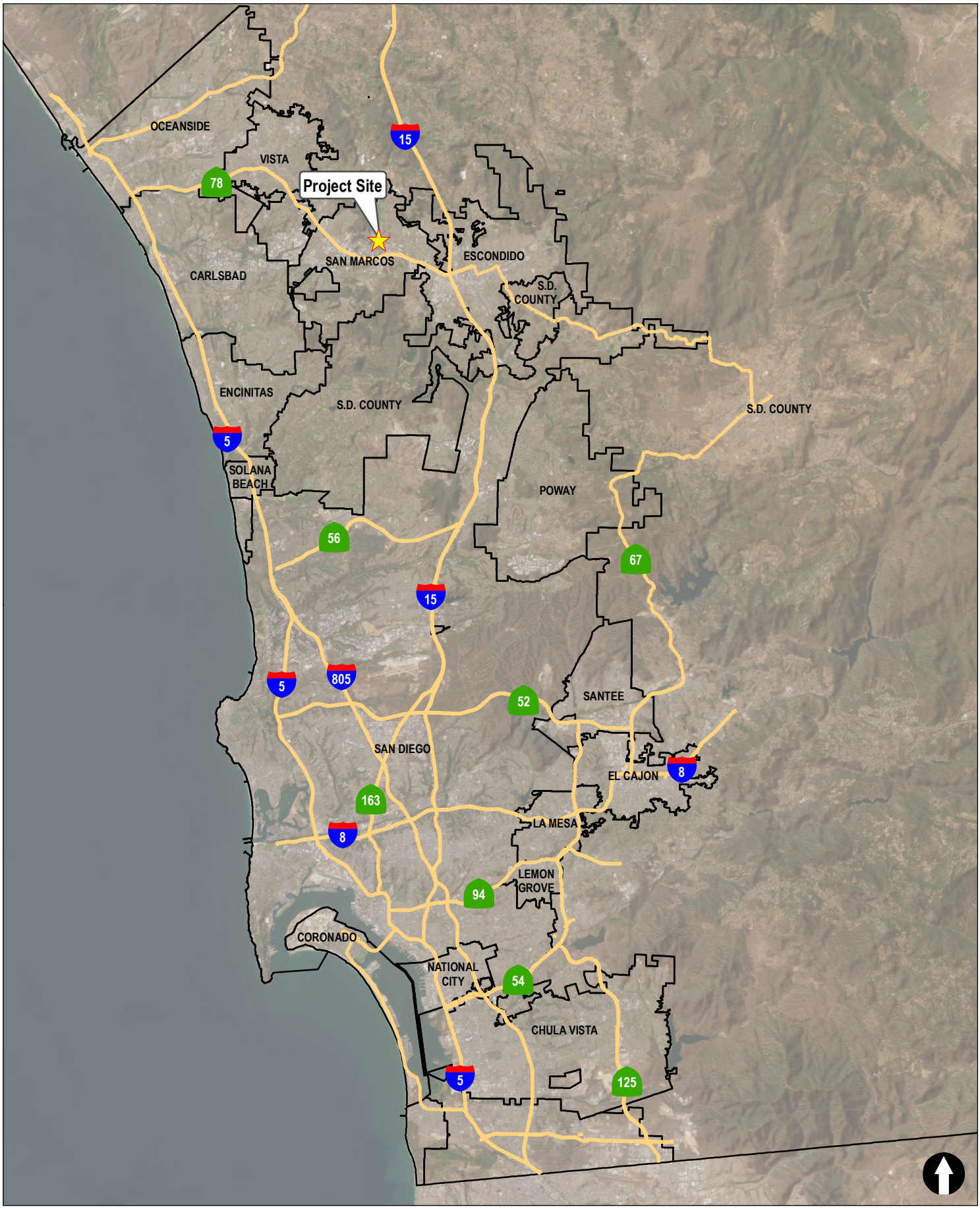

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Figure 2-1

Vicinity Map

WOODWARD 46 APARTMENT PROJECT

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Figure 2-2

Project Area Map

WOODWARD 46 APARTMENT PROJECT

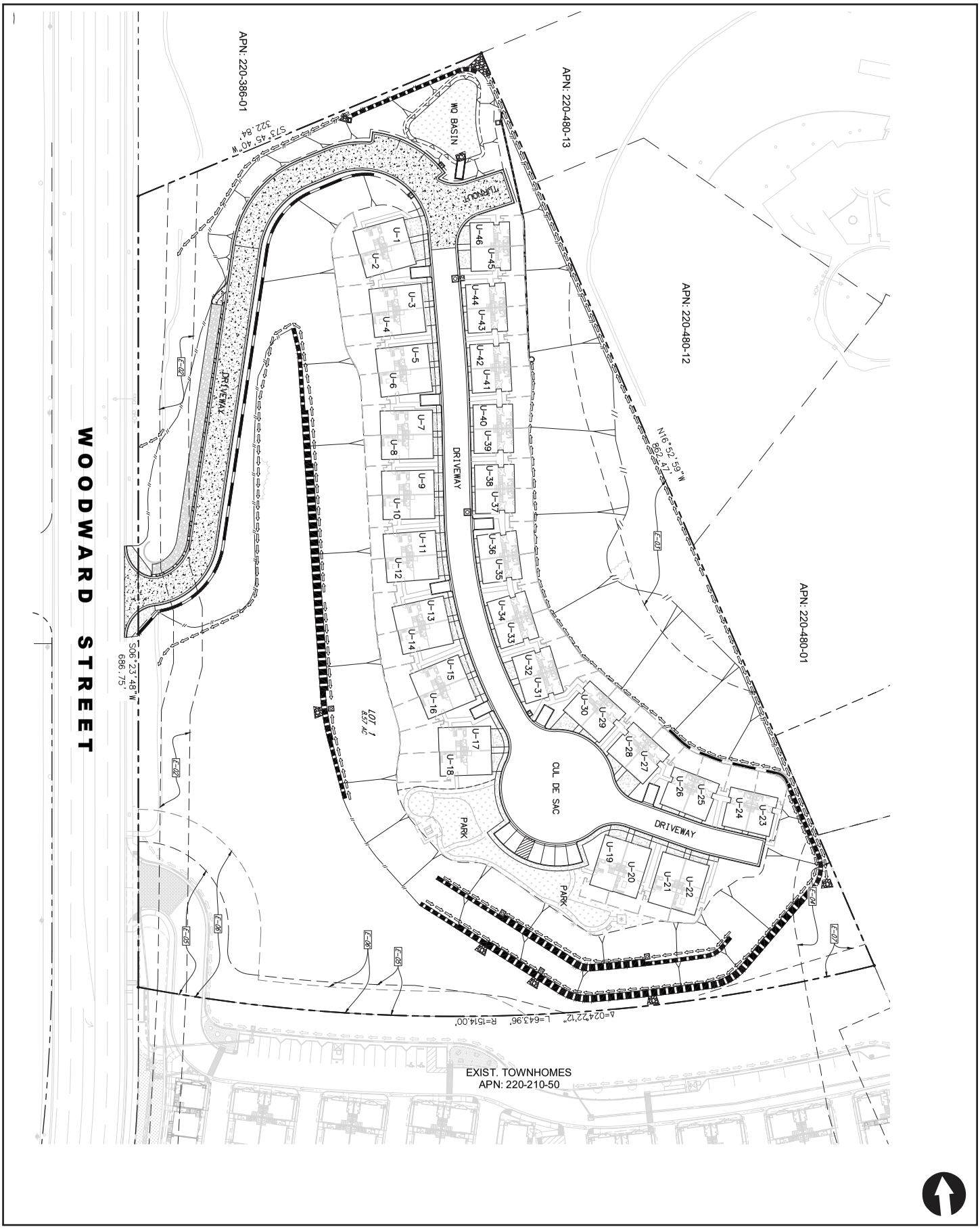

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Figure 2-3

Site Plan

WOODWARD 46 APARTMENT PROJECT

3.0 EXISTING CONDITIONS

Effective evaluation of the traffic impacts associated with the proposed Woodward 46 Apartment Project requires an understanding of the existing transportation system within the project area. ***Figure 3–1*** shows an existing conditions diagram, including signalized intersections and lane configurations.

The study area includes the following intersections and street segments:

INTERSECTIONS

1. Woodward Street / Project Driveway
2. Mission Road / Pico Avenue
3. Mission Road / Woodward Street (San Marcos Boulevard)
4. San Marcos Boulevard / Twin Oaks Valley Road
5. San Marcos Boulevard / Rancheros Drive

STREET SEGMENTS

Mission Road

1. Pico Avenue to Woodward Street
2. Woodward Street to Mission Villas Road

San Marcos Boulevard

3. Rancheros Drive to Mission Road

3.1 Existing Street Network

The following is a description of the existing street network in the study area.

Woodward Street is currently constructed as a 4-lane undivided roadway between Vineyard Road and Mission Road. The posted speed limit is 40 mph. On-street parking is prohibited. Sidewalks are provided on both sides of the roadway. Class II bike lanes are provided.

Mission Road is currently constructed as a 4-lane undivided roadway with a two-way left-turn lane west of Firebird Lane. Between Firebird Lane and San Marcos Boulevard, Mission Road is built as a 4-lane divided roadway. East of San Marcos Boulevard, it is built as a 6-lane divided roadway. The posted speed limit is 45 mph. On-street parking is prohibited. Sidewalks are provided on both sides of the roadway. Class II bike lanes are provided east of Pico Avenue.

Pico Avenue is currently constructed as a 4-lane undivided roadway south of Mission Road and as a 2-lane undivided roadway north of Mission Road. The posted speed limit is 25 mph. On-street parking is prohibited. Sidewalks are provided on both sides of the roadway. There are no existing bicycle facilities along Pico Avenue.

San Marcos Boulevard is currently constructed as a 4-lane divided roadway. The posted speed limit is 40 mph. On-street parking is prohibited. Sidewalks are provided on both sides of the roadway. Class II bike lanes are provided.

Twin Oaks Valley Road is currently constructed as a 4-lane divided roadway, north of San Marcos Boulevard. South of San Marcos Boulevard, Twin Oaks Valley Road is built as a 6-lane divided roadway. The posted speed limit is 45 mph. On-street parking is prohibited. Sidewalks are provided on both sides of the roadway. Class II bike lanes are provided.

Rancheros Drive is currently constructed as a 4-lane divided roadway between San Marcos Boulevard and Civic Center Drive. South of Civic Center Drive, Rancheros Drive is built as a 2-lane divided roadway. The posted speed limit is 35 mph. On-street parking is prohibited. Sidewalks are provided on both sides of the roadway except for the west side portion of the roadway, approximately 550-feet south from the Rancheros Drive and Civic Center Drive intersection. Class II bike lanes are provided, south of Civic Center Drive.

3.2 Existing Traffic Volumes

Peak hour intersection turning movement volume and street segment average daily traffic (ADT) volume counts were conducted at the study area intersections on Thursday, January 12, 2023, when area schools were in session.

Figure 3–2 shows the Existing Traffic Volumes. ***Appendix A*** contains the existing count sheets.

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Figure 3-1

Existing Conditions Diagram

WOODWARD 46 APARTMENT PROJECT

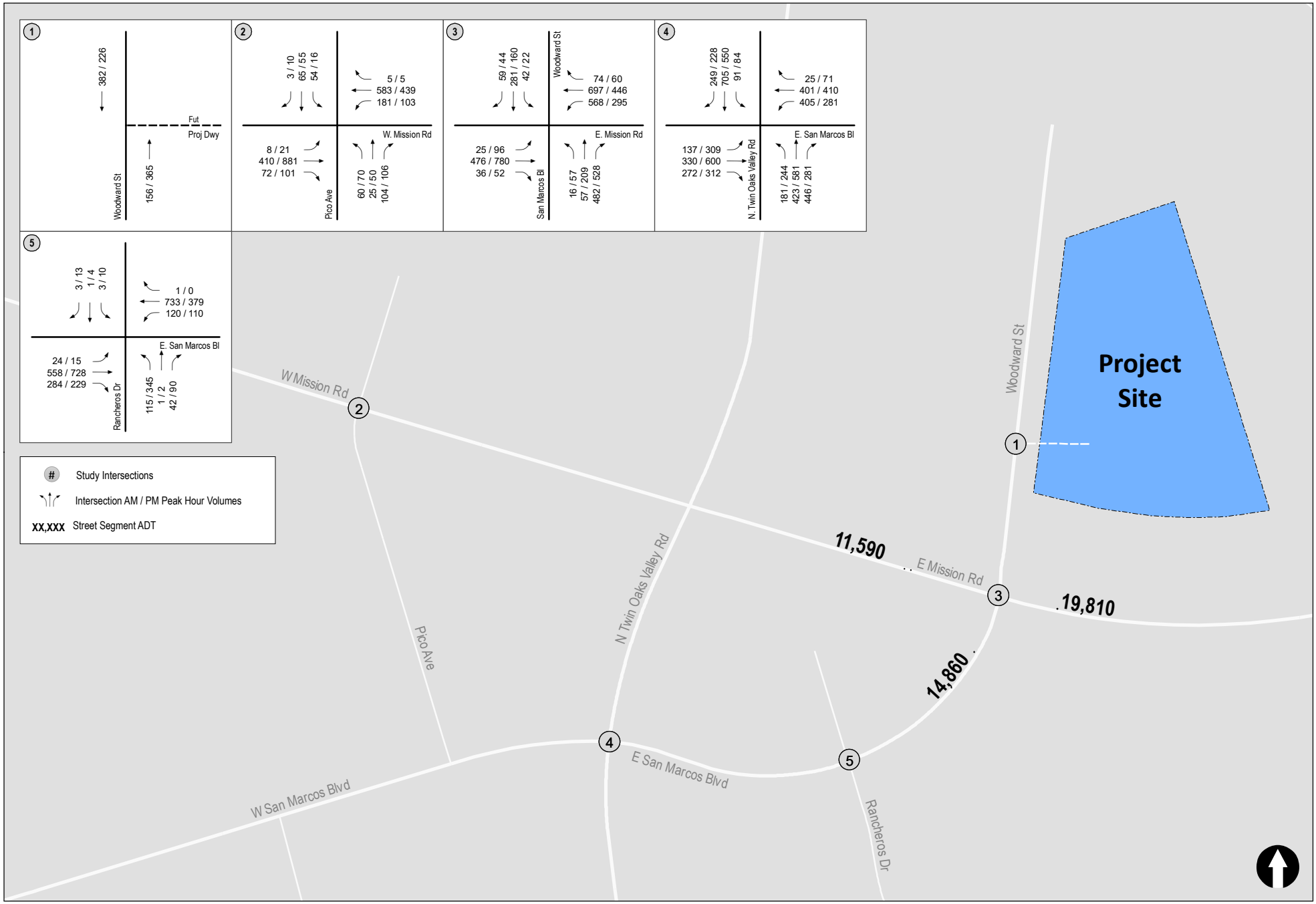

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Figure 3-2

Existing Traffic Volumes

WOODWARD 46 APARTMENT PROJECT

4.0 ANALYSIS APPROACH AND METHODOLOGY

4.1 Methodology

Level of service (LOS) is the term used to denote the different operating conditions which occur on a given roadway segment 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, freedom to maneuver, and safety. LOS provides an index to the operational qualities of a roadway segment or an intersection. LOS designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. LOS designation is reported differently for signalized and unsignalized intersections, as well as for roadway segments.

4.1.1 *Intersections*

Signalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay was determined utilizing the methodology found in Chapter 19 of the Highway Capacity Manual (HCM) 6th Edition, with the assistance of the Synchro (version 11) computer software. The delay values (represented in seconds) were qualified with a corresponding intersection LOS.

Unsignalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay and LOS was determined based upon the procedures found in Chapters 20 and 21 of the HCM 6th Edition, with the assistance of the Synchro (version 11) computer software.

4.1.2 *Street Segments*

Street segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the City of San Marcos'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. The City of San Marcos's *Roadway Classification*, *Level of Service*, and *ADT Table* is attached in ***Appendix B***.

4.2 Level of Service Standards

The City of San Marcos strives to maintain intersection and roadway segment operations based on LOS standards outlined in the General Plan Mobility Element. If the addition of the traffic generated from a proposed project results in any one of the following, improvements should be identified to increase performance to acceptable or pre-project conditions under each scenario:

- Triggers an intersection operating at acceptable LOS to operate at unacceptable LOS and increases the delay by more than 2.0 seconds.
- Increases the delay for a study intersection that is already operating at unacceptable LOS by more than 2.0 seconds.
- Triggers a roadway segment operating at acceptable LOS to operate at unacceptable LOS and increases the volume/capacity (V/C) ratio by more than 0.02.
- Increases the V/C ratio for a study roadway segment that is already operating at unacceptable LOS by more than 0.02.

5.0 ANALYSIS OF EXISTING CONDITIONS

5.1 Peak Hour Intersection Levels of Service

Table 5–1 summarizes the intersection operations under Existing conditions. As shown in *Table 5–1*, all the study area intersections are calculated to operate at LOS D or better during both the AM and PM peak hours with exception to the following intersection:

- Mission Road / Woodward Street (San Marcos Boulevard) – LOS E during the AM and PM peak hours

Appendix C contains the Existing intersection analysis worksheets.

TABLE 5–1
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing	
			Delay[a]	LOS[b]
1. Woodward Street / Project Driveway	DNE	AM	–	–
		PM	–	–
2. Mission Road / Pico Avenue	Signal	AM	30.5	C
		PM	26.3	C
3. Mission Road / Woodward Street (San Marcos Boulevard)	Signal	AM	70.9	E
		PM	59.7	E
4. San Marcos Boulevard / Twin Oaks Valley Road	Signal	AM	46.0	D
		PM	46.1	D
5. San Marcos Boulevard / Rancheros Drive	Signal	AM	23.9	C
		PM	27.8	C

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.

General Note:
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

5.2 Daily Street Segment Levels of Service

Table 5–2 summarizes the street segment operations under Existing conditions. As shown in *Table 5–2*, all segments are calculated to currently operate at LOS A.

TABLE 5–2
EXISTING STREET SEGMENT OPERATIONS

Street Segment	Classification	Capacity (LOS E) [a]	ADT [b]	LOS [c]	V/C [d]
Mission Road					
Pico Avenue to Woodward Street	4-Lane Major Arterial with Class II Bike Lanes	40,000	11,590	A	0.290
Woodward Street to Mission Villas Road	6-Lane Prime Arterial Enhanced with Class II Bike Lanes	60,000	19,810	A	0.330
San Marcos Boulevard					
Rancheros Drive to Mission Road	4-Lane Major Arterial with Class II Bike Lanes	40,000	14,860	A	0.372

Footnotes:

a. Capacities based on City of San Marcos Circulation Element Roadway Classification Table (see *Appendix B*).

b. Average Daily Traffic Volumes.

c. Level of Service.

d. Volume to Capacity Ratio.

6.0 TRIP GENERATION/DISTRIBUTION/ASSIGNMENT

As described in *Section 2.0*, The Project proposes to construct 46 condominium units.

6.1 Trip Generation

6.1.1 *Trip Rates*

The Project traffic generation calculations were conducted using the trip generation rates published in *SANDAG's (Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region, April 2002*. Based on the project description, the condominium trip rate of 8/unit was used.

6.1.2 *Project Trips*

Table 6–1 shows the Project trip generation. As shown in *Table 6–1*, the Project is calculated to generate 368 ADT, with 29 trips during the AM peak hour (6 inbound and 23 outbound), and 37 trips during the PM peak hour (26 inbound and 11 outbound).

TABLE 6–1
PROJECT TRIP GENERATION

Land Use	Size	Daily Trip Ends (ADTs)		AM Peak Hour					PM Peak Hour				
		Rate[a]	Volume	% of ADT	In:Out Split	Volume			% of ADT	In:Out Split	Volume		
						In	Out	Total			In	Out	Total
Condominiums	46 dwelling units	8/DU[b]	368	8%	20:80	6	23	29	10%	70:30	26	11	37

Footnotes:

a. Rate is based on *SANDAG's (Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region, April 2002*

b. Based on condominium rate of 8/DU

6.2 Trip Distribution and Assignment

The Project traffic was distributed based on the site location, access to SR-78, existing traffic patterns in the area and anticipated traffic routes to and from the site. The Project's regional distributions assumes 75% of trips oriented to/from the south, and local distributions assumes 10% oriented to/from the west, 10% to/from the east and 5% to/from the north.

Figure 6–1 shows the overall Project traffic distribution. ***Figure 6–2*** shows the Project traffic volumes.

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Figure 6-1

Project Traffic Distribution

WOODWARD 46 APARTMENT PROJECT

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Figure 6-2

Project Traffic Volumes

WOODWARD 46 APARTMENT PROJECT

7.0 NEAR-TERM (INTERIM YEAR 2026) CONDITIONS

This section describes Near-Term (Interim Year 2026) roadway network and traffic volume conditions. Per coordination with the client, it was determined that Year 2026 is the expected opening year of the proposed Project.

7.1 Near-Term (Interim Year 2026) Network Conditions

The existing street system as illustrated in *Figure 3–1* is assumed for Near-Term (Interim Year 2026) conditions with no assumed improvements within the study area.

7.2 Near-Term (Interim Year 2026) Traffic Volumes

To forecast future traffic volumes for Near-Term (Interim Year 2026) conditions, the SANDAG ABM2+ model was first utilized to obtain Year 2035 ADTs. Year 2026 traffic volumes were then developed based on an interpolation between Existing and Year 2035 traffic volumes. The forecasted ADT volumes were then used to calculate peak hour volumes based partially on the existing relationship between ADT and peak hour volumes.

Figure 7–1 shows the Near-Term (Interim Year 2026) traffic volumes. ***Figure 7–2*** shows the Near-Term (Interim Year 2026) + Project traffic volumes.

Figure 7-1

Near-Term (Interim Year 2026) without Project Traffic Volumes

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Figure 7-2

Near-Term (Interim Year 2026) + Project Traffic Volumes

8.0 ANALYSIS OF NEAR-TERM (INTERIM YEAR 2026) SCENARIOS

The following section presents the analysis of study area intersections and street segments under Near-Term (Interim Year 2026) conditions without and with the Project.

8.1 Near-Term (Interim Year 2026) Without Project

8.1.1 *Intersection Analysis*

Table 8–1 summarizes the intersection operations under Near-Term (Interim Year 2026) without Project conditions. As shown in *Table 8–1*, all the study area intersections are calculated to operate at LOS D or better during both the AM and PM peak hours with exception to the following intersection:

- Mission Road / Woodward Street (San Marcos Boulevard) – LOS F during the AM peak hour and LOS E during the PM peak hour.

Appendix D contains the Near-Term (Interim Year 2026) intersection analysis worksheets.

8.1.2 *Intersection Queuing*

Table 8–2 presents the 95th percentile peak hour queue lengths for intersection turn pockets where the Project adds traffic within the study area for the Near-Term (Interim Year 2026) with Project conditions. As shown in *Table 8–2*, all Near-Term (Interim Year 2026) without Project peak hour queues are contained within existing turn pockets.

Appendix E contains the Near-Term (Interim Year 2026) queuing analysis worksheets.

8.1.3 *Segment Operations*

Table 8–3 summarizes the street segment operations under Near-Term (Interim Year 2026) without Project conditions. As shown in *Table 8–3*, all street segments are calculated to operate at LOS B or better.

8.2 Near-Term (Interim Year 2026) + Projects

8.2.1 *Intersection Analysis*

Table 8–1 summarizes the intersection operations under Near-Term (Interim Year 2026) + Project conditions. As shown in *Table 8–1*, with the addition of project traffic, all the study area intersections are calculated to operate at LOS D or better during both the AM and PM peak hours with exception to the following intersection:

- Mission Road / Woodward Street (San Marcos Boulevard) – LOS F during the AM peak hour and LOS E during the PM peak hour.

Based on the established Level of Service Standards outlined in *Section 4.3*, no substantial effects are identified as the Project adds less than 2 seconds of average vehicle delay. Therefore, improvements are not required under this analysis.

Appendix F contains the Near-Term (Interim Year 2026) + Projects intersection analysis worksheets.

8.2.2 *Intersection Queuing*

Table 8–2 presents the 95th percentile peak hour queue lengths for intersection turn pockets where the Project adds traffic within the study area for the Near-Term (Interim Year 2026) with Project conditions. As shown in *Table 8–2*, all Near-Term (Interim Year 2026) + Project peak hour queues, with the addition of Project traffic, are contained within existing turn pockets.

Appendix G contains the Near-Term (Interim Year 2026) + Project queuing analysis worksheets.

8.2.3 *Segment Operations*

Table 8–3 summarizes the street segment operations under Near-Term (Interim Year 2026) + Project conditions. As shown in Table *8–3*, with the addition of project traffic, all street segments are calculated to operate at LOS B or better.

TABLE 8–1
NEAR-TERM (INTERIM YEAR 2026) INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Near-Term (Interim Year 2026)		Near-Term (Interim Year 2026) + Project		Δ[c]	Substantial Effect?
			Delay	LOS	Delay	LOS		
1. Woodward Street / Project Driveway	TWSC[d]	AM	–	–	11.5	B	–	No
		PM	–	–	12.8	B	–	No
2. Mission Road / Pico Avenue	Signal	AM	36.4	D	36.6	D	0.2	No
		PM	29.7	C	29.9	C	0.2	No
3. Mission Road / Woodward Street	Signal	AM	81.9	F	82.0	F	0.1	No
		PM	71.3	E	71.4	E	0.1	No
4. San Marcos Boulevard / Twin Oaks Valley Road	Signal	AM	51.9	D	53.5	D	1.6	No
		PM	48.2	D	48.5	D	0.3	No
5. San Marcos Boulevard / Rancheros Drive	Signal	AM	29.4	C	29.6	C	0.2	No
		PM	32.0	C	32.1	C	0.1	No

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Δ denotes an increase in delay due to project.
d. TWSC – Two-Way Stop Controlled intersection.

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
NEAR-TERM (INTERIM YEAR 2026) INTERSECTION QUEUING

Intersection	Movement	Storage (ft)	Peak Hour	Near-Term (Interim Year 2026) without Project	Near-Term (Interim Year 2026) + Project
				Queue (ft) [a]	Queue (ft) [a]
1. Woodward Street / Project Driveway	SBL	50’	AM	–	0
			PM	–	5’
	WBL	400’	AM	–	43’
			PM	–	35’
	WBR	400’	AM	–	43’
			PM	–	35’
	NBR	200’	AM	–	0
			PM	–	0
3. Mission Road / Woodward Street	SBL	240’	AM	123’	124’
			PM	66’	75’
	EBL	240’	AM	115’	116’
			PM	228’	238’
4. San Marcos Boulevard / Twin Oaks Valley Road	WBL	270’	AM	245’	246’
			PM	229’	230’
5. San Marcos Boulevard / Rancheros Drive	WBL	270’	AM	229’	230’
			PM	171’	172’
	NBR	100’	AM	40’	41’
			PM	80’	85’

Footnotes:

a. 95th percentile queue length.

General Notes:

- SBR = Direction/Turn Lane, e.g., southbound right-turn lane.

TABLE 8–3
NEAR-TERM (INTERIM YEAR 2026) STREET SEGMENT OPERATIONS

Street Segment	Capacity (LOS E)[a]	Near-Term (Interim Year 2026)			Near-Term (Interim Year 2026) + Project			Δ[e]	Substantial Effect?
		ADT[b]	LOS[c]	V/C[d]	ADT	LOS	V/C		
Mission Road									
Pico Avenue to Woodward Street	40,000	11,910	A	0.298	11,947	A	0.299	0.001	No
Woodward Street to Mission Villas Road	60,000	20,690	A	0.345	20,727	A	0.345	0.000	No
San Marcos Boulevard									
Rancheros Drive to Mission Road	40,000	15,980	B	0.400	16,256	B	0.406	0.006	No

Footnotes:

a. Capacities based on San Marcos Roadway Classification & LOS table (See *Appendix B*).
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

9.0 LONG-TERM (HORIZON YEAR 2050) CONDITIONS

9.1 Long-Term (Horizon Year 2050) Network Conditions

The Long-Term (Horizon Year 2050) street network in the SANDAG Series 14 forecast model includes the roadways built to their City Mobility Element Classification, including the planned widening of San Marcos Boulevard between Twin Oaks Valley Road and Mission Road to 6-lane Major Arterial standards.

For the purposes of this traffic study, this network addition is assumed in the long-term traffic volumes forecast but no changes to the study area roadway geometry or intersection control as shown in *Figure 3–1*, were assumed.

9.2 Long-Term (Horizon Year 2050) Traffic Volumes

To obtain future ADTs for Long-Term (Horizon Year 2050) conditions, the SANDAG ABM2+ Model was utilized. The forecasted ADT volumes were then used to calculate peak hour volumes based partially on the existing relationship between ADT and peak hour volumes.

Figure 9–1 shows the Long-Term (Horizon Year 2050) traffic volumes. ***Figure 9–2*** shows the Long-Term (Horizon Year 2050) + Project traffic volumes.

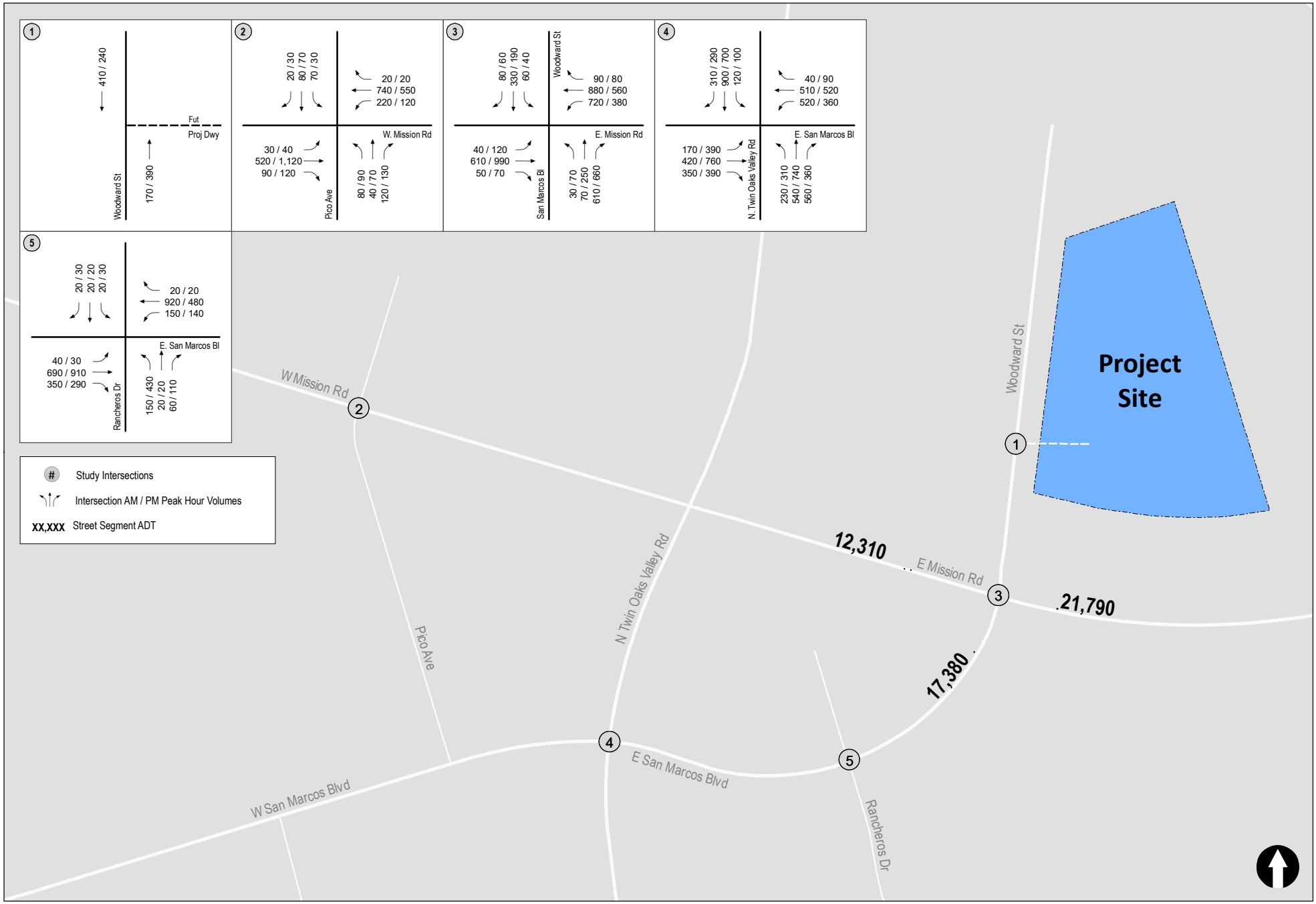

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Figure 9-1

Long-Term (Horizon Year 2050) without Project Traffic Volumes

Woodward 46 Apartment Project

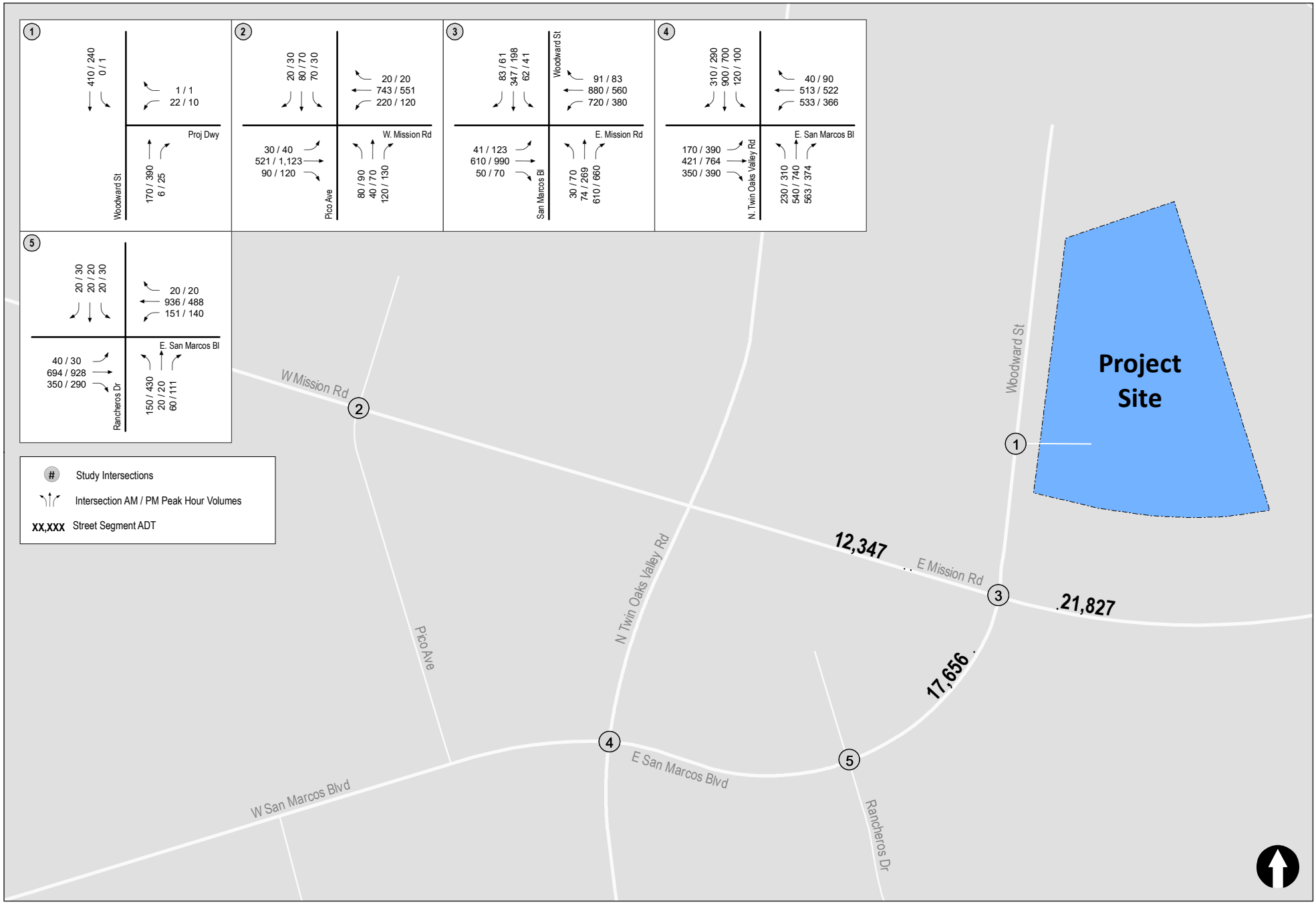

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Figure 9-2

Long-Term (Horizon Year 2050) + Project Traffic Volumes

Woodward 46 Apartment Project

10.0 ANALYSIS OF LONG-TERM (HORIZON YEAR 2050) SCENARIOS

The following section presents the analysis of study area intersections and street segments under Long-Term (Horizon Year 2050) conditions without and with the Project.

10.1 Long-Term (Horizon Year 2050) Without Project

10.1.1 *Intersection Analysis*

Table 10–1 summarizes the intersection operations under Long-Term (Horizon Year 2050) without Project conditions. As shown in *Table 10–1*, all the study area intersections are calculated to operate at LOS D or better during both the AM and PM peak hours with exception to the following intersections:

- Mission Road / Woodward Street (San Marcos Boulevard) – LOS F during the AM and PM peak hours
- San Marcos Boulevard / Twin Oaks Valley Road – LOS E during the AM and PM peak hours

Appendix H contains the Long-Term (Horizon Year 2050) intersection analysis worksheets.

10.1.2 *Intersection Queuing*

Table 10–2 presents the 95th percentile peak hour queue lengths for intersection turn pockets where the Project adds traffic within the study area for the Long-Term (Horizon Year 2050) with Project conditions. As shown in *Table 10–2*, all Long-Term (Horizon Year 2050) without Project peak hour queues are contained within existing turn pockets.

Appendix I contains the Long-Term (Horizon Year 2050) queuing analysis worksheets.

10.1.3 *Segment Operations*

Table 10–3 summarizes the street segment operations under Long-Term (Horizon Year 2050) without Project conditions. As shown in *Table 10–3*, all street segments are calculated to operate at LOS B or better.

10.2 Long-Term (Horizon Year 2050) + Projects

10.2.1 *Intersection Analysis*

Table 10–1 summarizes the Long-Term (Horizon Year 2050) + Project intersection operations. As shown in *Table 10–1*, with the addition of project traffic, all the study area intersections are calculated to operate at LOS D or better during both the AM and PM peak hours with exception to the following intersections:

- Mission Road / Woodward Street (San Marcos Boulevard) – LOS F during the AM and PM peak hours
- San Marcos Boulevard / Twin Oaks Valley Road – LOS E during the AM and PM peak hours

Based on the established Level of Service Standards outlined in *Section 4.3*, no substantial effects are identified as the Project adds less than 2 seconds of average vehicle delay. Therefore, improvements are not required under this analysis.

Appendix J contains the Long-Term (Horizon Year 2050) + Projects intersection analysis worksheets.

10.2.2 *Intersection Queuing*

Table 10–2 presents the 95th percentile peak hour queue lengths for intersection turn pockets where the Project adds traffic within the study area for the Long-Term (Horizon Year 2050) with Project condition. As shown in *Table 10–2*, all Long-Term (Horizon Year 2050) + Project peak hour queues, with the addition of Project traffic, are contained within existing turn pockets.

Appendix K contains the Long-Term (Horizon Year 2050) + Project queuing analysis worksheets.

10.2.3 *Segment Operations*

Table 10–3 summarizes the street segment operations under Long-Term (Horizon Year 2050) + Project conditions. As shown in *Table 10–3*, with the addition of project traffic, all street segments are calculated to continue to operate at LOS B or better.

TABLE 10–1
LONG-TERM (HORIZON YEAR 2050) INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Long-Term (Horizon Year 2050)		Long-Term (Horizon Year 2050) + Project		Δ[c]	Substantial Effect?
			Delay	LOS	Delay	LOS		
1. Woodward Street / Project Driveway	TWSC[d]	AM	–	–	11.7	B	–	No
		PM	–	–	13.1	B	–	No
2. Mission Road / Pico Avenue	Signal	AM	49.3	D	49.4	D	0.1	No
		PM	35.3	D	35.5	D	0.2	No
3. Mission Road / Woodward Street	Signal	AM	101.3	F	101.5	F	0.2	No
		PM	96.3	F	96.4	F	0.1	No
4. San Marcos Boulevard / Twin Oaks Valley Road	Signal	AM	71.4	E	72.5	E	1.1	No
		PM	58.2	E	58.8	E	0.6	No
5. San Marcos Boulevard / Rancheros Drive	Signal	AM	36.6	D	37.1	D	0.5	No
		PM	39.0	D	39.4	D	0.4	No

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Δ denotes an increase in delay due to project.
d. TWSC – Two-Way Stop Controlled intersection.

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 10–2
LONG-TERM (HORIZON YEAR 2050) INTERSECTION QUEUING

Intersection	Movement	Storage (ft)	Peak Hour	Long-Term (Horizon Year 2050) without Project	Long -Term (Horizon Year 2050) + Project
				Queue (ft) [a]	Queue (ft) [a]
1. Woodward Street / Project Driveway	SBL	50’	AM	–	0
			PM	–	0
	WBL	400’	AM	–	42’
			PM	–	33’
	WBR	400’	AM	–	42’
			PM	–	33’
	NBR	200’	AM	–	0
			PM	–	0
3. Mission Road / Woodward Street	SBL	240’	AM	183’	217’
			PM	81’	82’
	EBL	240’	AM	147’	163’
			PM	235’	236’
4. San Marcos Boulevard / Twin Oaks Valley Road	WBL	270’	AM	217’	220’
			PM	243’	244’
5. San Marcos Boulevard / Rancheros Drive	WBL	270’	AM	264’	266’
			PM	188’	195’
	NBR	100’	AM	58’	60’
			PM	86’	88’

Footnotes:

a. 95th percentile queue length.

General Notes:

- SBR = Direction/Turn Lane, e.g., southbound right-turn lane.

TABLE 10–3
LONG-TERM (HORIZON YEAR 2050) STREET SEGMENT OPERATIONS

Street Segment	Capacity (LOS E)[a]	Long-Term (Horizon Year 2050)			Long-Term (Horizon Year 2050) + Project			Δ[e]	Substantial Effect
		ADT[b]	LOS[c]	V/C[d]	ADT	LOS	V/C		
Mission Road									
Pico Avenue to Woodward Street	40,000	12,310	A	0.308	12,347	A	0.309	0.001	No
Woodward Street to Mission Villas Road	60,000	21,790	A	0.363	21,827	A	0.364	0.001	No
San Marcos Boulevard									
Rancheros Drive to Mission Road	40,000	17,380	B	0.435	17,656	B	0.441	0.006	No

Footnotes:

a. Capacities based on San Marcos Roadway Classification & LOS table (See *Appendix B*).
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

11.0 SITE ACCESS, ON-SITE CIRCULATION, AND PARKING

11.1 Site Access

As described in *Section 2.0*, the site access is proposed via one (1) full-access driveway to Woodward Street. The Project site is currently fronting a four-lane undivided roadway that primarily serves residents. As shown in *Table 8–1* and *Table 10–1*, the Project driveway is calculated to operate at LOS B during the AM and PM peak hours. The following recommendations with respect to the site access are noted:

- Access point shall provide driveway sight distance meeting City standards.
- A 50-foot long southbound left-turn pocket shall be provided on Woodward Street to allow for left-turn access to the Project site outside of the southbound through lane.

DRIVEWAY SIGHT DISTANCE

LLG performed a field survey (not an engineering survey) to determine whether or not the minimum required intersection sight distances can be achieved for drivers turning left from Woodward Street. Per the *AASHTO Geometric Design of Highways and Street Manual*, the point of observation for the review is offset 14.5 feet from the edge of the traveled way. The driver's eyes are measured at 3.5 feet from the ground surface, and the object to be observed is also 3.5 feet from the ground. The location of the object to be observed is located in the middle of the travel lane.

Based on the proposed traffic control at the Project driveway, the appropriate sight distance formula would reflect the left-turn from the minor road with stop control and represent the appropriate constraint on drivers leaving the Project site. The formula below has variables which are dependent on the design speed of the major road (V_{major}) and expected maneuver time (t_g) pertaining to each specific turning movement.

Per the above guidelines, the intersection distance for both left and right approaches of the minor leg need to be determined for vehicles turning left out of the Project driveway. As shown in ***Table 11–1***, looking left from the driveway towards the northbound approach, the minimum required intersection sight distance is 383 feet, and looking right from the driveway towards the southbound approach the sight distance is 441 feet. Based on our field observations, sight distance requirements are met for both northbound (383 feet) and southbound (441 feet) approaches.

Appendix L contains excerpts from AASHTO and a figure showing the results.

TABLE 11–1
SIGHT DISTANCE CALCULATIONS

Equation	V_{major}[a]	Viewing Direction	t_g[b]	ISD[c]
$ISD = 1.47\ V_{major}\ t_g$	40 mph	Traffic approaching minor road from the left	6.5 seconds	383 feet
		Traffic approaching minor road from the right	7.5 seconds	441 feet

Footnotes:
a. V_{major} = design speed of major road (mph)
b. t_g = time gap for minor road vehicle to enter the major road (s)
c. ISD = intersection sight distance (length of the leg of sight triangle along the major road) (ft)
General Notes:
1. Equation per *AASHTO's* Case B – Intersections with stop control on the minor road (Section 9.5.3.2). Excerpt included in *Appendix L*.

11.2 On-Site Circulation

The Project will provide adequate on-site circulation for passenger vehicles, heavy vehicles, bicyclists and pedestrians and any issues identified should be addressed in the site design and improvements.

11.3 Parking

The Project proposes a total of 46 condominium units. Per the *City of San Marcos Municipal Code, Chapter 20.340*, 108 parking spaces are required. A summary of the parking code requirements and calculations are shown in ***Table 11–2***.

The project proposes to provide 108 parking spaces. Therefore, the project meets the parking requirements.

Appendix L contains excerpts from the City of San Marcos Municipal Code Parking Rate.

TABLE 11–2
CITY OF SAN MARCOS MUNICIPAL CODE PARKING REQUIREMENTS & CALCULATIONS

Parking Code Land Use	Required Off-Street Parking Rate[a]	Project Quantity (dwelling units)	Required Parking
Residential Uses			
Duplex	2 spaces / dwelling unit	46 3-bedroom	92
Guest	1 space / 3 dwelling unit	46 3-bedroom	16
Total Spaces			**108**

Footnotes:
a. Rates from the *City of San Marcos Municipal Code, Chapter 20.340*.

12.0 ACTIVE TRANSPORTATION REVIEW

12.1 Bicycle Network

Currently, the City of San Marcos provides Class II Bike Lanes on Mission Road, Twin Oaks Valley Road, Woodward Street and San Marcos Boulevard. Per the *City of San Marcos Bicycle and Pedestrian Master Plan*, there are no plans to add or alter bicycle facilities within the Project vicinity.

Figure 12–1 shows the existing bicycle network.

12.2 Pedestrian Network

Sidewalk connection is provided between the Project site and the San Marcos Civic Center Station and bus stops. Sidewalks are provided on both sides of the roadways except for the west side of Rancheros Drive, approximately 550-feet south from the Rancheros Drive and Civic Center Drive intersection. Per the *City of San Marcos Bicycle and Pedestrian Master Plan*, there are no plans to add or alter sidewalks within the Project vicinity.

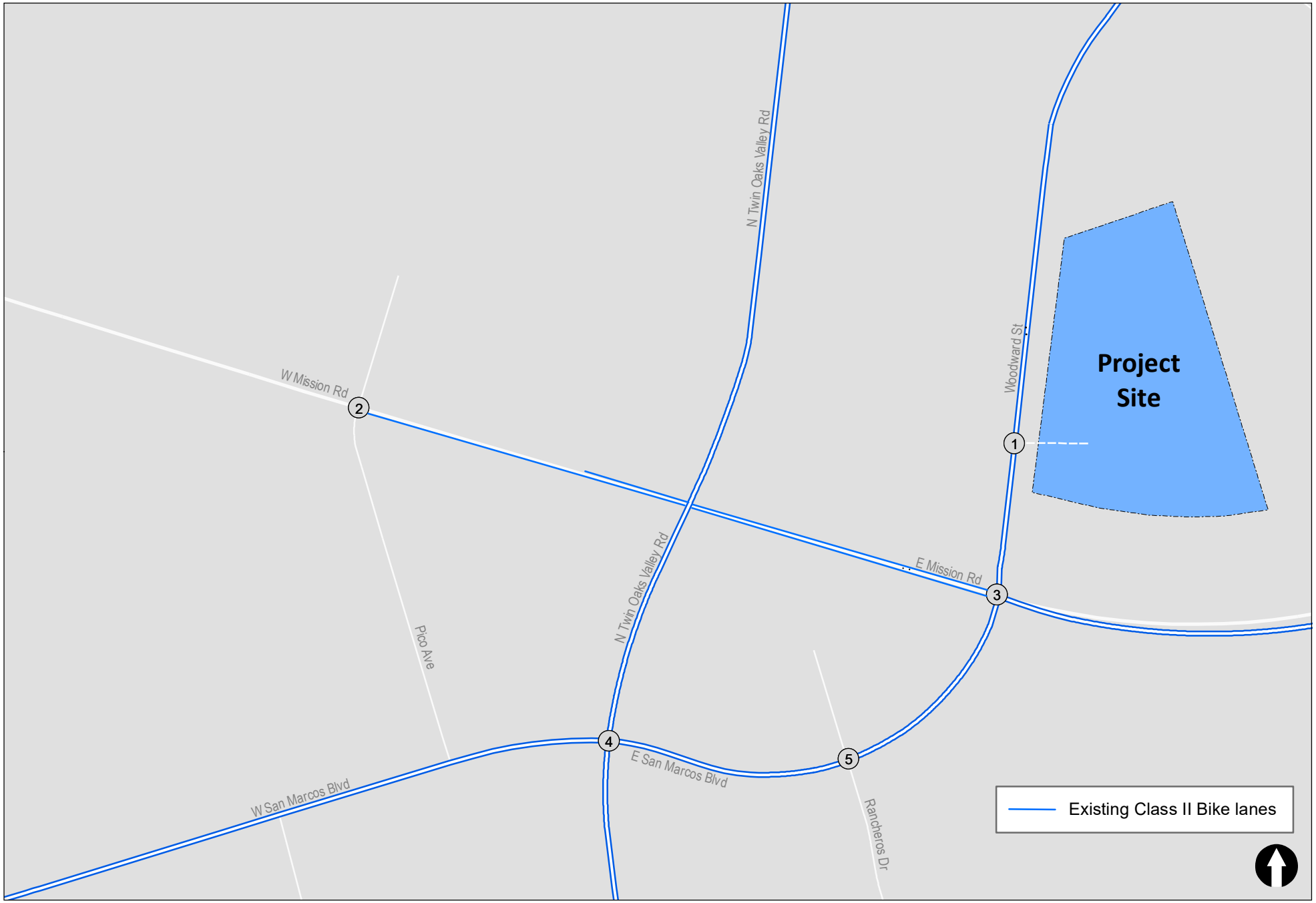
Figure 12–2 shows the existing pedestrian network.

12.3 Transit Network

Transit service is provided to the area via North County Transit District (NCTD). The nearest bus stop is located 1,000 feet south of the Project site, just west of the Mission Road / Woodward Street intersection. The San Marcos Civic Center Station, which serves the Sprinter, is located on the southwest corner of the Mission Road / Woodward Street intersection.

> **Bus Route 305** provides bus service to the area via Mission Road and South Santa Fe Avenue, connecting Escondido to Vista. During weekdays, headways are 30 minutes for the duration of the day. During weekends, headways are 30 minutes for the duration of the day. Route 305 has one bus stop near the project site located at the intersection of Mission Road and Woodward Street.
>
> The **SPRINTER** runs between Escondido and Oceanside. There are fifteen (15) stops along this route. SPRINTER service provides thirty-four (34) daily trips on the weekdays with an additional six (6) trips on Friday nights. It also provides twenty-five (25) daily weekend trips with an additional three (3) trips on Saturday nights.

Appendix M contains the bus route schedule and map.



LINSCOTT LAW & GREENSPAN engineers

N:\3703\Figures
Date: 2/1/2023
Time: 1:48 PM

Figure 12-1

Bicycle Network

LINSCOTT LAW & GREENSPAN engineers

N:\3703\Figures
Date: 2/1/2023
Time: 1:02 PM

Figure 12-2

Existing Pedestrian Network

WOODWARD 46 APARTMENT PROJECT

13.0 CONCLUSIONS

The Project proposes to construct 46 condominium units east of Woodward Street, north of Mission Road and south of Vineyard Road.

LOCAL TRANSPORTATION ANALYSIS

The study area intersections are calculated to operate acceptably at LOS D or better during the AM and PM peak hours under the Existing, Near-Term (Interim Year 2026) without and with Project, and Long-Term (Horizon Year 2050) without and with Project scenarios with exception to the following intersections:

- Mission Road / Woodward Street (San Marcos Boulevard) – LOS F during the AM and PM peak hours
- San Marcos Boulevard / Twin Oaks Valley Road – LOS E during the AM and PM peak hours

Based on the established Level of Service Standards outlined in *Section 4.3*, no substantial effects are identified as the Project adds less than 2 seconds of average vehicle delay. Therefore, improvements are not required under this analysis.

The study area street segments are calculated to operate acceptably at LOS B or better under the Existing, Near-Term (Interim Year 2026) without and with Project, and Long-Term (Horizon Year 2050) without and with Project scenarios.

PROJECT ACCESS

Site access is proposed via one (1) full-access driveway to Woodward Street. The Project site is currently fronting a four-lane undivided roadway that primarily serves residents. As shown in *Table 8–1* and *Table 10–1*, the Project driveway is calculated to operate at LOS B during the AM and PM peak hours. The following recommendations with respect to the site access are noted:

- Access point shall provide adequate driveway sight distance.
- A 50-foot southbound left-turn pocket shall be provided on Woodward Street to allow for left-turn access to the Project site outside of the southbound through lane.

LINSCOTT
LAW &
GREENSPAN
engineers

TECHNICAL APPENDICES
WOODWARD 46 APARTMENT PROJECT

San Marcos, California
March 27, 2024

LLG Ref. 3-22-3703

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APPENDICES

APPENDIX	
A.	Intersection and Street Segment Manual Count Sheets
B.	City of San Marcos Roadway Classification Table
C.	Existing Intersection Analysis Worksheets
D.	Near-Term (Interim Year 2026) Intersection Analysis Worksheets
E.	Near-Term (Interim Year 2026) Queuing Analysis Worksheets
F.	Near-Term (Interim Year 2026) + Project Intersection Analysis Worksheets
G.	Near-Term (Interim Year 2026) + Project Queuing Analysis Worksheets
H.	Long-Term (Horizon Year 2050) Intersection Analysis Worksheets
I.	Long-Term (Horizon Year 2050) Queuing Analysis Worksheets
J.	Long-Term (Horizon Year 2050) + Project Intersection Analysis Worksheets
K.	Long-Term (Horizon Year 2050) + Project Queuing Analysis Worksheets
L.	Excerpts from the City of San Marcos Municipal Code Parking Rate and AASHTO sight distance
M.	Bus Route Schedule and Map

APPENDIX A

INTERSECTION AND STREET SEGMENT MANUAL COUNT SHEETS

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
(951)268-6268

City of San Marcos
N/S: Pico Avenue
E/W: Mission Road
Weather: Clear

File Name : 01_SNM_Pico_Miss AM
Site Code : 05723047
Start Date : 1/12/2023
Page No : 1

Groups Printed- Total Volume

	Pico Avenue Southbound				Mission Road Westbound				Pico Avenue Northbound				Mission Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	5	5	5	15	15	73	0	88	6	3	17	26	2	49	11	62	191
07:15 AM	7	11	0	18	18	95	1	114	12	4	18	34	0	73	9	82	248
07:30 AM	6	5	1	12	16	111	1	128	21	2	28	51	1	99	21	121	312
07:45 AM	13	16	1	30	45	145	2	192	13	3	28	44	2	125	17	144	410
Total	31	37	7	75	94	424	4	522	52	12	91	155	5	346	58	409	1161
08:00 AM	24	24	1	49	70	182	2	254	14	9	26	49	3	98	12	113	465
08:15 AM	11	20	0	31	50	145	0	195	12	11	22	45	2	88	22	112	383
08:30 AM	3	9	1	13	34	126	0	160	14	7	7	28	2	59	15	76	277
08:45 AM	2	17	2	21	12	96	1	109	5	10	11	26	1	60	13	74	230
Total	40	70	4	114	166	549	3	718	45	37	66	148	8	305	62	375	1355
Grand Total	71	107	11	189	260	973	7	1240	97	49	157	303	13	651	120	784	2516
Apprch %	37.6	56.6	5.8		21	78.5	0.6		32	16.2	51.8		1.7	83	15.3		
Total %	2.8	4.3	0.4	7.5	10.3	38.7	0.3	49.3	3.9	1.9	6.2	12	0.5	25.9	4.8	31.2	

	Pico Avenue Southbound				Mission Road Westbound				Pico Avenue Northbound				Mission Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	6	5	**1**	12	16	111	1	128	**21**	2	**28**	**51**	1	99	21	121	312
07:45 AM	13	16	1	30	45	145	**2**	192	13	3	28	44	2	**125**	17	**144**	410
08:00 AM	**24**	**24**	1	**49**	**70**	**182**	2	**254**	14	9	26	49	**3**	98	12	113	**465**
08:15 AM	11	20	0	31	50	145	0	195	12	**11**	22	45	2	88	**22**	112	383
Total Volume	54	65	3	122	181	583	5	769	60	25	104	189	8	410	72	490	1570
% App. Total	44.3	53.3	2.5		23.5	75.8	0.7		31.7	13.2	55		1.6	83.7	14.7		
PHF	.563	.677	.750	.622	.646	.801	.625	.757	.714	.568	.929	.926	.667	.820	.818	.851	.844

Counts Unlimited, Inc.
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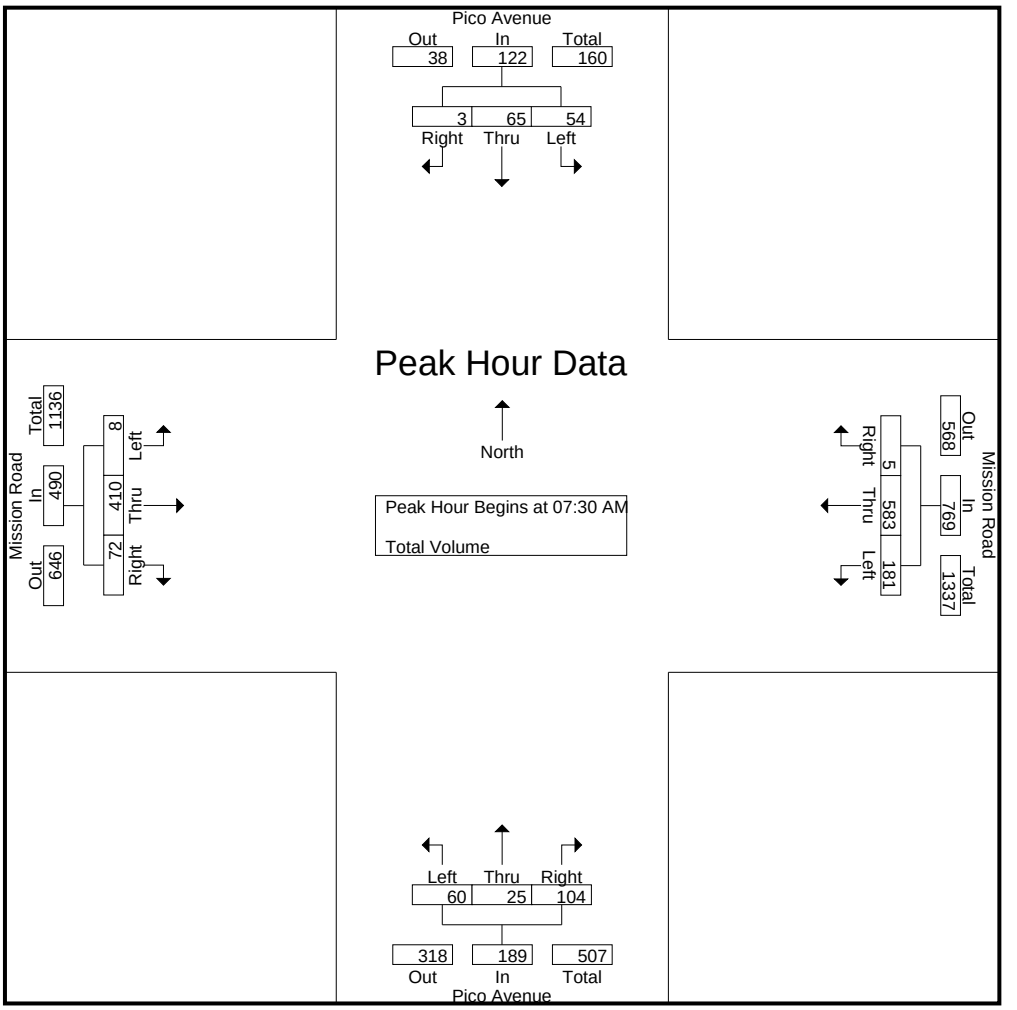
City of San Marcos
N/S: Pico Avenue
E/W: Mission Road
Weather: Clear

File Name : 01_SNM_Pico_Miss AM
Site Code : 05723047
Start Date : 1/12/2023
Page No : 2



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

	07:45 AM				07:45 AM				07:30 AM				07:30 AM			
+0 mins.	13	16	**1**	30	45	145	**2**	192	**21**	2	**28**	**51**	1	99	21	121
+15 mins.	**24**	**24**	1	**49**	**70**	**182**	2	**254**	13	3	28	44	2	**125**	17	**144**
+30 mins.	11	20	0	31	50	145	0	195	14	9	26	49	**3**	98	12	113
+45 mins.	3	9	1	13	34	126	0	160	12	**11**	22	45	2	88	**22**	112
Total Volume	51	69	3	123	199	598	4	801	60	25	104	189	8	410	72	490
% App. Total	41.5	56.1	2.4		24.8	74.7	0.5		31.7	13.2	55		1.6	83.7	14.7	
PHF	.531	.719	.750	.628	.711	.821	.500	.788	.714	.568	.929	.926	.667	.820	.818	.851

Counts Unlimited, Inc.
PO Box 1178
Corona, CA 92878
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City of San Marcos
N/S: Pico Avenue
E/W: Mission Road
Weather: Clear

File Name : 01_SNM_Pico_Miss PM
Site Code : 05723047
Start Date : 1/12/2023
Page No : 1

Groups Printed- Total Volume

	Pico Avenue Southbound				Mission Road Westbound				Pico Avenue Northbound				Mission Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	7	9	2	18	28	86	1	115	15	13	24	52	3	235	25	263	448
04:15 PM	2	14	1	17	23	104	2	129	13	15	16	44	8	220	28	256	446
04:30 PM	2	8	0	10	19	100	2	121	19	13	32	64	7	221	15	243	438
04:45 PM	3	23	2	28	32	107	2	141	19	9	19	47	2	201	29	232	448
Total	14	54	5	73	102	397	7	506	66	50	91	207	20	877	97	994	1780
05:00 PM	7	15	1	23	25	120	1	146	16	15	36	67	3	233	30	266	502
05:15 PM	4	9	7	20	27	112	0	139	16	13	19	48	9	226	27	262	469
05:30 PM	3	8	0	11	22	101	2	125	15	12	27	54	3	185	25	213	403
05:45 PM	4	15	2	21	28	79	0	107	23	4	22	49	3	175	20	198	375
Total	18	47	10	75	102	412	3	517	70	44	104	218	18	819	102	939	1749
Grand Total	32	101	15	148	204	809	10	1023	136	94	195	425	38	1696	199	1933	3529
Apprch %	21.6	68.2	10.1		19.9	79.1	1		32	22.1	45.9		2	87.7	10.3		
Total %	0.9	2.9	0.4	4.2	5.8	22.9	0.3	29	3.9	2.7	5.5	12	1.1	48.1	5.6	54.8	

	Pico Avenue Southbound				Mission Road Westbound				Pico Avenue Northbound				Mission Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	2	8	0	10	19	100	**2**	121	**19**	13	32	64	7	221	15	243	438
04:45 PM	3	**23**	2	**28**	**32**	107	2	141	19	9	19	47	2	201	29	232	448
05:00 PM	**7**	15	1	23	25	**120**	1	**146**	16	**15**	**36**	**67**	3	**233**	**30**	**266**	**502**
05:15 PM	4	9	**7**	20	27	112	0	139	16	13	19	48	**9**	226	27	262	469
Total Volume	16	55	10	81	103	439	5	547	70	50	106	226	21	881	101	1003	1857
% App. Total	19.8	67.9	12.3		18.8	80.3	0.9		31	22.1	46.9		2.1	87.8	10.1		
PHF	.571	.598	.357	.723	.805	.915	.625	.937	.921	.833	.736	.843	.583	.945	.842	.943	.925

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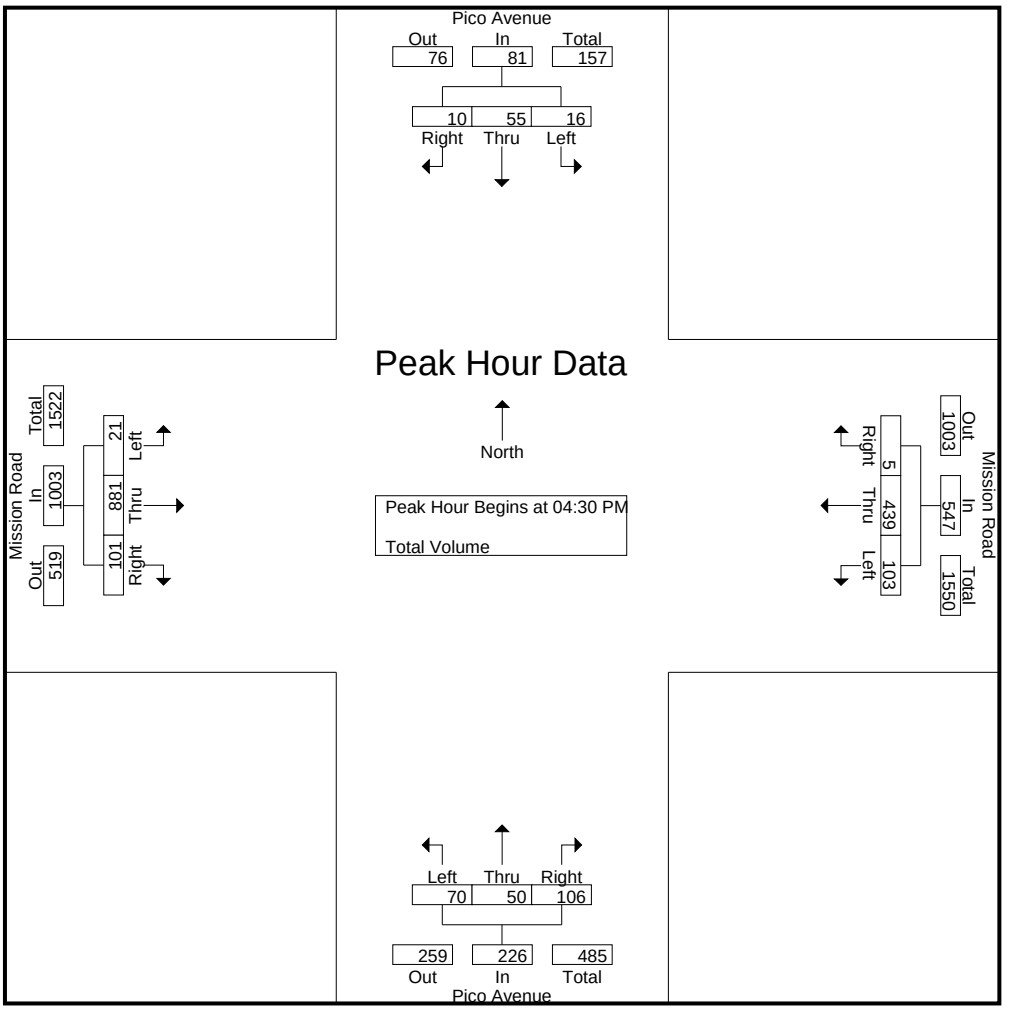
City of San Marcos
N/S: Pico Avenue
E/W: Mission Road
Weather: Clear

File Name : 01_SNM_Pico_Miss PM
Site Code : 05723047
Start Date : 1/12/2023
Page No : 2



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

	04:45 PM				04:45 PM				04:30 PM				04:30 PM			
+0 mins.	3	**23**	2	**28**	**32**	107	**2**	141	**19**	13	32	64	7	221	15	243
+15 mins.	**7**	15	1	23	25	**120**	1	**146**	19	9	19	47	2	201	29	232
+30 mins.	4	9	**7**	20	27	112	0	139	16	**15**	**36**	**67**	3	**233**	**30**	**266**
+45 mins.	3	8	0	11	22	101	2	125	16	13	19	48	**9**	226	27	262
Total Volume	17	55	10	82	106	440	5	551	70	50	106	226	21	881	101	1003
% App. Total	20.7	67.1	12.2		19.2	79.9	0.9		31	22.1	46.9		2.1	87.8	10.1	
PHF	.607	.598	.357	.732	.828	.917	.625	.943	.921	.833	.736	.843	.583	.945	.842	.943

Counts Unlimited, Inc.
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Corona, CA 92878
(951)268-6268

City of San Marcos
N/S: Woodward St/San Marcos Boulevard
E/W: Mission Road
Weather: Clear

File Name : 02_SNM_San M_Miss AM
Site Code : 05723047
Start Date : 1/12/2023
Page No : 1

Groups Printed- Total Volume

	Woodward Street Southbound				Mission Road Westbound				San Marcos Boulevard Northbound				Mission Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	6	71	8	85	50	67	3	120	0	12	50	62	2	50	2	54	321
07:15 AM	11	58	15	84	117	83	4	204	0	20	80	100	4	71	8	83	471
07:30 AM	7	78	10	95	85	105	5	195	1	21	98	120	2	106	2	110	520
07:45 AM	13	78	17	108	160	193	17	370	4	12	136	152	7	145	12	164	794
Total	37	285	50	372	412	448	29	889	5	65	364	434	15	372	24	411	2106
08:00 AM	16	64	23	103	131	206	33	370	2	9	131	142	8	131	10	149	764
08:15 AM	6	61	9	76	192	193	19	404	9	15	117	141	8	94	12	114	735
08:30 AM	3	57	12	72	99	109	14	222	1	17	77	95	5	44	9	58	447
08:45 AM	0	47	10	57	71	85	9	165	4	14	48	66	5	42	15	62	350
Total	25	229	54	308	493	593	75	1161	16	55	373	444	26	311	46	383	2296
Grand Total	62	514	104	680	905	1041	104	2050	21	120	737	878	41	683	70	794	4402
Apprch %	9.1	75.6	15.3		44.1	50.8	5.1		2.4	13.7	83.9		5.2	86	8.8		
Total %	1.4	11.7	2.4	15.4	20.6	23.6	2.4	46.6	0.5	2.7	16.7	19.9	0.9	15.5	1.6	18	

	Woodward Street Southbound				Mission Road Westbound				San Marcos Boulevard Northbound				Mission Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	7	**78**	10	95	85	105	5	195	1	**21**	98	120	2	106	2	110	520
07:45 AM	13	78	17	**108**	160	193	17	370	4	12	**136**	**152**	7	**145**	**12**	**164**	**794**
08:00 AM	**16**	64	**23**	103	131	**206**	**33**	370	2	9	131	142	**8**	131	10	149	764
08:15 AM	6	61	9	76	**192**	193	19	**404**	**9**	15	117	141	8	94	12	114	735
Total Volume	42	281	59	382	568	697	74	1339	16	57	482	555	25	476	36	537	2813
% App. Total	11	73.6	15.4		42.4	52.1	5.5		2.9	10.3	86.8		4.7	88.6	6.7		
PHF	.656	.901	.641	.884	.740	.846	.561	.829	.444	.679	.886	.913	.781	.821	.750	.819	.886

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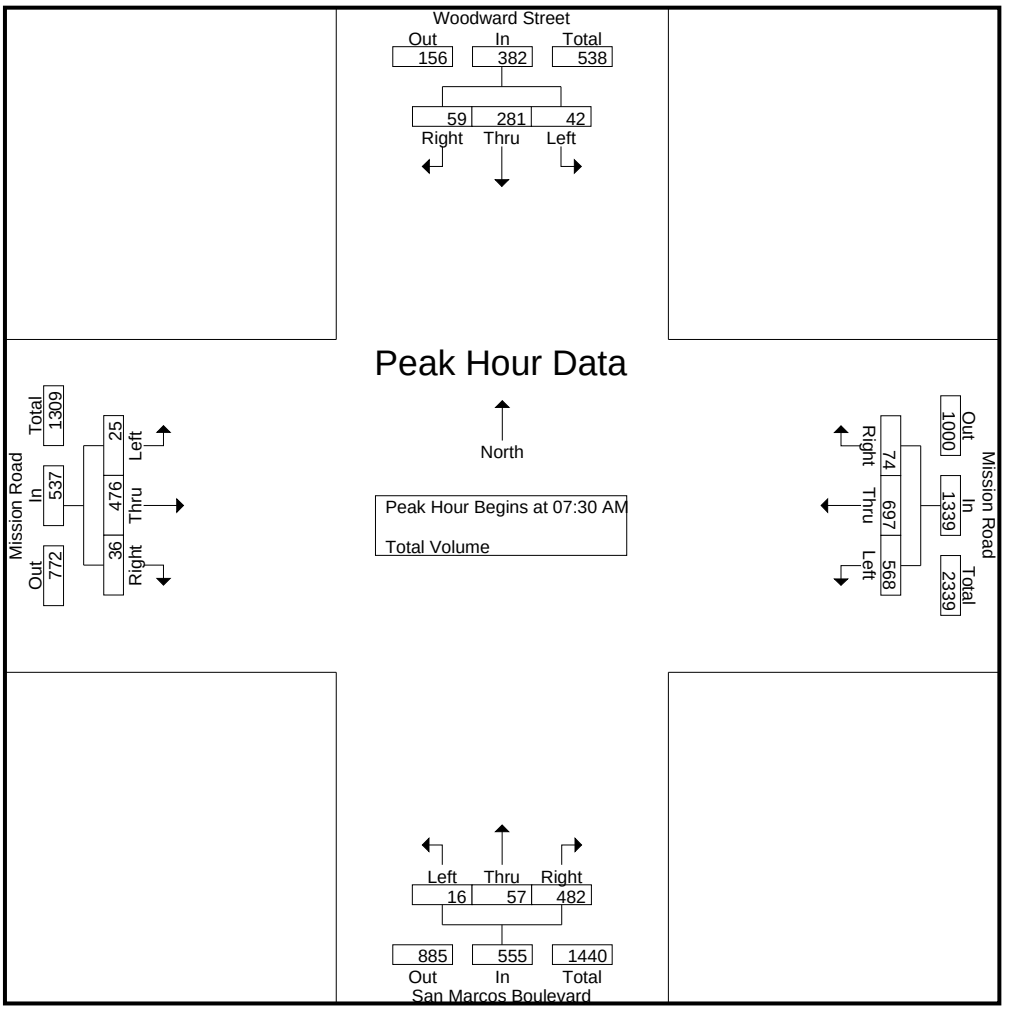
City of San Marcos
N/S: Woodward St/San Marcos Boulevard
E/W: Mission Road
Weather: Clear

File Name : 02_SNM_San M_Miss AM
Site Code : 05723047
Start Date : 1/12/2023



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

	07:15 AM				07:45 AM				07:30 AM				07:30 AM			
+0 mins.	11	58	15	84	160	193	17	370	1	**21**	98	120	2	106	2	110
+15 mins.	7	**78**	10	95	131	**206**	**33**	370	4	12	**136**	**152**	7	**145**	**12**	**164**
+30 mins.	13	78	17	**108**	**192**	193	19	**404**	2	9	131	142	**8**	131	10	149
+45 mins.	**16**	64	**23**	103	99	109	14	222	**9**	15	117	141	8	94	12	114
Total Volume	47	278	65	390	582	701	83	1366	16	57	482	555	25	476	36	537
% App. Total	12.1	71.3	16.7		42.6	51.3	6.1		2.9	10.3	86.8		4.7	88.6	6.7	
PHF	.734	.891	.707	.903	.758	.851	.629	.845	.444	.679	.886	.913	.781	.821	.750	.819

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City of San Marcos
N/S: Woodward St/San Marcos Boulevard
E/W: Mission Road
Weather: Clear

File Name : 02_SNM_San M_Miss PM
Site Code : 05723047
Start Date : 1/12/2023
Page No : 1

Groups Printed- Total Volume

	Woodward Street Southbound				Mission Road Westbound				San Marcos Boulevard Northbound				Mission Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	4	31	6	41	63	98	19	180	5	35	105	145	36	172	9	217	583
04:15 PM	9	40	11	60	68	111	13	192	17	60	140	217	20	180	12	212	681
04:30 PM	5	30	7	42	75	107	15	197	17	41	123	181	25	211	14	250	670
04:45 PM	1	56	17	74	83	104	14	201	10	43	141	194	34	155	13	202	671
Total	19	157	41	217	289	420	61	770	49	179	509	737	115	718	48	881	2605
05:00 PM	7	34	9	50	69	124	18	211	13	65	124	202	17	234	13	264	727
05:15 PM	4	31	16	51	70	100	11	181	10	41	145	196	28	200	6	234	662
05:30 PM	5	26	14	45	73	104	22	199	13	48	97	158	28	150	4	182	584
05:45 PM	6	21	13	40	62	93	11	166	12	41	115	168	26	145	14	185	559
Total	22	112	52	186	274	421	62	757	48	195	481	724	99	729	37	865	2532
Grand Total	41	269	93	403	563	841	123	1527	97	374	990	1461	214	1447	85	1746	5137
Apprch %	10.2	66.7	23.1		36.9	55.1	8.1		6.6	25.6	67.8		12.3	82.9	4.9		
Total %	0.8	5.2	1.8	7.8	11	16.4	2.4	29.7	1.9	7.3	19.3	28.4	4.2	28.2	1.7	34	

	Woodward Street Southbound				Mission Road Westbound				San Marcos Boulevard Northbound				Mission Road Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	**9**	40	11	60	68	111	13	192	**17**	60	140	**217**	20	180	12	212	681
04:30 PM	5	30	7	42	75	107	15	197	17	41	123	181	25	211	**14**	250	670
04:45 PM	1	**56**	**17**	**74**	**83**	104	14	201	10	43	**141**	194	**34**	155	13	202	671
05:00 PM	7	34	9	50	69	**124**	**18**	**211**	13	**65**	124	202	17	**234**	13	**264**	**727**
Total Volume	22	160	44	226	295	446	60	801	57	209	528	794	96	780	52	928	2749
% App. Total	9.7	70.8	19.5		36.8	55.7	7.5		7.2	26.3	66.5		10.3	84.1	5.6		
PHF	.611	.714	.647	.764	.889	.899	.833	.949	.838	.804	.936	.915	.706	.833	.929	.879	.945

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City of San Marcos
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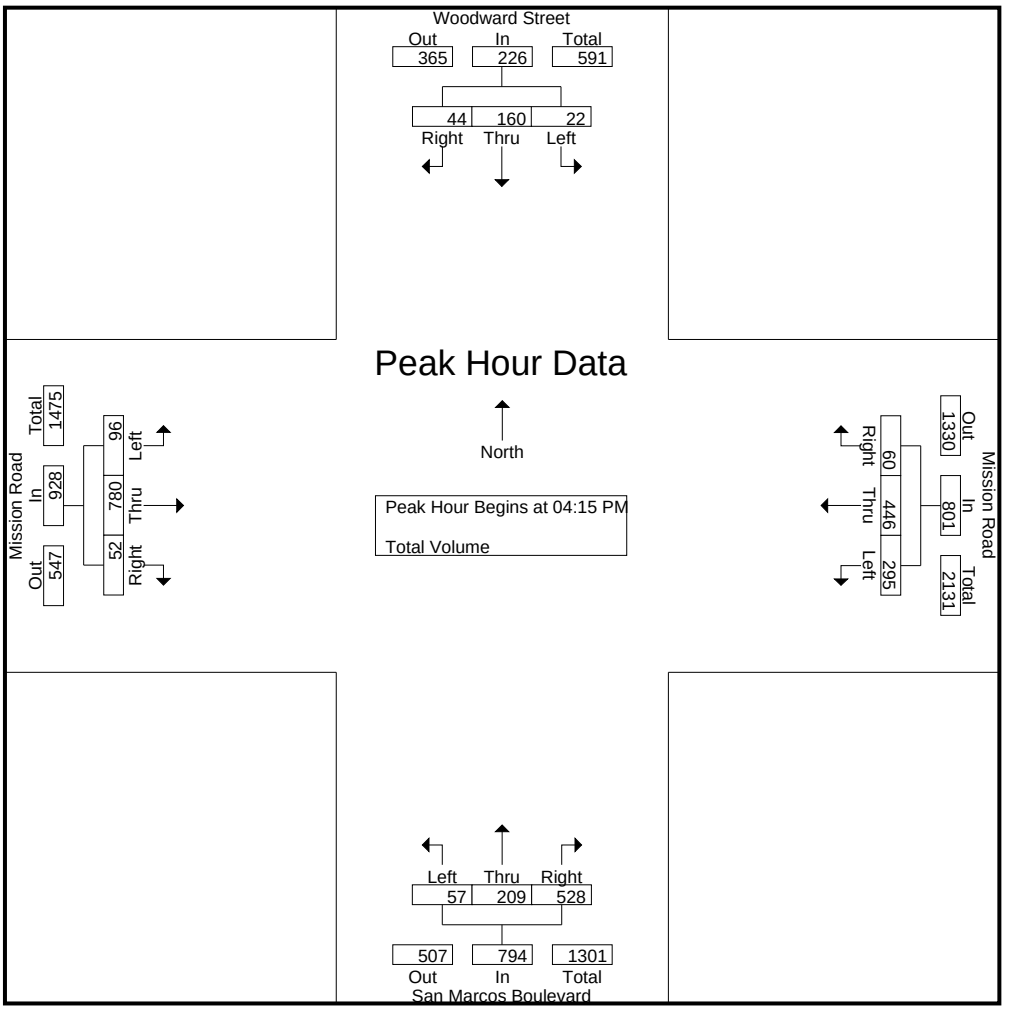
E/W: Mission Road
Weather: Clear

File Name : 02_SNM_San M_Miss PM
Site Code : 05723047
Start Date : 1/12/2023



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

	04:15 PM				04:15 PM				04:15 PM				04:30 PM			
+0 mins.	**9**	40	11	60	68	111	13	192	**17**	60	140	**217**	25	211	**14**	250
+15 mins.	5	30	7	42	75	107	15	197	17	41	123	181	**34**	155	13	202
+30 mins.	1	**56**	**17**	**74**	**83**	104	14	201	10	43	**141**	194	17	**234**	13	**264**
+45 mins.	7	34	9	50	69	**124**	**18**	**211**	13	**65**	124	202	28	200	6	234
Total Volume	22	160	44	226	295	446	60	801	57	209	528	794	104	800	46	950
% App. Total	9.7	70.8	19.5		36.8	55.7	7.5		7.2	26.3	66.5		10.9	84.2	4.8	
PHF	.611	.714	.647	.764	.889	.899	.833	.949	.838	.804	.936	.915	.765	.855	.821	.900

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City of San Marcos
N/S: Twin Oaks Valley Road
E/W: San Marcos Boulevard
Weather: Clear

File Name : 03_SNM_TOV_San M AM
Site Code : 05723047
Start Date : 1/12/2023
Page No : 1

Groups Printed- Total Volume

	Twin Oaks Valley Road Southbound				San Marcos Boulevard Westbound				Twin Oaks Valley Road Northbound				San Marcos Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	10	182	68	260	67	53	3	123	20	95	54	169	29	44	42	115	667
07:15 AM	21	164	56	241	85	94	4	183	29	70	80	179	42	66	56	164	767
07:30 AM	21	177	63	261	80	95	7	182	39	95	96	230	38	72	76	186	859
07:45 AM	27	170	66	263	104	103	6	213	49	82	123	254	36	106	79	221	951
Total	79	693	253	1025	336	345	20	701	137	342	353	832	145	288	253	686	3244
08:00 AM	22	173	60	255	108	93	6	207	39	113	131	283	33	81	52	166	911
08:15 AM	21	185	60	266	113	110	6	229	54	133	96	283	30	71	65	166	944
08:30 AM	17	143	68	228	98	76	7	181	50	115	84	249	40	83	72	195	853
08:45 AM	31	148	61	240	63	65	4	132	40	106	60	206	23	64	48	135	713
Total	91	649	249	989	382	344	23	749	183	467	371	1021	126	299	237	662	3421
Grand Total	170	1342	502	2014	718	689	43	1450	320	809	724	1853	271	587	490	1348	6665
Apprch %	8.4	66.6	24.9		49.5	47.5	3		17.3	43.7	39.1		20.1	43.5	36.4		
Total %	2.6	20.1	7.5	30.2	10.8	10.3	0.6	21.8	4.8	12.1	10.9	27.8	4.1	8.8	7.4	20.2	

	Twin Oaks Valley Road Southbound				San Marcos Boulevard Westbound				Twin Oaks Valley Road Northbound				San Marcos Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	21	177	63	261	80	95	**7**	182	39	95	96	230	**38**	72	76	186	859
07:45 AM	**27**	170	**66**	263	104	103	6	213	49	82	123	254	36	**106**	**79**	**221**	**951**
08:00 AM	22	173	60	255	108	93	6	207	39	113	**131**	**283**	33	81	52	166	911
08:15 AM	21	**185**	60	**266**	**113**	**110**	6	**229**	**54**	**133**	96	283	30	71	65	166	944
Total Volume	91	705	249	1045	405	401	25	831	181	423	446	1050	137	330	272	739	3665
% App. Total	8.7	67.5	23.8		48.7	48.3	3		17.2	40.3	42.5		18.5	44.7	36.8		
PHF	.843	.953	.943	.982	.896	.911	.893	.907	.838	.795	.851	.928	.901	.778	.861	.836	.963

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City of San Marcos
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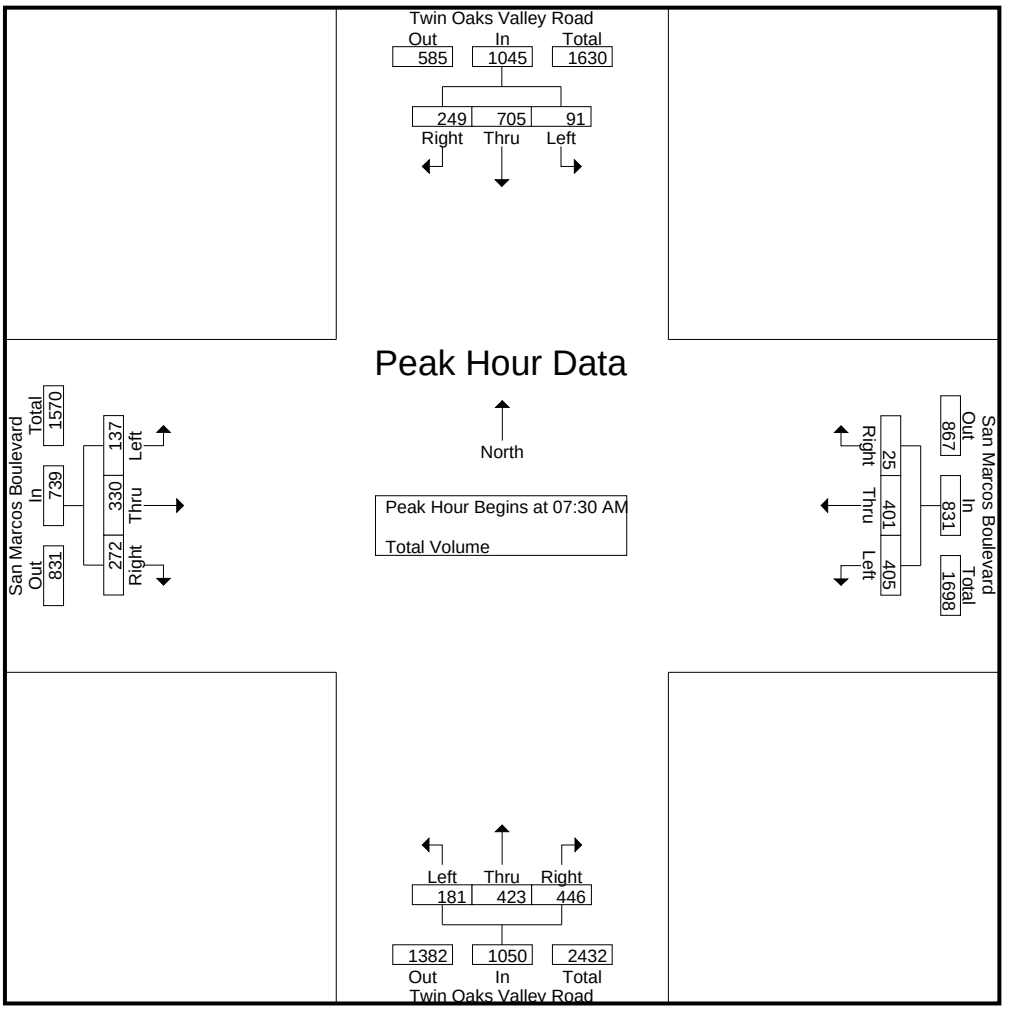
E/W: San Marcos Boulevard
Weather: Clear

File Name : 03_SNM_TOV_San M AM
Site Code : 05723047
Start Date : 1/12/2023
Page No : 2



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

	07:30 AM				07:30 AM				07:45 AM				07:45 AM			
+0 mins.	21	177	63	261	80	95	**7**	182	49	82	123	254	36	**106**	**79**	**221**
+15 mins.	**27**	170	**66**	263	104	103	6	213	39	113	**131**	**283**	33	81	52	166
+30 mins.	22	173	60	255	108	93	6	207	**54**	**133**	96	283	30	71	65	166
+45 mins.	21	**185**	60	**266**	**113**	**110**	6	**229**	50	115	84	249	**40**	83	72	195
Total Volume	91	705	249	1045	405	401	25	831	192	443	434	1069	139	341	268	748
% App. Total	8.7	67.5	23.8		48.7	48.3	3		18	41.4	40.6		18.6	45.6	35.8	
PHF	.843	.953	.943	.982	.896	.911	.893	.907	.889	.833	.828	.944	.869	.804	.848	.846

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City of San Marcos
N/S: Twin Oaks Valley Road
E/W: San Marcos Boulevard
Weather: Clear

File Name : 03_SNM_TOV_San M PM
Site Code : 05723047
Start Date : 1/12/2023
Page No : 1

Groups Printed- Total Volume

	Twin Oaks Valley Road Southbound				San Marcos Boulevard Westbound				Twin Oaks Valley Road Northbound				San Marcos Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	28	138	65	231	61	90	22	173	73	141	68	282	91	141	86	318	1004
04:15 PM	18	151	63	232	54	81	16	151	52	137	66	255	82	150	75	307	945
04:30 PM	17	122	52	191	75	118	17	210	71	137	68	276	82	157	60	299	976
04:45 PM	27	120	52	199	72	96	21	189	66	161	67	294	76	145	83	304	986
Total	90	531	232	853	262	385	76	723	262	576	269	1107	331	593	304	1228	3911
05:00 PM	22	157	61	240	80	115	17	212	55	146	80	281	69	148	94	311	1044
05:15 PM	29	108	61	198	55	98	20	173	63	150	67	280	75	149	67	291	942
05:30 PM	13	132	54	199	60	77	11	148	76	154	50	280	76	127	69	272	899
05:45 PM	22	122	53	197	43	78	8	129	69	143	66	278	60	134	66	260	864
Total	86	519	229	834	238	368	56	662	263	593	263	1119	280	558	296	1134	3749
Grand Total	176	1050	461	1687	500	753	132	1385	525	1169	532	2226	611	1151	600	2362	7660
Apprch %	10.4	62.2	27.3		36.1	54.4	9.5		23.6	52.5	23.9		25.9	48.7	25.4		
Total %	2.3	13.7	6	22	6.5	9.8	1.7	18.1	6.9	15.3	6.9	29.1	8	15	7.8	30.8	

	Twin Oaks Valley Road Southbound				San Marcos Boulevard Westbound				Twin Oaks Valley Road Northbound				San Marcos Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:15 PM																	
04:15 PM	18	151	**63**	232	54	81	16	151	52	137	66	255	**82**	150	75	307	945
04:30 PM	17	122	52	191	75	**118**	17	210	**71**	137	68	276	82	**157**	60	299	976
04:45 PM	**27**	120	52	199	72	96	**21**	189	66	**161**	67	**294**	76	145	83	304	986
05:00 PM	22	**157**	61	**240**	**80**	115	17	**212**	55	146	**80**	281	69	148	**94**	**311**	**1044**
Total Volume	84	550	228	862	281	410	71	762	244	581	281	1106	309	600	312	1221	3951
% App. Total	9.7	63.8	26.5		36.9	53.8	9.3		22.1	52.5	25.4		25.3	49.1	25.6		
PHF	.778	.876	.905	.898	.878	.869	.845	.899	.859	.902	.878	.940	.942	.955	.830	.982	.946

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City of San Marcos
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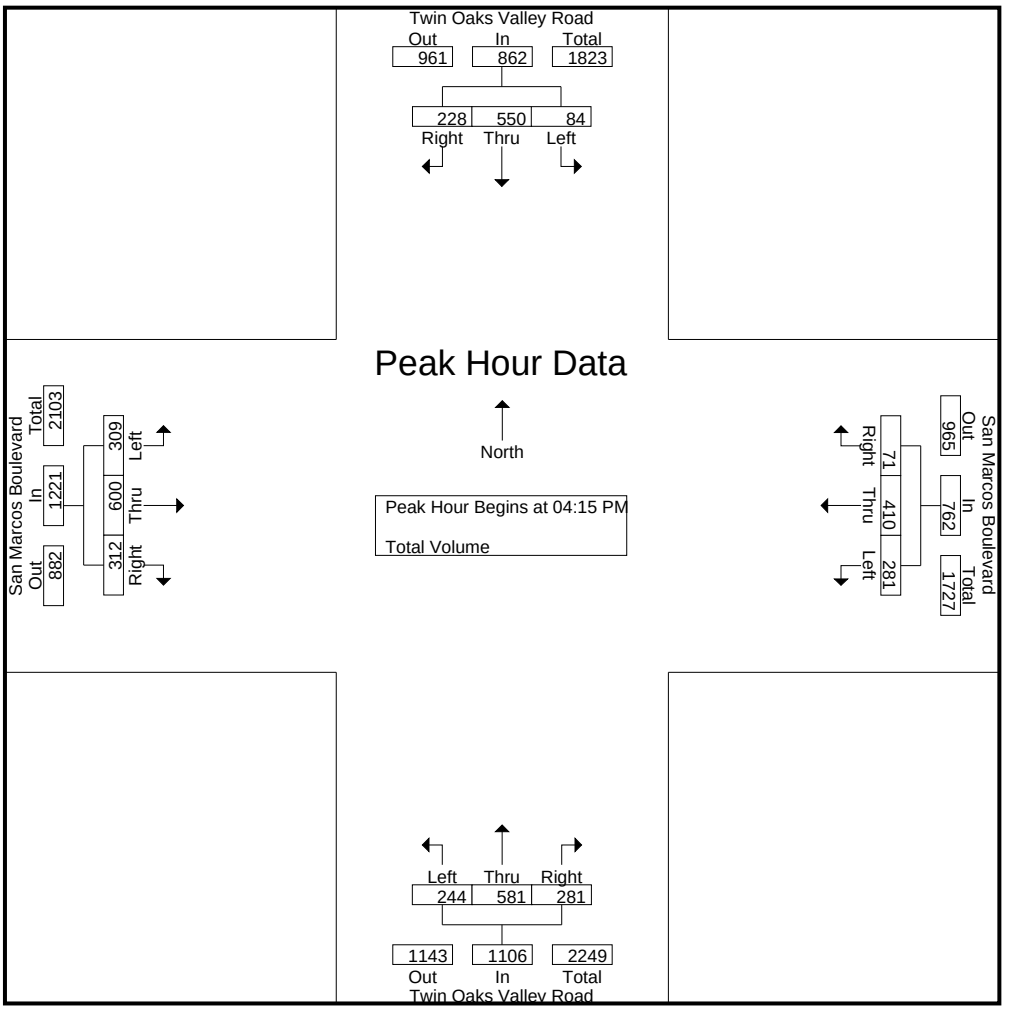
Weather: Clear

File Name : 03_SNM_TOV_San M PM
Site Code : 05723047
Start Date : 1/12/2023
Page No : 2



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

	04:15 PM				04:30 PM				04:45 PM				04:00 PM			
+0 mins.	18	151	**63**	232	75	**118**	17	210	66	**161**	67	**294**	**91**	141	**86**	**318**
+15 mins.	17	122	52	191	72	96	**21**	189	55	146	**80**	281	82	150	75	307
+30 mins.	**27**	120	52	199	**80**	115	17	**212**	63	150	67	280	82	**157**	60	299
+45 mins.	22	**157**	61	**240**	55	98	20	173	**76**	154	50	280	76	145	83	304
Total Volume	84	550	228	862	282	427	75	784	260	611	264	1135	331	593	304	1228
% App. Total	9.7	63.8	26.5		36	54.5	9.6		22.9	53.8	23.3		27	48.3	24.8	
PHF	.778	.876	.905	.898	.881	.905	.893	.925	.855	.949	.825	.965	.909	.944	.884	.965

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City of San Marcos
N/S: Rancheros Drive
E/W: San Marcos Boulevard
Weather: Clear

File Name : 04_SNM_Ran_San M AM
Site Code : 05723047
Start Date : 1/12/2023
Page No : 1

Groups Printed- Total Volume

	Rancheros Drive Southbound				San Marcos Boulevard Westbound				Rancheros Drive Northbound				San Marcos Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
07:00 AM	0	0	2	2	7	111	0	118	16	0	9	25	1	69	40	110	255
07:15 AM	0	0	0	0	19	154	0	173	15	0	13	28	5	101	65	171	372
07:30 AM	0	0	2	2	13	150	0	163	28	0	7	35	5	116	71	192	392
07:45 AM	1	0	0	1	38	209	0	247	25	0	7	32	6	147	89	242	522
Total	1	0	4	5	77	624	0	701	84	0	36	120	17	433	265	715	1541
08:00 AM	2	1	0	3	36	165	1	202	24	1	12	37	5	175	55	235	477
08:15 AM	0	0	1	1	33	209	0	242	38	0	16	54	8	120	69	197	494
08:30 AM	0	0	0	0	32	127	0	159	28	2	8	38	11	97	78	186	383
08:45 AM	1	1	0	2	38	102	0	140	34	1	9	44	10	75	72	157	343
Total	3	2	1	6	139	603	1	743	124	4	45	173	34	467	274	775	1697
Grand Total	4	2	5	11	216	1227	1	1444	208	4	81	293	51	900	539	1490	3238
Apprch %	36.4	18.2	45.5		15	85	0.1		71	1.4	27.6		3.4	60.4	36.2		
Total %	0.1	0.1	0.2	0.3	6.7	37.9	0	44.6	6.4	0.1	2.5	9	1.6	27.8	16.6	46	

	Rancheros Drive Southbound				San Marcos Boulevard Westbound				Rancheros Drive Northbound				San Marcos Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	0	0	**2**	2	13	150	0	163	28	0	7	35	5	116	71	192	392
07:45 AM	1	0	0	1	**38**	**209**	0	**247**	25	0	7	32	6	147	**89**	**242**	**522**
08:00 AM	**2**	**1**	0	**3**	36	165	**1**	202	24	**1**	12	37	5	**175**	55	235	477
08:15 AM	0	0	1	1	33	209	0	242	**38**	0	**16**	**54**	**8**	120	69	197	494
Total Volume	3	1	3	7	120	733	1	854	115	1	42	158	24	558	284	866	1885
% App. Total	42.9	14.3	42.9		14.1	85.8	0.1		72.8	0.6	26.6		2.8	64.4	32.8		
PHF	.375	.250	.375	.583	.789	.877	.250	.864	.757	.250	.656	.731	.750	.797	.798	.895	.903

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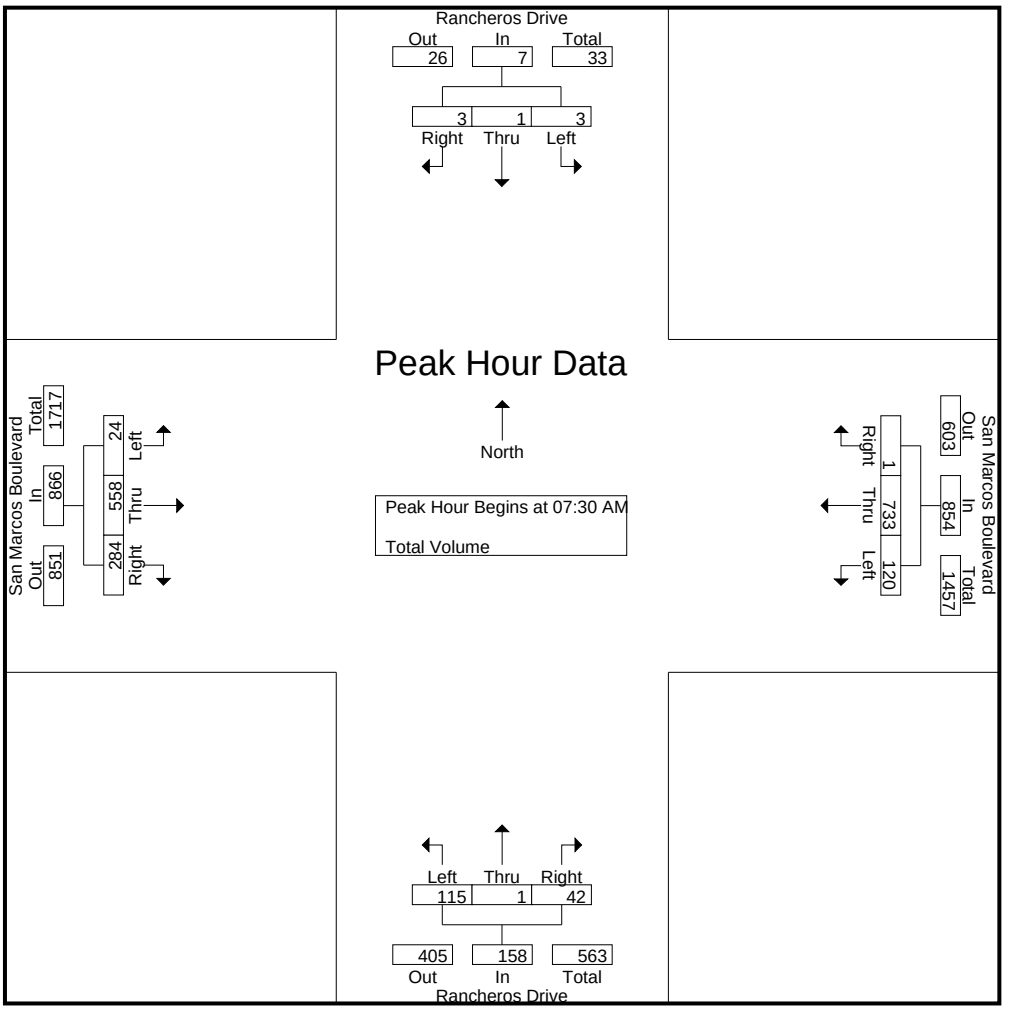
City of San Marcos
N/S: Rancheros Drive
E/W: San Marcos Boulevard
Weather: Clear

File Name : 04_SNM_Ran_San M AM
Site Code : 05723047
Start Date : 1/12/2023



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

	07:30 AM				07:30 AM				08:00 AM				07:30 AM			
+0 mins.	0	0	**2**	2	13	150	0	163	24	1	12	37	5	116	71	192
+15 mins.	1	0	0	1	**38**	**209**	0	**247**	**38**	0	**16**	**54**	6	147	**89**	**242**
+30 mins.	**2**	**1**	0	**3**	36	165	**1**	202	28	**2**	8	38	5	**175**	55	235
+45 mins.	0	0	1	1	33	209	0	242	34	1	9	44	**8**	120	69	197
Total Volume	3	1	3	7	120	733	1	854	124	4	45	173	24	558	284	866
% App. Total	42.9	14.3	42.9		14.1	85.8	0.1		71.7	2.3	26		2.8	64.4	32.8	
PHF	.375	.250	.375	.583	.789	.877	.250	.864	.816	.500	.703	.801	.750	.797	.798	.895

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City of San Marcos
N/S: Rancheros Drive
E/W: San Marcos Boulevard
Weather: Clear

File Name : 04_SNM_Ran_San M PM
Site Code : 05723047
Start Date : 1/12/2023
Page No : 1

Groups Printed- Total Volume

	Rancheros Drive Southbound				San Marcos Boulevard Westbound				Rancheros Drive Northbound				San Marcos Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
04:00 PM	3	2	5	10	25	82	1	108	76	0	19	95	7	153	79	239	452
04:15 PM	1	0	4	5	23	88	0	111	61	0	25	86	4	172	57	233	435
04:30 PM	2	2	5	9	30	104	0	134	84	1	28	113	3	189	56	248	504
04:45 PM	1	1	3	5	39	109	0	148	74	1	26	101	3	164	72	239	493
Total	7	5	17	29	117	383	1	501	295	2	98	395	17	678	264	959	1884
05:00 PM	4	0	3	7	26	76	0	102	102	0	27	129	4	185	49	238	476
05:15 PM	3	1	2	6	15	90	0	105	85	0	9	94	5	190	52	247	452
05:30 PM	2	1	2	5	22	85	0	107	54	1	18	73	2	126	45	173	358
05:45 PM	4	1	2	7	24	63	1	88	47	1	18	66	3	133	68	204	365
Total	13	3	9	25	87	314	1	402	288	2	72	362	14	634	214	862	1651
Grand Total	20	8	26	54	204	697	2	903	583	4	170	757	31	1312	478	1821	3535
Apprch %	37	14.8	48.1		22.6	77.2	0.2		77	0.5	22.5		1.7	72	26.2		
Total %	0.6	0.2	0.7	1.5	5.8	19.7	0.1	25.5	16.5	0.1	4.8	21.4	0.9	37.1	13.5	51.5	

	Rancheros Drive Southbound				San Marcos Boulevard Westbound				Rancheros Drive Northbound				San Marcos Boulevard Eastbound				
Start Time	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Int. Total
Peak Hour Analysis From 04:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:30 PM																	
04:30 PM	2	**2**	**5**	**9**	30	104	0	134	84	**1**	**28**	113	3	189	56	**248**	**504**
04:45 PM	1	1	3	5	**39**	**109**	0	**148**	74	1	26	101	3	164	**72**	239	493
05:00 PM	**4**	0	3	7	26	76	0	102	**102**	0	27	**129**	4	185	49	238	476
05:15 PM	3	1	2	6	15	90	0	105	85	0	9	94	**5**	**190**	52	247	452
Total Volume	10	4	13	27	110	379	0	489	345	2	90	437	15	728	229	972	1925
% App. Total	37	14.8	48.1		22.5	77.5	0		78.9	0.5	20.6		1.5	74.9	23.6		
PHF	.625	.500	.650	.750	.705	.869	.000	.826	.846	.500	.804	.847	.750	.958	.795	.980	.955

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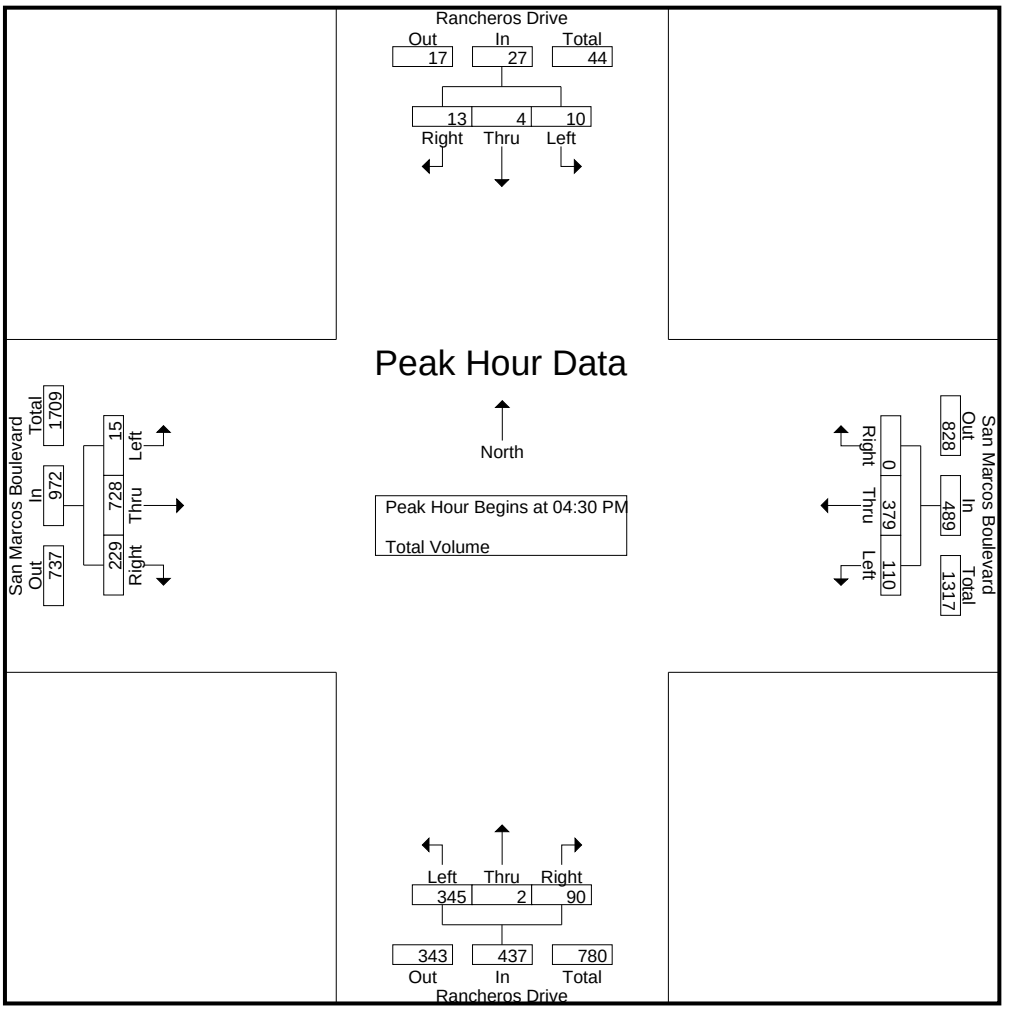
City of San Marcos
N/S: Rancheros Drive
E/W: San Marcos Boulevard
Weather: Clear

File Name : 04_SNM_Ran_San M PM
Site Code : 05723047
Start Date : 1/12/2023
Page No : 2



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

	04:00 PM				04:00 PM				04:30 PM				04:30 PM			
+0 mins.	**3**	**2**	**5**	**10**	25	82	**1**	108	84	**1**	**28**	113	3	189	56	**248**
+15 mins.	1	0	4	5	23	88	0	111	74	1	26	101	3	164	**72**	239
+30 mins.	2	2	5	9	30	104	0	134	**102**	0	27	**129**	4	185	49	238
+45 mins.	1	1	3	5	**39**	**109**	0	**148**	85	0	9	94	**5**	**190**	52	247
Total Volume	7	5	17	29	117	383	1	501	345	2	90	437	15	728	229	972
% App. Total	24.1	17.2	58.6		23.4	76.4	0.2		78.9	0.5	20.6		1.5	74.9	23.6	
PHF	.583	.625	.850	.725	.750	.878	.250	.846	.846	.500	.804	.847	.750	.958	.795	.980

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City of San Marcos
Mission Road
B/ Twin Oaks Valley Rd Overpass - San Marcos Blvd
24 Hour Directional Volume Count

SNM001
Site Code: 057-23047

Start Time	1/12/23 Thu	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		5	58			2	53				
12:15		6	57			6	60				
12:30		7	62			5	68				
12:45		3	51	21	228	3	103	16	284	37	512
01:00		3	69			4	63				
01:15		3	84			3	76				
01:30		4	61			5	71				
01:45		3	67	13	281	3	66	15	276	28	557
02:00		2	81			4	68				
02:15		2	107			3	66				
02:30		3	117			2	65				
02:45		1	174	8	479	5	74	14	273	22	752
03:00		0	180			3	104				
03:15		3	223			4	96				
03:30		3	201			0	**245**				
03:45		2	200	8	804	2	**177**	9	622	17	1426
04:00		3	217			8	**121**				
04:15		2	216			12	**127**				
04:30		3	**248**			15	121				
04:45		10	**212**	18	893	10	153	45	522	63	1415
05:00		5	**254**			9	109				
05:15		9	**238**			20	143				
05:30		13	183			21	171				
05:45		19	185	46	860	25	161	75	584	121	1444
06:00		19	141			35	116				
06:15		25	105			40	76				
06:30		29	54			49	63				
06:45		59	55	132	355	97	57	221	312	353	667
07:00		62	53			81	41				
07:15		81	35			99	43				
07:30		**126**	34			127	42				
07:45		**155**	42	424	164	**205**	48	512	174	936	338
08:00		**148**	32			**231**	25				
08:15		**115**	30			**197**	25				
08:30		61	30			**140**	27				
08:45		65	19	389	111	106	29	674	106	1063	217
09:00		57	35			77	18				
09:15		47	35			60	18				
09:30		34	22			55	15				
09:45		41	16	179	108	65	22	257	73	436	181
10:00		47	23			51	10				
10:15		46	10			52	17				
10:30		43	8			61	15				
10:45		49	11	185	52	56	6	220	48	405	100
11:00		40	5			57	8				
11:15		46	12			64	12				
11:30		54	7			62	4				
11:45		54	4	194	28	69	1	252	25	446	53
Total		1617	4363	1617	4363	2310	3299	2310	3299	3927	7662
Combined Total		5980		5980		5609		5609		11589	
AM Peak	-	07:30	-	-	-	07:45	-	-	-	-	-
Vol.	-	544	-	-	-	773	-	-	-	-	-
P.H.F.		0.877				0.837					
PM Peak	-	-	04:30	-	-	-	03:30	-	-	-	-
Vol.	-	-	952	-	-	-	670	-	-	-	-
P.H.F.			0.937				0.684				
Percentage		27.0%	73.0%			41.2%	58.8%				
ADT/AADT		ADT 11,589		AADT 11,589							

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City of San Marcos
Mission Road
B/ San Marcos Boulevard - Mission Villas Road
24 Hour Directional Volume Count

SNM002
Site Code: 057-23047

Start Time	1/12/23 Thu	Eastbound Morning	Eastbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Westbound Morning	Westbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		14	132			10	101				
12:15		14	112			9	84				
12:30		6	138			6	101				
12:45		5	141	39	523	6	187	31	473	70	996
01:00		10	134			10	111				
01:15		4	154			9	119				
01:30		7	120			5	100				
01:45		2	148	23	556	5	95	29	425	52	981
02:00		5	167			9	104				
02:15		2	191			14	124				
02:30		3	215			10	185				
02:45		5	265	15	838	4	127	37	540	52	1378
03:00		5	266			11	161				
03:15		5	334			2	**214**				
03:30		4	319			3	**421**				
03:45		8	325	22	1244	3	**244**	19	1040	41	2284
04:00		5	285			7	**175**				
04:15		2	323			16	191				
04:30		13	**342**			17	205				
04:45		18	**292**	38	1242	23	190	63	761	101	2003
05:00		13	**387**			21	222				
05:15		18	**366**			30	182				
05:30		46	266			56	204				
05:45		59	268	136	1287	52	152	159	760	295	2047
06:00		38	243			50	159				
06:15		57	208			95	127				
06:30		71	123			82	114				
06:45		95	121	261	695	134	85	361	485	622	1180
07:00		118	101			160	85				
07:15		166	93			187	76				
07:30		**223**	75			230	56				
07:45		**300**	90	807	359	**354**	59	931	276	1738	635
08:00		**285**	75			**380**	67				
08:15		**226**	80			**382**	48				
08:30		128	64			**236**	50				
08:45		105	62	744	281	162	46	1160	211	1904	492
09:00		94	66			102	41				
09:15		80	61			85	35				
09:30		78	47			95	35				
09:45		96	44	348	218	103	28	385	139	733	357
10:00		82	45			84	20				
10:15		98	22			80	20				
10:30		88	18			88	28				
10:45		118	20	386	105	103	12	355	80	741	185
11:00		86	14			115	15				
11:15		85	20			104	8				
11:30		97	10			99	8				
11:45		99	17	367	61	125	16	443	47	810	108
Total		3186	7409	3186	7409	3973	5237	3973	5237	7159	12646
Combined Total		10595		10595		9210		9210		19805	
AM Peak	-	07:30	-	-	-	07:45	-	-	-	-	-
Vol.	-	1034	-	-	-	1352	-	-	-	-	-
P.H.F.		0.862				0.885					
PM Peak	-	-	04:30	-	-	-	03:15	-	-	-	-
Vol.	-	-	1387	-	-	-	1054	-	-	-	-
P.H.F.			0.896				0.626				
Percentage		30.1%	69.9%			43.1%	56.9%				
ADT/AADT		ADT 19,805		AADT 19,805							

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City of San Marcos
San Marcos Boulevard
B/ Rancheros Drive - Misson Road
24 Hour Directional Volume Count

SNM003
Site Code: 057-23047

Start Time	1/12/23 Thu	Northbound Morning	Northbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Southbound Morning	Southbound Afternoon	Hour Totals Morning	Hour Totals Afternoon	Combined Totals Morning	Combined Totals Afternoon
12:00		18	117			8	72				
12:15		15	107			3	77				
12:30		10	144			6	67				
12:45		3	131	46	499	4	121	21	337	67	836
01:00		10	137			7	86				
01:15		3	133			5	92				
01:30		4	129			3	70				
01:45		4	128	21	527	2	83	17	331	38	858
02:00		5	141			6	66				
02:15		3	149			12	101				
02:30		1	161			12	95				
02:45		5	143	14	594	3	93	33	355	47	949
03:00		7	163			8	**108**				
03:15		4	211			3	**122**				
03:30		2	192			6	**197**				
03:45		7	203	20	769	5	**155**	22	582	42	1351
04:00		1	186			3	106				
04:15		0	**212**			15	121				
04:30		10	**226**			17	137				
04:45		9	**207**	20	831	32	153	67	517	87	1348
05:00		10	**218**			25	118				
05:15		14	203			25	109				
05:30		36	164			62	106				
05:45		47	174	107	759	49	111	161	444	268	1203
06:00		40	181			51	94				
06:15		41	181			90	97				
06:30		59	116			69	63				
06:45		66	122	206	600	92	77	302	331	508	931
07:00		83	114			120	58				
07:15		123	87			185	73				
07:30		**127**	93			**176**	37				
07:45		**167**	94	500	388	**247**	55	728	223	1228	611
08:00		**186**	97			**221**	43				
08:15		**143**	85			**255**	35				
08:30		115	58			173	30				
08:45		100	74	544	314	140	36	789	144	1333	458
09:00		96	68			77	30				
09:15		67	53			84	27				
09:30		74	57			73	26				
09:45		77	43	314	221	69	15	303	98	617	319
10:00		82	36			86	20				
10:15		89	37			80	17				
10:30		101	28			76	11				
10:45		97	23	369	124	100	7	342	55	711	179
11:00		82	19			83	6				
11:15		85	21			103	18				
11:30		94	14			85	7				
11:45		129	18	390	72	100	10	371	41	761	113
Total		2551	5698	2551	5698	3156	3458	3156	3458	5707	9156
Combined Total		8249		8249		6614		6614		14863	
AM Peak	-	07:30	-	-	-	07:30	-	-	-	-	-
Vol.	-	623	-	-	-	899	-	-	-	-	-
P.H.F.		0.837				0.881					
PM Peak	-	-	04:15	-	-	-	03:00	-	-	-	-
Vol.	-	-	863	-	-	-	582	-	-	-	-
P.H.F.			0.955				0.739				
Percentage		30.9%	69.1%			47.7%	52.3%				
ADT/AADT		ADT 14,863		AADT 14,863							

APPENDIX B

CITY OF SAN MARCOS ROADWAY CLASSIFICATION TABLE

Table 3: Roadway Classifications, Capacity, and LOS

Street Classification	Lanes	LOS A	LOS B	LOS C	LOS D	LOS E (Capacity)
Expressway	6	30,000	42,000	60,000	70,000	80,000
Prime Arterial	6	25,000	35,000	50,000	55,000	60,000
Major Arterial	6	20,000	28,000	40,000	45,000	50,000
Major Arterial	4	15,000	21,000	30,000	35,000	40,000
Major Arterial (One-Way)	3	12,500	16,500	22,500	25,000	27,500
Major Arterial (One-Way)	2	10,000	13,000	17,500	20,000	22,500
Secondary Arterial/Collector	4	10,000	14,000	20,000	25,000	30,000
Collector (no center lane)	4	5,000	7,000	10,000	13,000	15,000
Collector (continuous left-turn lane)	2	5,000	7,000	10,000	13,000	15,000
Collector (no fronting property)	2	4,000	5,500	7,500	9,000	10,000
Collector (commercial-industrial fronting)	2	2,500	3,500	5,000	6,500	8,000
Collector (multi-family)	2	2,500	3,500	5,000	6,500	8,000
Collector (one-way)	3	11,000	14,000	19,000	22,500	26,000
Collector (one-way)	2	7,500	9,500	12,500	15,000	17,500
Collector (one-way)	1	2,500	3,500	5,000	6,500	7,500
Sub-Collector (single-family)	2	--	--	2,200	--	--

Source: *Guidelines for Transportation Impact Studies in the San Diego Region* (May 2019)
Notes: 1. The volumes and the average daily level of service listed above are only intended as a general planning outline.
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.

3.7. LEVEL OF SERVICE STANDARDS

The City of San Marcos strives to maintain intersection and roadway segment operations based on LOS standards outlined in the General Plan Mobility Element. The local transportation analysis should note intersections and roadway segments that perform unacceptably (based on standards in the current General Plan Mobility Element) under no project and/or plus project conditions, and improvements that can be applied to increase performance to acceptable levels.

For study intersections, the study should identify if the addition of the traffic generated from the proposed project results in any one of the following, and improvements should be identified to increase performance to acceptable or pre-project conditions under each scenario:

- Triggers an intersection operating at acceptable LOS to operate at unacceptable LOS and increases the average delay per vehicle by more than 2.0 seconds.
- Increases the average delay per vehicle for a study intersection that is already operating at unacceptable LOS by more than 2.0 seconds.

APPENDIX C

EXISTING INTERSECTION ANALYSIS WORKSHEETS

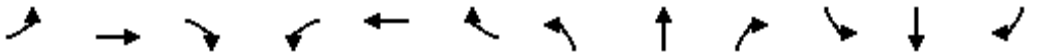
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	156	0	0	382
Future Vol, veh/h	0	0	156	0	0	382
Conflicting Peds, #/hr	0	0	0	10	10	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	170	0	0	415

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	388	95	0	0	180	0
Stage 1	180	-	-	-	-	-
Stage 2	208	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	588	943	-	-	1393	-
Stage 1	833	-	-	-	-	-
Stage 2	807	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	582	934	-	-	1380	-
Mov Cap-2 Maneuver	582	-	-	-	-	-
Stage 1	825	-	-	-	-	-
Stage 2	807	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1380	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	410	72	181	583	5	60	25	104	54	65	3
Future Volume (veh/h)	8	410	72	181	583	5	60	25	104	54	65	3
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.95	1.00		0.96
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	9	482	85	238	767	7	46	54	112	87	105	5
Peak Hour Factor	0.85	0.85	0.85	0.76	0.76	0.76	0.93	0.93	0.93	0.62	0.62	0.62
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	24	1337	234	257	2060	19	222	234	187	142	141	7
Arrive On Green	0.01	0.45	0.45	0.14	0.57	0.57	0.12	0.12	0.12	0.08	0.08	0.08
Sat Flow, veh/h	1781	3001	526	1781	3607	33	1781	1870	1502	1781	1767	84
Grp Volume(v), veh/h	9	284	283	238	378	396	46	54	112	87	0	110
Grp Sat Flow(s),veh/h/ln	1781	1777	1750	1781	1777	1863	1781	1870	1502	1781	0	1851
Q Serve(g_s), s	0.5	10.6	10.7	13.2	11.6	11.6	2.3	2.6	7.1	4.7	0.0	5.8
Cycle Q Clear(g_c), s	0.5	10.6	10.7	13.2	11.6	11.6	2.3	2.6	7.1	4.7	0.0	5.8
Prop In Lane	1.00		0.30	1.00		0.02	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	24	792	780	257	1015	1064	222	234	187	142	0	147
V/C Ratio(X)	0.38	0.36	0.36	0.93	0.37	0.37	0.21	0.23	0.60	0.61	0.00	0.75
Avail Cap(c_a), veh/h	107	792	780	257	1015	1064	517	542	435	143	0	148
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	48.9	18.3	18.3	42.3	11.7	11.7	39.3	39.4	41.4	44.5	0.0	45.0
Incr Delay (d2), s/veh	9.8	1.3	1.3	37.3	1.0	1.0	0.5	0.5	3.0	7.5	0.0	18.4
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	0.3	4.3	4.3	8.2	4.3	4.5	1.1	1.2	2.8	2.4	0.0	3.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.7	19.6	19.6	79.6	12.7	12.7	39.8	39.9	44.4	52.0	0.0	63.4
LnGrp LOS	E	B	B	E	B	B	D	D	D	D	A	E
Approach Vol, veh/h		576			1012			212			197	
Approach Delay, s/veh		20.2			28.4			42.3			58.4	
Approach LOS		C			C			D			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.0	50.8		12.6	6.4	63.4		17.6				
Change Period (Y+Rc), s	4.6	6.3		4.6	5.1	6.3		5.1				
Max Green Setting (Gmax), s	14.4	28.0		8.0	6.0	35.9		29.0				
Max Q Clear Time (g_c+I1), s	15.2	12.7		7.8	2.5	13.6		9.1				
Green Ext Time (p_c), s	0.0	2.7		0.0	0.0	4.4		0.8				

Intersection Summary			
HCM 6th Ctrl Delay		30.5	
HCM 6th LOS		C	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	476	36	568	697	74	16	57	482	42	281	59
Future Volume (veh/h)	25	476	36	568	697	74	16	57	482	42	281	59
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		0.98	1.00		0.99	1.00		0.97
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	30	580	44	684	840	89	18	63	530	48	319	67
Peak Hour Factor	0.82	0.82	0.82	0.83	0.83	0.83	0.91	0.91	0.91	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	69	1025	444	758	1667	727	63	925	408	84	772	160
Arrive On Green	0.04	0.29	0.29	0.22	0.47	0.47	0.04	0.26	0.26	0.05	0.26	0.26
Sat Flow, veh/h	1781	3554	1538	3456	3554	1549	1781	3554	1567	1781	2913	602
Grp Volume(v), veh/h	30	580	44	684	840	89	18	63	530	48	193	193
Grp Sat Flow(s),veh/h/ln	1781	1777	1538	1728	1777	1549	1781	1777	1567	1781	1777	1739
Q Serve(g_s), s	2.4	20.3	3.1	28.1	24.0	4.7	1.4	1.9	38.0	3.9	13.0	13.4
Cycle Q Clear(g_c), s	2.4	20.3	3.1	28.1	24.0	4.7	1.4	1.9	38.0	3.9	13.0	13.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.35
Lane Grp Cap(c), veh/h	69	1025	444	758	1667	727	63	925	408	84	471	461
V/C Ratio(X)	0.44	0.57	0.10	0.90	0.50	0.12	0.28	0.07	1.30	0.57	0.41	0.42
Avail Cap(c_a), veh/h	98	1025	444	947	1667	727	122	925	408	110	471	461
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	68.6	44.2	38.0	55.5	26.9	21.8	68.6	40.7	54.0	68.1	44.2	44.4
Incr Delay (d2), s/veh	4.3	2.3	0.4	10.1	1.1	0.3	2.4	0.0	151.8	6.1	0.6	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	1.2	9.1	1.2	13.0	10.1	1.8	0.7	0.9	31.9	1.9	5.8	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.9	46.4	38.5	65.6	28.0	22.2	71.0	40.7	205.8	74.2	44.8	45.0
LnGrp LOS	E	D	D	E	C	C	E	D	F	E	D	D
Approach Vol, veh/h		654			1613			611			434	
Approach Delay, s/veh		47.1			43.6			184.8			48.1	
Approach LOS		D			D			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	9.0	49.1	12.2	45.7	12.6	75.5	12.9	45.0
Change Period (Y+Rc), s	7.0	7.0	7.0	* 7	7.0	* 7	6.0	7.0
Max Green Setting (Gmax), s	40.0	36.0	10.0	* 37	8.0	* 69	9.0	38.0
Max Q Clear Time (g_c+I1), s	30.1	22.3	3.4	15.4	4.4	26.0	5.9	40.0
Green Ext Time (p_c), s	1.9	3.1	0.0	2.0	0.0	6.6	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	70.9
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)	137	330	272	405	401	25	181	423	446	91	705	249
Future Volume (veh/h)	137	330	272	405	401	25	181	423	446	91	705	249
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	1.00		0.98	1.00		0.98
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	163	393	324	445	441	27	195	455	480	93	719	254
Peak Hour Factor	0.84	0.84	0.84	0.91	0.91	0.91	0.93	0.93	0.93	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	222	1066	992	444	1238	76	222	1536	873	192	1073	379
Arrive On Green	0.06	0.30	0.30	0.13	0.36	0.36	0.06	0.43	0.43	0.06	0.42	0.42
Sat Flow, veh/h	3456	3554	2709	3456	3396	207	3456	3554	1547	3456	2555	903
Grp Volume(v), veh/h	163	393	324	445	230	238	195	455	480	93	500	473
Grp Sat Flow(s),veh/h/ln	1728	1777	1354	1728	1777	1827	1728	1777	1547	1728	1777	1681
Q Serve(g_s), s	6.5	12.2	12.1	18.0	13.2	13.3	7.8	11.7	27.7	3.7	31.8	31.8
Cycle Q Clear(g_c), s	6.5	12.2	12.1	18.0	13.2	13.3	7.8	11.7	27.7	3.7	31.8	31.8
Prop In Lane	1.00		1.00	1.00		0.11	1.00		1.00	1.00		0.54
Lane Grp Cap(c), veh/h	222	1066	992	444	647	666	222	1536	873	192	746	706
V/C Ratio(X)	0.74	0.37	0.33	1.00	0.36	0.36	0.88	0.30	0.55	0.48	0.67	0.67
Avail Cap(c_a), veh/h	272	1066	992	444	647	666	222	1536	873	200	746	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	0.93	0.93	0.93	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.3	38.6	32.1	61.0	32.5	32.5	65.0	25.9	19.6	64.2	32.8	32.8
Incr Delay (d2), s/veh	7.9	1.0	0.9	41.6	1.4	1.4	30.3	0.5	2.5	1.9	4.7	5.0
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	3.1	5.4	4.0	10.3	5.9	6.1	4.3	4.9	10.0	1.6	14.2	13.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	72.2	39.5	33.0	102.6	33.9	33.9	95.3	26.4	22.1	66.0	37.5	37.8
LnGrp LOS	E	D	C	F	C	C	F	C	C	E	D	D
Approach Vol, veh/h		880			913			1130			1066	
Approach Delay, s/veh		43.2			67.4			36.4			40.1	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.0	49.4	16.0	67.1	16.0	58.4	14.3	68.8
Change Period (Y+Rc), s	7.0	7.4	7.0	* 7.8	7.0	7.4	6.5	7.8
Max Green Setting (Gmax), s	18.0	42.0	9.0	* 42	11.0	49.0	8.1	43.2
Max Q Clear Time (g_c+I1), s	20.0	14.2	9.8	33.8	8.5	15.3	5.7	29.7
Green Ext Time (p_c), s	0.0	4.0	0.0	3.7	0.1	2.7	0.0	3.9

Intersection Summary	
HCM 6th Ctrl Delay	46.0
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* 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)	24	558	284	120	733	1	115	1	42	3	1	3
Future Volume (veh/h)	24	558	284	120	733	1	115	1	42	3	1	3
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		0.98	1.00		0.96	1.00		0.98
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	27	620	316	140	852	1	159	0	58	5	2	5
Peak Hour Factor	0.90	0.90	0.90	0.86	0.86	0.86	0.73	0.73	0.73	0.58	0.58	0.58
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	81	1267	550	195	1531	2	574	0	244	38	15	45
Arrive On Green	0.05	0.36	0.36	0.11	0.42	0.42	0.16	0.00	0.16	0.03	0.03	0.03
Sat Flow, veh/h	1781	3554	1543	1781	3642	4	3563	0	1516	1290	516	1548
Grp Volume(v), veh/h	27	620	316	140	416	437	159	0	58	7	0	5
Grp Sat Flow(s),veh/h/ln	1781	1777	1543	1781	1777	1869	1781	0	1516	1806	0	1548
Q Serve(g_s), s	1.2	10.7	13.0	6.0	13.9	13.9	3.1	0.0	2.6	0.3	0.0	0.2
Cycle Q Clear(g_c), s	1.2	10.7	13.0	6.0	13.9	13.9	3.1	0.0	2.6	0.3	0.0	0.2
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	0.71		1.00
Lane Grp Cap(c), veh/h	81	1267	550	195	747	786	574	0	244	53	0	45
V/C Ratio(X)	0.33	0.49	0.57	0.72	0.56	0.56	0.28	0.00	0.24	0.13	0.00	0.11
Avail Cap(c_a), veh/h	181	1267	550	204	747	786	1633	0	695	230	0	197
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	36.3	19.7	20.4	33.8	17.2	17.2	28.9	0.0	28.7	37.1	0.0	37.1
Incr Delay (d2), s/veh	2.4	1.4	4.3	11.1	3.0	2.8	0.3	0.0	0.5	1.1	0.0	1.1
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	0.5	4.3	4.9	3.0	5.7	5.9	1.3	0.0	0.9	0.1	0.0	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.7	21.1	24.8	44.9	20.2	20.1	29.2	0.0	29.2	38.3	0.0	38.2
LnGrp LOS	D	C	C	D	C	C	C	A	C	D	A	D
Approach Vol, veh/h		963			993			217			12	
Approach Delay, s/veh		22.8			23.6			29.2			38.2	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.1	34.5		9.3	10.1	39.5		19.7				
Change Period (Y+Rc), s	6.5	6.5		7.0	6.5	6.5		7.0				
Max Green Setting (Gmax), s	9.0	28.0		10.0	8.0	29.0		36.0				
Max Q Clear Time (g_c+I1), s	3.0	15.0		2.3	3.2	15.9		5.1				
Green Ext Time (p_c), s	0.0	4.2		0.0	0.0	4.2		0.7				

Intersection Summary	
HCM 6th Ctrl Delay	23.9
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

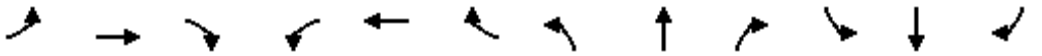
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	365	0	0	226
Future Vol, veh/h	0	0	365	0	0	226
Conflicting Peds, #/hr	0	0	0	10	10	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	397	0	0	246

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	530	209	0	0	407	0
Stage 1	407	-	-	-	-	-
Stage 2	123	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	479	797	-	-	1148	-
Stage 1	641	-	-	-	-	-
Stage 2	889	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	474	789	-	-	1137	-
Mov Cap-2 Maneuver	474	-	-	-	-	-
Stage 1	635	-	-	-	-	-
Stage 2	889	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1137	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	21	881	101	103	439	5	70	50	106	16	55	10
Future Volume (veh/h)	21	881	101	103	439	5	70	50	106	16	55	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.97	1.00		0.95	1.00		0.96
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	22	937	107	110	467	5	72	76	126	22	76	14
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.84	0.84	0.84	0.72	0.72	0.72
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	48	1717	196	136	2094	22	231	242	195	125	107	20
Arrive On Green	0.03	0.54	0.54	0.08	0.58	0.58	0.13	0.13	0.13	0.07	0.07	0.07
Sat Flow, veh/h	1781	3200	365	1781	3600	39	1781	1870	1504	1781	1525	281
Grp Volume(v), veh/h	22	520	524	110	230	242	72	76	126	22	0	90
Grp Sat Flow(s),veh/h/ln	1781	1777	1789	1781	1777	1862	1781	1870	1504	1781	0	1806
Q Serve(g_s), s	1.3	21.1	21.1	6.7	6.9	6.9	4.0	4.1	8.8	1.3	0.0	5.4
Cycle Q Clear(g_c), s	1.3	21.1	21.1	6.7	6.9	6.9	4.0	4.1	8.8	1.3	0.0	5.4
Prop In Lane	1.00		0.20	1.00		0.02	1.00		1.00	1.00		0.16
Lane Grp Cap(c), veh/h	48	953	959	136	1034	1083	231	242	195	125	0	127
V/C Ratio(X)	0.46	0.55	0.55	0.81	0.22	0.22	0.31	0.31	0.65	0.18	0.00	0.71
Avail Cap(c_a), veh/h	99	953	959	168	1034	1083	471	495	398	152	0	154
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.8	16.7	16.7	50.0	11.1	11.1	43.4	43.5	45.5	48.1	0.0	50.0
Incr Delay (d2), s/veh	6.8	2.2	2.2	20.4	0.5	0.5	0.8	0.7	3.6	0.7	0.0	11.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	8.4	8.5	3.7	2.6	2.7	1.8	1.9	3.5	0.6	0.0	2.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.6	19.0	18.9	70.4	11.6	11.5	44.2	44.2	49.1	48.8	0.0	61.0
LnGrp LOS	E	B	B	E	B	B	D	D	D	D	A	E
Approach Vol, veh/h		1066			582			274			112	
Approach Delay, s/veh		19.8			22.7			46.4			58.6	
Approach LOS		B			C			D			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.0	65.3		12.3	8.0	70.3		19.3				
Change Period (Y+Rc), s	4.6	6.3		4.6	5.1	6.3		5.1				
Max Green Setting (Gmax), s	10.4	40.5		9.4	6.1	44.3		29.1				
Max Q Clear Time (g_c+I1), s	8.7	23.1		7.4	3.3	8.9		10.8				
Green Ext Time (p_c), s	0.0	5.9		0.1	0.0	2.6		1.0				

Intersection Summary			
HCM 6th Ctrl Delay		26.3	
HCM 6th LOS		C	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	96	780	52	295	446	60	57	209	528	22	160	44
Future Volume (veh/h)	96	780	52	295	446	60	57	209	528	22	160	44
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	1.00		0.99	1.00		0.97
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	109	886	59	311	469	63	62	227	574	29	211	58
Peak Hour Factor	0.88	0.88	0.88	0.95	0.95	0.95	0.92	0.92	0.92	0.76	0.76	0.76
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	132	1179	512	362	1288	560	113	1204	532	68	844	225
Arrive On Green	0.07	0.33	0.33	0.10	0.36	0.36	0.06	0.34	0.34	0.04	0.31	0.31
Sat Flow, veh/h	1781	3554	1542	3456	3554	1544	1781	3554	1571	1781	2754	735
Grp Volume(v), veh/h	109	886	59	311	469	63	62	227	574	29	134	135
Grp Sat Flow(s),veh/h/ln	1781	1777	1542	1728	1777	1544	1781	1777	1571	1781	1777	1712
Q Serve(g_s), s	8.7	32.1	3.8	12.8	14.0	3.9	4.9	6.5	49.0	2.3	8.2	8.6
Cycle Q Clear(g_c), s	8.7	32.1	3.8	12.8	14.0	3.9	4.9	6.5	49.0	2.3	8.2	8.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.43
Lane Grp Cap(c), veh/h	132	1179	512	362	1288	560	113	1204	532	68	545	525
V/C Ratio(X)	0.83	0.75	0.12	0.86	0.36	0.11	0.55	0.19	1.08	0.43	0.25	0.26
Avail Cap(c_a), veh/h	209	1179	512	430	1288	560	135	1204	532	99	559	539
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	66.1	43.0	33.6	63.7	33.9	30.6	65.7	33.8	47.8	68.0	37.6	37.8
Incr Delay (d2), s/veh	13.8	4.4	0.5	14.1	0.8	0.4	4.1	0.1	61.9	4.2	0.2	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	14.5	1.5	6.2	6.1	1.5	2.3	2.8	27.8	1.1	3.6	3.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.8	47.4	34.0	77.8	34.7	31.0	69.8	33.9	109.7	72.2	37.9	38.0
LnGrp LOS	E	D	C	E	C	C	E	C	F	E	D	D
Approach Vol, veh/h		1054			843			863			298	
Approach Delay, s/veh		50.0			50.3			86.9			41.3	
Approach LOS		D			D			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.1	55.0	16.2	51.3	17.7	59.4	11.5	56.0
Change Period (Y+Rc), s	7.0	7.0	7.0	* 7	7.0	* 7	6.0	7.0
Max Green Setting (Gmax), s	18.0	48.0	11.0	* 46	17.0	* 50	8.0	49.0
Max Q Clear Time (g_c+I1), s	14.8	34.1	6.9	10.6	10.7	16.0	4.3	51.0
Green Ext Time (p_c), s	0.3	5.0	0.0	1.5	0.1	3.2	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	59.7
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)	309	600	312	281	410	71	244	581	281	84	550	228
Future Volume (veh/h)	309	600	312	281	410	71	244	581	281	84	550	228
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	1.00		0.98	1.00		0.98
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	315	612	318	312	456	79	260	618	299	93	611	253
Peak Hour Factor	0.98	0.98	0.98	0.90	0.90	0.90	0.94	0.94	0.94	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	368	1066	1032	346	885	152	272	1638	872	192	1056	437
Arrive On Green	0.11	0.30	0.30	0.10	0.29	0.29	0.08	0.46	0.46	0.06	0.43	0.43
Sat Flow, veh/h	3456	3554	2709	3456	3016	519	3456	3554	1548	3456	2431	1006
Grp Volume(v), veh/h	315	612	318	312	267	268	260	618	299	93	446	418
Grp Sat Flow(s),veh/h/ln	1728	1777	1354	1728	1777	1758	1728	1777	1548	1728	1777	1660
Q Serve(g_s), s	12.5	20.4	11.6	12.5	17.5	17.8	10.5	15.9	14.7	3.7	26.6	26.6
Cycle Q Clear(g_c), s	12.5	20.4	11.6	12.5	17.5	17.8	10.5	15.9	14.7	3.7	26.6	26.6
Prop In Lane	1.00		1.00	1.00		0.30	1.00		1.00	1.00		0.61
Lane Grp Cap(c), veh/h	368	1066	1032	346	521	516	272	1638	872	192	772	721
V/C Ratio(X)	0.86	0.57	0.31	0.90	0.51	0.52	0.96	0.38	0.34	0.48	0.58	0.58
Avail Cap(c_a), veh/h	444	1066	1032	346	521	516	272	1638	872	200	772	721
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	0.95	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.5	41.4	30.6	62.3	41.1	41.2	64.3	24.6	16.7	64.2	29.9	29.9
Incr Delay (d2), s/veh	13.1	2.2	0.8	24.9	3.4	3.5	43.0	0.7	1.1	1.9	3.1	3.4
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	6.1	9.2	3.8	6.6	8.1	8.1	6.2	6.6	5.3	1.6	11.6	11.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.6	43.7	31.4	87.2	44.5	44.7	107.2	25.3	17.8	66.0	33.1	33.3
LnGrp LOS	E	D	C	F	D	D	F	C	B	E	C	C
Approach Vol, veh/h		1245			847			1177			957	
Approach Delay, s/veh		48.4			60.3			41.5			36.4	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	49.4	18.0	69.1	21.9	48.5	14.3	72.8
Change Period (Y+Rc), s	7.0	7.4	7.0	* 7.8	7.0	7.4	6.5	7.8
Max Green Setting (Gmax), s	14.0	42.0	11.0	* 44	18.0	38.0	8.1	47.2
Max Q Clear Time (g_c+I1), s	14.5	22.4	12.5	28.6	14.5	19.8	5.7	17.9
Green Ext Time (p_c), s	0.0	5.2	0.0	4.6	0.4	2.8	0.0	5.3

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

Notes

User approved pedestrian interval to be less than phase max green.

* 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)	15	728	229	110	379	0	345	2	90	10	4	13
Future Volume (veh/h)	15	728	229	110	379	0	345	2	90	10	4	13
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		1.00	1.00		0.96	1.00		0.97
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	15	743	234	133	457	0	407	0	106	13	5	17
Peak Hour Factor	0.98	0.98	0.98	0.83	0.83	0.83	0.85	0.85	0.85	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	50	1176	510	181	1438	0	647	0	277	86	33	102
Arrive On Green	0.03	0.33	0.33	0.10	0.40	0.00	0.18	0.00	0.18	0.07	0.07	0.07
Sat Flow, veh/h	1781	3554	1541	1781	3647	0	3563	0	1522	1304	501	1545
Grp Volume(v), veh/h	15	743	234	133	457	0	407	0	106	18	0	17
Grp Sat Flow(s),veh/h/ln	1781	1777	1541	1781	1777	0	1781	0	1522	1805	0	1545
Q Serve(g_s), s	0.7	15.0	10.1	6.1	7.4	0.0	8.9	0.0	5.2	0.8	0.0	0.9
Cycle Q Clear(g_c), s	0.7	15.0	10.1	6.1	7.4	0.0	8.9	0.0	5.2	0.8	0.0	0.9
Prop In Lane	1.00		1.00	1.00		0.00	1.00		1.00	0.72		1.00
Lane Grp Cap(c), veh/h	50	1176	510	181	1438	0	647	0	277	120	0	102
V/C Ratio(X)	0.30	0.63	0.46	0.73	0.32	0.00	0.63	0.00	0.38	0.15	0.00	0.17
Avail Cap(c_a), veh/h	168	1176	510	190	1438	0	1516	0	648	213	0	183
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	0.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	40.3	23.9	22.3	36.9	17.2	0.0	32.0	0.0	30.4	37.2	0.0	37.3
Incr Delay (d2), s/veh	3.3	2.6	3.0	13.1	0.6	0.0	1.0	0.0	0.9	0.6	0.0	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	0.3	6.2	3.8	3.2	2.9	0.0	3.8	0.0	1.9	0.4	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.6	26.5	25.3	50.0	17.8	0.0	33.0	0.0	31.3	37.8	0.0	38.0
LnGrp LOS	D	C	C	D	B	A	C	A	C	D	A	D
Approach Vol, veh/h		992			590			513			35	
Approach Delay, s/veh		26.5			25.1			32.6			37.9	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	15.1	34.5		12.6	8.9	40.7		22.4
Change Period (Y+Rc), s	6.5	6.5		7.0	6.5	6.5		7.0
Max Green Setting (Gmax), s	9.0	28.0		10.0	8.0	29.0		36.0
Max Q Clear Time (g_c+I1), s	9.1	17.0		2.9	2.7	9.4		10.9
Green Ext Time (p_c), s	0.0	4.2		0.0	0.0	2.7		1.8

Intersection Summary	
HCM 6th Ctrl Delay	27.8
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

APPENDIX D

NEAR-TERM (INTERIM YEAR 2026) INTERSECTION ANALYSIS WORKSHEETS

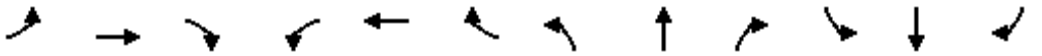
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	160	0	0	390
Future Vol, veh/h	0	0	160	0	0	390
Conflicting Peds, #/hr	0	0	0	10	10	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	174	0	0	424

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	396	97	0	0	184	0
Stage 1	184	-	-	-	-	-
Stage 2	212	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	581	940	-	-	1388	-
Stage 1	829	-	-	-	-	-
Stage 2	803	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	575	931	-	-	1375	-
Mov Cap-2 Maneuver	575	-	-	-	-	-
Stage 1	821	-	-	-	-	-
Stage 2	803	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1375	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	450	80	200	640	10	70	30	110	60	70	10
Future Volume (veh/h)	20	450	80	200	640	10	70	30	110	60	70	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.95	1.00		0.96
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	529	94	263	842	13	54	62	118	97	113	16
Peak Hour Factor	0.85	0.85	0.85	0.76	0.76	0.76	0.93	0.93	0.93	0.62	0.62	0.62
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	52	1326	235	257	1978	31	227	238	191	143	127	18
Arrive On Green	0.03	0.44	0.44	0.14	0.55	0.55	0.13	0.13	0.13	0.08	0.08	0.08
Sat Flow, veh/h	1781	2996	530	1781	3580	55	1781	1870	1503	1781	1594	226
Grp Volume(v), veh/h	24	313	310	263	418	437	54	62	118	97	0	129
Grp Sat Flow(s),veh/h/ln	1781	1777	1749	1781	1777	1858	1781	1870	1503	1781	0	1819
Q Serve(g_s), s	1.3	11.9	12.0	14.4	13.8	13.8	2.7	3.0	7.4	5.3	0.0	7.0
Cycle Q Clear(g_c), s	1.3	11.9	12.0	14.4	13.8	13.8	2.7	3.0	7.4	5.3	0.0	7.0
Prop In Lane	1.00		0.30	1.00		0.03	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	52	786	774	257	982	1026	227	238	191	143	0	146
V/C Ratio(X)	0.46	0.40	0.40	1.03	0.43	0.43	0.24	0.26	0.62	0.68	0.00	0.89
Avail Cap(c_a), veh/h	107	786	774	257	982	1026	517	542	436	143	0	146
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.8	18.8	18.9	42.8	13.1	13.1	39.3	39.4	41.3	44.8	0.0	45.5
Incr Delay (d2), s/veh	6.2	1.5	1.5	62.9	1.4	1.3	0.5	0.6	3.2	12.4	0.0	43.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	4.8	4.8	10.5	5.2	5.4	1.2	1.4	2.9	2.8	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.0	20.4	20.4	105.7	14.4	14.4	39.8	40.0	44.5	57.1	0.0	88.6
LnGrp LOS	D	C	C	F	B	B	D	D	D	E	A	F
Approach Vol, veh/h		647			1118			234			226	
Approach Delay, s/veh		21.6			35.9			42.2			75.1	
Approach LOS		C			D			D			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	19.0	50.6		12.6	8.0	61.5		17.8				
Change Period (Y+Rc), s	4.6	6.3		4.6	5.1	6.3		5.1				
Max Green Setting (Gmax), s	14.4	28.0		8.0	6.0	35.9		29.0				
Max Q Clear Time (g_c+I1), s	16.4	14.0		9.0	3.3	15.8		9.4				
Green Ext Time (p_c), s	0.0	2.9		0.0	0.0	4.8		0.8				

Intersection Summary			
HCM 6th Ctrl Delay		36.4	
HCM 6th LOS		D	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	530	40	630	770	80	20	60	530	50	310	70
Future Volume (veh/h)	30	530	40	630	770	80	20	60	530	50	310	70
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		0.98	1.00		0.99	1.00		0.97
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	37	646	19	759	928	60	22	66	577	57	352	80
Peak Hour Factor	0.82	0.82	0.82	0.83	0.83	0.83	0.91	0.91	0.91	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	75	962	416	822	1657	722	72	925	408	87	751	168
Arrive On Green	0.04	0.27	0.27	0.24	0.47	0.47	0.04	0.26	0.26	0.05	0.26	0.26
Sat Flow, veh/h	1781	3554	1536	3456	3554	1549	1781	3554	1567	1781	2865	642
Grp Volume(v), veh/h	37	646	19	759	928	60	22	66	577	57	216	216
Grp Sat Flow(s),veh/h/ln	1781	1777	1536	1728	1777	1549	1781	1777	1567	1781	1777	1730
Q Serve(g_s), s	3.0	24.0	1.4	31.7	27.9	3.2	1.8	2.1	38.5	4.7	15.1	15.5
Cycle Q Clear(g_c), s	3.0	24.0	1.4	31.7	27.9	3.2	1.8	2.1	38.5	4.7	15.1	15.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	75	962	416	822	1657	722	72	925	408	87	466	453
V/C Ratio(X)	0.49	0.67	0.05	0.92	0.56	0.08	0.31	0.07	1.42	0.65	0.46	0.48
Avail Cap(c_a), veh/h	96	962	416	911	1657	722	120	925	408	96	466	453
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	69.3	48.1	39.9	55.1	28.5	21.9	69.0	41.3	54.7	69.1	45.9	46.0
Incr Delay (d2), s/veh	4.9	3.7	0.2	13.9	1.4	0.2	2.4	0.0	201.0	13.0	0.7	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	1.5	10.9	0.5	15.1	11.8	1.2	0.9	0.9	37.7	2.4	6.7	6.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.2	51.8	40.1	68.9	29.9	22.2	71.4	41.3	255.7	82.2	46.6	46.8
LnGrp LOS	E	D	D	E	C	C	E	D	F	F	D	D
Approach Vol, veh/h		702			1747			665			489	
Approach Delay, s/veh		52.7			46.6			228.4			50.8	
Approach LOS		D			D			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	42.2	47.0	13.0	45.8	13.3	76.0	13.2	45.5
Change Period (Y+Rc), s	7.0	7.0	7.0	* 7	7.0	* 7	6.0	7.0
Max Green Setting (Gmax), s	39.0	37.5	10.0	* 36	8.0	* 69	8.0	38.5
Max Q Clear Time (g_c+I1), s	33.7	26.0	3.8	17.5	5.0	29.9	6.7	40.5
Green Ext Time (p_c), s	1.5	3.1	0.0	2.2	0.0	7.3	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	81.9
HCM 6th LOS	F

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)	150	360	300	450	440	30	200	470	490	100	780	270
Future Volume (veh/h)	150	360	300	450	440	30	200	470	490	100	780	270
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	1.00		0.98	1.00		0.98
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	179	429	357	495	484	33	215	505	527	102	796	276
Peak Hour Factor	0.84	0.84	0.84	0.91	0.91	0.91	0.93	0.93	0.93	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	229	1066	992	444	1221	83	222	1534	872	194	1080	374
Arrive On Green	0.07	0.30	0.30	0.13	0.36	0.36	0.06	0.43	0.43	0.06	0.42	0.42
Sat Flow, veh/h	3456	3554	2709	3456	3370	229	3456	3554	1547	3456	2570	891
Grp Volume(v), veh/h	179	429	357	495	255	262	215	505	527	102	550	522
Grp Sat Flow(s),veh/h/ln	1728	1777	1354	1728	1777	1822	1728	1777	1547	1728	1777	1684
Q Serve(g_s), s	7.1	13.5	13.5	18.0	14.9	15.0	8.7	13.2	31.8	4.0	36.4	36.5
Cycle Q Clear(g_c), s	7.1	13.5	13.5	18.0	14.9	15.0	8.7	13.2	31.8	4.0	36.4	36.5
Prop In Lane	1.00		1.00	1.00		0.13	1.00		1.00	1.00		0.53
Lane Grp Cap(c), veh/h	229	1066	992	444	644	660	222	1534	872	194	746	707
V/C Ratio(X)	0.78	0.40	0.36	1.11	0.40	0.40	0.97	0.33	0.60	0.53	0.74	0.74
Avail Cap(c_a), veh/h	296	1066	992	444	644	660	222	1534	872	210	746	707
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	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.4	39.0	32.6	61.0	33.2	33.3	65.4	26.3	20.5	64.3	34.1	34.1
Incr Delay (d2), s/veh	9.7	1.1	1.0	73.5	1.5	1.4	51.1	0.6	3.1	2.2	6.4	6.8
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	3.4	6.0	4.5	12.3	6.6	6.8	5.3	5.6	11.6	1.8	16.5	15.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.1	40.1	33.6	134.5	34.7	34.7	116.4	26.9	23.6	66.5	40.5	40.9
LnGrp LOS	E	D	C	F	C	C	F	C	C	E	D	D
Approach Vol, veh/h		965			1012			1247			1174	
Approach Delay, s/veh		44.0			83.5			41.0			42.9	
Approach LOS		D			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	15.0	49.4	16.0	67.1	16.3	58.1	14.3	68.8
Change Period (Y+Rc), s	7.0	7.4	7.0	* 7.8	7.0	7.4	6.5	7.8
Max Green Setting (Gmax), s	8.0	42.0	9.0	* 42	12.0	48.0	8.5	42.8
Max Q Clear Time (g_c+I1), s	20.0	15.5	10.7	38.5	9.1	17.0	6.0	33.8
Green Ext Time (p_c), s	0.0	4.4	0.0	2.2	0.1	3.0	0.1	3.5

Intersection Summary	
HCM 6th Ctrl Delay	51.9
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* 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)	30	610	310	130	810	10	130	10	50	10	10	10
Future Volume (veh/h)	30	610	310	130	810	10	130	10	50	10	10	10
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	1.00		0.95	1.00		0.97
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	33	678	344	151	942	12	188	0	68	17	17	17
Peak Hour Factor	0.90	0.90	0.90	0.86	0.86	0.86	0.73	0.73	0.73	0.58	0.58	0.58
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	91	1191	517	186	1395	18	549	0	233	76	76	128
Arrive On Green	0.05	0.34	0.34	0.10	0.39	0.39	0.15	0.00	0.15	0.08	0.08	0.08
Sat Flow, veh/h	1781	3554	1542	1781	3592	46	3563	0	1514	912	912	1545
Grp Volume(v), veh/h	33	678	344	151	466	488	188	0	68	34	0	17
Grp Sat Flow(s),veh/h/ln	1781	1777	1542	1781	1777	1861	1781	0	1514	1825	0	1545
Q Serve(g_s), s	1.5	13.1	16.0	6.9	18.2	18.2	3.9	0.0	3.3	1.5	0.0	0.9
Cycle Q Clear(g_c), s	1.5	13.1	16.0	6.9	18.2	18.2	3.9	0.0	3.3	1.5	0.0	0.9
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.50		1.00
Lane Grp Cap(c), veh/h	91	1191	517	186	690	723	549	0	233	152	0	128
V/C Ratio(X)	0.36	0.57	0.67	0.81	0.68	0.68	0.34	0.00	0.29	0.22	0.00	0.13
Avail Cap(c_a), veh/h	171	1191	517	192	690	723	1535	0	652	218	0	185
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	38.3	22.8	23.8	36.6	21.2	21.2	31.6	0.0	31.3	35.8	0.0	35.5
Incr Delay (d2), s/veh	2.4	2.0	6.6	22.0	5.2	5.0	0.4	0.0	0.7	0.7	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	0.7	5.4	6.3	4.0	7.9	8.2	1.7	0.0	1.2	0.7	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.7	24.8	30.4	58.6	26.4	26.2	31.9	0.0	32.0	36.5	0.0	36.0
LnGrp LOS	D	C	C	E	C	C	C	A	C	D	A	D
Approach Vol, veh/h		1055			1105			256			51	
Approach Delay, s/veh		27.1			30.7			31.9			36.3	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	15.2	34.5		13.9	10.8	38.9		19.9
Change Period (Y+Rc), s	6.5	6.5		7.0	6.5	6.5		7.0
Max Green Setting (Gmax), s	9.0	28.0		10.0	8.0	29.0		36.0
Max Q Clear Time (g_c+I1), s	8.9	18.0		3.5	3.5	20.2		5.9
Green Ext Time (p_c), s	0.0	4.0		0.1	0.0	3.7		0.9

Intersection Summary	
HCM 6th Ctrl Delay	29.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

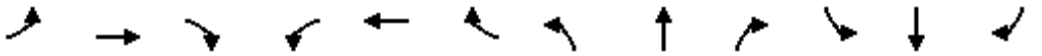
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	370	0	0	230
Future Vol, veh/h	0	0	370	0	0	230
Conflicting Peds, #/hr	0	0	0	10	10	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	402	0	0	250

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	537	211	0	0	412	0
Stage 1	412	-	-	-	-	-
Stage 2	125	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	474	794	-	-	1143	-
Stage 1	637	-	-	-	-	-
Stage 2	887	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	469	786	-	-	1132	-
Mov Cap-2 Maneuver	469	-	-	-	-	-
Stage 1	631	-	-	-	-	-
Stage 2	887	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1132	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	970	110	110	480	10	80	60	120	20	60	20
Future Volume (veh/h)	30	970	110	110	480	10	80	60	120	20	60	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.95	1.00		0.96
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	32	1032	117	117	511	11	83	88	143	28	83	28
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.84	0.84	0.84	0.72	0.72	0.72
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	61	1653	187	144	1984	43	249	261	210	136	101	34
Arrive On Green	0.03	0.52	0.52	0.08	0.56	0.56	0.14	0.14	0.14	0.08	0.08	0.08
Sat Flow, veh/h	1781	3203	363	1781	3554	76	1781	1870	1508	1781	1322	446
Grp Volume(v), veh/h	32	572	577	117	255	267	83	88	143	28	0	111
Grp Sat Flow(s),veh/h/ln	1781	1777	1789	1781	1777	1853	1781	1870	1508	1781	0	1769
Q Serve(g_s), s	1.9	25.3	25.3	7.1	8.2	8.2	4.6	4.7	9.9	1.6	0.0	6.8
Cycle Q Clear(g_c), s	1.9	25.3	25.3	7.1	8.2	8.2	4.6	4.7	9.9	1.6	0.0	6.8
Prop In Lane	1.00		0.20	1.00		0.04	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	61	917	923	144	992	1035	249	261	210	136	0	135
V/C Ratio(X)	0.53	0.62	0.62	0.81	0.26	0.26	0.33	0.34	0.68	0.21	0.00	0.82
Avail Cap(c_a), veh/h	102	917	923	168	992	1035	471	495	399	136	0	135
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.3	19.0	19.0	49.7	12.5	12.5	42.7	42.7	45.0	47.7	0.0	50.1
Incr Delay (d2), s/veh	6.9	3.2	3.2	22.4	0.6	0.6	0.8	0.8	3.8	0.7	0.0	31.8
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	10.3	10.4	4.0	3.1	3.3	2.1	2.2	4.0	0.8	0.0	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.2	22.2	22.2	72.2	13.2	13.1	43.5	43.5	48.8	48.4	0.0	81.8
LnGrp LOS	E	C	C	E	B	B	D	D	D	D	A	F
Approach Vol, veh/h		1181			639			314			139	
Approach Delay, s/veh		23.2			24.0			45.9			75.1	
Approach LOS		C			C			D			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.5	63.1		13.0	8.8	67.7		20.4				
Change Period (Y+Rc), s	4.6	6.3		4.6	5.1	6.3		5.1				
Max Green Setting (Gmax), s	10.4	41.5		8.4	6.3	45.1		29.1				
Max Q Clear Time (g_c+I1), s	9.1	27.3		8.8	3.9	10.2		11.9				
Green Ext Time (p_c), s	0.0	6.0		0.0	0.0	3.0		1.1				

Intersection Summary		
HCM 6th Ctrl Delay		29.7
HCM 6th LOS		C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	110	860	60	330	490	70	60	230	580	30	180	50
Future Volume (veh/h)	110	860	60	330	490	70	60	230	580	30	180	50
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.97	1.00		0.97	1.00		0.99	1.00		0.97
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	125	977	34	347	516	58	65	250	625	39	237	66
Peak Hour Factor	0.88	0.88	0.88	0.95	0.95	0.95	0.92	0.92	0.92	0.76	0.76	0.76
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	148	1159	503	393	1268	551	113	1184	523	77	841	228
Arrive On Green	0.08	0.33	0.33	0.11	0.36	0.36	0.06	0.33	0.33	0.04	0.31	0.31
Sat Flow, veh/h	1781	3554	1541	3456	3554	1543	1781	3554	1571	1781	2743	744
Grp Volume(v), veh/h	125	977	34	347	516	58	65	250	625	39	151	152
Grp Sat Flow(s),veh/h/ln	1781	1777	1541	1728	1777	1543	1781	1777	1571	1781	1777	1710
Q Serve(g_s), s	10.2	37.6	2.2	14.6	16.1	3.7	5.2	7.4	49.0	3.2	9.5	9.9
Cycle Q Clear(g_c), s	10.2	37.6	2.2	14.6	16.1	3.7	5.2	7.4	49.0	3.2	9.5	9.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.43
Lane Grp Cap(c), veh/h	148	1159	503	393	1268	551	113	1184	523	77	544	524
V/C Ratio(X)	0.84	0.84	0.07	0.88	0.41	0.11	0.58	0.21	1.19	0.51	0.28	0.29
Avail Cap(c_a), veh/h	218	1159	503	423	1268	551	145	1184	523	97	544	524
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	66.5	46.1	34.1	64.2	35.6	31.6	67.0	35.2	49.1	68.8	38.7	38.8
Incr Delay (d2), s/veh	17.5	7.5	0.3	18.3	1.0	0.4	4.6	0.1	105.2	5.0	0.3	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	5.3	17.4	0.9	7.3	7.0	1.4	2.5	3.2	34.0	1.5	4.2	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.0	53.6	34.4	82.5	36.6	32.0	71.6	35.3	154.2	73.9	39.0	39.1
LnGrp LOS	F	D	C	F	D	C	E	D	F	E	D	D
Approach Vol, veh/h		1136			921			940			342	
Approach Delay, s/veh		56.3			53.6			116.9			43.0	
Approach LOS		E			D			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.7	55.0	16.3	52.1	19.2	59.5	12.4	56.0
Change Period (Y+Rc), s	7.0	7.0	7.0	* 7	7.0	* 7	6.0	7.0
Max Green Setting (Gmax), s	18.0	48.0	12.0	* 45	18.0	* 49	8.0	49.0
Max Q Clear Time (g_c+I1), s	16.6	39.6	7.2	11.9	12.2	18.1	5.2	51.0
Green Ext Time (p_c), s	0.2	4.0	0.0	1.7	0.1	3.5	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	71.3
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)	340	660	340	310	450	80	270	640	310	90	610	250
Future Volume (veh/h)	340	660	340	310	450	80	270	640	310	90	610	250
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	1.00		0.98	1.00		0.98
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	347	673	347	344	500	89	287	681	330	100	678	278
Peak Hour Factor	0.98	0.98	0.98	0.90	0.90	0.90	0.94	0.94	0.94	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	395	1066	1052	370	879	156	296	1611	872	193	1024	420
Arrive On Green	0.11	0.30	0.30	0.11	0.29	0.29	0.09	0.45	0.45	0.06	0.42	0.42
Sat Flow, veh/h	3456	3554	2709	3456	3001	531	3456	3554	1548	3456	2438	1000
Grp Volume(v), veh/h	347	673	347	344	295	294	287	681	330	100	494	462
Grp Sat Flow(s),veh/h/ln	1728	1777	1354	1728	1777	1756	1728	1777	1548	1728	1777	1661
Q Serve(g_s), s	13.8	22.9	12.6	13.8	19.7	19.9	11.6	18.1	16.7	3.9	31.3	31.3
Cycle Q Clear(g_c), s	13.8	22.9	12.6	13.8	19.7	19.9	11.6	18.1	16.7	3.9	31.3	31.3
Prop In Lane	1.00		1.00	1.00		0.30	1.00		1.00	1.00		0.60
Lane Grp Cap(c), veh/h	395	1066	1052	370	520	514	296	1611	872	193	746	698
V/C Ratio(X)	0.88	0.63	0.33	0.93	0.57	0.57	0.97	0.42	0.38	0.52	0.66	0.66
Avail Cap(c_a), veh/h	420	1066	1052	370	520	514	296	1611	872	207	746	698
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	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.0	42.3	30.3	62.0	42.0	42.0	63.8	25.9	17.2	64.2	32.6	32.6
Incr Delay (d2), s/veh	18.1	2.8	0.8	27.6	4.0	4.2	43.7	0.8	1.3	2.1	4.6	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	10.3	4.2	7.4	9.1	9.1	6.8	7.6	6.0	1.8	13.9	13.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.1	45.2	31.1	89.6	46.0	46.2	107.5	26.7	18.4	66.4	37.2	37.5
LnGrp LOS	E	D	C	F	D	D	F	C	B	E	D	D
Approach Vol, veh/h		1367			933			1298			1056	
Approach Delay, s/veh		50.2			62.1			42.5			40.1	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	49.4	19.0	67.1	23.0	48.4	14.3	71.8
Change Period (Y+Rc), s	7.0	7.4	7.0	* 7.8	7.0	7.4	6.5	7.8
Max Green Setting (Gmax), s	15.0	42.0	12.0	* 42	17.0	40.0	8.4	45.9
Max Q Clear Time (g_c+I1), s	15.8	24.9	13.6	33.3	15.8	21.9	5.9	20.1
Green Ext Time (p_c), s	0.0	5.4	0.0	3.8	0.2	3.2	0.1	5.8

Intersection Summary	
HCM 6th Ctrl Delay	48.2
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* 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)	20	800	250	120	420	10	380	10	100	20	10	20
Future Volume (veh/h)	20	800	250	120	420	10	380	10	100	20	10	20
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	1.00		0.96	1.00		0.97
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	20	816	255	145	506	12	456	0	118	27	13	27
Peak Hour Factor	0.98	0.98	0.98	0.83	0.83	0.83	0.85	0.85	0.85	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	62	1117	484	177	1342	32	685	0	293	111	53	140
Arrive On Green	0.04	0.31	0.31	0.10	0.38	0.38	0.19	0.00	0.19	0.09	0.09	0.09
Sat Flow, veh/h	1781	3554	1540	1781	3545	84	3563	0	1524	1221	588	1543
Grp Volume(v), veh/h	20	816	255	145	253	265	456	0	118	40	0	27
Grp Sat Flow(s),veh/h/ln	1781	1777	1540	1781	1777	1853	1781	0	1524	1809	0	1543
Q Serve(g_s), s	1.0	18.2	12.1	7.1	9.2	9.2	10.6	0.0	6.0	1.8	0.0	1.4
Cycle Q Clear(g_c), s	1.0	18.2	12.1	7.1	9.2	9.2	10.6	0.0	6.0	1.8	0.0	1.4
Prop In Lane	1.00		1.00	1.00		0.05	1.00		1.00	0.67		1.00
Lane Grp Cap(c), veh/h	62	1117	484	177	673	701	685	0	293	164	0	140
V/C Ratio(X)	0.32	0.73	0.53	0.82	0.38	0.38	0.67	0.00	0.40	0.24	0.00	0.19
Avail Cap(c_a), veh/h	160	1117	484	180	673	701	1439	0	616	203	0	173
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.0	27.2	25.1	39.3	20.1	20.1	33.3	0.0	31.5	37.7	0.0	37.5
Incr Delay (d2), s/veh	2.9	4.2	4.1	24.5	1.6	1.5	1.1	0.0	0.9	0.8	0.0	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	0.5	7.9	4.7	4.2	3.9	4.0	4.5	0.0	2.2	0.8	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.9	31.4	29.2	63.9	21.7	21.6	34.4	0.0	32.4	38.4	0.0	38.1
LnGrp LOS	D	C	C	E	C	C	C	A	C	D	A	D
Approach Vol, veh/h		1091			663			574			67	
Approach Delay, s/veh		31.1			30.9			34.0			38.3	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	15.4	34.5		15.1	9.6	40.2		24.1
Change Period (Y+Rc), s	6.5	6.5		7.0	6.5	6.5		7.0
Max Green Setting (Gmax), s	9.0	28.0		10.0	8.0	29.0		36.0
Max Q Clear Time (g_c+I1), s	11.1	20.2		3.8	3.0	11.2		12.6
Green Ext Time (p_c), s	0.0	3.7		0.1	0.0	2.7		2.0

Intersection Summary	
HCM 6th Ctrl Delay	32.0
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

APPENDIX E

NEAR-TERM (INTERIM YEAR 2026) QUEUING ANALYSIS WORKSHEETS

Intersection: 1: Woodward St & Project Dwy

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 2: Pico Ave & Mission Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LT	R	L	TR
Maximum Queue (ft)	60	240	203	175	320	316	94	150	58	99	156
Average Queue (ft)	21	120	85	131	112	109	39	38	44	51	63
95th Queue (ft)	52	203	167	198	272	248	79	106	60	95	129
Link Distance (ft)		394	394		1386	1386	256	256			162
Upstream Blk Time (%)											1
Queuing Penalty (veh)											0
Storage Bay Dist (ft)	200			150					30	75	
Storage Blk Time (%)		1		12	2			25	12	6	11
Queuing Penalty (veh)		0		39	4			28	8	5	7

Intersection: 3: San Marcos Blvd/Woodward St & Mission Rd

Movement	EB	EB	EB	EB	B15	B15	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	R	T	T	L	L	T	T	R	L
Maximum Queue (ft)	195	277	281	190	45	56	322	334	608	484	141	68
Average Queue (ft)	40	166	178	38	2	3	260	250	256	199	24	18
95th Queue (ft)	115	261	270	131	27	27	350	370	556	412	92	52
Link Distance (ft)		220	220		1386	1386			721	721	721	
Upstream Blk Time (%)	0	4	4	0					3			
Queuing Penalty (veh)	0	12	13	0					0			
Storage Bay Dist (ft)	180			215			310	310				250
Storage Blk Time (%)		10	4	0			6	8	0			
Queuing Penalty (veh)		3	2	0			24	30	2			

Intersection: 3: San Marcos Blvd/Woodward St & Mission Rd

Movement	NB	NB	NB	SB	SB	SB
Directions Served	T	T	R	L	T	TR
Maximum Queue (ft)	39	82	316	206	298	230
Average Queue (ft)	8	31	30	54	165	108
95th Queue (ft)	30	67	170	123	249	195
Link Distance (ft)		492	492		568	568
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	250			205		
Storage Blk Time (%)					4	
Queuing Penalty (veh)					2	

Intersection: 4: Twin Oaks Valley Rd & San Marcos Blvd

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	R	L	L	T	TR	L	L
Maximum Queue (ft)	142	154	273	311	206	88	202	215	544	511	191	205
Average Queue (ft)	48	109	107	183	81	4	189	203	359	211	123	168
95th Queue (ft)	148	169	237	285	154	36	234	245	643	436	224	230
Link Distance (ft)			323	323	323				526	526		
Upstream Blk Time (%)			0	0					9	0		
Queuing Penalty (veh)			0	0					43	1		
Storage Bay Dist (ft)	130	130				85	190	190			180	180
Storage Blk Time (%)	1	13	1		7		8	45	1		0	12
Queuing Penalty (veh)	1	23	2		10		17	99	6		1	29

Intersection: 4: Twin Oaks Valley Rd & San Marcos Blvd

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	L	T	TR
Maximum Queue (ft)	357	286	344	152	205	263	275
Average Queue (ft)	190	131	152	23	114	232	249
95th Queue (ft)	311	228	267	94	223	276	265
Link Distance (ft)	406	406	406			232	232
Upstream Blk Time (%)		0	0			34	72
Queuing Penalty (veh)		0	0			0	0
Storage Bay Dist (ft)				180	180		
Storage Blk Time (%)	6			0	1	53	
Queuing Penalty (veh)	13			0	6	53	

Intersection: 5: Rancheros Dr & San Marcos Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	LT	R	LT	R
Maximum Queue (ft)	107	488	529	195	205	477	416	160	84	56	57	35
Average Queue (ft)	29	104	252	130	124	233	165	68	12	16	16	9
95th Queue (ft)	77	300	463	251	229	465	342	131	48	40	46	33
Link Distance (ft)		526	526			492	492	323	323		181	
Upstream Blk Time (%)		0	1			1	0					
Queuing Penalty (veh)		0	2			7	0					
Storage Bay Dist (ft)	165			170	180					70		75
Storage Blk Time (%)	0	2	17	0	2	20			0	0	0	
Queuing Penalty (veh)	0	1	53	0	10	26			0	0	0	

Network Summary

Network wide Queuing Penalty: 579

Intersection: 1: Woodward St & Project Dwy

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 2: Pico Ave & Mission Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LT	R	L	TR
Maximum Queue (ft)	224	397	334	161	228	238	133	235	60	76	134
Average Queue (ft)	36	258	199	84	63	75	48	75	47	19	61
95th Queue (ft)	117	391	316	156	176	181	100	171	66	56	112
Link Distance (ft)		394	394		1386	1386	256	256			162
Upstream Blk Time (%)		1						0			0
Queuing Penalty (veh)		0						0			0
Storage Bay Dist (ft)	200			150					30	75	
Storage Blk Time (%)	0	16		2	2			39	22	0	12
Queuing Penalty (veh)	0	5		6	2			47	22	0	2

Intersection: 3: San Marcos Blvd/Woodward St & Mission Rd

Movement	EB	EB	EB	EB	B15	B15	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	R	T	T	L	L	T	T	R	L
Maximum Queue (ft)	205	317	294	220	264	274	264	259	248	227	61	133
Average Queue (ft)	125	249	258	62	61	68	152	145	147	118	25	53
95th Queue (ft)	228	356	350	200	194	205	230	225	234	202	50	111
Link Distance (ft)		220	220		1386	1386			721	721	721	
Upstream Blk Time (%)	0	23	24	0								
Queuing Penalty (veh)	0	128	134	0								
Storage Bay Dist (ft)	180			215			310	310				250
Storage Blk Time (%)	2	29	24	0			0	0				
Queuing Penalty (veh)	9	32	15	1			0	0				

Intersection: 3: San Marcos Blvd/Woodward St & Mission Rd

Movement	NB	NB	NB	SB	SB	SB
Directions Served	T	T	R	L	T	TR
Maximum Queue (ft)	129	148	421	84	183	141
Average Queue (ft)	58	79	123	28	95	57
95th Queue (ft)	114	133	362	66	160	121
Link Distance (ft)		492	492		568	568
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	250			205		
Storage Blk Time (%)					0	
Queuing Penalty (veh)					0	

Intersection: 4: Twin Oaks Valley Rd & San Marcos Blvd

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	R	L	L	T	TR	L	L
Maximum Queue (ft)	142	155	368	352	337	93	202	214	375	347	192	205
Average Queue (ft)	130	152	328	321	105	10	142	159	158	166	141	187
95th Queue (ft)	176	175	385	398	275	59	221	229	298	275	212	230
Link Distance (ft)			323	323	323				526	526		
Upstream Blk Time (%)			46	32	1							
Queuing Penalty (veh)			0	0	0							
Storage Bay Dist (ft)	130	130				85	190	190			180	180
Storage Blk Time (%)	6	55	18		6	0	1	7	2		1	16
Queuing Penalty (veh)	21	181	61		9	0	3	16	7		2	51

Intersection: 4: Twin Oaks Valley Rd & San Marcos Blvd

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	L	T	TR
Maximum Queue (ft)	414	330	303	152	205	254	274
Average Queue (ft)	255	186	125	48	121	233	237
95th Queue (ft)	395	301	245	137	242	279	284
Link Distance (ft)	406	406	406			232	232
Upstream Blk Time (%)	1		0			22	32
Queuing Penalty (veh)	0		0			0	0
Storage Bay Dist (ft)				180	180		
Storage Blk Time (%)	16			0	7	31	
Queuing Penalty (veh)	42			0	21	28	

Intersection: 5: Rancheros Dr & San Marcos Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	LT	R	LT	R
Maximum Queue (ft)	105	540	546	195	198	238	236	247	185	91	70	48
Average Queue (ft)	22	293	415	152	92	94	94	135	63	37	26	14
95th Queue (ft)	76	551	619	262	171	191	189	214	154	80	61	41
Link Distance (ft)		526	526			492	492	323	323		181	
Upstream Blk Time (%)		1	6									
Queuing Penalty (veh)		5	30									
Storage Bay Dist (ft)	165			170	180					70		75
Storage Blk Time (%)		13	41	0	1	1			3	1	1	0
Queuing Penalty (veh)		3	103	1	3	1			3	2	0	0

Network Summary

Network wide Queuing Penalty: 995

APPENDIX F

NEAR-TERM (INTERIM YEAR 2026) + PROJECT INTERSECTION ANALYSIS WORKSHEETS

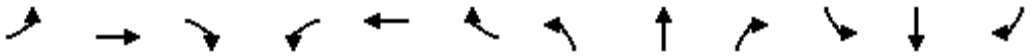
Intersection	
Int Delay, s/veh	0.5

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	22	1	160	6	0	390
Future Vol, veh/h	22	1	160	6	0	390
Conflicting Peds, #/hr	0	0	0	10	10	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	1	174	7	0	424

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	400	101	0	0	191	0
Stage 1	188	-	-	-	-	-
Stage 2	212	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	578	935	-	-	1380	-
Stage 1	825	-	-	-	-	-
Stage 2	803	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	572	926	-	-	1367	-
Mov Cap-2 Maneuver	572	-	-	-	-	-
Stage 1	817	-	-	-	-	-
Stage 2	803	-	-	-	-	-

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

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	582	1367	-
HCM Lane V/C Ratio	-	-	0.043	-	-
HCM Control Delay (s)	-	-	11.5	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	451	80	200	643	10	70	30	110	60	70	10
Future Volume (veh/h)	20	451	80	200	643	10	70	30	110	60	70	10
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.95	1.00		0.96
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	531	94	263	846	13	54	62	118	97	113	16
Peak Hour Factor	0.85	0.85	0.85	0.76	0.76	0.76	0.93	0.93	0.93	0.62	0.62	0.62
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	52	1330	234	255	1978	30	227	238	191	143	127	18
Arrive On Green	0.03	0.44	0.44	0.14	0.55	0.55	0.13	0.13	0.13	0.08	0.08	0.08
Sat Flow, veh/h	1781	2998	528	1781	3580	55	1781	1870	1503	1781	1594	226
Grp Volume(v), veh/h	24	314	311	263	420	439	54	62	118	97	0	129
Grp Sat Flow(s),veh/h/ln	1781	1777	1750	1781	1777	1858	1781	1870	1503	1781	0	1819
Q Serve(g_s), s	1.3	11.9	12.0	14.3	13.8	13.9	2.7	3.0	7.4	5.3	0.0	7.0
Cycle Q Clear(g_c), s	1.3	11.9	12.0	14.3	13.8	13.9	2.7	3.0	7.4	5.3	0.0	7.0
Prop In Lane	1.00		0.30	1.00		0.03	1.00		1.00	1.00		0.12
Lane Grp Cap(c), veh/h	52	788	776	255	982	1026	227	238	191	143	0	146
V/C Ratio(X)	0.46	0.40	0.40	1.03	0.43	0.43	0.24	0.26	0.62	0.68	0.00	0.89
Avail Cap(c_a), veh/h	107	788	776	255	982	1026	517	542	436	143	0	146
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.8	18.8	18.8	42.8	13.1	13.1	39.3	39.4	41.3	44.8	0.0	45.5
Incr Delay (d2), s/veh	6.2	1.5	1.5	65.1	1.4	1.3	0.5	0.6	3.2	12.4	0.0	43.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	4.9	4.8	10.6	5.3	5.5	1.2	1.4	2.9	2.8	0.0	4.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.0	20.3	20.4	107.9	14.5	14.4	39.8	40.0	44.5	57.1	0.0	88.6
LnGrp LOS	D	C	C	F	B	B	D	D	D	E	A	F
Approach Vol, veh/h		649			1122			234			226	
Approach Delay, s/veh		21.6			36.4			42.2			75.1	
Approach LOS		C			D			D			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	18.9	50.7		12.6	8.0	61.5		17.8				
Change Period (Y+Rc), s	4.6	6.3		4.6	5.1	6.3		5.1				
Max Green Setting (Gmax), s	14.3	28.1		8.0	6.0	35.9		29.0				
Max Q Clear Time (g_c+I1), s	16.3	14.0		9.0	3.3	15.9		9.4				
Green Ext Time (p_c), s	0.0	3.0		0.0	0.0	4.8		0.8				

Intersection Summary		
HCM 6th Ctrl Delay		36.6
HCM 6th LOS		D

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	530	40	630	770	81	20	64	530	52	327	73
Future Volume (veh/h)	31	530	40	630	770	81	20	64	530	52	327	73
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		0.98	1.00		0.99	1.00		0.97
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	38	646	49	759	928	98	22	70	582	59	372	83
Peak Hour Factor	0.82	0.82	0.82	0.83	0.83	0.83	0.91	0.91	0.91	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	76	962	416	822	1655	721	72	924	407	88	754	166
Arrive On Green	0.04	0.27	0.27	0.24	0.47	0.47	0.04	0.26	0.26	0.05	0.26	0.26
Sat Flow, veh/h	1781	3554	1536	3456	3554	1549	1781	3554	1567	1781	2876	633
Grp Volume(v), veh/h	38	646	49	759	928	98	22	70	582	59	228	227
Grp Sat Flow(s),veh/h/ln	1781	1777	1536	1728	1777	1549	1781	1777	1567	1781	1777	1732
Q Serve(g_s), s	3.1	24.0	3.6	31.8	28.0	5.3	1.8	2.2	38.5	4.8	16.1	16.5
Cycle Q Clear(g_c), s	3.1	24.0	3.6	31.8	28.0	5.3	1.8	2.2	38.5	4.8	16.1	16.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.37
Lane Grp Cap(c), veh/h	76	962	416	822	1655	721	72	924	407	88	466	454
V/C Ratio(X)	0.50	0.67	0.12	0.92	0.56	0.14	0.31	0.08	1.43	0.67	0.49	0.50
Avail Cap(c_a), veh/h	96	962	416	910	1655	721	120	924	407	96	466	454
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	69.3	48.1	40.7	55.1	28.6	22.6	69.1	41.4	54.8	69.2	46.2	46.4
Incr Delay (d2), s/veh	5.0	3.7	0.6	13.9	1.4	0.4	2.4	0.0	206.8	15.1	0.8	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	10.9	1.4	15.1	11.9	2.0	0.9	1.0	38.3	2.5	7.2	7.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.3	51.9	41.3	69.0	30.0	23.0	71.5	41.4	261.7	84.3	47.0	47.2
LnGrp LOS	E	D	D	E	C	C	E	D	F	F	D	D
Approach Vol, veh/h		733			1785			674			514	
Approach Delay, s/veh		52.3			46.2			232.6			51.4	
Approach LOS		D			D			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.2	47.1	13.0	45.8	13.3	76.0	13.3	45.5
Change Period (Y+Rc), s	7.0	7.0	7.0	* 7	7.0	* 7	6.0	7.0
Max Green Setting (Gmax), s	39.0	37.5	10.0	* 36	8.0	* 69	8.0	38.5
Max Q Clear Time (g_c+I1), s	30.0	26.0	3.8	18.5	5.1	30.0	6.8	40.5
Green Ext Time (p_c), s	1.5	3.2	0.0	2.3	0.0	7.5	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	82.0
HCM 6th LOS	F

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)	150	361	300	463	443	30	200	470	493	100	780	270
Future Volume (veh/h)	150	361	300	463	443	30	200	470	493	100	780	270
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	1.00		0.98	1.00		0.98
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	179	430	357	509	487	33	215	505	530	102	796	276
Peak Hour Factor	0.84	0.84	0.84	0.91	0.91	0.91	0.93	0.93	0.93	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	229	1066	992	444	1221	83	222	1534	872	194	1080	374
Arrive On Green	0.07	0.30	0.30	0.13	0.36	0.36	0.06	0.43	0.43	0.06	0.42	0.42
Sat Flow, veh/h	3456	3554	2709	3456	3371	228	3456	3554	1547	3456	2570	891
Grp Volume(v), veh/h	179	430	357	509	256	264	215	505	530	102	550	522
Grp Sat Flow(s),veh/h/ln	1728	1777	1354	1728	1777	1822	1728	1777	1547	1728	1777	1684
Q Serve(g_s), s	7.1	13.5	13.5	18.0	15.0	15.1	8.7	13.2	32.1	4.0	36.4	36.5
Cycle Q Clear(g_c), s	7.1	13.5	13.5	18.0	15.0	15.1	8.7	13.2	32.1	4.0	36.4	36.5
Prop In Lane	1.00		1.00	1.00		0.12	1.00		1.00	1.00		0.53
Lane Grp Cap(c), veh/h	229	1066	992	444	644	660	222	1534	872	194	746	707
V/C Ratio(X)	0.78	0.40	0.36	1.15	0.40	0.40	0.97	0.33	0.61	0.53	0.74	0.74
Avail Cap(c_a), veh/h	296	1066	992	444	644	660	222	1534	872	210	746	707
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	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	64.4	39.0	32.6	61.0	33.3	33.3	65.4	26.3	20.6	64.3	34.1	34.1
Incr Delay (d2), s/veh	9.7	1.1	1.0	84.9	1.5	1.4	51.1	0.6	3.1	2.2	6.4	6.8
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	3.4	6.0	4.5	13.0	6.7	6.9	5.3	5.6	11.7	1.8	16.5	15.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.1	40.2	33.6	145.9	34.7	34.7	116.4	26.9	23.7	66.5	40.5	40.9
LnGrp LOS	E	D	C	F	C	C	F	C	C	E	D	D
Approach Vol, veh/h		966			1029			1250			1174	
Approach Delay, s/veh		44.0			89.7			41.0			42.9	
Approach LOS		D			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.0	49.4	16.0	67.1	16.3	58.1	14.3	68.8
Change Period (Y+Rc), s	7.0	7.4	7.0	* 7.8	7.0	7.4	6.5	7.8
Max Green Setting (Gmax), s	18.0	42.0	9.0	* 42	12.0	48.0	8.5	42.8
Max Q Clear Time (g_c+I1), s	20.0	15.5	10.7	38.5	9.1	17.1	6.0	34.1
Green Ext Time (p_c), s	0.0	4.4	0.0	2.2	0.1	3.1	0.1	3.4

Intersection Summary	
HCM 6th Ctrl Delay	53.5
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* 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)	30	614	310	131	826	10	130	10	50	10	10	10
Future Volume (veh/h)	30	614	310	131	826	10	130	10	50	10	10	10
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	1.00		0.95	1.00		0.97
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	33	682	344	152	960	12	188	0	68	17	17	17
Peak Hour Factor	0.90	0.90	0.90	0.86	0.86	0.86	0.73	0.73	0.73	0.58	0.58	0.58
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	91	1191	517	186	1396	17	549	0	233	76	76	128
Arrive On Green	0.05	0.34	0.34	0.10	0.39	0.39	0.15	0.00	0.15	0.08	0.08	0.08
Sat Flow, veh/h	1781	3554	1542	1781	3593	45	3563	0	1514	912	912	1545
Grp Volume(v), veh/h	33	682	344	152	475	497	188	0	68	34	0	17
Grp Sat Flow(s),veh/h/ln	1781	1777	1542	1781	1777	1861	1781	0	1514	1825	0	1545
Q Serve(g_s), s	1.5	13.2	16.0	7.0	18.6	18.6	3.9	0.0	3.3	1.5	0.0	0.9
Cycle Q Clear(g_c), s	1.5	13.2	16.0	7.0	18.6	18.6	3.9	0.0	3.3	1.5	0.0	0.9
Prop In Lane	1.00		1.00	1.00		0.02	1.00		1.00	0.50		1.00
Lane Grp Cap(c), veh/h	91	1191	517	186	690	723	549	0	233	152	0	128
V/C Ratio(X)	0.36	0.57	0.67	0.82	0.69	0.69	0.34	0.00	0.29	0.22	0.00	0.13
Avail Cap(c_a), veh/h	171	1191	517	192	690	723	1535	0	652	218	0	185
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	38.3	22.9	23.8	36.6	21.3	21.3	31.6	0.0	31.3	35.8	0.0	35.5
Incr Delay (d2), s/veh	2.4	2.0	6.6	22.7	5.5	5.3	0.4	0.0	0.7	0.7	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	0.7	5.4	6.3	4.1	8.1	8.4	1.7	0.0	1.2	0.7	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.7	24.9	30.4	59.3	26.9	26.6	31.9	0.0	32.0	36.5	0.0	36.0
LnGrp LOS	D	C	C	E	C	C	C	A	C	D	A	D
Approach Vol, veh/h		1059			1124			256			51	
Approach Delay, s/veh		27.2			31.1			31.9			36.3	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	15.2	34.5		13.9	10.8	39.0		19.9
Change Period (Y+Rc), s	6.5	6.5		7.0	6.5	6.5		7.0
Max Green Setting (Gmax), s	9.0	28.0		10.0	8.0	29.0		36.0
Max Q Clear Time (g_c+I1), s	9.0	18.0		3.5	3.5	20.6		5.9
Green Ext Time (p_c), s	0.0	4.0		0.1	0.0	3.7		0.9

Intersection Summary	
HCM 6th Ctrl Delay	29.6
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

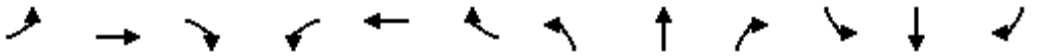
Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	1	370	25	1	230
Future Vol, veh/h	10	1	370	25	1	230
Conflicting Peds, #/hr	0	0	0	10	10	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	1	402	27	1	250

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	553	225	0	0	439	0
Stage 1	426	-	-	-	-	-
Stage 2	127	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	463	778	-	-	1117	-
Stage 1	627	-	-	-	-	-
Stage 2	885	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	458	771	-	-	1106	-
Mov Cap-2 Maneuver	458	-	-	-	-	-
Stage 1	621	-	-	-	-	-
Stage 2	884	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	12.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	476	1106	-
HCM Lane V/C Ratio	-	-	0.025	0.001	-
HCM Control Delay (s)	-	-	12.8	8.3	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	973	110	110	481	10	80	60	120	20	60	20
Future Volume (veh/h)	30	973	110	110	481	10	80	60	120	20	60	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.95	1.00		0.96
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	32	1035	117	117	512	11	83	88	143	28	83	28
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.84	0.84	0.84	0.72	0.72	0.72
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	61	1654	187	144	1984	43	249	261	210	136	101	34
Arrive On Green	0.03	0.52	0.52	0.08	0.56	0.56	0.14	0.14	0.14	0.08	0.08	0.08
Sat Flow, veh/h	1781	3204	362	1781	3554	76	1781	1870	1508	1781	1322	446
Grp Volume(v), veh/h	32	574	578	117	256	267	83	88	143	28	0	111
Grp Sat Flow(s),veh/h/ln	1781	1777	1789	1781	1777	1853	1781	1870	1508	1781	0	1769
Q Serve(g_s), s	1.9	25.4	25.4	7.1	8.2	8.2	4.6	4.7	9.9	1.6	0.0	6.8
Cycle Q Clear(g_c), s	1.9	25.4	25.4	7.1	8.2	8.2	4.6	4.7	9.9	1.6	0.0	6.8
Prop In Lane	1.00		0.20	1.00		0.04	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	61	917	924	144	992	1035	249	261	210	136	0	135
V/C Ratio(X)	0.53	0.63	0.63	0.82	0.26	0.26	0.33	0.34	0.68	0.21	0.00	0.82
Avail Cap(c_a), veh/h	102	917	924	152	992	1035	471	495	399	136	0	135
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.3	19.0	19.0	49.8	12.5	12.5	42.7	42.7	45.0	47.7	0.0	50.1
Incr Delay (d2), s/veh	6.9	3.2	3.2	26.7	0.6	0.6	0.8	0.8	3.8	0.7	0.0	31.8
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	10.3	10.4	4.1	3.1	3.3	2.1	2.2	4.0	0.8	0.0	4.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.2	22.2	22.2	76.5	13.2	13.1	43.5	43.5	48.8	48.4	0.0	81.8
LnGrp LOS	E	C	C	E	B	B	D	D	D	D	A	F
Approach Vol, veh/h		1184			640			314			139	
Approach Delay, s/veh		23.2			24.7			45.9			75.1	
Approach LOS		C			C			D			E	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.5	63.1		13.0	8.8	67.7		20.4				
Change Period (Y+Rc), s	4.6	6.3		4.6	5.1	6.3		5.1				
Max Green Setting (Gmax), s	9.4	42.5		8.4	6.3	45.1		29.1				
Max Q Clear Time (g_c+I1), s	9.1	27.4		8.8	3.9	10.2		11.9				
Green Ext Time (p_c), s	0.0	6.2		0.0	0.0	3.0		1.1				

Intersection Summary		
HCM 6th Ctrl Delay		29.9
HCM 6th LOS		C

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	113	860	60	330	490	73	60	249	580	31	188	51
Future Volume (veh/h)	113	860	60	330	490	73	60	249	580	31	188	51
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	1.00		0.99	1.00		0.97
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	128	977	68	347	516	77	65	271	630	41	247	67
Peak Hour Factor	0.88	0.88	0.88	0.95	0.95	0.95	0.92	0.92	0.92	0.76	0.76	0.76
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	151	1158	502	393	1261	547	112	1182	523	79	847	224
Arrive On Green	0.08	0.33	0.33	0.11	0.35	0.35	0.06	0.33	0.33	0.04	0.31	0.31
Sat Flow, veh/h	1781	3554	1541	3456	3554	1543	1781	3554	1571	1781	2760	730
Grp Volume(v), veh/h	128	977	68	347	516	77	65	271	630	41	157	157
Grp Sat Flow(s),veh/h/ln	1781	1777	1541	1728	1777	1543	1781	1777	1571	1781	1777	1713
Q Serve(g_s), s	10.4	37.6	4.6	14.6	16.1	5.0	5.2	8.1	49.0	3.3	9.9	10.3
Cycle Q Clear(g_c), s	10.4	37.6	4.6	14.6	16.1	5.0	5.2	8.1	49.0	3.3	9.9	10.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.43
Lane Grp Cap(c), veh/h	151	1158	502	393	1261	547	112	1182	523	79	545	526
V/C Ratio(X)	0.85	0.84	0.14	0.88	0.41	0.14	0.58	0.23	1.21	0.52	0.29	0.30
Avail Cap(c_a), veh/h	230	1158	502	422	1261	547	145	1182	523	97	545	526
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	66.4	46.1	35.0	64.3	35.9	32.3	67.1	35.5	49.1	68.9	38.8	38.9
Incr Delay (d2), s/veh	16.2	7.6	0.6	18.4	1.0	0.5	4.6	0.1	109.5	5.3	0.3	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	5.3	17.4	1.8	7.3	7.1	1.9	2.5	3.5	34.7	1.6	4.3	4.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	82.6	53.7	35.6	82.6	36.8	32.8	71.7	35.6	158.6	74.1	39.1	39.3
LnGrp LOS	F	D	D	F	D	C	E	D	F	E	D	D
Approach Vol, veh/h		1173			940			966			355	
Approach Delay, s/veh		55.8			53.4			118.3			43.2	
Approach LOS		E			D			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.8	55.0	16.3	52.2	19.5	59.2	12.5	56.0
Change Period (Y+Rc), s	7.0	7.0	7.0	* 7	7.0	* 7	6.0	7.0
Max Green Setting (Gmax), s	18.0	48.0	12.0	* 45	19.0	* 48	8.0	49.0
Max Q Clear Time (g_c+I1), s	16.6	39.6	7.2	12.3	12.4	18.1	5.3	51.0
Green Ext Time (p_c), s	0.2	4.0	0.0	1.8	0.1	3.6	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	71.4
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)	340	664	340	316	452	80	270	640	324	90	610	250
Future Volume (veh/h)	340	664	340	316	452	80	270	640	324	90	610	250
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	1.00		0.98	1.00		0.98
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	347	678	347	351	502	89	287	681	345	100	678	278
Peak Hour Factor	0.98	0.98	0.98	0.90	0.90	0.90	0.94	0.94	0.94	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	395	1066	1052	370	880	155	296	1611	872	193	1024	420
Arrive On Green	0.11	0.30	0.30	0.11	0.29	0.29	0.09	0.45	0.45	0.06	0.42	0.42
Sat Flow, veh/h	3456	3554	2709	3456	3003	530	3456	3554	1548	3456	2438	1000
Grp Volume(v), veh/h	347	678	347	351	296	295	287	681	345	100	494	462
Grp Sat Flow(s),veh/h/ln	1728	1777	1354	1728	1777	1756	1728	1777	1548	1728	1777	1661
Q Serve(g_s), s	13.8	23.1	12.6	14.1	19.8	20.0	11.6	18.1	17.6	3.9	31.3	31.3
Cycle Q Clear(g_c), s	13.8	23.1	12.6	14.1	19.8	20.0	11.6	18.1	17.6	3.9	31.3	31.3
Prop In Lane	1.00		1.00	1.00		0.30	1.00		1.00	1.00		0.60
Lane Grp Cap(c), veh/h	395	1066	1052	370	520	514	296	1611	872	193	746	698
V/C Ratio(X)	0.88	0.64	0.33	0.95	0.57	0.57	0.97	0.42	0.40	0.52	0.66	0.66
Avail Cap(c_a), veh/h	420	1066	1052	370	520	514	296	1611	872	207	746	698
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	0.91	0.91	0.91	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	61.0	42.4	30.3	62.1	42.0	42.1	63.8	25.9	17.4	64.2	32.6	32.6
Incr Delay (d2), s/veh	18.1	2.9	0.8	31.5	4.1	4.2	43.7	0.8	1.3	2.1	4.6	4.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.0	10.4	4.2	7.8	9.2	9.2	6.8	7.6	6.3	1.8	13.9	13.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	79.1	45.3	31.1	93.7	46.1	46.3	107.5	26.7	18.7	66.4	37.2	37.5
LnGrp LOS	E	D	C	F	D	D	F	C	B	E	D	D
Approach Vol, veh/h		1372			942			1313			1056	
Approach Delay, s/veh		50.3			63.9			42.3			40.1	
Approach LOS		D			E			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	22.0	49.4	19.0	67.1	23.0	48.4	14.3	71.8
Change Period (Y+Rc), s	7.0	7.4	7.0	* 7.8	7.0	7.4	6.5	7.8
Max Green Setting (Gmax), s	15.0	42.0	12.0	* 42	17.0	40.0	8.4	45.9
Max Q Clear Time (g_c+I1), s	16.1	25.1	13.6	33.3	15.8	22.0	5.9	20.1
Green Ext Time (p_c), s	0.0	5.4	0.0	3.8	0.2	3.2	0.1	5.9

Intersection Summary	
HCM 6th Ctrl Delay	48.5
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

* 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)	20	818	250	120	428	10	380	10	101	20	10	20
Future Volume (veh/h)	20	818	250	120	428	10	380	10	101	20	10	20
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	1.00		0.96	1.00		0.97
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	20	835	255	145	516	12	456	0	119	27	13	27
Peak Hour Factor	0.98	0.98	0.98	0.83	0.83	0.83	0.85	0.85	0.85	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	62	1117	484	177	1343	31	686	0	293	111	53	140
Arrive On Green	0.04	0.31	0.31	0.10	0.38	0.38	0.19	0.00	0.19	0.09	0.09	0.09
Sat Flow, veh/h	1781	3554	1540	1781	3547	82	3563	0	1524	1221	588	1543
Grp Volume(v), veh/h	20	835	255	145	258	270	456	0	119	40	0	27
Grp Sat Flow(s),veh/h/ln	1781	1777	1540	1781	1777	1853	1781	0	1524	1809	0	1543
Q Serve(g_s), s	1.0	18.8	12.1	7.1	9.4	9.4	10.6	0.0	6.1	1.8	0.0	1.4
Cycle Q Clear(g_c), s	1.0	18.8	12.1	7.1	9.4	9.4	10.6	0.0	6.1	1.8	0.0	1.4
Prop In Lane	1.00		1.00	1.00		0.04	1.00		1.00	0.67		1.00
Lane Grp Cap(c), veh/h	62	1117	484	177	673	702	686	0	293	164	0	140
V/C Ratio(X)	0.32	0.75	0.53	0.82	0.38	0.38	0.67	0.00	0.41	0.24	0.00	0.19
Avail Cap(c_a), veh/h	160	1117	484	180	673	702	1439	0	616	203	0	173
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.0	27.4	25.1	39.3	20.1	20.1	33.3	0.0	31.5	37.7	0.0	37.5
Incr Delay (d2), s/veh	2.9	4.6	4.1	24.5	1.7	1.6	1.1	0.0	0.9	0.8	0.0	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	0.5	8.2	4.7	4.2	3.9	4.1	4.5	0.0	2.2	0.8	0.0	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.9	32.0	29.2	63.9	21.8	21.7	34.4	0.0	32.4	38.4	0.0	38.1
LnGrp LOS	D	C	C	E	C	C	C	A	C	D	A	D
Approach Vol, veh/h		1110			673			575			67	
Approach Delay, s/veh		31.6			30.8			34.0			38.3	
Approach LOS		C			C			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	15.4	34.5		15.1	9.6	40.2		24.1
Change Period (Y+Rc), s	6.5	6.5		7.0	6.5	6.5		7.0
Max Green Setting (Gmax), s	9.0	28.0		10.0	8.0	29.0		36.0
Max Q Clear Time (g_c+I1), s	11.1	20.8		3.8	3.0	11.4		12.6
Green Ext Time (p_c), s	0.0	3.6		0.1	0.0	2.7		2.0

Intersection Summary	
HCM 6th Ctrl Delay	32.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

APPENDIX G

NEAR-TERM (INTERIM YEAR 2026) + PROJECT QUEUING ANALYSIS WORKSHEETS

Intersection: 1: Woodward St & Project Dwy

Movement	WB
Directions Served	LR
Maximum Queue (ft)	40
Average Queue (ft)	18
95th Queue (ft)	43
Link Distance (ft)	255
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Pico Ave & Mission Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LT	R	L	TR
Maximum Queue (ft)	66	233	196	175	321	322	91	112	62	99	153
Average Queue (ft)	19	118	76	133	134	115	38	29	45	51	63
95th Queue (ft)	50	197	156	204	306	261	77	82	59	96	127
Link Distance (ft)		394	394		1386	1386	256	256			162
Upstream Blk Time (%)											1
Queuing Penalty (veh)											0
Storage Bay Dist (ft)	200			150					30	75	
Storage Blk Time (%)		1		13	3			19	15	8	10
Queuing Penalty (veh)		0		40	6			20	10	6	6

Intersection: 3: San Marcos Blvd/Woodward St & Mission Rd

Movement	EB	EB	EB	EB	B15	B15	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	R	T	T	L	L	T	T	R	L
Maximum Queue (ft)	138	265	282	219	12	19	322	334	650	517	64	74
Average Queue (ft)	35	161	174	30	0	1	249	235	240	185	23	18
95th Queue (ft)	116	249	261	104	8	10	344	354	510	353	50	52
Link Distance (ft)		220	220		1386	1386			721	721	721	
Upstream Blk Time (%)		3	3	0					1			
Queuing Penalty (veh)		8	10	0					0			
Storage Bay Dist (ft)	180			215			310	310				250
Storage Blk Time (%)		9	4	0			4	5	0			
Queuing Penalty (veh)		3	1	0			16	19	0			

Intersection: 3: San Marcos Blvd/Woodward St & Mission Rd

Movement	NB	NB	NB	SB	SB	SB
Directions Served	T	T	R	L	T	TR
Maximum Queue (ft)	56	80	295	180	280	233
Average Queue (ft)	10	31	37	57	166	106
95th Queue (ft)	38	69	185	124	251	192
Link Distance (ft)		492	492		568	568
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	250			205		
Storage Blk Time (%)					4	
Queuing Penalty (veh)					2	

Intersection: 4: Twin Oaks Valley Rd & San Marcos Blvd

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	R	L	L	T	TR	L	L
Maximum Queue (ft)	141	153	254	309	210	88	202	215	522	442	188	205
Average Queue (ft)	53	112	102	173	83	7	189	202	317	192	116	163
95th Queue (ft)	154	166	225	267	160	52	233	246	596	400	215	217
Link Distance (ft)			323	323	323				526	526		
Upstream Blk Time (%)				0					6	0		
Queuing Penalty (veh)				0					28	0		
Storage Bay Dist (ft)	130	130				85	190	190			180	180
Storage Blk Time (%)	0	10	1		7	0	8	39	1		0	8
Queuing Penalty (veh)	1	19	2		10	0	18	85	6		1	20

Intersection: 4: Twin Oaks Valley Rd & San Marcos Blvd

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	L	T	TR
Maximum Queue (ft)	330	228	298	148	205	257	277
Average Queue (ft)	172	125	164	29	126	233	250
95th Queue (ft)	269	217	278	104	228	276	263
Link Distance (ft)	406	406	406			232	232
Upstream Blk Time (%)						31	76
Queuing Penalty (veh)						0	0
Storage Bay Dist (ft)				180	180		
Storage Blk Time (%)	6			0	3	51	
Queuing Penalty (veh)	12			0	10	51	

Intersection: 5: Rancheros Dr & San Marcos Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	LT	R	LT	R
Maximum Queue (ft)	109	400	480	195	204	429	359	149	83	46	57	32
Average Queue (ft)	25	100	239	124	113	200	148	66	10	16	16	9
95th Queue (ft)	66	275	433	246	230	402	307	124	48	41	45	32
Link Distance (ft)		526	526			492	492	323	323		181	
Upstream Blk Time (%)		0	0			0	0					
Queuing Penalty (veh)		0	1			1	0					
Storage Bay Dist (ft)	165			170	180					70		75
Storage Blk Time (%)	0	1	16	0	1	11			0	0	0	
Queuing Penalty (veh)	0	0	50	0	5	15			0	0	0	

Network Summary

Network wide Queuing Penalty: 485

Intersection: 1: Woodward St & Project Dwy

Movement	WB	SB
Directions Served	LR	L
Maximum Queue (ft)	35	10
Average Queue (ft)	11	0
95th Queue (ft)	35	5
Link Distance (ft)	255	
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		50
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 2: Pico Ave & Mission Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LT	R	L	TR
Maximum Queue (ft)	136	400	335	174	250	249	108	189	57	85	158
Average Queue (ft)	34	225	177	75	66	77	49	62	48	21	64
95th Queue (ft)	117	346	291	146	183	190	93	139	62	61	128
Link Distance (ft)		394	394		1386	1386	256	256			162
Upstream Blk Time (%)		0	0					0			1
Queuing Penalty (veh)		0	0					0			0
Storage Bay Dist (ft)	200			150					30	75	
Storage Blk Time (%)		11		1	2			33	22	0	14
Queuing Penalty (veh)		3		3	2			40	22	0	3

Intersection: 3: San Marcos Blvd/Woodward St & Mission Rd

Movement	EB	EB	EB	EB	B15	B15	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	R	T	T	L	L	T	T	R	L
Maximum Queue (ft)	205	304	312	220	190	184	259	260	260	231	63	109
Average Queue (ft)	133	253	257	67	47	48	149	146	153	128	25	54
95th Queue (ft)	238	347	344	208	145	147	238	236	236	213	50	104
Link Distance (ft)		220	220		1386	1386			721	721	721	
Upstream Blk Time (%)	0	22	23	0								
Queuing Penalty (veh)	0	121	129	0								
Storage Bay Dist (ft)	180			215			310	310				250
Storage Blk Time (%)	2	26	24	0			0	0	0			
Queuing Penalty (veh)	7	30	14	1			1	0	0			

Intersection: 3: San Marcos Blvd/Woodward St & Mission Rd

Movement	NB	NB	NB	SB	SB	SB
Directions Served	T	T	R	L	T	TR
Maximum Queue (ft)	142	176	360	93	200	140
Average Queue (ft)	58	85	108	31	100	63
95th Queue (ft)	121	144	330	75	165	126
Link Distance (ft)		492	492		568	568
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	250			205		
Storage Blk Time (%)					0	
Queuing Penalty (veh)					0	

Intersection: 4: Twin Oaks Valley Rd & San Marcos Blvd

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	R	L	L	T	TR	L	L
Maximum Queue (ft)	142	155	350	350	309	71	201	214	295	286	192	205
Average Queue (ft)	133	153	320	305	104	2	134	154	148	167	150	191
95th Queue (ft)	164	161	390	398	257	28	217	230	250	256	225	232
Link Distance (ft)			323	323	323				526	526		
Upstream Blk Time (%)			37	23	1							
Queuing Penalty (veh)			0	0	0							
Storage Bay Dist (ft)	130	130				85	190	190			180	180
Storage Blk Time (%)	5	52	16		4	0	1	4	3		2	20
Queuing Penalty (veh)	17	173	55		7	0	2	9	8		7	64

Intersection: 4: Twin Oaks Valley Rd & San Marcos Blvd

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	L	T	TR
Maximum Queue (ft)	425	335	284	154	205	258	280
Average Queue (ft)	270	201	126	44	120	229	242
95th Queue (ft)	407	306	240	131	236	282	289
Link Distance (ft)	406	406	406			232	232
Upstream Blk Time (%)	1					19	44
Queuing Penalty (veh)	0					0	0
Storage Bay Dist (ft)				180	180		
Storage Blk Time (%)	14			0	6	33	
Queuing Penalty (veh)	38			0	20	30	

Intersection: 5: Rancheros Dr & San Marcos Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	LT	R	LT	R
Maximum Queue (ft)	133	522	544	195	192	243	200	239	174	93	64	48
Average Queue (ft)	22	290	411	165	99	96	86	143	67	39	26	16
95th Queue (ft)	78	549	617	259	172	196	173	219	161	85	59	46
Link Distance (ft)		526	526			492	492	323	323		181	
Upstream Blk Time (%)		1	6									
Queuing Penalty (veh)		6	30									
Storage Bay Dist (ft)	165			170	180					70		75
Storage Blk Time (%)	0	14	40	0	2	1			4	1	1	0
Queuing Penalty (veh)	0	3	101	1	4	1			4	2	0	0

Network Summary

Network wide Queuing Penalty: 959

APPENDIX H

LONG-TERM (HORIZON YEAR 2050) INTERSECTION ANALYSIS WORKSHEETS

Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	170	0	0	410
Future Vol, veh/h	0	0	170	0	0	410
Conflicting Peds, #/hr	0	0	0	10	10	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	185	0	0	446

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	418	103	0	0	195	0
Stage 1	195	-	-	-	-	-
Stage 2	223	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	563	932	-	-	1375	-
Stage 1	819	-	-	-	-	-
Stage 2	793	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	557	923	-	-	1362	-
Mov Cap-2 Maneuver	557	-	-	-	-	-
Stage 1	811	-	-	-	-	-
Stage 2	793	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1362	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	520	90	220	740	20	80	40	120	70	80	20
Future Volume (veh/h)	30	520	90	220	740	20	80	40	120	70	80	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.95	1.00		0.96
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	35	612	106	289	974	26	64	73	124	113	129	32
Peak Hour Factor	0.85	0.85	0.85	0.76	0.76	0.76	0.93	0.93	0.93	0.62	0.62	0.62
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	66	1349	233	239	1908	51	234	246	198	143	115	28
Arrive On Green	0.04	0.45	0.45	0.13	0.54	0.54	0.13	0.13	0.13	0.08	0.08	0.08
Sat Flow, veh/h	1781	3009	520	1781	3532	94	1781	1870	1505	1781	1434	356
Grp Volume(v), veh/h	35	361	357	289	490	510	64	73	124	113	0	161
Grp Sat Flow(s),veh/h/ln	1781	1777	1752	1781	1777	1849	1781	1870	1505	1781	0	1790
Q Serve(g_s), s	1.9	14.1	14.1	13.4	17.5	17.5	3.2	3.5	7.8	6.2	0.0	8.0
Cycle Q Clear(g_c), s	1.9	14.1	14.1	13.4	17.5	17.5	3.2	3.5	7.8	6.2	0.0	8.0
Prop In Lane	1.00		0.30	1.00		0.05	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	66	797	786	239	960	999	234	246	198	143	0	143
V/C Ratio(X)	0.53	0.45	0.45	1.21	0.51	0.51	0.27	0.30	0.63	0.79	0.00	1.12
Avail Cap(c_a), veh/h	109	797	786	239	960	999	517	542	436	143	0	143
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.3	19.1	19.1	43.3	14.6	14.6	39.1	39.2	41.1	45.2	0.0	46.0
Incr Delay (d2), s/veh	6.3	1.9	1.9	127.2	1.9	1.9	0.6	0.7	3.2	25.6	0.0	112.5
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	0.9	5.7	5.7	14.1	6.8	7.0	1.5	1.7	3.1	3.8	0.0	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.6	20.9	21.0	170.5	16.5	16.5	39.7	39.9	44.3	70.8	0.0	158.5
LnGrp LOS	D	C	C	F	B	B	D	D	D	E	A	F
Approach Vol, veh/h		753			1289			261			274	
Approach Delay, s/veh		22.5			51.0			42.0			122.3	
Approach LOS		C			D			D			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	18.0	51.1		12.6	8.8	60.3		18.3				
Change Period (Y+Rc), s	4.6	6.3		4.6	5.1	6.3		5.1				
Max Green Setting (Gmax), s	13.4	29.0		8.0	6.1	35.8		29.0				
Max Q Clear Time (g_c+I1), s	15.4	16.1		10.0	3.9	19.5		9.8				
Green Ext Time (p_c), s	0.0	3.3		0.0	0.0	5.4		1.0				

Intersection Summary			
HCM 6th Ctrl Delay		49.3	
HCM 6th LOS		D	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	610	50	720	880	90	30	70	610	60	330	80
Future Volume (veh/h)	40	610	50	720	880	90	30	70	610	60	330	80
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		0.98	1.00		0.99	1.00		0.97
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	49	744	61	867	1060	108	33	77	670	68	375	91
Peak Hour Factor	0.82	0.82	0.82	0.83	0.83	0.83	0.91	0.91	0.91	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	83	854	368	919	1633	712	89	925	408	90	717	172
Arrive On Green	0.05	0.24	0.24	0.27	0.46	0.46	0.05	0.26	0.26	0.05	0.25	0.25
Sat Flow, veh/h	1781	3554	1532	3456	3554	1548	1781	3554	1567	1781	2823	676
Grp Volume(v), veh/h	49	744	61	867	1060	108	33	77	670	68	234	232
Grp Sat Flow(s),veh/h/ln	1781	1777	1532	1728	1777	1548	1781	1777	1567	1781	1777	1722
Q Serve(g_s), s	4.0	29.8	4.7	36.4	34.0	6.0	2.7	2.4	38.5	5.6	16.7	17.2
Cycle Q Clear(g_c), s	4.0	29.8	4.7	36.4	34.0	6.0	2.7	2.4	38.5	5.6	16.7	17.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.39
Lane Grp Cap(c), veh/h	83	854	368	919	1633	712	89	925	408	90	451	438
V/C Ratio(X)	0.59	0.87	0.17	0.94	0.65	0.15	0.37	0.08	1.64	0.75	0.52	0.53
Avail Cap(c_a), veh/h	108	854	368	958	1633	712	120	925	408	96	451	438
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	69.1	54.0	44.4	53.2	30.8	23.2	68.0	41.4	54.7	69.3	47.4	47.6
Incr Delay (d2), s/veh	6.4	11.8	1.0	16.7	2.0	0.5	2.5	0.0	300.3	26.3	1.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	14.4	1.9	17.5	14.5	2.3	1.3	1.1	48.9	3.2	7.5	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.5	65.8	45.4	69.9	32.8	23.7	70.5	41.4	355.0	95.6	48.5	48.8
LnGrp LOS	E	E	D	E	C	C	E	D	F	F	D	D
Approach Vol, veh/h		854			2035			780			534	
Approach Delay, s/veh		64.9			48.1			312.0			54.6	
Approach LOS		E			D			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	46.4	42.6	14.4	44.6	13.9	75.0	13.5	45.5
Change Period (Y+Rc), s	7.0	7.0	7.0	* 7	7.0	* 7	6.0	7.0
Max Green Setting (Gmax), s	41.0	35.5	10.0	* 36	9.0	* 68	8.0	38.5
Max Q Clear Time (g_c+I1), s	38.4	31.8	4.7	19.2	6.0	36.0	7.6	40.5
Green Ext Time (p_c), s	1.0	1.7	0.0	2.4	0.0	8.7	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	101.3
HCM 6th LOS	F

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	420	350	520	510	40	230	540	560	120	900	310
Future Volume (veh/h)	170	420	350	520	510	40	230	540	560	120	900	310
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	1.00		0.98	1.00		0.98
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	202	500	417	571	560	44	247	581	602	122	918	316
Peak Hour Factor	0.84	0.84	0.84	0.91	0.91	0.91	0.93	0.93	0.93	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	252	1066	992	395	1137	89	222	1583	871	196	1120	384
Arrive On Green	0.07	0.30	0.30	0.11	0.34	0.34	0.06	0.45	0.45	0.06	0.43	0.43
Sat Flow, veh/h	3456	3554	2709	3456	3331	261	3456	3554	1548	3456	2579	883
Grp Volume(v), veh/h	202	500	417	571	298	306	247	581	602	122	631	603
Grp Sat Flow(s),veh/h/ln	1728	1777	1354	1728	1777	1815	1728	1777	1548	1728	1777	1686
Q Serve(g_s), s	8.1	16.0	16.2	16.0	18.6	18.7	9.0	15.2	39.2	4.8	43.6	44.1
Cycle Q Clear(g_c), s	8.1	16.0	16.2	16.0	18.6	18.7	9.0	15.2	39.2	4.8	43.6	44.1
Prop In Lane	1.00		1.00	1.00		0.14	1.00		1.00	1.00		0.52
Lane Grp Cap(c), veh/h	252	1066	992	395	606	619	222	1583	871	196	772	732
V/C Ratio(X)	0.80	0.47	0.42	1.45	0.49	0.49	1.11	0.37	0.69	0.62	0.82	0.82
Avail Cap(c_a), veh/h	321	1066	992	395	606	619	222	1583	871	239	772	732
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	0.67	0.67	0.67	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.9	39.9	33.4	62.0	36.5	36.5	65.5	25.7	22.2	64.6	34.7	34.9
Incr Delay (d2), s/veh	10.7	1.5	1.3	210.1	1.9	1.9	93.6	0.7	4.5	3.4	9.4	10.2
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	3.9	7.2	5.4	18.5	8.3	8.5	6.8	6.4	14.4	2.2	20.0	19.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.6	41.4	34.7	272.1	38.4	38.4	159.1	26.4	26.7	68.0	44.1	45.0
LnGrp LOS	E	D	C	F	D	D	F	C	C	E	D	D
Approach Vol, veh/h		1119			1175			1430			1356	
Approach Delay, s/veh		44.9			152.0			49.4			46.7	
Approach LOS		D			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.0	49.4	16.0	69.1	17.2	55.2	14.4	70.7
Change Period (Y+Rc), s	7.0	7.4	7.0	* 7.8	7.0	7.4	6.5	7.8
Max Green Setting (Gmax), s	16.0	42.0	9.0	* 44	13.0	45.0	9.7	43.6
Max Q Clear Time (g_c+I1), s	18.0	18.2	11.0	46.1	10.1	20.7	6.8	41.2
Green Ext Time (p_c), s	0.0	5.1	0.0	0.0	0.2	3.5	0.1	1.4

Intersection Summary	
HCM 6th Ctrl Delay	71.4
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

* 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)	40	690	350	150	920	20	150	20	60	20	20	20
Future Volume (veh/h)	40	690	350	150	920	20	150	20	60	20	20	20
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	1.00		0.95	1.00		0.97
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	44	767	389	174	1070	23	224	0	82	34	34	34
Peak Hour Factor	0.90	0.90	0.90	0.86	0.86	0.86	0.73	0.73	0.73	0.58	0.58	0.58
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	108	1156	501	186	1312	28	537	0	228	97	97	164
Arrive On Green	0.06	0.33	0.33	0.10	0.37	0.37	0.15	0.00	0.15	0.11	0.11	0.11
Sat Flow, veh/h	1781	3554	1541	1781	3555	76	3563	0	1513	912	912	1544
Grp Volume(v), veh/h	44	767	389	174	535	558	224	0	82	68	0	34
Grp Sat Flow(s),veh/h/ln	1781	1777	1541	1781	1777	1854	1781	0	1513	1825	0	1544
Q Serve(g_s), s	2.0	16.0	19.6	8.3	23.4	23.4	4.9	0.0	4.2	3.0	0.0	1.7
Cycle Q Clear(g_c), s	2.0	16.0	19.6	8.3	23.4	23.4	4.9	0.0	4.2	3.0	0.0	1.7
Prop In Lane	1.00		1.00	1.00		0.04	1.00		1.00	0.50		1.00
Lane Grp Cap(c), veh/h	108	1156	501	186	656	685	537	0	228	193	0	164
V/C Ratio(X)	0.41	0.66	0.78	0.93	0.82	0.82	0.42	0.00	0.36	0.35	0.00	0.21
Avail Cap(c_a), veh/h	165	1156	501	186	656	685	1489	0	632	212	0	179
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.0	25.0	26.2	38.3	24.5	24.5	33.1	0.0	32.8	35.7	0.0	35.2
Incr Delay (d2), s/veh	2.5	3.0	11.2	47.5	10.7	10.3	0.5	0.0	1.0	1.1	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	0.9	6.7	8.2	5.9	10.9	11.3	2.1	0.0	1.6	1.3	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.4	28.0	37.4	85.7	35.2	34.8	33.7	0.0	33.8	36.8	0.0	35.8
LnGrp LOS	D	C	D	F	D	C	C	A	C	D	A	D
Approach Vol, veh/h		1200			1267			306			102	
Approach Delay, s/veh		31.6			42.0			33.7			36.5	
Approach LOS		C			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.5	34.5		16.1	11.7	38.3		20.0				
Change Period (Y+Rc), s	6.5	6.5		7.0	6.5	6.5		7.0				
Max Green Setting (Gmax), s	9.0	28.0		10.0	8.0	29.0		36.0				
Max Q Clear Time (g_c+I1), s	10.3	21.6		5.0	4.0	25.4		6.9				
Green Ext Time (p_c), s	0.0	3.3		0.1	0.0	2.1		1.1				

Intersection Summary		
HCM 6th Ctrl Delay	36.6	
HCM 6th LOS	D	

Notes

User approved volume balancing among the lanes for turning movement.

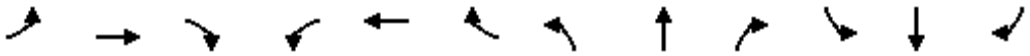
Intersection	
Int Delay, s/veh	0

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	0	0	390	0	0	240
Future Vol, veh/h	0	0	390	0	0	240
Conflicting Peds, #/hr	0	0	0	10	10	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	0	424	0	0	261

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	565	222	0	0	434	0
Stage 1	434	-	-	-	-	-
Stage 2	131	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	455	782	-	-	1122	-
Stage 1	621	-	-	-	-	-
Stage 2	881	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	450	775	-	-	1111	-
Mov Cap-2 Maneuver	450	-	-	-	-	-
Stage 1	615	-	-	-	-	-
Stage 2	881	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	0	0	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	-	1111	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	-	-	0	0	-
HCM Lane LOS	-	-	A	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	1120	120	120	550	20	90	70	130	30	70	30
Future Volume (veh/h)	40	1120	120	120	550	20	90	70	130	30	70	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.95	1.00		0.96
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	43	1191	128	128	585	21	95	100	155	42	97	42
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.84	0.84	0.84	0.72	0.72	0.72
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	71	1610	173	152	1889	68	262	275	222	144	99	43
Arrive On Green	0.04	0.50	0.50	0.09	0.54	0.54	0.15	0.15	0.15	0.08	0.08	0.08
Sat Flow, veh/h	1781	3224	345	1781	3494	125	1781	1870	1511	1781	1222	529
Grp Volume(v), veh/h	43	655	664	128	297	309	95	100	155	42	0	139
Grp Sat Flow(s),veh/h/ln	1781	1777	1792	1781	1777	1842	1781	1870	1511	1781	0	1751
Q Serve(g_s), s	2.6	32.1	32.4	7.8	10.2	10.2	5.3	5.3	10.7	2.4	0.0	8.7
Cycle Q Clear(g_c), s	2.6	32.1	32.4	7.8	10.2	10.2	5.3	5.3	10.7	2.4	0.0	8.7
Prop In Lane	1.00		0.19	1.00		0.07	1.00		1.00	1.00		0.30
Lane Grp Cap(c), veh/h	71	888	895	152	960	996	262	275	222	144	0	142
V/C Ratio(X)	0.61	0.74	0.74	0.84	0.31	0.31	0.36	0.36	0.70	0.29	0.00	0.98
Avail Cap(c_a), veh/h	112	888	895	152	960	996	470	493	398	144	0	142
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.0	21.8	21.9	49.6	13.9	13.9	42.3	42.3	44.6	47.6	0.0	50.5
Incr Delay (d2), s/veh	8.0	5.5	5.5	32.3	0.8	0.8	0.8	0.8	3.9	1.1	0.0	69.6
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	1.3	13.5	13.7	4.7	4.0	4.1	2.4	2.5	4.3	1.1	0.0	6.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.0	27.3	27.4	81.9	14.8	14.8	43.1	43.1	48.6	48.7	0.0	120.1
LnGrp LOS	E	C	C	F	B	B	D	D	D	D	A	F
Approach Vol, veh/h		1362			734			350			181	
Approach Delay, s/veh		28.4			26.5			45.5			103.5	
Approach LOS		C			C			D			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.0	61.2		13.5	9.5	65.8		21.3				
Change Period (Y+Rc), s	4.6	6.3		4.6	5.1	6.3		5.1				
Max Green Setting (Gmax), s	9.4	42.1		8.9	6.9	44.1		29.0				
Max Q Clear Time (g_c+I1), s	9.8	34.4		10.7	4.6	12.2		12.7				
Green Ext Time (p_c), s	0.0	4.6		0.0	0.0	3.5		1.3				

Intersection Summary			
HCM 6th Ctrl Delay		35.3	
HCM 6th LOS		D	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	120	990	70	380	560	80	70	250	660	40	190	60
Future Volume (veh/h)	120	990	70	380	560	80	70	250	660	40	190	60
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	1.00		0.99	1.00		0.97
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	136	1125	40	400	589	84	76	272	712	53	250	79
Peak Hour Factor	0.88	0.88	0.88	0.95	0.95	0.95	0.92	0.92	0.92	0.76	0.76	0.76
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	159	1192	517	417	1303	566	114	1120	495	85	775	238
Arrive On Green	0.09	0.34	0.34	0.12	0.37	0.37	0.06	0.32	0.32	0.05	0.29	0.29
Sat Flow, veh/h	1781	3554	1542	3456	3554	1544	1781	3554	1570	1781	2655	816
Grp Volume(v), veh/h	136	1125	40	400	589	84	76	272	712	53	165	164
Grp Sat Flow(s),veh/h/ln	1781	1777	1542	1728	1777	1544	1781	1777	1570	1781	1777	1694
Q Serve(g_s), s	11.2	45.9	2.6	17.2	18.8	5.4	6.2	8.5	47.0	4.4	10.8	11.3
Cycle Q Clear(g_c), s	11.2	45.9	2.6	17.2	18.8	5.4	6.2	8.5	47.0	4.4	10.8	11.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.48
Lane Grp Cap(c), veh/h	159	1192	517	417	1303	566	114	1120	495	85	519	495
V/C Ratio(X)	0.85	0.94	0.08	0.96	0.45	0.15	0.66	0.24	1.44	0.62	0.32	0.33
Avail Cap(c_a), veh/h	239	1192	517	417	1303	566	143	1120	495	96	519	495
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	66.9	48.2	33.8	65.2	35.9	31.6	68.2	37.9	51.1	69.7	41.2	41.4
Incr Delay (d2), s/veh	17.0	15.7	0.3	33.5	1.1	0.6	7.8	0.1	208.7	10.0	0.3	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	5.8	22.3	1.0	9.4	8.2	2.1	3.1	3.7	46.8	2.2	4.8	4.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	83.9	63.9	34.1	98.7	37.0	32.2	76.0	38.0	259.8	79.7	41.5	41.8
LnGrp LOS	F	E	C	F	D	C	E	D	F	E	D	D
Approach Vol, veh/h		1301			1073			1060			382	
Approach Delay, s/veh		65.1			59.6			189.7			46.9	
Approach LOS		E			E			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.0	57.0	16.6	50.5	20.3	61.7	13.1	54.0
Change Period (Y+Rc), s	7.0	7.0	7.0	* 7	7.0	* 7	6.0	7.0
Max Green Setting (Gmax), s	18.0	50.0	12.0	* 43	20.0	* 49	8.0	47.0
Max Q Clear Time (g_c+I1), s	19.2	47.9	8.2	13.3	13.2	20.8	6.4	49.0
Green Ext Time (p_c), s	0.0	1.4	0.0	1.9	0.2	4.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	96.3
HCM 6th LOS	F

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)	390	760	390	360	520	90	310	740	360	100	700	290
Future Volume (veh/h)	390	760	390	360	520	90	310	740	360	100	700	290
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	1.00		0.98	1.00		0.98
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	398	776	398	400	578	100	330	787	383	111	778	322
Peak Hour Factor	0.98	0.98	0.98	0.90	0.90	0.90	0.94	0.94	0.94	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	446	1066	1052	346	817	141	296	1635	871	195	1039	429
Arrive On Green	0.13	0.30	0.30	0.10	0.27	0.27	0.09	0.46	0.46	0.06	0.43	0.43
Sat Flow, veh/h	3456	3554	2709	3456	3014	520	3456	3554	1548	3456	2432	1005
Grp Volume(v), veh/h	398	776	398	400	340	338	330	787	383	111	568	532
Grp Sat Flow(s),veh/h/ln	1728	1777	1354	1728	1777	1757	1728	1777	1548	1728	1777	1660
Q Serve(g_s), s	15.9	27.4	14.8	14.0	24.1	24.3	12.0	21.5	20.2	4.4	37.7	37.8
Cycle Q Clear(g_c), s	15.9	27.4	14.8	14.0	24.1	24.3	12.0	21.5	20.2	4.4	37.7	37.8
Prop In Lane	1.00		1.00	1.00		0.30	1.00		1.00	1.00		0.61
Lane Grp Cap(c), veh/h	446	1066	1052	346	482	476	296	1635	871	195	759	709
V/C Ratio(X)	0.89	0.73	0.38	1.16	0.71	0.71	1.11	0.48	0.44	0.57	0.75	0.75
Avail Cap(c_a), veh/h	469	1066	1052	346	482	476	296	1635	871	220	759	709
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	0.87	0.87	0.87	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.0	43.9	31.0	63.0	46.0	46.1	64.0	26.2	18.0	64.4	33.8	33.8
Incr Delay (d2), s/veh	18.5	4.4	1.0	95.6	7.4	7.6	86.5	1.0	1.6	2.7	6.7	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	12.5	4.9	10.7	11.5	11.5	8.7	9.0	7.3	2.0	17.0	16.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.6	48.2	32.0	158.6	53.4	53.7	150.5	27.2	19.6	67.1	40.4	41.0
LnGrp LOS	E	D	C	F	D	D	F	C	B	E	D	D
Approach Vol, veh/h		1572			1078			1500			1211	
Approach Delay, s/veh		51.8			92.5			52.4			43.1	
Approach LOS		D			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	49.4	19.0	68.1	25.1	45.3	14.4	72.7
Change Period (Y+Rc), s	7.0	7.4	7.0	* 7.8	7.0	7.4	6.5	7.8
Max Green Setting (Gmax), s	14.0	42.0	12.0	* 43	19.0	37.0	8.9	46.4
Max Q Clear Time (g_c+I1), s	16.0	29.4	14.0	39.8	17.9	26.3	6.4	23.5
Green Ext Time (p_c), s	0.0	5.4	0.0	2.1	0.2	2.9	0.1	6.7

Intersection Summary	
HCM 6th Ctrl Delay	58.2
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

* 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)	30	910	290	140	480	20	430	20	110	30	20	30
Future Volume (veh/h)	30	910	290	140	480	20	430	20	110	30	20	30
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	1.00		0.96	1.00		0.97
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	31	929	296	169	578	24	523	0	129	40	27	40
Peak Hour Factor	0.98	0.98	0.98	0.83	0.83	0.83	0.85	0.85	0.85	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	85	1074	465	173	1222	51	742	0	318	110	74	156
Arrive On Green	0.05	0.30	0.30	0.10	0.35	0.35	0.21	0.00	0.21	0.10	0.10	0.10
Sat Flow, veh/h	1781	3554	1539	1781	3473	144	3563	0	1527	1084	732	1541
Grp Volume(v), veh/h	31	929	296	169	295	307	523	0	129	67	0	40
Grp Sat Flow(s),veh/h/ln	1781	1777	1539	1781	1777	1840	1781	0	1527	1816	0	1541
Q Serve(g_s), s	1.6	22.9	15.4	8.8	12.0	12.0	12.6	0.0	6.8	3.2	0.0	2.2
Cycle Q Clear(g_c), s	1.6	22.9	15.4	8.8	12.0	12.0	12.6	0.0	6.8	3.2	0.0	2.2
Prop In Lane	1.00		1.00	1.00		0.08	1.00		1.00	0.60		1.00
Lane Grp Cap(c), veh/h	85	1074	465	173	625	647	742	0	318	184	0	156
V/C Ratio(X)	0.37	0.87	0.64	0.98	0.47	0.47	0.70	0.00	0.41	0.37	0.00	0.26
Avail Cap(c_a), veh/h	154	1074	465	173	625	647	1384	0	593	196	0	166
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.8	30.5	27.9	41.7	23.3	23.4	34.0	0.0	31.7	38.9	0.0	38.4
Incr Delay (d2), s/veh	2.6	9.3	6.5	61.4	2.6	2.5	1.2	0.0	0.8	1.2	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	10.6	6.2	6.7	5.2	5.4	5.4	0.0	2.5	1.5	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.4	39.9	34.4	103.1	25.9	25.8	35.3	0.0	32.6	40.1	0.0	39.3
LnGrp LOS	D	D	C	F	C	C	D	A	C	D	A	D
Approach Vol, veh/h		1256			771			652			107	
Approach Delay, s/veh		38.7			42.8			34.7			39.8	
Approach LOS		D			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8
Phs Duration (G+Y+Rc), s	5.5	34.5		16.4	10.9	39.1		26.3
Change Period (Y+Rc), s	6.5	6.5		7.0	6.5	6.5		7.0
Max Green Setting (Gmax), s	9.0	28.0		10.0	8.0	29.0		36.0
Max Q Clear Time (g_c+I1), s	10.8	24.9		5.2	3.6	14.0		14.6
Green Ext Time (p_c), s	0.0	2.0		0.1	0.0	3.0		2.3

Intersection Summary	
HCM 6th Ctrl Delay	39.0
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

APPENDIX I

LONG-TERM (HORIZON YEAR 2050) QUEUING ANALYSIS WORKSHEETS

Intersection: 1: Woodward St & Project Dwy

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 2: Pico Ave & Mission Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LT	R	L	TR
Maximum Queue (ft)	117	244	199	175	325	327	132	138	66	100	174
Average Queue (ft)	25	136	100	121	114	118	43	38	45	52	85
95th Queue (ft)	70	223	190	199	283	264	93	101	63	104	162
Link Distance (ft)		394	394		1386	1386	256	256			162
Upstream Blk Time (%)											4
Queuing Penalty (veh)											0
Storage Bay Dist (ft)	200			150					30	75	
Storage Blk Time (%)		1		13	2			25	14	11	21
Queuing Penalty (veh)		0		48	4			30	11	11	15

Intersection: 3: San Marcos Blvd/Woodward St & Mission Rd

Movement	EB	EB	EB	EB	B15	B15	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	R	T	T	L	L	T	T	R	L
Maximum Queue (ft)	204	290	304	220	58	64	322	335	767	727	188	76
Average Queue (ft)	54	203	215	64	4	6	312	327	674	452	26	26
95th Queue (ft)	147	288	300	188	31	40	341	358	944	861	161	64
Link Distance (ft)		220	220		1386	1386			721	721	721	
Upstream Blk Time (%)	0	9	10	0					57	2	1	
Queuing Penalty (veh)	0	30	37	0					0	0	0	
Storage Bay Dist (ft)	180			215			310	310				250
Storage Blk Time (%)	0	18	11	0			44	48	0			
Queuing Penalty (veh)	0	7	5	1			195	210	2			

Intersection: 3: San Marcos Blvd/Woodward St & Mission Rd

Movement	NB	NB	NB	SB	SB	SB
Directions Served	T	T	R	L	T	TR
Maximum Queue (ft)	51	76	389	230	417	386
Average Queue (ft)	10	31	99	77	208	146
95th Queue (ft)	36	68	328	183	356	302
Link Distance (ft)		492	492		568	568
Upstream Blk Time (%)					0	
Queuing Penalty (veh)					0	
Storage Bay Dist (ft)	250			205		
Storage Blk Time (%)				0	16	
Queuing Penalty (veh)				0	9	

Intersection: 4: Twin Oaks Valley Rd & San Marcos Blvd

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	R	L	L	T	TR	L	L
Maximum Queue (ft)	141	155	341	342	331	110	202	215	545	540	192	205
Average Queue (ft)	63	120	225	269	128	18	200	213	531	301	137	177
95th Queue (ft)	164	186	404	394	292	84	206	217	571	585	236	237
Link Distance (ft)			323	323	323				526	526		
Upstream Blk Time (%)			17	30	2				29	0		
Queuing Penalty (veh)			0	0	0				161	2		
Storage Bay Dist (ft)	130	130				85	190	190			180	180
Storage Blk Time (%)	1	15	15		10	0	16	77	1		2	22
Queuing Penalty (veh)	2	32	26		17	0	42	196	5		6	60

Intersection: 4: Twin Oaks Valley Rd & San Marcos Blvd

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	L	T	TR
Maximum Queue (ft)	428	406	445	183	205	268	281
Average Queue (ft)	235	261	330	49	148	234	247
95th Queue (ft)	410	477	521	154	238	278	280
Link Distance (ft)	406	406	406			232	232
Upstream Blk Time (%)	2	6	39			38	70
Queuing Penalty (veh)	0	0	0			0	0
Storage Bay Dist (ft)				180	180		
Storage Blk Time (%)	10			0	17	45	
Queuing Penalty (veh)	24			1	75	54	

Intersection: 5: Rancheros Dr & San Marcos Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	LT	R	LT	R
Maximum Queue (ft)	147	546	554	195	205	510	506	216	137	86	83	47
Average Queue (ft)	34	312	472	173	173	459	271	94	33	24	37	16
95th Queue (ft)	96	619	658	255	264	596	494	179	107	58	74	43
Link Distance (ft)		526	526			492	492	323	323		181	
Upstream Blk Time (%)		1	16			20	1					
Queuing Penalty (veh)		5	90			112	3					
Storage Bay Dist (ft)	165			170	180					70		75
Storage Blk Time (%)	0	6	48	0	6	65			1	0	2	0
Queuing Penalty (veh)	0	3	168	1	28	97			1	0	0	0

Network Summary

Network wide Queuing Penalty: 1826

Intersection: 1: Woodward St & Project Dwy

Movement
Directions Served
Maximum Queue (ft)
Average Queue (ft)
95th Queue (ft)
Link Distance (ft)
Upstream Blk Time (%)
Queuing Penalty (veh)
Storage Bay Dist (ft)
Storage Blk Time (%)
Queuing Penalty (veh)

Intersection: 2: Pico Ave & Mission Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LT	R	L	TR
Maximum Queue (ft)	225	410	406	174	294	276	112	198	63	100	165
Average Queue (ft)	67	302	250	92	96	100	49	72	48	34	82
95th Queue (ft)	194	440	389	170	240	235	95	154	65	82	152
Link Distance (ft)		394	394		1386	1386	256	256			162
Upstream Blk Time (%)		3	1					0			2
Queuing Penalty (veh)		0	0					0			0
Storage Bay Dist (ft)	200			150					30	75	
Storage Blk Time (%)		23		4	3			35	26	2	24
Queuing Penalty (veh)		9		12	3			46	30	2	7

Intersection: 3: San Marcos Blvd/Woodward St & Mission Rd

Movement	EB	EB	EB	EB	B15	B15	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	R	T	T	L	L	T	T	R	L
Maximum Queue (ft)	205	316	312	220	434	424	314	315	404	324	64	164
Average Queue (ft)	139	282	284	78	159	166	216	194	183	150	24	63
95th Queue (ft)	235	332	331	233	372	376	320	311	321	253	50	127
Link Distance (ft)		220	220		1386	1386			721	721	721	
Upstream Blk Time (%)	0	36	38	0								
Queuing Penalty (veh)	0	230	245	0								
Storage Bay Dist (ft)	180			215			310	310				250
Storage Blk Time (%)	6	39	38	0			1	2	0			
Queuing Penalty (veh)	28	47	27	2			3	6	0			

Intersection: 3: San Marcos Blvd/Woodward St & Mission Rd

Movement	NB	NB	NB	SB	SB	SB
Directions Served	T	T	R	L	T	TR
Maximum Queue (ft)	116	127	435	113	232	178
Average Queue (ft)	53	73	164	37	102	64
95th Queue (ft)	107	124	412	81	183	135
Link Distance (ft)		492	492		568	568
Upstream Blk Time (%)						
Queuing Penalty (veh)						
Storage Bay Dist (ft)	250			205		
Storage Blk Time (%)					0	
Queuing Penalty (veh)					0	

Intersection: 4: Twin Oaks Valley Rd & San Marcos Blvd

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	R	L	L	T	TR	L	L
Maximum Queue (ft)	142	155	358	363	338	94	202	215	522	507	192	205
Average Queue (ft)	125	149	336	336	153	10	183	201	339	282	169	199
95th Queue (ft)	185	177	381	358	358	58	237	243	578	495	220	221
Link Distance (ft)			323	323	323				526	526		
Upstream Blk Time (%)			61	58	5				3	0		
Queuing Penalty (veh)			0	0	0				12	1		
Storage Bay Dist (ft)	130	130				85	190	190			180	180
Storage Blk Time (%)	6	44	30		7	0	8	42	6		8	43
Queuing Penalty (veh)	24	166	115		13	0	20	109	22		30	160

Intersection: 4: Twin Oaks Valley Rd & San Marcos Blvd

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	L	T	TR
Maximum Queue (ft)	436	415	418	180	204	255	279
Average Queue (ft)	350	277	168	54	126	223	248
95th Queue (ft)	483	423	333	150	232	278	276
Link Distance (ft)	406	406	406			232	232
Upstream Blk Time (%)	20	2	1			28	68
Queuing Penalty (veh)	0	0	0			0	0
Storage Bay Dist (ft)				180	180		
Storage Blk Time (%)	18			0	10	39	
Queuing Penalty (veh)	55			0	37	39	

Intersection: 5: Rancheros Dr & San Marcos Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	LT	R	LT	R
Maximum Queue (ft)	151	561	552	195	204	290	235	312	233	93	113	88
Average Queue (ft)	24	396	504	177	115	115	108	177	95	40	39	22
95th Queue (ft)	82	639	613	254	188	223	218	277	207	86	85	57
Link Distance (ft)		526	526			492	492	323	323		181	
Upstream Blk Time (%)		2	15					0				
Queuing Penalty (veh)		13	90					0				
Storage Bay Dist (ft)	165			170	180					70		75
Storage Blk Time (%)		16	57	0	1	3			5	1	3	0
Queuing Penalty (veh)		5	165	1	3	4			6	2	1	0

Network Summary

Network wide Queuing Penalty: 1790

APPENDIX J

LONG-TERM (HORIZON YEAR 2050) + PROJECT INTERSECTION ANALYSIS WORKSHEETS

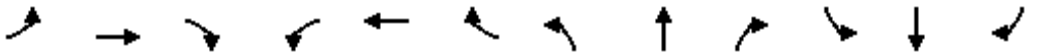
Intersection	
Int Delay, s/veh	0.4

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	22	1	170	6	0	410
Future Vol, veh/h	22	1	170	6	0	410
Conflicting Peds, #/hr	0	0	0	10	10	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	24	1	185	7	0	446

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	422	106	0	0	202	0
Stage 1	199	-	-	-	-	-
Stage 2	223	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	560	928	-	-	1367	-
Stage 1	815	-	-	-	-	-
Stage 2	793	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	554	919	-	-	1354	-
Mov Cap-2 Maneuver	554	-	-	-	-	-
Stage 1	807	-	-	-	-	-
Stage 2	793	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	11.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	564	1354	-
HCM Lane V/C Ratio	-	-	0.044	-	-
HCM Control Delay (s)	-	-	11.7	0	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	30	521	90	220	743	20	80	40	120	70	80	20
Future Volume (veh/h)	30	521	90	220	743	20	80	40	120	70	80	20
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.95	1.00		0.96
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	35	613	106	289	978	26	64	73	129	113	129	32
Peak Hour Factor	0.85	0.85	0.85	0.76	0.76	0.76	0.93	0.93	0.93	0.62	0.62	0.62
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	66	1341	231	239	1898	50	239	251	202	143	115	28
Arrive On Green	0.04	0.45	0.45	0.13	0.54	0.54	0.13	0.13	0.13	0.08	0.08	0.08
Sat Flow, veh/h	1781	3010	519	1781	3532	94	1781	1870	1506	1781	1434	356
Grp Volume(v), veh/h	35	361	358	289	492	512	64	73	129	113	0	161
Grp Sat Flow(s),veh/h/ln	1781	1777	1752	1781	1777	1849	1781	1870	1506	1781	0	1790
Q Serve(g_s), s	1.9	14.1	14.2	13.4	17.7	17.7	3.2	3.5	8.1	6.2	0.0	8.0
Cycle Q Clear(g_c), s	1.9	14.1	14.2	13.4	17.7	17.7	3.2	3.5	8.1	6.2	0.0	8.0
Prop In Lane	1.00		0.30	1.00		0.05	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	66	792	781	239	955	994	239	251	202	143	0	143
V/C Ratio(X)	0.53	0.46	0.46	1.21	0.52	0.52	0.27	0.29	0.64	0.79	0.00	1.12
Avail Cap(c_a), veh/h	109	792	781	239	955	994	517	542	437	143	0	143
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.3	19.3	19.3	43.3	14.8	14.8	38.9	39.0	41.0	45.2	0.0	46.0
Incr Delay (d2), s/veh	6.3	1.9	1.9	127.2	2.0	1.9	0.6	0.6	3.3	25.6	0.0	112.5
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	0.9	5.8	5.7	14.1	6.8	7.1	1.5	1.7	3.2	3.8	0.0	8.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.6	21.2	21.2	170.5	16.8	16.7	39.5	39.6	44.3	70.8	0.0	158.5
LnGrp LOS	D	C	C	F	B	B	D	D	D	E	A	F
Approach Vol, veh/h		754			1293			266			274	
Approach Delay, s/veh		22.7			51.1			41.8			122.3	
Approach LOS		C			D			D			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	18.0	50.9		12.6	8.8	60.0		18.5				
Change Period (Y+Rc), s	4.6	6.3		4.6	5.1	6.3		5.1				
Max Green Setting (Gmax), s	13.4	29.0		8.0	6.1	35.8		29.0				
Max Q Clear Time (g_c+I1), s	15.4	16.2		10.0	3.9	19.7		10.1				
Green Ext Time (p_c), s	0.0	3.3		0.0	0.0	5.4		1.0				

Intersection Summary			
HCM 6th Ctrl Delay		49.4	
HCM 6th LOS		D	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	41	610	50	720	880	91	30	74	610	62	347	83
Future Volume (veh/h)	41	610	50	720	880	91	30	74	610	62	347	83
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		0.98	1.00		0.99	1.00		0.97
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	50	744	61	867	1060	110	33	81	670	70	394	94
Peak Hour Factor	0.82	0.82	0.82	0.83	0.83	0.83	0.91	0.91	0.91	0.88	0.88	0.88
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	84	853	368	921	1632	711	90	919	405	91	716	169
Arrive On Green	0.05	0.24	0.24	0.27	0.46	0.46	0.05	0.26	0.26	0.05	0.25	0.25
Sat Flow, veh/h	1781	3554	1532	3456	3554	1548	1781	3554	1567	1781	2833	668
Grp Volume(v), veh/h	50	744	61	867	1060	110	33	81	670	70	245	243
Grp Sat Flow(s),veh/h/ln	1781	1777	1532	1728	1777	1548	1781	1777	1567	1781	1777	1724
Q Serve(g_s), s	4.0	29.6	4.6	36.1	33.8	6.1	2.6	2.5	38.0	5.7	17.6	18.0
Cycle Q Clear(g_c), s	4.0	29.6	4.6	36.1	33.8	6.1	2.6	2.5	38.0	5.7	17.6	18.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.39
Lane Grp Cap(c), veh/h	84	853	368	921	1632	711	90	919	405	91	449	436
V/C Ratio(X)	0.59	0.87	0.17	0.94	0.65	0.15	0.37	0.09	1.65	0.77	0.55	0.56
Avail Cap(c_a), veh/h	109	853	368	964	1632	711	121	919	405	109	449	436
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	68.6	53.7	44.2	52.8	30.6	23.1	67.5	41.4	54.5	68.9	47.6	47.8
Incr Delay (d2), s/veh	6.5	11.9	1.0	16.3	2.0	0.5	2.5	0.0	305.3	23.2	1.4	1.6
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	2.0	14.3	1.9	17.4	14.4	2.3	1.3	1.1	49.1	3.2	7.9	7.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	75.1	65.6	45.2	69.1	32.7	23.6	70.0	41.4	359.8	92.0	49.0	49.4
LnGrp LOS	E	E	D	E	C	C	E	D	F	F	D	D
Approach Vol, veh/h		855			2037			784			558	
Approach Delay, s/veh		64.7			47.7			314.7			54.6	
Approach LOS		E			D			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	46.2	42.3	14.4	44.1	14.0	74.5	13.5	45.0
Change Period (Y+Rc), s	7.0	7.0	7.0	* 7	7.0	* 7	6.0	7.0
Max Green Setting (Gmax), s	41.0	35.0	10.0	* 37	9.0	* 68	9.0	38.0
Max Q Clear Time (g_c+I1), s	38.1	31.6	4.6	20.0	6.0	35.8	7.7	40.0
Green Ext Time (p_c), s	1.1	1.6	0.0	2.5	0.0	8.7	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	101.5
HCM 6th LOS	F

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	421	350	533	513	40	230	540	563	120	900	310
Future Volume (veh/h)	170	421	350	533	513	40	230	540	563	120	900	310
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	1.00		0.98	1.00		0.98
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	202	501	417	586	564	44	247	581	605	122	918	316
Peak Hour Factor	0.84	0.84	0.84	0.91	0.91	0.91	0.93	0.93	0.93	0.98	0.98	0.98
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	252	1066	1012	395	1137	89	247	1583	871	196	1102	377
Arrive On Green	0.07	0.30	0.30	0.11	0.34	0.34	0.07	0.45	0.45	0.06	0.43	0.43
Sat Flow, veh/h	3456	3554	2709	3456	3333	259	3456	3554	1548	3456	2579	883
Grp Volume(v), veh/h	202	501	417	586	300	308	247	581	605	122	631	603
Grp Sat Flow(s),veh/h/ln	1728	1777	1354	1728	1777	1815	1728	1777	1548	1728	1777	1686
Q Serve(g_s), s	8.1	16.1	16.0	16.0	18.7	18.8	10.0	15.2	39.6	4.8	44.2	44.7
Cycle Q Clear(g_c), s	8.1	16.1	16.0	16.0	18.7	18.8	10.0	15.2	39.6	4.8	44.2	44.7
Prop In Lane	1.00		1.00	1.00		0.14	1.00		1.00	1.00		0.52
Lane Grp Cap(c), veh/h	252	1066	1012	395	606	619	247	1583	871	196	759	720
V/C Ratio(X)	0.80	0.47	0.41	1.48	0.49	0.50	1.00	0.37	0.69	0.62	0.83	0.84
Avail Cap(c_a), veh/h	321	1066	1012	395	606	619	247	1583	871	239	759	720
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	0.65	0.65	0.65	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	63.9	39.9	32.7	62.0	36.6	36.6	65.0	25.7	22.3	64.6	35.6	35.8
Incr Delay (d2), s/veh	10.7	1.5	1.2	226.4	1.9	1.9	57.5	0.7	4.6	3.4	10.3	11.2
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	3.9	7.2	5.3	19.3	8.4	8.6	6.3	6.4	14.6	2.2	20.5	19.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.6	41.4	33.9	288.4	38.4	38.4	122.5	26.4	26.8	68.0	45.9	46.9
LnGrp LOS	E	D	C	F	D	D	F	C	C	E	D	D
Approach Vol, veh/h		1120			1194			1433			1356	
Approach Delay, s/veh		44.6			161.1			43.1			48.4	
Approach LOS		D			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	23.0	49.4	17.0	68.1	17.2	55.2	14.4	70.7
Change Period (Y+Rc), s	7.0	7.4	7.0	* 7.8	7.0	7.4	6.5	7.8
Max Green Setting (Gmax), s	16.0	42.0	10.0	* 43	13.0	45.0	9.7	43.6
Max Q Clear Time (g_c+I1), s	18.0	18.1	12.0	46.7	10.1	20.8	6.8	41.6
Green Ext Time (p_c), s	0.0	5.1	0.0	0.0	0.2	3.5	0.1	1.2

Intersection Summary	
HCM 6th Ctrl Delay	72.5
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

* 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)	40	694	350	151	936	20	150	20	60	20	20	20
Future Volume (veh/h)	40	694	350	151	936	20	150	20	60	20	20	20
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	1.00		0.95	1.00		0.97
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	44	771	389	176	1088	23	224	0	82	34	34	34
Peak Hour Factor	0.90	0.90	0.90	0.86	0.86	0.86	0.73	0.73	0.73	0.58	0.58	0.58
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	108	1156	501	186	1313	28	537	0	228	97	97	164
Arrive On Green	0.06	0.33	0.33	0.10	0.37	0.37	0.15	0.00	0.15	0.11	0.11	0.11
Sat Flow, veh/h	1781	3554	1541	1781	3556	75	3563	0	1513	912	912	1544
Grp Volume(v), veh/h	44	771	389	176	544	567	224	0	82	68	0	34
Grp Sat Flow(s),veh/h/ln	1781	1777	1541	1781	1777	1854	1781	0	1513	1825	0	1544
Q Serve(g_s), s	2.0	16.1	19.6	8.5	23.9	23.9	4.9	0.0	4.2	3.0	0.0	1.7
Cycle Q Clear(g_c), s	2.0	16.1	19.6	8.5	23.9	23.9	4.9	0.0	4.2	3.0	0.0	1.7
Prop In Lane	1.00		1.00	1.00		0.04	1.00		1.00	0.50		1.00
Lane Grp Cap(c), veh/h	108	1156	501	186	656	685	537	0	228	193	0	164
V/C Ratio(X)	0.41	0.67	0.78	0.95	0.83	0.83	0.42	0.00	0.36	0.35	0.00	0.21
Avail Cap(c_a), veh/h	165	1156	501	186	656	685	1489	0	632	212	0	179
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	39.0	25.0	26.2	38.3	24.7	24.7	33.1	0.0	32.8	35.7	0.0	35.2
Incr Delay (d2), s/veh	2.5	3.1	11.2	50.2	11.5	11.1	0.5	0.0	1.0	1.1	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	0.9	6.8	8.2	6.1	11.3	11.7	2.1	0.0	1.6	1.3	0.0	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.4	28.1	37.4	88.5	36.2	35.8	33.7	0.0	33.8	36.8	0.0	35.8
LnGrp LOS	D	C	D	F	D	D	C	A	C	D	A	D
Approach Vol, veh/h		1204			1287			306			102	
Approach Delay, s/veh		31.6			43.2			33.7			36.5	
Approach LOS		C			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.5	34.5		16.1	11.7	38.3		20.0				
Change Period (Y+Rc), s	6.5	6.5		7.0	6.5	6.5		7.0				
Max Green Setting (Gmax), s	9.0	28.0		10.0	8.0	29.0		36.0				
Max Q Clear Time (g_c+I1), s	10.5	21.6		5.0	4.0	25.9		6.9				
Green Ext Time (p_c), s	0.0	3.3		0.1	0.0	1.9		1.1				

Intersection Summary		
HCM 6th Ctrl Delay	37.1	
HCM 6th LOS	D	

Notes

User approved volume balancing among the lanes for turning movement.

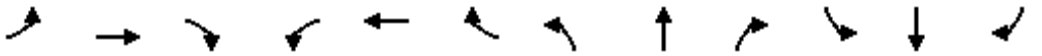
Intersection	
Int Delay, s/veh	0.2

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Vol, veh/h	10	1	390	25	1	240
Future Vol, veh/h	10	1	390	25	1	240
Conflicting Peds, #/hr	0	0	0	10	10	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	50	-
Veh in Median Storage, #	0	-	0	-	-	0
Grade, %	0	-	0	-	-	0
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	11	1	424	27	1	261

Major/Minor	Minor1		Major1		Major2	
Conflicting Flow All	581	236	0	0	461	0
Stage 1	448	-	-	-	-	-
Stage 2	133	-	-	-	-	-
Critical Hdwy	6.84	6.94	-	-	4.14	-
Critical Hdwy Stg 1	5.84	-	-	-	-	-
Critical Hdwy Stg 2	5.84	-	-	-	-	-
Follow-up Hdwy	3.52	3.32	-	-	2.22	-
Pot Cap-1 Maneuver	445	766	-	-	1096	-
Stage 1	611	-	-	-	-	-
Stage 2	879	-	-	-	-	-
Platoon blocked, %			-	-		-
Mov Cap-1 Maneuver	440	759	-	-	1086	-
Mov Cap-2 Maneuver	440	-	-	-	-	-
Stage 1	605	-	-	-	-	-
Stage 2	878	-	-	-	-	-

Approach	WB	NB	SB
HCM Control Delay, s	13.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT	NBR	WBLn1	SBL	SBT
Capacity (veh/h)	-	-	457	1086	-
HCM Lane V/C Ratio	-	-	0.026	0.001	-
HCM Control Delay (s)	-	-	13.1	8.3	-
HCM Lane LOS	-	-	B	A	-
HCM 95th %tile Q(veh)	-	-	0.1	0	-



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	40	1123	120	120	551	20	90	70	130	30	70	30
Future Volume (veh/h)	40	1123	120	120	551	20	90	70	130	30	70	30
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.96	1.00		0.95	1.00		0.96
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	43	1195	128	128	586	21	95	100	155	42	97	42
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.84	0.84	0.84	0.72	0.72	0.72
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	71	1614	172	152	1892	68	262	275	222	143	98	42
Arrive On Green	0.04	0.50	0.50	0.09	0.54	0.54	0.15	0.15	0.15	0.08	0.08	0.08
Sat Flow, veh/h	1781	3225	344	1781	3494	125	1781	1870	1511	1781	1222	529
Grp Volume(v), veh/h	43	657	666	128	298	309	95	100	155	42	0	139
Grp Sat Flow(s),veh/h/ln	1781	1777	1793	1781	1777	1842	1781	1870	1511	1781	0	1751
Q Serve(g_s), s	2.6	32.2	32.5	7.8	10.2	10.2	5.3	5.3	10.7	2.4	0.0	8.7
Cycle Q Clear(g_c), s	2.6	32.2	32.5	7.8	10.2	10.2	5.3	5.3	10.7	2.4	0.0	8.7
Prop In Lane	1.00		0.19	1.00		0.07	1.00		1.00	1.00		0.30
Lane Grp Cap(c), veh/h	71	889	897	152	962	997	262	275	222	143	0	140
V/C Ratio(X)	0.61	0.74	0.74	0.84	0.31	0.31	0.36	0.36	0.70	0.29	0.00	0.99
Avail Cap(c_a), veh/h	112	889	897	152	962	997	471	495	400	143	0	140
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	52.0	21.8	21.8	49.6	13.9	13.9	42.3	42.3	44.6	47.7	0.0	50.6
Incr Delay (d2), s/veh	8.0	5.5	5.5	32.3	0.8	0.8	0.8	0.8	3.9	1.1	0.0	73.6
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	1.3	13.5	13.8	4.7	4.0	4.1	2.4	2.5	4.3	1.1	0.0	6.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.0	27.2	27.4	81.9	14.7	14.7	43.1	43.1	48.5	48.8	0.0	124.2
LnGrp LOS	E	C	C	F	B	B	D	D	D	D	A	F
Approach Vol, veh/h		1366			735			350			181	
Approach Delay, s/veh		28.3			26.4			45.5			106.7	
Approach LOS		C			C			D			F	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.0	61.3		13.4	9.5	65.9		21.3				
Change Period (Y+Rc), s	4.6	6.3		4.6	5.1	6.3		5.1				
Max Green Setting (Gmax), s	9.4	42.1		8.8	6.9	44.1		29.1				
Max Q Clear Time (g_c+I1), s	9.8	34.5		10.7	4.6	12.2		12.7				
Green Ext Time (p_c), s	0.0	4.6		0.0	0.0	3.5		1.3				

Intersection Summary			
HCM 6th Ctrl Delay		35.5	
HCM 6th LOS		D	

Notes

User approved volume balancing among the lanes for turning movement.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	123	990	70	380	560	83	70	269	660	41	198	61
Future Volume (veh/h)	123	990	70	380	560	83	70	269	660	41	198	61
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	1.00		0.99	1.00		0.97
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	140	1125	80	400	589	87	76	292	717	54	261	80
Peak Hour Factor	0.88	0.88	0.88	0.95	0.95	0.95	0.92	0.92	0.92	0.76	0.76	0.76
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	163	1191	517	417	1294	562	114	1120	495	85	782	233
Arrive On Green	0.09	0.34	0.34	0.12	0.36	0.36	0.06	0.32	0.32	0.05	0.29	0.29
Sat Flow, veh/h	1781	3554	1542	3456	3554	1544	1781	3554	1570	1781	2676	799
Grp Volume(v), veh/h	140	1125	80	400	589	87	76	292	717	54	171	170
Grp Sat Flow(s),veh/h/ln	1781	1777	1542	1728	1777	1544	1781	1777	1570	1781	1777	1698
Q Serve(g_s), s	11.6	45.9	5.4	17.2	18.8	5.7	6.2	9.1	47.0	4.4	11.2	11.7
Cycle Q Clear(g_c), s	11.6	45.9	5.4	17.2	18.8	5.7	6.2	9.1	47.0	4.4	11.2	11.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.47
Lane Grp Cap(c), veh/h	163	1191	517	417	1294	562	114	1120	495	85	519	496
V/C Ratio(X)	0.86	0.94	0.15	0.96	0.46	0.15	0.66	0.26	1.45	0.63	0.33	0.34
Avail Cap(c_a), veh/h	239	1191	517	417	1294	562	143	1120	495	96	519	496
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	66.8	48.2	34.8	65.2	36.1	31.9	68.2	38.1	51.1	69.7	41.3	41.5
Incr Delay (d2), s/veh	18.1	15.7	0.6	33.6	1.2	0.6	7.8	0.1	213.3	10.9	0.4	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	6.0	22.3	2.1	9.4	8.2	2.2	3.1	4.0	47.4	2.3	5.0	5.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	84.9	64.0	35.4	98.8	37.3	32.5	76.0	38.2	264.4	80.6	41.7	41.9
LnGrp LOS	F	E	D	F	D	C	E	D	F	F	D	D
Approach Vol, veh/h		1345			1076			1085			395	
Approach Delay, s/veh		64.4			59.8			190.3			47.1	
Approach LOS		E			E			F			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	25.0	57.0	16.6	50.6	20.7	61.3	13.1	54.0
Change Period (Y+Rc), s	7.0	7.0	7.0	* 7	7.0	* 7	6.0	7.0
Max Green Setting (Gmax), s	18.0	50.0	12.0	* 43	20.0	* 49	8.0	47.0
Max Q Clear Time (g_c+I1), s	19.2	47.9	8.2	13.7	13.6	20.8	6.4	49.0
Green Ext Time (p_c), s	0.0	1.4	0.0	1.9	0.2	4.1	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	96.4
HCM 6th LOS	F

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)	390	764	390	366	522	90	310	740	374	100	700	290
Future Volume (veh/h)	390	764	390	366	522	90	310	740	374	100	700	290
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	1.00		0.98	1.00		0.98
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	398	780	398	407	580	100	330	787	398	111	778	322
Peak Hour Factor	0.98	0.98	0.98	0.90	0.90	0.90	0.94	0.94	0.94	0.90	0.90	0.90
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	446	1066	1052	346	817	140	296	1635	871	195	1039	429
Arrive On Green	0.13	0.30	0.30	0.10	0.27	0.27	0.09	0.46	0.46	0.06	0.43	0.43
Sat Flow, veh/h	3456	3554	2709	3456	3016	518	3456	3554	1548	3456	2432	1005
Grp Volume(v), veh/h	398	780	398	407	341	339	330	787	398	111	568	532
Grp Sat Flow(s),veh/h/ln	1728	1777	1354	1728	1777	1758	1728	1777	1548	1728	1777	1660
Q Serve(g_s), s	15.9	27.6	14.8	14.0	24.2	24.4	12.0	21.5	21.3	4.4	37.7	37.8
Cycle Q Clear(g_c), s	15.9	27.6	14.8	14.0	24.2	24.4	12.0	21.5	21.3	4.4	37.7	37.8
Prop In Lane	1.00		1.00	1.00		0.29	1.00		1.00	1.00		0.61
Lane Grp Cap(c), veh/h	446	1066	1052	346	482	476	296	1635	871	195	759	709
V/C Ratio(X)	0.89	0.73	0.38	1.18	0.71	0.71	1.11	0.48	0.46	0.57	0.75	0.75
Avail Cap(c_a), veh/h	469	1066	1052	346	482	476	296	1635	871	220	759	709
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	0.86	0.86	0.86	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	60.0	43.9	31.0	63.0	46.0	46.1	64.0	26.2	18.2	64.4	33.8	33.8
Incr Delay (d2), s/veh	18.5	4.4	1.0	103.0	7.4	7.6	86.5	1.0	1.7	2.7	6.7	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	12.6	4.9	11.0	11.5	11.5	8.7	9.0	7.7	2.0	17.0	16.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	78.6	48.4	32.0	166.0	53.4	53.7	150.5	27.2	20.0	67.1	40.4	41.0
LnGrp LOS	E	D	C	F	D	D	F	C	B	E	D	D
Approach Vol, veh/h		1576			1087			1515			1211	
Approach Delay, s/veh		51.9			95.7			52.2			43.1	
Approach LOS		D			F			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	21.0	49.4	19.0	68.1	25.1	45.3	14.4	72.7
Change Period (Y+Rc), s	7.0	7.4	7.0	* 7.8	7.0	7.4	6.5	7.8
Max Green Setting (Gmax), s	14.0	42.0	12.0	* 43	19.0	37.0	8.9	46.4
Max Q Clear Time (g_c+I1), s	16.0	29.6	14.0	39.8	17.9	26.4	6.4	23.5
Green Ext Time (p_c), s	0.0	5.4	0.0	2.1	0.2	2.9	0.1	6.8

Intersection Summary	
HCM 6th Ctrl Delay	58.8
HCM 6th LOS	E

Notes

User approved pedestrian interval to be less than phase max green.

* 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)	30	928	290	140	488	20	430	20	111	30	20	30
Future Volume (veh/h)	30	928	290	140	488	20	430	20	111	30	20	30
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	1.00		0.96	1.00		0.97
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	31	947	296	169	588	24	523	0	131	40	27	40
Peak Hour Factor	0.98	0.98	0.98	0.83	0.83	0.83	0.85	0.85	0.85	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	85	1074	465	173	1223	50	742	0	318	110	74	156
Arrive On Green	0.05	0.30	0.30	0.10	0.35	0.35	0.21	0.00	0.21	0.10	0.10	0.10
Sat Flow, veh/h	1781	3554	1539	1781	3475	142	3563	0	1527	1084	732	1541
Grp Volume(v), veh/h	31	947	296	169	300	312	523	0	131	67	0	40
Grp Sat Flow(s),veh/h/ln	1781	1777	1539	1781	1777	1840	1781	0	1527	1816	0	1541
Q Serve(g_s), s	1.6	23.5	15.4	8.8	12.2	12.2	12.6	0.0	6.9	3.2	0.0	2.2
Cycle Q Clear(g_c), s	1.6	23.5	15.4	8.8	12.2	12.2	12.6	0.0	6.9	3.2	0.0	2.2
Prop In Lane	1.00		1.00	1.00		0.08	1.00		1.00	0.60		1.00
Lane Grp Cap(c), veh/h	85	1074	465	173	625	647	742	0	318	184	0	156
V/C Ratio(X)	0.37	0.88	0.64	0.98	0.48	0.48	0.70	0.00	0.41	0.37	0.00	0.26
Avail Cap(c_a), veh/h	154	1074	465	173	625	647	1384	0	593	196	0	166
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	42.8	30.8	27.9	41.7	23.4	23.4	34.0	0.0	31.8	38.9	0.0	38.4
Incr Delay (d2), s/veh	2.6	10.5	6.5	61.4	2.6	2.6	1.2	0.0	0.9	1.2	0.0	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	11.0	6.2	6.7	5.3	5.5	5.4	0.0	2.5	1.5	0.0	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.4	41.2	34.5	103.1	26.1	26.0	35.3	0.0	32.6	40.1	0.0	39.3
LnGrp LOS	D	D	C	F	C	C	D	A	C	D	A	D
Approach Vol, veh/h		1274			781			654			107	
Approach Delay, s/veh		39.8			42.7			34.7			39.8	
Approach LOS		D			D			C			D	

Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.5	34.5		16.4	10.9	39.1		26.3				
Change Period (Y+Rc), s	6.5	6.5		7.0	6.5	6.5		7.0				
Max Green Setting (Gmax), s	9.0	28.0		10.0	8.0	29.0		36.0				
Max Q Clear Time (g_c+I1), s	10.8	25.5		5.2	3.6	14.2		14.6				
Green Ext Time (p_c), s	0.0	1.7		0.1	0.0	3.0		2.3				

Intersection Summary	
HCM 6th Ctrl Delay	39.4
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

APPENDIX K

LONG-TERM (HORIZON YEAR 2050) + PROJECT QUEUING ANALYSIS WORKSHEETS

Intersection: 1: Woodward St & Project Dwy

Movement	WB	SB	SB
Directions Served	LR	T	T
Maximum Queue (ft)	36	59	47
Average Queue (ft)	16	7	3
95th Queue (ft)	42	71	45
Link Distance (ft)	255	376	376
Upstream Blk Time (%)			
Queuing Penalty (veh)			
Storage Bay Dist (ft)			
Storage Blk Time (%)		2	
Queuing Penalty (veh)		0	

Intersection: 2: Pico Ave & Mission Rd

Movement	EB	EB	EB	WB	WB	WB	B15	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	T	L	LT	R	L	TR
Maximum Queue (ft)	82	245	202	174	353	321	6	110	147	56	100	178
Average Queue (ft)	25	130	91	105	107	109	0	42	37	44	58	85
95th Queue (ft)	64	209	171	190	301	272	4	85	96	61	108	162
Link Distance (ft)		394	394		1386	1386	220	256	256			162
Upstream Blk Time (%)												3
Queuing Penalty (veh)												0
Storage Bay Dist (ft)	200			150						30	75	
Storage Blk Time (%)		1		9	2				23	16	12	20
Queuing Penalty (veh)		0		32	4				28	12	12	14

Intersection: 3: San Marcos Blvd/Woodward St & Mission Rd

Movement	EB	EB	EB	EB	B15	B15	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	R	T	T	L	L	T	T	R	L
Maximum Queue (ft)	204	294	298	220	83	94	322	335	762	725	193	89
Average Queue (ft)	64	210	222	64	9	10	311	327	719	395	29	31
95th Queue (ft)	163	305	312	185	48	53	343	368	859	854	197	71
Link Distance (ft)		220	220		1386	1386			721	721	721	
Upstream Blk Time (%)	0	9	10	0					65	2	0	
Queuing Penalty (veh)	0	31	37	0					0	0	0	
Storage Bay Dist (ft)	180			215			310	310				250
Storage Blk Time (%)		18	11	0			51	58	1			
Queuing Penalty (veh)		7	5	1			225	255	6			

Intersection: 3: San Marcos Blvd/Woodward St & Mission Rd

Movement	NB	NB	NB	SB	SB	SB
Directions Served	T	T	R	L	T	TR
Maximum Queue (ft)	57	74	394	230	423	373
Average Queue (ft)	9	31	113	96	232	168
95th Queue (ft)	35	64	345	217	419	350
Link Distance (ft)		492	492		568	568
Upstream Blk Time (%)					2	0
Queuing Penalty (veh)					3	0
Storage Bay Dist (ft)	250			205		
Storage Blk Time (%)				0	21	
Queuing Penalty (veh)				0	13	

Intersection: 4: Twin Oaks Valley Rd & San Marcos Blvd

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	R	L	L	T	TR	L	L
Maximum Queue (ft)	142	155	338	356	299	110	202	215	546	526	191	205
Average Queue (ft)	55	112	186	249	107	14	199	213	533	259	116	168
95th Queue (ft)	156	177	365	382	233	73	208	220	568	571	225	235
Link Distance (ft)			323	323	323				526	526		
Upstream Blk Time (%)			11	18	2				33	0		
Queuing Penalty (veh)			0	0	0				184	2		
Storage Bay Dist (ft)	130	130				85	190	190			180	180
Storage Blk Time (%)	0	12	7		10	0	17	74	1		1	13
Queuing Penalty (veh)	1	24	12		18	0	43	189	6		2	36

Intersection: 4: Twin Oaks Valley Rd & San Marcos Blvd

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	L	T	TR
Maximum Queue (ft)	403	415	448	185	205	259	280
Average Queue (ft)	218	241	342	51	144	228	250
95th Queue (ft)	385	455	540	161	248	283	265
Link Distance (ft)	406	406	406			232	232
Upstream Blk Time (%)	3	5	47			32	75
Queuing Penalty (veh)	0	0	0			0	0
Storage Bay Dist (ft)				180	180		
Storage Blk Time (%)	12			0	13	48	
Queuing Penalty (veh)	27			1	56	58	

Intersection: 5: Rancheros Dr & San Marcos Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	LT	R	LT	R
Maximum Queue (ft)	149	533	550	195	205	511	503	233	184	70	79	64
Average Queue (ft)	38	296	477	172	168	479	260	100	37	19	33	17
95th Queue (ft)	110	602	660	257	266	576	476	193	127	60	70	47
Link Distance (ft)		526	526			492	492	323	323		181	
Upstream Blk Time (%)		0	15			24	1	1				
Queuing Penalty (veh)		3	81			133	5	0				
Storage Bay Dist (ft)	165			170	180					70		75
Storage Blk Time (%)	0	6	49	1	3	68			1	0	1	0
Queuing Penalty (veh)	0	2	171	2	15	103			0	0	0	0

Network Summary

Network wide Queuing Penalty: 1860

Intersection: 1: Woodward St & Project Dwy

Movement	WB
Directions Served	LR
Maximum Queue (ft)	35
Average Queue (ft)	10
95th Queue (ft)	33
Link Distance (ft)	255
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 2: Pico Ave & Mission Rd

Movement	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	TR	L	T	TR	L	LT	R	L	TR
Maximum Queue (ft)	224	424	405	174	290	290	110	211	63	99	175
Average Queue (ft)	59	306	247	98	79	96	50	78	49	30	85
95th Queue (ft)	171	442	385	172	209	223	100	163	68	74	159
Link Distance (ft)		394	394		1386	1386	256	256			162
Upstream Blk Time (%)		4	1					0			4
Queuing Penalty (veh)		0	0					0			0
Storage Bay Dist (ft)	200			150					30	75	
Storage Blk Time (%)		24		6	2			41	26	1	24
Queuing Penalty (veh)		9		15	3			53	30	1	7

Intersection: 3: San Marcos Blvd/Woodward St & Mission Rd

Movement	EB	EB	EB	EB	B15	B15	WB	WB	WB	WB	WB	NB
Directions Served	L	T	T	R	T	T	L	L	T	T	R	L
Maximum Queue (ft)	205	316	317	220	379	378	317	316	543	464	76	129
Average Queue (ft)	138	282	286	86	146	157	232	225	220	168	27	54
95th Queue (ft)	236	337	332	238	324	333	343	352	444	337	55	109
Link Distance (ft)		220	220		1386	1386			721	721	721	
Upstream Blk Time (%)	0	34	38	0								
Queuing Penalty (veh)	0	221	241	0								
Storage Bay Dist (ft)	180			215			310	310				250
Storage Blk Time (%)	3	38	38	0			4	7	0			
Queuing Penalty (veh)	15	47	26	2			12	18	0			

Intersection: 3: San Marcos Blvd/Woodward St & Mission Rd

Movement	NB	NB	NB	SB	SB	SB
Directions Served	T	T	R	L	T	TR
Maximum Queue (ft)	146	166	454	91	179	159
Average Queue (ft)	63	83	188	39	104	68
95th Queue (ft)	126	144	432	82	171	134
Link Distance (ft)		492	492		568	568
Upstream Blk Time (%)			0			
Queuing Penalty (veh)			1			
Storage Bay Dist (ft)	250			205		
Storage Blk Time (%)					0	
Queuing Penalty (veh)					0	

Intersection: 4: Twin Oaks Valley Rd & San Marcos Blvd

Movement	EB	EB	EB	EB	EB	EB	WB	WB	WB	WB	NB	NB
Directions Served	L	L	T	T	R	R	L	L	T	TR	L	L
Maximum Queue (ft)	142	155	359	361	345	110	202	215	503	472	192	205
Average Queue (ft)	116	147	335	335	157	10	182	201	312	273	171	198
95th Queue (ft)	188	180	377	366	369	59	234	244	547	465	215	224
Link Distance (ft)			323	323	323				526	526		
Upstream Blk Time (%)			60	62	7				2	0		
Queuing Penalty (veh)			0	0	0				11	0		
Storage Bay Dist (ft)	130	130				85	190	190			180	180
Storage Blk Time (%)	4	38	36		5	0	7	37	5		5	41
Queuing Penalty (veh)	16	145	140		10	0	17	98	19		20	152

Intersection: 4: Twin Oaks Valley Rd & San Marcos Blvd

Movement	NB	NB	NB	SB	SB	SB	SB
Directions Served	T	T	R	L	L	T	TR
Maximum Queue (ft)	435	418	430	191	205	265	280
Average Queue (ft)	342	261	236	65	147	232	247
95th Queue (ft)	481	405	427	172	238	288	274
Link Distance (ft)	406	406	406			232	232
Upstream Blk Time (%)	10	1	5			31	58
Queuing Penalty (veh)	0	0	0			0	0
Storage Bay Dist (ft)				180	180		
Storage Blk Time (%)	15			0	14	40	
Queuing Penalty (veh)	47			1	49	40	

Intersection: 5: Rancheros Dr & San Marcos Blvd

Movement	EB	EB	EB	EB	WB	WB	WB	NB	NB	NB	SB	SB
Directions Served	L	T	T	R	L	T	TR	L	LT	R	LT	R
Maximum Queue (ft)	161	566	564	195	202	273	239	289	225	95	82	74
Average Queue (ft)	33	433	512	170	114	121	111	168	88	40	37	21
95th Queue (ft)	107	632	606	258	195	228	212	254	193	88	72	52
Link Distance (ft)		526	526			492	492	323	323		181	
Upstream Blk Time (%)		4	19					0				
Queuing Penalty (veh)		26	119					0				
Storage Bay Dist (ft)	165			170	180					70		75
Storage Blk Time (%)		21	59	0	4	3			6	1	2	0
Queuing Penalty (veh)		6	172	1	9	5			7	2	1	0

Network Summary

Network wide Queuing Penalty: 1815

APPENDIX L

EXCERPTS FROM THE CITY OF SAN MARCOS MUNICIPAL CODE PARKING RATE AND AASHTO SIGHT DISTANCE

CHAPTER 20.340 - OFF-STREET PARKING AND LOADING

Section 20.340.010 - Purpose of Chapter

The purpose of this chapter is to regulate the provision of off-street parking and loading for all land uses, facilitate community-wide accessibility, and promote viability of business within San Marcos. Specifically, the purpose of this chapter is to do the following:

A. Ensure adequate off-street parking and loading facilities to serve land use needs.

B. Provide adequate off-street parking, circulation, and access to help support the viability of businesses in the City.

C. Maintain efficient use of land by avoiding excessive amounts of parking.

D. Allow parking alternatives and reductions to off-street parking requirements that provide flexibility in meeting off-street parking needs, when appropriate.

E. Ensure off-street parking and loading facilities are designed in a manner that ensures efficiency, protects public safety, minimizes adverse impacts to adjacent land uses, and promotes the general welfare of the community.

Section 20.340.020 - Applicability

A. **Applicability.** The standards of this chapter shall be applied to new construction and establishment, conversion, or expansion of any land use in the City, applicable to increases in floor space, seating capacity, dwelling units, employees, or rooms/beds associated with a building or structure. Operations associated with a land use shall not commence, nor a building be occupied, unless off-street parking and loading facilities conform to the requirements of this chapter. Exceptions to these standards are permitted when either of the following occurs:

1. An adopted Specific Plan, policy plan, or special overlay district supersedes the provisions of this chapter; or
2. An exception has been granted through a Variance or DP in accordance with the provisions in Chapters 20.525 (Variances) and 20.510 (Director's Permit), respectively.

Section 20.340.030 - General Requirements

A. **Use of Parking Areas.** Parking spaces regulated in this chapter shall be solely used for parking, not for the display of merchandise; storage or display of equipment; display for sale or lease; or repair of vehicles, trailers, recreation vehicles, boats, and etc. except when permitted by Chapter 20.455 (Temporary Events).

B. **Required Availability and Maintenance.** All off-street parking and loading required by this chapter shall be available during all hours of operation, marked for their intended uses, and reserved for parking and loading purposes for the life of the use or facility. Parking spaces and associated driveways, maneuvering areas, and landscaping shall be maintained free of vandalism and litter. Striping, paving, walls, lights, and all other facilities shall be maintained in good condition.

C. **Existing Facilities.** Any building or use for which parking facilities become substandard by the adoption of this chapter shall be considered a nonconforming use. Such nonconforming use may continue, but no enlargement or expansion in such a use or building shall be made unless the required number of parking spaces or parking area, as designated by this chapter are provided.

D. **Change of Occupancy or Use.** For a change of occupancy, a new business license, or enlargement of a structure or use where the parking demand is increased, off-street parking facilities and loading shall be provided in compliance with the minimum requirements of this chapter.

E. **Parking of Inoperable or Unregistered Vehicles.** Except as set forth in this chapter, it shall be unlawful for any

person to park or store an automotive vehicle or trailer without current registration from the Department of Motor Vehicles or in inoperable condition, except when stored in a fully enclosed building.

F. **Change of Parking Requirements.** When parking requirements, as set forth in this chapter, are amended, such amendments shall not invalidate a previously approved permit.

G. **Request for Special Review of Parking.** Modifications to parking improvement standards or other parking provisions in this chapter shall be considered in conjunction with the review permit applications or Site Development Plans by the appropriate authority. The applicant shall submit with the request, evidence necessary to demonstrate the unusual conditions warranting the modification, such as floor plans and other evidence, as requested by the reviewing authority.

Section 20.340.040 - Required Number of Parking Spaces

The requirements of this Section shall be applied uniformly, based on land uses, regardless of the Zone in which a land use is to be located, unless otherwise specified.

A. **Minimum Standards.** Every use shall provide at least the minimum number of off-street parking spaces required by Table 20.340-1 (see Section 20.340.090 (Bicycle Parking) for bicycle parking requirements). Reductions to the parking requirements may be permitted, subject to compliance with the provisions of Section 20.340.050 (Off-Street Parking and Trip Reduction Measures). Required parking space dimensions, based on parking configuration, are established in Table 20.3403, Section 20.340.060 (Off-Street Parking Size and Location).

B. **Uses Not Listed.** Parking requirements for uses not specifically listed in Table 20.340-1 will be determined by the Director, based on comparable uses in the Table or through a parking demand analysis of similar facilities in the region.

C. **Mixed Use Sites.** Where multiple land uses are combined within a single building, structure, or parcel, off-street parking facilities for a single use shall not be considered as providing required parking facilities for any other uses. The aggregate number of parking spaces for each separate use, required by this chapter, shall be met, except where otherwise specified and a reduction of parking is allowed in compliance with Section 20.340.050 (Off-Street Parking and Trip Reduction Measures).

D. **Rounding Calculations.** Calculations resulting in a fractional number shall be treated as follows: one (1) parking space is required for fractions of one-half (0.5) or greater; no additional parking space is required for fractions of less than one-half (0.5).

E. **Calculations.**

1. Gross Floor Area Calculations. Gross floor area calculations are based on the area within the surrounding exterior walls of a building or any portion, thereof, including shared bathroom spaces, storage areas, and areas for circulation.
2. Seating Calculations. Where fixed seats provided are either benches, bleachers, or pews, such seats shall be calculated at one (1) seat per eighteen (18) inches and one (1) seat per twenty-four (24) inches of booth length for dining.
3. Assembly Area Calculations. All rooms or areas that can be logically used for seating, in addition to any fixed seating area, shall be calculated in determining the parking requirement for assembly areas.

Table 20.340-1

Parking Requirements by Land Use

Land Use	Minimum Required Parking	Additional Use Regulations

Residential Uses		
Animal Keeping, Small	None required	
Accessory Dwelling Unit/Accessory Dwelling (**Ord. 2017-1445, 7/11/2017)**	1 space/accessory dwelling unit	
Caretaker Unit	1 space	Interior dimension: 20 feet x 20 feet
Child Care Facility, Large Family Home	Required residential unit parking spaces and 1 space/2 employees	Tandem parking is permitted in driveways; vehicles cannot encroach into public rights-of-way
Child Care Facility, Small Family Home	Required residential unit parking spaces	Tandem parking is permitted in driveways; vehicles cannot encroach into public rights-of-way
Community Garden	None required.	
Continuing Care Retirement Community	**Studio:** 1 space/unit **1 Bedroom Unit:** 1.5 space/unit **2+ Bedroom Unit:** 2 spaces/unit; 1 space shall be covered Guest Parking: 1 space/3 units	
Duplex	2 spaces/unit; guest parking: 1 space/3 units	1 space shall be covered
Emergency Shelter	1 space/4 beds	
Farm Employee Housing, Large	1 space/unit	Space shall be covered
Farm Employee Housing, Small		
Live/Work Space or Live/Work Unit	Refer to live/work requirements under Section 20.340.040.F, Table 20.240-2	
Mobile/Manufactured Home	2 covered spaces/mobilehome; 1 guest space/6 mobilehomes	Tandem parking is permitted
Mobile/Manufactured Home Mini Park		

Mobile/Manufactured Home Park		
Multifamily Dwelling	**Studio:** 1 space/unit; **1 Bedroom Unit:** 1.5 space/unit **2+ Bedroom Unit*:** 2 spaces/unit; 1 space shall be covered Guest Parking: 1 space/3 units	*1 garage space shall be provided for condominiums, duplexes, townhomes, patio homes. Apartments shall provide one covered parking space (garage or carport) of the required ratio. Additional multifamily requirements are provided in Section 20.340.040.G
Multifamily Dwelling, Affordable Housing (deed restricted)	1.7 spaces/unit	Additional multifamily requirements are provided in Section 20.340.040.G
Non-Commercial Horticulture	None required.	
Planned Residential Development (PRD)	Sum of individual parking requirements for each use; residential parking by bedroom count	Chapter 20.435 (Planned Residential Development)
Private Residential Garage	None required.	
Recreational Vehicles (RVs)/Parks	To be determined by the Director during SDP or CUP review process.	
Residential Care Facility, Small & Large	1 space/3 residents	Provision of parking shall be based on the population served and level of care provided at the facility. Minimum requirements here are guidelines for establishing appropriate service levels on a case by case basis at time of SDP review
Rooming House	1 space/room; plus 2 spaces	
Senior/Age-Restricted Dwelling or Unit	1.25 spaces/unit	Satisfies resident and visitor parking
Single-Family Attached	2 spaces/unit	1 space shall be covered

in Table 9-6. The length of the sight triangle leg to the right needed for a left-turn maneuver by a passenger car onto the major road, shown as dimension *b* in the drawing on the right in Figure 9-17, is based on a time gap of 7.5 s. A sight triangle to the left is also needed for the left-turning vehicle to cross the near lane(s) of the major road on which traffic approaches from the left; the length of the leg of this sight triangle along the major road is shown as dimension *b* in the drawing to the left in Figure 9-17. This sight triangle to the left is normally provided by Case B2 for the right-turn maneuver (see below). In the rare case where a right-turn maneuver is not permitted onto a two-way street, Case B2 should still be provided so that sight distance is available for crossing the near lane(s) in a left-turn maneuver. In applying Table 9-6, it can usually be assumed that the minor-road vehicle is a passenger car. However, where substantial volumes of heavy vehicles enter the major road, such as from a ramp terminal, the use of tabulated values for single-unit or combination trucks should be considered.

Table 9-6 includes appropriate adjustments to the gap times for the number of lanes on the major road and for the approach grade of the minor road. The adjustment for the grade of the minor-road approach is needed only if the rear wheels of the design vehicle would be on an upgrade that exceeds 3 percent when the vehicle is at the stop line of the minor-road approach.

Table 9-6. Time Gap for Case B1, Left Turn from Stop

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	7.5
Single-unit truck	9.5
Combination truck	11.5

Note: Time gaps are for a stopped vehicle to turn left onto a two-lane highway with no median and with minor-road approach grades of 3 percent or less. The time gaps are applicable to determining sight distance to the right in left-turn maneuvers. The table values should be adjusted as follows:

For multilane roadways or medians—For left turns onto two-way roadways with more than two lanes, including turn lanes, add 0.5 s for passenger cars or 0.7 s for trucks for each additional lane, from the left, in excess of one, to be crossed by the turning vehicle. Median widths should be converted to an equivalent number of lanes in applying the 0.5 and 0.7 s criteria presented above; for example, an 18-ft [5.5-m] median is equivalent to one and a half lanes, and would require an additional 0.75 s for a passenger to cross and an additional 1.05 s for a truck to cross.

For minor-road approach grades—If the approach grade is an upgrade that exceeds 3 percent, add 0.2 s for each percent grade by which the approach grade exceeds zero percent.

The intersection sight distance along the major road (distance *b* in Figure 9-17) is determined by:

U.S. Customary	Metric
$ISD = 1.47\ V_{major}\ t_g$	$ISD = 0.278\ V_{major}\ t_g$ (9-1)
where:	where:
ISD = intersection sight distance (length of the leg of sight triangle along the major road) (ft)	ISD = intersection sight distance (length of the leg of sight triangle along the major road) (m)
V_{major} = design speed of major road (mph)	V_{major} = design speed of major road (km/h)
t_g = time gap for minor road vehicle to enter the major road (s)	t_g = time gap for minor road vehicle to enter the major road (s)

For example, a passenger car turning left onto a two-lane major road should be provided sight distance equivalent to a time gap of 7.5 s in major-road traffic. If the design speed of the major road is 60 mph [100 km/h], this corresponds to a sight distance of 1.47(60)(7.5) = 661.5 or 665 ft [0.278(100)(7.5) = 208.5 or 210 m], rounded for design.

A passenger car turning left onto a four-lane undivided roadway will need to cross two near lanes, rather than one. This increases the recommended gap in major-road traffic from 7.5 to 8.0 s. The corresponding value of sight distance for this example would be 706 ft [223 m]. If the minor-road approach to such an intersection is located on a 4 percent upgrade, then the time gap selected for intersection sight distance design for left turns should be increased from 8.0 to 8.8 s, equivalent to an increase of 0.2 s for each percent grade.

The design values for intersection sight distance for passenger cars are shown in Table 9-7.

No adjustment of the recommended sight distance values for the major-road grade is generally needed because both the major- and minor-road vehicle will be on the same grade when departing from the intersection. However, if the minor-road design vehicle is a heavy truck and the intersection is located near a sag vertical curve with grades over 3 percent, then an adjustment to extend the recommended sight distance based on the major-road grade should be considered.

Table 9-7. Design Intersection Sight Distance—Case B1, Left Turn from Stop

U.S. Customary				Metric			
Design Speed (mph)	Stopping Sight Distance (ft)	Intersection Sight Distance for Passenger Cars		Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (ft)	Design (ft)			Calculated (m)	Design (m)
15	80	165.4	170	20	20	41.7	45
20	115	220.5	225	30	35	62.6	65
25	155	275.6	280	40	50	83.4	85
30	200	330.8	335	50	65	104.3	105
35	250	385.9	390	60	85	125.1	130
40	305	441.0	445	70	105	146.0	150
45	360	496.1	500	80	130	166.8	170
50	425	551.3	555	90	160	187.7	190
55	495	606.4	610	100	185	208.5	210
60	570	661.5	665	110	220	229.4	230
65	645	716.6	720	120	250	250.2	255
70	730	771.8	775	130	285	271.1	275
75	820	826.9	830				
80	910	882.0	885				

Note: Intersection sight distance shown is for a stopped passenger car to turn left onto a two-lane highway with no median and grades 3 percent or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

Sight distance design for left turns at intersections on divided roads or streets should consider multiple design vehicles and median width. If the design vehicle used to determine sight distance for an intersection on a divided road or street is larger than a passenger car, then sight distance for left turns should be checked for that selected design vehicle and for a passenger car as well. If the median on a divided road or street is wide enough to store the design vehicle with a clearance to the through lanes of approximately 3 ft [1 m] at both ends of the vehicle, no separate analysis for the departure sight triangle for left turns is needed on the minor-road approach for the near roadway to the left. In most cases, the departure sight triangle for right turns (Case B2) will provide sufficient sight distance for a passenger car to cross the near roadway to reach the median. Possible exceptions are addressed in the discussion of Case B3.

If the design vehicle can be stored in the median with adequate clearance to the through lanes, a departure sight triangle to the right for left turns should be provided for that design vehicle turning left from the median roadway. Where the median is not wide enough to store the design vehicle, a departure sight triangle should be provided for that design vehicle to turn left from the minor-road approach.

The median width should be considered in determining the number of lanes to be crossed. The median width should be converted to equivalent lanes. For example, an 18-ft [5.5-m] median should be considered as one and a half additional lanes to be crossed in applying the multilane roadway adjustment for time gaps in Table 9-6. Furthermore, a departure sight triangle for left turns from the median roadway should be provided for the largest design vehicle that can be stored on the median roadway with adequate clearance to the through lanes.

If the sight distance along the major road shown in Figure 9-17, including any appropriate adjustments, cannot be provided, then consideration should be given to installing regulatory speed signing on the major-road approaches.

For left-turns onto a one-way roadway, time gaps based on Case B2 (see below) can be applied in determining the sight triangle needed for looking at vehicles approaching from the right.

9.5.3.2.2 Case B2—Right Turn from the Minor Road

A departure sight triangle for traffic approaching from the left like that shown in Figure 9-17 should be provided for right turns from the minor road onto the major road. The intersection sight distance for right turns is determined in the same manner as for Case B1, except that the time gaps (t_g) in Table 9-6 should be adjusted. Field observations indicate that, in making right turns, drivers generally accept gaps that are slightly shorter than those accepted in making left turns (*21*). The time gaps in Table 9-6 can be decreased by 1.0 s for right-turn maneuvers without undue interference with major-road traffic. These adjusted time gaps for the right turn from the minor road are shown in Table 9-8. Design values based on these adjusted time gaps are shown in Table 9-9 for passenger cars. This 1.0-s reduction in the time gap applies only where turns are limited to right turns; where left turns are also permitted, the time gaps for Case B1 from Table 9-5 apply. When the minimum recommended sight distance for a right-turn maneuver cannot be provided, even with the reduction of 1.0 s from the values in Table 9-6, consideration should be given to installing regulatory speed signing or other traffic control devices on the major-road approaches.

Table 9-8. Time Gap for Case B2—Right Turn from Stop

Design Vehicle	Time Gap (t_g)(s) at Design Speed of Major Road
Passenger car	6.5
Single-unit truck	8.5
Combination truck	10.5

Note: Time gaps are for a stopped vehicle to turn right onto or to cross a two-lane roadway with no median and with minor-road approach grades of 3 percent or less. The table values should be adjusted as follows:

For minor-road approach grades—If the approach grade is an upgrade that exceeds 3 percent, add 0.1 s for each percent grade by which the approach grade exceeds zero percent.

Table 9-9. Design Intersection Sight Distance—Case B2, Right Turn from Stop

U.S. Customary			
Design Speed (mph)	Stopping Sight Distance (ft)	Intersection Sight Distance for Passenger Cars	
		Calculated (ft)	Design (ft)
15	80	143.3	145
20	115	191.1	195
25	155	238.9	240
30	200	286.7	290
35	250	334.4	335
40	305	382.2	385
45	360	430.0	430
50	425	477.8	480
55	495	525.5	530
60	570	573.3	575
65	645	621.1	625
70	730	668.9	670
75	820	716.6	720
80	910	764.4	765

Metric			
Design Speed (km/h)	Stopping Sight Distance (m)	Intersection Sight Distance for Passenger Cars	
		Calculated (m)	Design (m)
20	20	36.1	40
30	35	54.2	55
40	50	72.3	75
50	65	90.4	95
60	85	108.4	110
70	105	126.5	130
80	130	144.6	145
90	160	162.6	165
100	185	180.7	185
110	220	198.8	200
120	250	216.8	220
130	285	234.9	235

Note: Intersection sight distance shown is for a stopped passenger car to turn right onto or to cross a two-lane roadway with no median and with grades of 3 percent or less. For other conditions, the time gap should be adjusted and the sight distance recalculated.

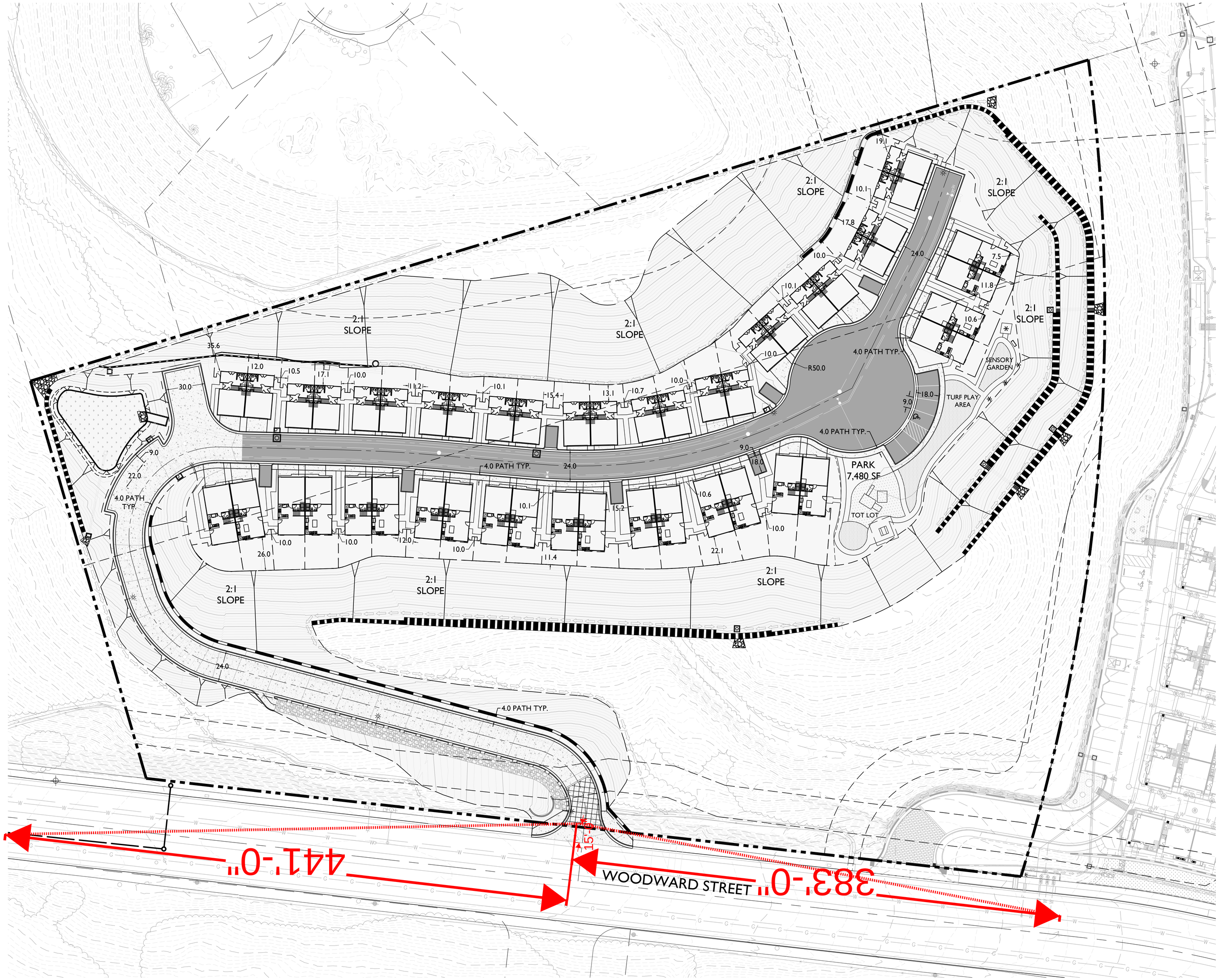
9.5.3.2.3 Case B3—Crossing Maneuver from the Minor Road

In most cases, the departure sight triangles for left and right turns onto the major road, as described for Cases B1 and B2, will also provide adequate sight distance for minor-road vehicles to cross the major road. However, in the following situations, it is advisable to check the availability of sight distance for crossing maneuvers:

- where left or right turns or both are not permitted from a particular approach and the crossing maneuver is the only legal maneuver;
- where the crossing vehicle would cross the equivalent width of more than six lanes; or
- where substantial volumes of heavy vehicles cross the roadway and steep grades that might slow the vehicle while its back portion is still in the intersection are present on the departure roadway on the far side of the intersection.

The equation for intersection sight distance in Case B1 (see Equation 9-1) is used again for the crossing maneuver except that time gaps (t_g) are the same as those for the Right Turn from Stop maneuver, which presents time gaps and appropriate adjustment factors to determine the intersection sight distance along the major road to accommodate crossing maneuvers. At divid-


Woodward St
441'
383'
Woodward St
N Twin Oaks Valley Rd
W Mission Rd
S14
E Mission Rd
E Mission Rd
E Mission Rd
Mission Terrace Ave
Mission Villas Rd



PROJECT SUMMARY

3-STORY DUPLEXES

HOMES	46 HOMES
GROSS AREA	8.57 ACRES GROSS
PAD AREA	2.7 ACRES NET
DENSITY	5.37 DU/AC (17 DU/AC NET)
LOT COVERAGE	10%

UNIT MIX

24	PLAN 1	3BD/3.5BA	1,585 SF
11	PLAN 2	3BD/3.5BA	1,900 SF
11	PLAN 3	3BD/3.5BA	1,900 SF

46 TOTAL UNITS

PARKING SUMMARY

REQUIRED

DUPLEX	46 DU X 2	92 SPACES
GUEST	46 DU X .33	16 SPACES
TOTAL REQUIRED		108 SPACES

PROVIDED

GARAGE	92 SPACES
OPEN	16 SPACES
TOTAL PROVIDED	108 SPACES

OPEN SPACE SUMMARY

COMMON OPEN SPACE

PLAN 1	24 X 262 SF	6,288 SF X 30%	1,886 SF
PLAN 2	11 X 488 SF	5,368 SF X 30%	1,610 SF
PLAN 3	11 X 488 SF	5,368 SF X 30%	1,610 SF
TOTAL REQUIRED			5,106 SF
TOTAL PROVIDED			7,480 SF

PRIVATE OPEN SPACE

DECK

REQUIRED	46 X 50 SF	2,300 SF

PROVIDED

PLAN 1	24 X 65 SF	1,560 SF
PLAN 2	11 X 540 SF	5,940 SF
PLAN 3	11 X 540 SF	5,940 SF
TOTAL PROVIDED		13,440 SF

GROUND FLOOR

REQUIRED	46 X 250 SF	11,500 SF
PROVIDED		24,935 SF

SAN MARCOS, CA

WOODWARD STREET

CONCEPTUAL SITE PLAN

CORNERSTONE COMMUNITIES
1241 CAVE STREET, STE. 200 | LA JOLLA, CA 92037
858.458.9700 EXT. 120

OCTOBER 26, 2022

SCALE: 0 30 60 90 N

SUMMA ARCHITECTURE
5256 S. Mission Road, Ste 404
Bonsall, CA 92003
760.724.1198 summarch.com

APPENDIX M

BUS ROUTE SCHEDULE AND MAP

305

Escondido to Vista via Mission Rd. & S. Santa Fe Ave.

Escondido a Vista vía Mission Rd. y S. Santa Fe Ave.

M-F • SA • SU
L-V • SÁ • DO

Destinations/Destinos

- Palomar College
- San Marcos Civic Center
- Mission Hills High School
- San Marcos Middle School
- Vista Transit Center
- Escondido Transit Center
- North Inland Live Well Center
- DMV

305 Escondido to Vista via Mission Rd. & S. Santa Fe Ave.

Escondido a Vista vía Mission Rd. y S. Santa Fe Ave.

See pg. 6 for Holiday schedules/Ver pág. 270 para obtener los horarios de días festivos

Monday - Friday
Eastbound to Escondido Transit Center
Lunes a Viernes • Dirección hacia el este al Centro de Tránsito Escondido

Vista Transit Center	S. Santa Fe & Civic Center Dr.	S. Santa Fe & Buena Creek Rd.	Palomar College Transit Center	Mission Rd. & San Marcos Bl.	Mission Rd. & Auto Pkwy.	Escondido Transit Center
1	**2**	**3**	**4**	**5**	**6**	**7**
4:32	4:36	4:41	4:50	4:54	5:00	5:08a
5:02	5:06	5:12	5:23	5:28	5:36	5:45
5:32	5:36	5:42	5:53	5:58	6:06	6:15
6:02	6:08	6:14	6:26	6:32	6:44	6:54
6:32	6:38	6:46	7:00	7:08	7:20	7:32
7:02	7:08	7:17	7:30	7:38	7:50	8:02
7:32	7:38	7:47	8:00	8:08	8:20	8:32
8:02	8:08	8:16	8:28	8:35	8:44	8:56
–	–	–	*8:42	*8:49	*8:58	*9:10
8:32	8:38	8:45	8:57	9:04	9:13	9:25
9:02	9:07	9:14	9:26	9:31	9:40	9:52
9:32	9:37	9:44	9:56	10:01	10:10	10:22
10:02	10:07	10:14	10:26	10:31	10:40	10:52
10:32	10:37	10:44	10:56	11:01	11:10	11:22
11:02	11:07	11:14	11:27	11:32	11:42	11:54
11:32	11:37	11:44	11:57	**12:02**	**12:12**	**12:24p**
12:02	**12:07**	**12:14**	**12:27**	**12:32**	**12:42**	**12:54**
12:32	**12:37**	**12:44**	**12:57**	**1:02**	**1:12**	**1:24**
1:02	**1:07**	**1:15**	**1:28**	**1:33**	**1:43**	**1:55**
1:32	**1:37**	**1:45**	**1:58**	**2:03**	**2:13**	**2:25**
2:02	**2:07**	**2:15**	**2:29**	**2:36**	**2:46**	**3:00**
2:32	**2:38**	**2:46**	**3:00**	**3:07**	**3:17**	**3:31**
3:02	**3:08**	**3:16**	**3:30**	**3:37**	**3:48**	**4:02**
3:32	**3:38**	**3:46**	**4:00**	**4:07**	**4:18**	**4:32**
4:02	**4:08**	**4:16**	**4:30**	**4:37**	**4:48**	**5:00**
4:32	**4:38**	**4:46**	**5:00**	**5:07**	**5:18**	**5:30**
5:02	**5:08**	**5:16**	**5:30**	**5:37**	**5:46**	**5:57**
5:32	**5:38**	**5:46**	**5:59**	**6:05**	**6:14**	**6:24**
6:02	**6:08**	**6:15**	**6:27**	**6:33**	**6:41**	**6:51**
6:32	**6:37**	**6:44**	**6:56**	**7:02**	**7:10**	**7:20**

* **Operates Tuesdays only.**
Opera solamente los Martes.

Please note, BREEZE "school tripper" bus service only runs while schools are in session for in-person learning and are subject to change based on bell times. NCTD will update trip planning applications and GoNCTD.com if this service changes.

Tenga en cuenta que el servicio de autobús "school tripper" de BREEZE solo funciona mientras las escuelas se encuentren abiertas para clases presenciales y está sujeto a cambios en función de los horarios de entrada y salida. El NCTD actualizará las aplicaciones de planificación de viaje y GoNCTD.com si este servicio cambia.

305 Escondido to Vista via Mission Rd. & S. Santa Fe Ave.

Escondido a Vista vía Mission Rd. y S. Santa Fe Ave.

See pg. 6 for Holiday schedules/Ver pág. 270 para obtener los horarios de días festivos

Monday - Friday
Eastbound to Escondido Transit Center
Lunes a Viernes • Dirección hacia el este al Centro de Tránsito Escondido

Vista Transit Center	S. Santa Fe & Civic Center Dr.	S. Santa Fe & Buena Creek Rd.	Palomar College Transit Center	Mission Rd. & San Marcos Bl.	Mission Rd. & Auto Pkwy.	Escondido Transit Center
1	2	3	4	5	6	7
7:02	7:07	7:14	7:25	7:30	7:38	7:46
7:32	7:37	7:44	7:55	8:00	8:08	8:16
8:02	8:07	8:12	8:22	8:27	8:34	8:42
8:32	8:37	8:42	8:52	8:57	9:04	9:12
9:02	9:07	9:12	9:22	9:27	9:34	9:42
9:32	9:37	9:42	9:52	9:57	10:04	10:12
10:02	10:07	10:12	10:22	10:27	10:33	10:41
11:12	11:16	11:21	11:30	11:34	11:39	11:47

305 Escondido to Vista via Mission Rd. & S. Santa Fe Ave.

Escondido a Vista vía Mission Rd. y S. Santa Fe Ave.

See pg. 6 for Holiday schedules/Ver pág. 270 para obtener los horarios de días festivos

Monday - Friday
Westbound to Vista Transit Center
Lunes a Viernes • Dirección hacia el oeste al Centro de Tránsito Vista

Escondido Transit Center	Mission Rd. & Auto Pkwy.	Mission Rd. & San Marcos Bl.	Palomar College Transit Center	S. Santa Fe & Buena Creek Rd.	S. Santa Fe & Civic Center Dr.	Vista Transit Center
7	**6**	**5**	**4**	**3**	**2**	**1**
4:21	4:27	4:32	4:37	4:44	4:49	4:56a
4:50	4:57	5:02	5:07	5:14	5:19	5:26
5:16	5:23	5:28	5:35	5:44	5:49	5:56
5:44	5:52	5:58	6:05	6:14	6:19	6:26
6:11	6:20	6:27	6:34	6:43	6:49	6:56
6:39	6:48	6:57	7:04	7:13	7:19	7:26
7:01	7:11	7:22	7:31	7:42	7:48	7:56
7:31	7:41	7:52	8:01	8:12	8:18	8:26
8:03	8:13	8:22	8:31	8:42	8:48	8:56
8:35	8:45	8:52	9:01	9:12	9:18	9:26
9:06	9:16	9:23	9:31	9:42	9:48	9:56
9:36	9:46	9:53	10:01	10:12	10:18	10:26
10:06	10:16	10:23	10:31	10:42	10:48	10:56
10:36	10:46	10:53	11:01	11:12	11:18	11:26
11:06	11:16	11:23	11:31	11:42	11:48	11:56
11:34	11:44	11:51	**12:00**	**12:11**	**12:18**	**12:26p**
12:03	**12:13**	**12:21**	**12:30**	**12:41**	**12:48**	**12:56**
12:33	**12:43**	**12:51**	**1:00**	**1:11**	**1:18**	**1:26**
1:03	**1:13**	**1:21**	**1:30**	**1:41**	**1:48**	**1:56**
–	***1:21**	***1:29**	***1:38**	**1:49***	***1:56**	***2:04**
1:33	**1:43**	**1:51**	**2:00**	**2:11**	**2:18**	**2:26**
1:57	**2:07**	**2:15**	**2:24**	**2:39**	**2:46**	**2:56**
–	****2:22**	****2:30**	****2:39**	****2:54**	****3:01**	****3:13**
2:26	**2:36**	**2:45**	**2:54**	**3:09**	**3:16**	**3:26**
2:51	**3:01**	**3:13**	**3:22**	**3:39**	**3:46**	**3:56**
3:21	**3:31**	**3:43**	**3:52**	**4:09**	**4:16**	**4:26**
3:51	**4:01**	**4:13**	**4:22**	**4:39**	**4:46**	**4:56**
4:23	**4:32**	**4:43**	**4:52**	**5:09**	**5:16**	**5:26**
4:54	**5:03**	**5:14**	**5:23**	**5:40**	**5:47**	**5:57**

* **Operates Wednesdays only.**
Opera solamente los Miércoles.

** **Operates Monday, Tuesday, Thursday, and Friday.**
Opera Lunes, Martes, Jueves y Viernes.

Please note, BREEZE "school tripper" bus service only runs while schools are in session for in-person learning and are subject to change based on bell times. NCTD will update trip planning applications and GoNCTD.com when this service returns.

Tenga en cuenta que el servicio de autobús "school tripper" de BREEZE solo funciona mientras las escuelas se encuentren abiertas para clases presenciales y está sujeto a cambios en función de los horarios de entrada y salida. El NCTD actualizará las aplicaciones de planificación de viaje y GoNCTD.com cuando el servicio se reanude.

305 Escondido to Vista via Mission Rd. & S. Santa Fe Ave.

Escondido a Vista vía Mission Rd. y S. Santa Fe Ave.

See pg. 6 for Holiday schedules/Ver pág. 270 para obtener los horarios de días festivos

Monday - Friday
Westbound to Vista Transit Center
Lunes a Viernes • Dirección hacia el oeste al Centro de Tránsito Vista

Escondido Transit Center	Mission Rd. & Auto Pkwy.	Mission Rd. & San Marcos Bl.	Palomar College Transit Center	S. Santa Fe & Buena Creek Rd.	S. Santa Fe & Civic Center Dr.	Vista Transit Center
7	**6**	**5**	**4**	**3**	**2**	**1**
5:29	5:38	5:48	5:55	6:10	6:17	6:26
6:03	6:12	6:21	6:28	6:41	6:48	6:56
6:38	6:46	6:55	7:02	7:12	7:18	7:26
7:12	7:20	7:27	7:34	7:44	7:49	7:56
7:42	7:50	7:57	8:04	8:14	8:19	8:26
8:13	8:21	8:28	8:35	8:44	8:49	8:56
8:43	8:51	8:58	9:05	9:14	9:19	9:26
9:14	9:22	9:29	9:36	9:44	9:49	9:56
9:53	10:00	10:07	10:14	10:22	10:27	10:34
10:33	10:39	10:45	10:50	10:57	11:01	11:08

305 Escondido to Vista via Mission Rd. & S. Santa Fe Ave.

Escondido a Vista vía Mission Rd. y S. Santa Fe Ave.

See pg. 6 for Holiday schedules/Ver pág. 270 para obtener los horarios de días festivos

Saturday & Sunday
Eastbound to Escondido Transit Center
Sábado y Domingo • Dirección hacia el este al Centro de Tránsito Escondido

Vista Transit Center	S. Santa Fe & Civic Center Dr.	S. Santa Fe & Buena Creek Rd.	Palomar College Transit Center	Mission Rd. & San Marcos Bl.	Mission Rd. & Auto Pkwy.	Escondido Transit Center
1	2	3	4	5	6	7
5:32	5:38	5:43	5:51	5:55	6:03	6:09a
6:02	6:08	6:13	6:21	6:25	6:33	6:39
6:32	6:38	6:43	6:51	6:56	7:04	7:10
7:02	7:08	7:13	7:21	7:26	7:34	7:41
7:32	7:38	7:44	7:54	7:59	8:07	8:14
8:02	8:08	8:14	8:24	8:29	8:37	8:45
8:32	8:38	8:44	8:54	8:59	9:07	9:15
9:02	9:08	9:14	9:24	9:29	9:38	9:47
9:32	9:39	9:45	9:55	10:00	10:09	10:18
10:02	10:09	10:15	10:25	10:30	10:39	10:48
10:32	10:39	10:45	10:55	11:00	11:10	11:19
11:02	11:09	11:15	11:25	11:30	11:40	11:49
11:32	11:39	11:45	11:55	**12:00**	**12:10**	**12:19p**
12:02	**12:09**	**12:15**	**12:25**	**12:30**	**12:38**	**12:47**
12:32	**12:39**	**12:45**	**12:55**	**1:00**	**1:08**	**1:17**
1:02	**1:09**	**1:15**	**1:25**	**1:30**	**1:38**	**1:47**
1:32	**1:39**	**1:45**	**1:55**	**2:00**	**2:08**	**2:17**
2:02	**2:09**	**2:15**	**2:24**	**2:30**	**2:38**	**2:47**
2:32	**2:39**	**2:45**	**2:54**	**3:00**	**3:08**	**3:17**
3:02	**3:09**	**3:15**	**3:24**	**3:30**	**3:38**	**3:47**
3:32	**3:39**	**3:45**	**3:54**	**4:00**	**4:08**	**4:17**
4:02	**4:09**	**4:15**	**4:24**	**4:30**	**4:38**	**4:47**
4:32	**4:39**	**4:45**	**4:54**	**5:00**	**5:08**	**5:17**
5:02	**5:09**	**5:15**	**5:24**	**5:30**	**5:37**	**5:46**
5:32	**5:39**	**5:45**	**5:54**	**5:59**	**6:06**	**6:14**
6:02	**6:09**	**6:15**	**6:24**	**6:29**	**6:36**	**6:44**
6:32	**6:39**	**6:45**	**6:54**	**6:59**	**7:06**	**7:14**
7:02	**7:09**	**7:14**	**7:22**	**7:27**	**7:34**	**7:42**
7:32	**7:39**	**7:44**	**7:52**	**7:57**	**8:04**	**8:11**
8:02	**8:09**	**8:14**	**8:22**	**8:27**	**8:34**	**8:41**
8:32	**8:38**	**8:43**	**8:51**	**8:55**	**9:02**	**9:09**
9:02	**9:08**	**9:13**	**9:21**	**9:25**	**9:32**	**9:39**
9:32	**9:38**	**9:43**	**9:51**	**9:55**	**10:02**	**10:09**
10:02	**10:08**	**10:13**	**10:21**	**10:25**	**10:31**	**10:37**
11:12	**11:18**	**11:23**	**11:31**	**11:35**	**11:41**	**11:47**

305 Escondido to Vista via Mission Rd. & S. Santa Fe Ave.

Escondido a Vista vía Mission Rd. y S. Santa Fe Ave.

See pg. 6 for Holiday schedules/Ver pág. 270 para obtener los horarios de días festivos

Saturday & Sunday
Westbound to Vista Transit Center
Sábado y Domingo • Dirección hacia el oeste al Centro de Tránsito Vista

Escondido Transit Center	Mission Rd. & Auto Pkwy.	Mission Rd. & San Marcos Bl.	Palomar College Transit Center	S. Santa Fe & Buena Creek Rd.	S. Santa Fe & Civic Center Dr.	Vista Transit Center
7	**6**	**5**	**4**	**3**	**2**	**1**
5:16	5:24	5:29	5:34	5:43	5:49	5:55a
5:46	5:54	5:59	6:04	6:13	6:19	6:25
6:15	6:23	6:28	6:33	6:42	6:48	6:54
6:43	6:52	6:58	7:03	7:13	7:19	7:25
7:11	7:21	7:27	7:32	7:42	7:48	7:55
7:40	7:50	7:56	8:01	8:11	8:17	8:24
8:09	8:19	8:25	8:30	8:40	8:47	8:55
8:38	8:48	8:55	9:00	9:11	9:18	9:26
9:07	9:17	9:24	9:29	9:40	9:47	9:55
9:37	9:47	9:54	9:59	10:10	10:17	10:25
10:07	10:17	10:24	10:29	10:40	10:47	10:55
10:37	10:47	10:54	10:59	11:10	11:17	11:25
11:07	11:17	11:24	11:29	11:40	11:47	11:55
11:37	11:47	11:54	11:59	**12:10**	**12:17**	**12:25p**
12:06	**12:16**	**12:23**	**12:28**	**12:39**	**12:46**	**12:54**
12:36	**12:46**	**12:53**	**12:58**	**1:09**	**1:16**	**1:24**
1:06	**1:16**	**1:23**	**1:28**	**1:39**	**1:46**	**1:54**
1:36	**1:46**	**1:53**	**1:58**	**2:09**	**2:16**	**2:24**
2:06	**2:16**	**2:23**	**2:28**	**2:39**	**2:46**	**2:54**
2:36	**2:46**	**2:53**	**2:58**	**3:09**	**3:16**	**3:24**
3:06	**3:16**	**3:23**	**3:28**	**3:39**	**3:46**	**3:54**
3:36	**3:46**	**3:53**	**3:58**	**4:09**	**4:16**	**4:24**
4:06	**4:16**	**4:23**	**4:28**	**4:39**	**4:46**	**4:54**
4:36	**4:46**	**4:53**	**4:58**	**5:09**	**5:16**	**5:24**
5:07	**5:17**	**5:24**	**5:29**	**5:40**	**5:47**	**5:55**
5:38	**5:48**	**5:55**	**6:00**	**6:11**	**6:17**	**6:24**
6:10	**6:19**	**6:26**	**6:31**	**6:41**	**6:47**	**6:54**
6:41	**6:50**	**6:56**	**7:01**	**7:11**	**7:17**	**7:24**
7:12	**7:21**	**7:27**	**7:32**	**7:42**	**7:48**	**7:55**
7:42	**7:51**	**7:57**	**8:02**	**8:12**	**8:18**	**8:24**
8:13	**8:22**	**8:28**	**8:33**	**8:43**	**8:49**	**8:55**
8:44	**8:51**	**8:57**	**9:02**	**9:12**	**9:18**	**9:24**
9:15	**9:22**	**9:28**	**9:32**	**9:40**	**9:46**	**9:52**
10:33	**10:40**	**10:46**	**10:50**	**10:58**	**11:04**	**11:09**

SPRINTER SCHEDULE

Schedule subject to change / Los horarios están sujetos a cambios

EASTBOUND — OCEANSIDE TO ESCONDIDO

MONDAY-SUNDAY (Half-shaded boxes indicate NO SATURDAY, SUNDAY, or HOLIDAY service)

STATIONS	READ DOWN	30 MIN FREQUENCY																
Oceanside Transit Center	↓	:03 | :33	4:03a	4:33a	5:03a	5:33a	6:03a	6:33a	7:03a	7:33a	8:03a	8:33a	9:03a	9:33a	10:03a	10:33a	11:03a	11:33a
Coast Highway	↓	:05 | :35	4:05a	4:35a	5:05a	5:35a	6:05a	6:35a	7:05a	7:35a	8:05a	8:35a	9:05a	9:35a	10:05a	10:35a	11:05a	11:35a
Crouch Street	↓	:07 | :37	4:07a	4:37a	5:07a	5:37a	6:07a	6:37a	7:07a	7:37a	8:07a	8:37a	9:07a	9:37a	10:07a	10:37a	11:07a	11:37a
El Camino Real	↓	:11 | :41	4:11a	4:41a	5:11a	5:41a	6:11a	6:41a	7:11a	7:41a	8:11a	8:41a	9:11a	9:41a	10:11a	10:41a	11:11a	11:41a
Rancho Del Oro	↓	:14 | :44	4:14a	4:44a	5:14a	5:44a	6:14a	6:44a	7:14a	7:44a	8:14a	8:44a	9:14a	9:44a	10:14a	10:44a	11:14a	11:44a
College Boulevard	↓	:17 | :47	4:17a	4:47a	5:17a	5:47a	6:17a	6:47a	7:17a	7:47a	8:17a	8:47a	9:17a	9:47a	10:17a	10:47a	11:17a	11:47a
Melrose Drive	↓	:22 | :52	4:22a	4:52a	5:22a	5:52a	6:22a	6:52a	7:22a	7:52a	8:22a	8:52a	9:22a	9:52a	10:22a	10:52a	11:22a	11:52a
Vista Transit Center	↓	:26 | :56	4:26a	4:56a	5:26a	5:56a	6:26a	6:56a	7:26a	7:56a	8:26a	8:56a	9:26a	9:56a	10:26a	10:56a	11:26a	11:56a
Civic Center-Vista	↓	:29 | :59	4:29a	4:59a	5:29a	5:59a	6:29a	6:59a	7:29a	7:59a	8:29a	8:59a	9:29a	9:59a	10:29a	10:59a	11:29a	11:59a
Buena Creek	↓	:35 | :05	4:35a	5:05a	5:35a	6:05a	6:35a	7:05a	7:35a	8:05a	8:35a	9:05a	9:35a	10:05a	10:35a	11:05a	11:35a	12:05p
Palomar College	↓	:40 | :10	4:40a	5:10a	5:40a	6:10a	6:40a	7:10a	7:40a	8:10a	8:40a	9:10a	9:40a	10:10a	10:40a	11:10a	11:40a	12:10p
San Marcos Civic Center	↓	:43 | :13	4:43a	5:13a	5:43a	6:13a	6:43a	7:13a	7:43a	8:13a	8:43a	9:13a	9:43a	10:13a	10:43a	11:13a	11:43a	12:13p
Cal State San Marcos	↓	:46 | :16	4:46a	5:16a	5:46a	6:16a	6:46a	7:16a	7:46a	8:16a	8:46a	9:16a	9:46a	10:16a	10:46a	11:16a	11:46a	12:16p
Nordahl Road	↓	:51 | :21	4:51a	5:21a	5:51a	6:21a	6:51a	7:21a	7:51a	8:21a	8:51a	9:21a	9:51a	10:21a	10:51a	11:21a	11:51a	12:21p
Escondido Transit Center	↓	:56 | :26	4:56a	5:26a	5:56a	6:26a	6:56a	7:26a	7:56a	8:26a	8:56a	9:26a	9:56a	10:26a	10:56a	11:26a	11:56a	12:26p

STATIONS																		
Oceanside Transit Center	12:03p	12:33p	1:03p	1:33p	2:03p	2:33p	3:03p	3:33p	4:03p	4:33p	5:03p	5:33p	6:03p	6:33p	7:03p	7:33p	8:03p	8:33p
Coast Highway	12:05p	12:35p	1:05p	1:35p	2:05p	2:35p	3:05p	3:35p	4:05p	4:35p	5:05p	5:35p	6:05p	6:35p	7:05p	7:35p	8:05p	8:35p
Crouch Street	12:07p	12:37p	1:07p	1:37p	2:07p	2:37p	3:07p	3:37p	4:07p	4:37p	5:07p	5:37p	6:07p	6:37p	7:07p	7:37p	8:07p	8:37p
El Camino Real	12:11p	12:41p	1:11p	1:41p	2:11p	2:41p	3:11p	3:41p	4:11p	4:41p	5:11p	5:41p	6:11p	6:41p	7:11p	7:41p	8:11p	8:41p
Rancho Del Oro	12:14p	12:44p	1:14p	1:44p	2:14p	2:44p	3:14p	3:44p	4:14p	4:44p	5:14p	5:44p	6:14p	6:44p	7:14p	7:44p	8:14p	8:44p
College Boulevard	12:17p	12:47p	1:17p	1:47p	2:17p	2:47p	3:17p	3:47p	4:17p	4:47p	5:17p	5:47p	6:17p	6:47p	7:17p	7:47p	8:17p	8:47p
Melrose Drive	12:22p	12:52p	1:22p	1:52p	2:22p	2:52p	3:22p	3:52p	4:22p	4:52p	5:22p	5:52p	6:22p	6:52p	7:22p	7:52p	8:22p	8:52p
Vista Transit Center	12:26p	12:56p	1:26p	1:56p	2:26p	2:56p	3:26p	3:56p	4:26p	4:56p	5:26p	5:56p	6:26p	6:56p	7:26p	7:56p	8:26p	8:56p
Civic Center-Vista	12:29p	12:59p	1:29p	1:59p	2:29p	2:59p	3:29p	3:59p	4:29p	4:59p	5:29p	5:59p	6:29p	6:59p	7:29p	7:59p	8:29p	8:59p
Buena Creek	12:35p	1:05p	1:35p	2:05p	2:35p	3:05p	3:35p	4:05p	4:35p	5:05p	5:35p	6:05p	6:35p	7:05p	7:35p	8:05p	8:35p	9:05p
Palomar College	12:40p	1:10p	1:40p	2:10p	2:40p	3:10p	3:40p	4:10p	4:40p	5:10p	5:40p	6:10p	6:40p	7:10p	7:40p	8:10p	8:40p	9:10p
San Marcos Civic Center	12:43p	1:13p	1:43p	2:13p	2:43p	3:13p	3:43p	4:13p	4:43p	5:13p	5:43p	6:13p	6:43p	7:13p	7:43p	8:13p	8:43p	9:13p
Cal State San Marcos	12:46p	1:16p	1:46p	2:16p	2:46p	3:16p	3:46p	4:16p	4:46p	5:16p	5:46p	6:16p	6:46p	7:16p	7:46p	8:16p	8:46p	9:16p
Nordahl Road	12:51p	1:21p	1:51p	2:21p	2:51p	3:21p	3:51p	4:21p	4:51p	5:21p	5:51p	6:21p	6:51p	7:21p	7:51p	8:21p	8:51p	9:21p
Escondido Transit Center	12:56p	1:26p	1:56p	2:26p	2:56p	3:26p	3:56p	4:26p	4:56p	5:26p	5:56p	6:26p	6:56p	7:26p	7:56p	8:26p	8:56p	9:26p

EASTBOUND — FRIDAY NIGHT ONLY

STATIONS						
Oceanside Transit Center	9:03p	9:33p	10:03p	10:33p	11:03p	11:33p
Coast Highway	9:05p	9:35p	10:05p	10:35p	11:05p	11:35p
Crouch Street	9:07p	9:37p	10:07p	10:37p	11:07p	11:37p
El Camino Real	9:11p	9:41p	10:11p	10:41p	11:11p	11:41p
Rancho Del Oro	9:14p	9:44p	10:14p	10:44p	11:14p	11:44p
College Boulevard	9:17p	9:47p	10:17p	10:47p	11:17p	11:47p
Melrose Drive	9:22p	9:52p	10:22p	10:52p	11:22p	11:52p
Vista Transit Center	9:26p	9:56p	10:26p	10:56p	11:26p	11:56p
Civic Center-Vista	9:29p	9:59p	10:29p	10:59p	11:29p	11:59p
Buena Creek	9:35p	10:05p	10:35p	11:05p	11:35p	12:05a
Palomar College	9:40p	10:10p	10:40p	11:10p	11:40p	12:10a
San Marcos Civic Center	9:43p	10:13p	10:43p	11:13p	11:43p	12:13a
Cal State San Marcos	9:46p	10:16p	10:46p	11:16p	11:46p	12:16a
Nordahl Road	9:51p	10:21p	10:51p	11:21p	11:51p	12:21a
Escondido Transit Center	9:56p	10:26p	10:56p	11:26p	11:56p	12:26a

EB — SATURDAY NIGHT ONLY

STATIONS			
Oceanside Transit Center	9:33p	10:33p	11:33p
Coast Highway	9:35p	10:35p	11:35p
Crouch Street	9:37p	10:37p	11:37p
El Camino Real	9:41p	10:41p	11:41p
Rancho Del Oro	9:44p	10:44p	11:44p
College Boulevard	9:47p	10:47p	11:47p
Melrose Drive	9:52p	10:52p	11:52p
Vista Transit Center	9:56p	10:56p	11:56p
Civic Center-Vista	9:59p	10:59p	11:59p
Buena Creek	10:05p	11:05p	12:05a
Palomar College	10:10p	11:10p	12:10a
San Marcos Civic Center	10:13p	11:13p	12:13a
Cal State San Marcos	10:16p	11:16p	12:16a
Nordahl Road	10:21p	11:21p	12:21a
Escondido Transit Center	10:26p	11:26p	12:26a

WESTBOUND — ESCONDIDO TO OCEANSIDE

MONDAY-SUNDAY (Half-shaded boxes indicate NO SATURDAY, SUNDAY, or HOLIDAY service)

STATIONS	READ DOWN	30 MIN FREQUENCY																
Escondido Transit Center	↓	:03 | :33	4:03a	4:33a	5:03a	5:33a	6:03a	6:33a	7:03a	7:33a	8:03a	8:33a	9:03a	9:33a	10:03a	10:33a	11:03a	11:33a
Nordahl Road	↓	:06 | :36	4:06a	4:36a	5:06a	5:36a	6:06a	6:36a	7:06a	7:36a	8:06a	8:36a	9:06a	9:36a	10:06a	10:36a	11:06a	11:36a
Cal State San Marcos	↓	:11 | :41	4:11a	4:41a	5:11a	5:41a	6:11a	6:41a	7:11a	7:41a	8:11a	8:41a	9:11a	9:41a	10:11a	10:41a	11:11a	11:41a
San Marcos Civic Center	↓	:14 | :44	4:14a	4:44a	5:14a	5:44a	6:14a	6:44a	7:14a	7:44a	8:14a	8:44a	9:14a	9:44a	10:14a	10:44a	11:14a	11:44a
Palomar College	↓	:17 | :47	4:17a	4:47a	5:17a	5:47a	6:17a	6:47a	7:17a	7:47a	8:17a	8:47a	9:17a	9:47a	10:17a	10:47a	11:17a	11:47a
Buena Creek	↓	:22 | :52	4:22a	4:52a	5:22a	5:52a	6:22a	6:52a	7:22a	7:52a	8:22a	8:52a	9:22a	9:52a	10:22a	10:52a	11:22a	11:52a
Civic Center-Vista	↓	:27 | :57	4:27a	4:57a	5:27a	5:57a	6:27a	6:57a	7:27a	7:57a	8:27a	8:57a	9:27a	9:57a	10:27a	10:57a	11:27a	11:57a
Vista Transit Center	↓	:30 | :00	4:30a	5:00a	5:30a	6:00a	6:30a	7:00a	7:30a	8:00a	8:30a	9:00a	9:30a	10:00a	10:30a	11:00a	11:30a	12:00p
Melrose Drive	↓	:35 | :05	4:35a	5:05a	5:35a	6:05a	6:35a	7:05a	7:35a	8:05a	8:35a	9:05a	9:35a	10:05a	10:35a	11:05a	11:35a	12:05p
College Boulevard	↓	:40 | :10	4:40a	5:10a	5:40a	6:10a	6:40a	7:10a	7:40a	8:10a	8:40a	9:10a	9:40a	10:10a	10:40a	11:10a	11:40a	12:10p
Rancho Del Oro	↓	:43 | :13	4:43a	5:13a	5:43a	6:13a	6:43a	7:13a	7:43a	8:13a	8:43a	9:13a	9:43a	10:13a	10:43a	11:13a	11:43a	12:13p
El Camino Real	↓	:46 | :16	4:46a	5:16a	5:46a	6:16a	6:46a	7:16a	7:46a	8:16a	8:46a	9:16a	9:46a	10:16a	10:46a	11:16a	11:46a	12:16p
Crouch Street	↓	:49 | :19	4:49a	5:19a	5:49a	6:19a	6:49a	7:19a	7:49a	8:19a	8:49a	9:19a	9:49a	10:19a	10:49a	11:19a	11:49a	12:19p
Coast Highway	↓	:52 | :22	4:52a	5:22a	5:52a	6:22a	6:52a	7:22a	7:52a	8:22a	8:52a	9:22a	9:52a	10:22a	10:52a	11:22a	11:52a	12:22p
Oceanside Transit Center	↓	:56 | :26	4:56a	5:26a	5:56a	6:26a	6:56a	7:26a	7:56a	8:26a	8:56a	9:26a	9:56a	10:26a	10:56a	11:26a	11:56a	12:26p

STATIONS																		
Escondido Transit Center	12:03p	12:33p	1:03p	1:33p	2:03p	2:33p	3:03p	3:33p	4:03p	4:33p	5:03p	5:33p	6:03p	6:33p	7:03p	7:33p	8:03p	8:33p
Nordahl Road	12:06p	12:36p	1:06p	1:36p	2:06p	2:36p	3:06p	3:36p	4:06p	4:36p	5:06p	5:36p	6:06p	6:36p	7:06p	7:36p	8:06p	8:36p
Cal State San Marcos	12:11p	12:41p	1:11p	1:41p	2:11p	2:41p	3:11p	3:41p	4:11p	4:41p	5:11p	5:41p	6:11p	6:41p	7:11p	7:41p	8:11p	8:41p
San Marcos Civic Center	12:14p	12:44p	1:14p	1:44p	2:14p	2:44p	3:14p	3:44p	4:14p	4:44p	5:14p	5:44p	6:14p	6:44p	7:14p	7:44p	8:14p	8:44p
Palomar College	12:17p	12:47p	1:17p	1:47p	2:17p	2:47p	3:17p	3:47p	4:17p	4:47p	5:17p	5:47p	6:17p	6:47p	7:17p	7:47p	8:17p	8:47p
Buena Creek	12:22p	12:52p	1:22p	1:52p	2:22p	2:52p	3:22p	3:52p	4:22p	4:52p	5:22p	5:52p	6:22p	6:52p	7:22p	7:52p	8:22p	8:52p
Civic Center-Vista	12:27p	12:57p	1:27p	1:57p	2:27p	2:57p	3:27p	3:57p	4:27p	4:57p	5:27p	5:57p	6:27p	6:57p	7:27p	7:57p	8:27p	8:57p
Vista Transit Center	12:30p	1:00p	1:30p	2:00p	2:30p	3:00p	3:30p	4:00p	4:30p	5:00p	5:30p	6:00p	6:30p	7:00p	7:30p	8:00p	8:30p	9:00p
Melrose Drive	12:35p	1:05p	1:35p	2:05p	2:35p	3:05p	3:35p	4:05p	4:35p	5:05p	5:35p	6:05p	6:35p	7:05p	7:35p	8:05p	8:35p	9:05p
College Boulevard	12:40p	1:10p	1:40p	2:10p	2:40p	3:10p	3:40p	4:10p	4:40p	5:10p	5:40p	6:10p	6:40p	7:10p	7:40p	8:10p	8:40p	9:10p
Rancho Del Oro	12:43p	1:13p	1:43p	2:13p	2:43p	3:13p	3:43p	4:13p	4:43p	5:13p	5:43p	6:13p	6:43p	7:13p	7:43p	8:13p	8:43p	9:13p
El Camino Real	12:46p	1:16p	1:46p	2:16p	2:46p	3:16p	3:46p	4:16p	4:46p	5:16p	5:46p	6:16p	6:46p	7:16p	7:46p	8:16p	8:46p	9:16p
Crouch Street	12:49p	1:19p	1:49p	2:19p	2:49p	3:19p	3:49p	4:19p	4:49p	5:19p	5:49p	6:19p	6:49p	7:19p	7:49p	8:19p	8:49p	9:19p
Coast Highway	12:52p	1:22p	1:52p	2:22p	2:52p	3:22p	3:52p	4:22p	4:52p	5:22p	5:52p	6:22p	6:52p	7:22p	7:52p	8:22p	8:52p	9:22p
Oceanside Transit Center	12:56p	1:26p	1:56p	2:26p	2:56p	3:26p	3:56p	4:26p	4:56p	5:26p	5:56p	6:26p	6:56p	7:26p	7:56p	8:26p	8:56p	9:26p

WESTBOUND — FRIDAY NIGHT ONLY

STATIONS				
Escondido Transit Center	9:03p	9:33p	10:03p	10:33p
Nordahl Road	9:06p	9:36p	10:06p	10:36p
Cal State San Marcos	9:11p	9:41p	10:11p	10:41p
San Marcos Civic Center	9:14p	9:44p	10:14p	10:44p
Palomar College	9:17p	9:47p	10:17p	10:47p
Buena Creek	9:22p	9:52p	10:22p	10:52p
Civic Center-Vista	9:27p	9:57p	10:27p	10:57p
Vista Transit Center	9:30p	10:00p	10:30p	11:00p
Melrose Drive	9:35p	10:05p	10:35p	11:05p
College Boulevard	9:40p	10:10p	10:40p	11:10p
Rancho Del Oro	9:43p	10:13p	10:43p	11:13p
El Camino Real	9:46p	10:16p	10:46p	11:16p
Crouch Street	9:49p	10:19p	10:49p	11:19p
Coast Highway	9:52p	10:22p	10:52p	11:22p
Oceanside Transit Center	9:56p	10:26p	10:56p	11:26p

WB — SAT NIGHT ONLY

STATIONS		
Escondido Transit Center	9:33p	10:33p
Nordahl Road	9:36p	10:36p
Cal State San Marcos	9:41p	10:41p
San Marcos Civic Center	9:44p	10:44p
Palomar College	9:47p	10:47p
Buena Creek	9:52p	10:52p
Civic Center-Vista	9:57p	10:57p
Vista Transit Center	10:00p	11:00p
Melrose Drive	10:05p	11:05p
College Boulevard	10:10p	11:10p
Rancho Del Oro	10:13p	11:13p
El Camino Real	10:16p	11:16p
Crouch Street	10:19p	11:19p
Coast Highway	10:22p	11:22p
Oceanside Transit Center	10:26p	11:26p

- **Monday - Sunday 7 days a week service/**Lunes - domingo servicio los 7 días a la semana
- **Monday - Friday ONLY. Service does not run on Saturday, Sunday, and Holidays/**Lunes - viernes ÚNICAMENTE. El servicio no funciona los sábados, domingos, ni en días festivos
- **Friday night service ONLY/**Servicio el viernes en la noche ÚNICAMENTE
- **Saturday night service ONLY/**Servicio el sábado en la noche ÚNICAMENTE

Holiday SPRINTER Schedule

Saturday Schedule
- Memorial Day
- Independence Day
- Labor Day

Sunday Schedule
- New Year's Day
- Thanksgiving Day
- Christmas Day

Schedule subject to change.

Horario Festivo de SPRINTER

Horario del sábado
- Día de la Recordación
- Día de la Independencia
- Día del Trabajo

Horario del domingo
- Año Nuevo
- Día de Acción de Gracias
- Día de Navidad

Los horarios están sujetos a cambios.

NORTH COUNTY TRANSIT DISTRICT
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SPRINTER STATIONS

W — OCEANSIDE TRANSIT CENTER — COAST HIGHWAY — CROUCH STREET — EL CAMINO REAL — RANCHO DEL ORO — COLLEGE BOULEVARD — MELROSE DRIVE — VISTA TRANSIT CENTER — CIVIC CENTER-VISTA — BUENA CREEK — PALOMAR COLLEGE — SAN MARCOS CIVIC CENTER — CAL STATE SAN MARCOS — NORDAHL ROAD — ESCONDIDO TRANSIT CENTER — E