

Appendix J

Transportation Impact Analysis

TRANSPORTATION IMPACT ANALYSIS

SUNRISE PROJECT

San Marcos, California
December 10, 2019

LLG Ref. 3-17-2835

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APPENDIX

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TRANSPORTATION IMPACT ANALYSIS

SUNRISE PROJECT

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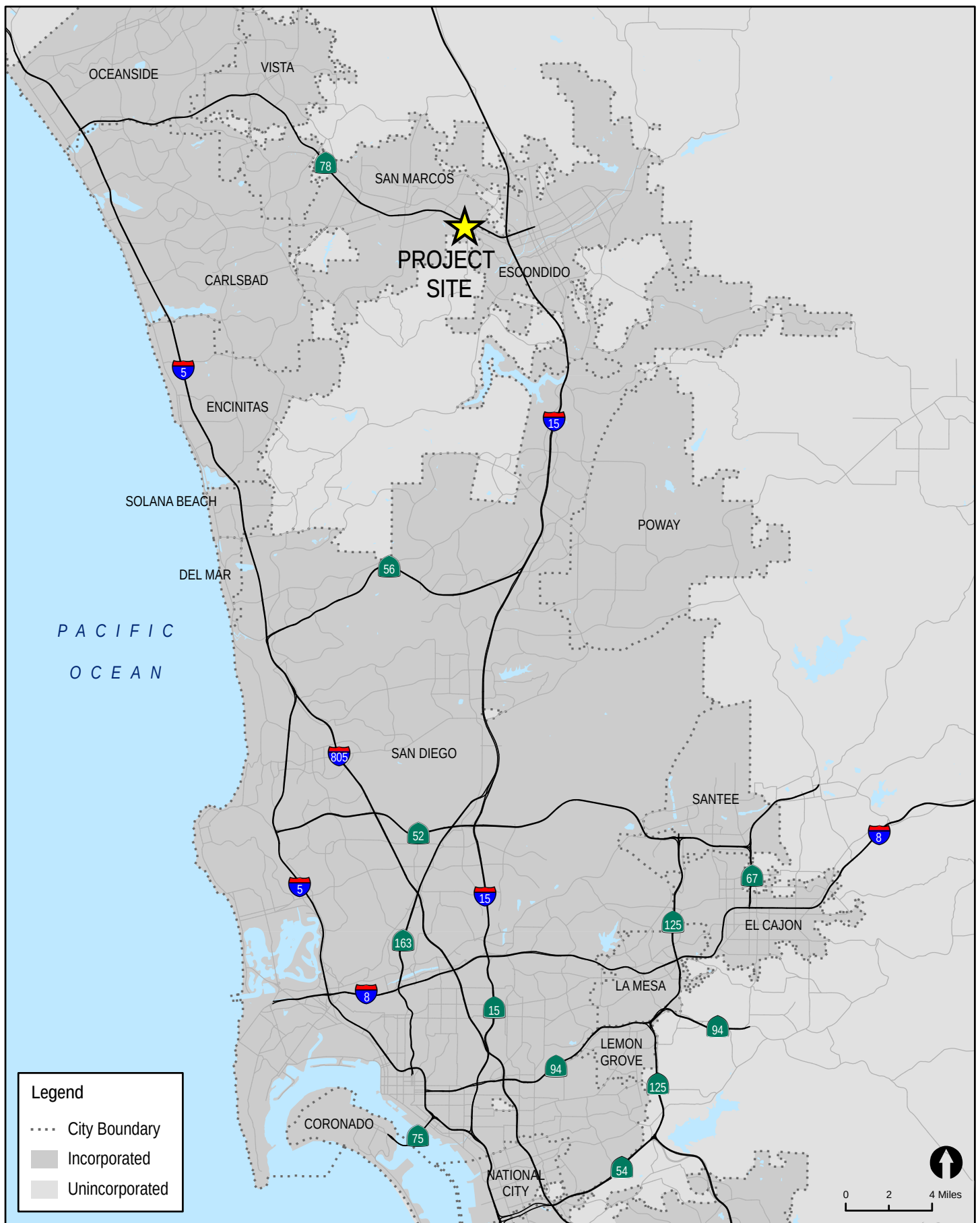
1.0 INTRODUCTION

Linscott, Law and Greenspan, Engineers (LLG) has prepared the following transportation impact analysis to assess the impacts to the street system as a result of Sunrise project (“Project”), which proposes the development of 192 multi-family residential dwelling units. The Project site is located generally south of Barham Drive and west of Meyers Avenue, and will be annexed into the City of San Marcos.

Figure 1–1 shows the Project vicinity and **Figure 1–2** illustrates, in more detail, the site location.

The transportation analysis presented in this report includes the following:

- Project Description
- Existing Conditions
- Analysis Approach and Methodology
- Significance Criteria
- Analysis of Existing Conditions
- Project Trip Generation/Distribution/Assignment
- Cumulative Projects
- Analysis of Near-Term Scenarios
- General Plan (Year 2035) Analysis
- Significance of Impacts and Mitigation Measures



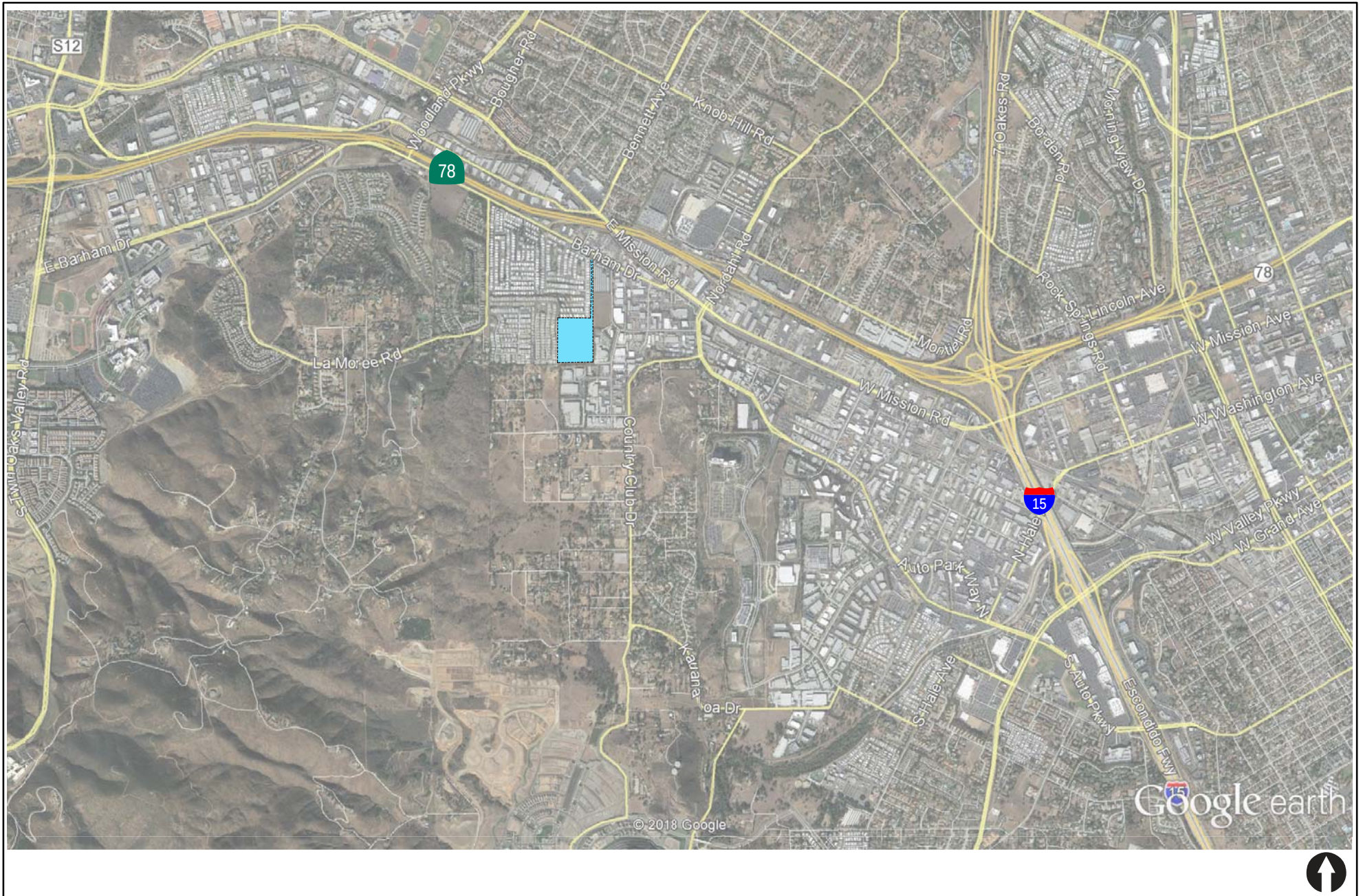


Figure 1-2

Project Area Map

SUNRISE RESIDENTIAL

2.0 PROJECT DESCRIPTION

2.1 Project Location

The Project site is located south of Barham Drive, west of Meyers Avenue in the County of San Diego. The Project seeks annexation into the City of San Marcos, and will require a General Plan Amendment (GPA) and a Conditional Use Permit (CUP). The site is currently undeveloped.

Local access is via Barham Drive to the north and Meyers Avenue to the east. Regional freeway access to State Route 78 (SR-78) is provided via an eastbound on-ramp on Barham Drive, between Lago Marcos and Casitas Del Sol, and an eastbound off-ramp west of Woodland Parkway. Access to/from westbound SR-78 is provided via hook-ramps at Rancheros Drive. A full diamond interchange is located at Nordahl Road to the east.

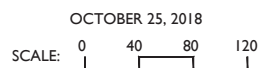
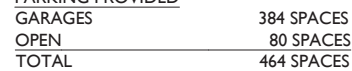
A major transit station (Nordahl Station) is located approximately one-quarter mile to the east of the site. This station provides access to the SPRINTER light rail system, and to bus service provided by the North County Transit District.

The Inland Rail Trail Class I bikeway is also approximately one-quarter mile from the site to the east.

2.2 Project Description

The Project proposes to construct 192 multi-family residential units on a vacant lot. Primary Project access is proposed via an east-west driveway to Meyers Avenue, with secondary access via a north-south driveway to Barham Drive. This secondary intersection is proposed to be restricted to right-in/right-out only movements with the physical design of the intersection curb returns, and is expected to serve only a small amount of Project traffic. To be conservative, 100% of Project traffic volumes are assumed to use the primary access to Meyers Avenue in this analysis.

Figure 2–1 depicts the conceptual Project site plan.



3.0 EXISTING CONDITIONS

Effective evaluation of the transportation impacts associated with the proposed Project requires an understanding of the existing transportation system within the Project study area. **Figure 3–1** depicts existing conditions, including signalized/unsignalized intersections and lane configurations.

The study area includes the following twelve (12) intersections, including the proposed Project driveways, and seven (7) street segments. These locations were selected based on a due-diligence report prepared for the Project by KOA Corporation, in conjunction with the regional SANTEC/ITE Guidelines for Traffic Impact Studies in the San Diego Region. Additionally, three (3) metered on-ramp locations are studied. Prior to completion of the “Woodland Parkway Highway 78 Interchange” project, Project traffic oriented to SR-78 eastbound would primarily use the on-ramp from Barham Drive. With the completion of that project it is anticipated this traffic would shift to the Nordahl Road on-ramp. See *Section 10.2* for additional discussion of the planned interchange project.

Intersections:

1. Barham Drive / SR-78 EB Off-Ramp
2. Rancheros Drive / SR-78 WB Ramps
3. Woodland Parkway / Rancheros Drive
4. Woodland Parkway / Barham Drive
5. Barham Drive / SR-78 EB On-Ramp
6. Barham Drive / Project Driveway (*future intersection*)
7. Barham Drive / Meyers Avenue
8. Barham Drive / W. Mission Road
9. Mission Road / Auto Park Way / Nordahl Road
10. Mission Road / Auto Park Way / SR-78 EB Ramps
11. Mission Road / Auto Park Way / SR-78 WB Ramps
12. Meyers Avenue / Project Driveway

Street Segments:

Rancheros Drive

1. SR-78 Ramps to Woodland Parkway

Barham Drive

2. Woodland Parkway to SR-78 EB On-Ramp
3. SR-78 EB On-Ramp to Meyers Avenue
4. Meyers Avenue to Mission Road

Mission Road

5. Barham Drive to Nordahl Road

Nordahl Road

6. SR-78 Ramps to Mission Road

Meyers Avenue

7. Barham Drive to Project Driveway

Freeway Ramp Meter Locations

State Route 78 (SR-78)

1. Rancheros Drive – Westbound On-Ramp (AM/PM peak hours)
2. Barham Drive – Eastbound On-Ramp (AM/PM peak hours) *[Existing & Near-Term only]*
3. Nordahl Road – Eastbound On-Ramp (AM/PM peak hours) *[Long-Term only]*

3.1 Existing Street Network

The following is a brief description of the street system in the Project study area.

State Route 78 (SR-78) is an east/west freeway facility connecting Oceanside, Vista, San Marcos, and Escondido. SR-78 is generally built with three general purpose lanes in each direction. The posted speed limit in the study area is 65 MPH. In the study area, local access is provided as follows:

- Westbound SR-78
 - Signalized on/off-ramps at the Nordahl Road diamond interchange
 - Unsignalized on/off ramps from/to Rancheros Drive
- Eastbound SR-78
 - Signalized on/off-ramps at the Nordahl Road diamond interchange
 - Signalized off-ramp to Barham Drive (west of Woodland Parkway)
 - Signalized on-ramp from Barham Drive (east of Woodland Parkway)

The on-ramp from Barham Drive to eastbound SR-78 joins the freeway as the second of two auxiliary lanes that trap to Nordahl Road to the east.

Major improvements are planned to the SR-78 freeway system in the long-term. These are described in detail in *Section 10.2* of this report.

Rancheros Drive is an east/west facility generally north and east of the project site. It is identified as an unclassified Major Road on the *City of San Marcos Mobility Element*. In the project study area Rancheros Drive provides access to SR-78 and is currently built as a two-lane undivided roadway with a posted speed limit that ranges from of 30-35 mph. The distance between the SR-78 westbound ramps and Woodland Parkway is approximately 400 feet. On-street parking is generally not allowed west of Woodland Parkway, but is provided intermittently on portions of Rancheros Drive east of Woodland Parkway.

Woodland Parkway is a north-south facility west of the project site. It is identified as a 4-lane roadway on the *City of San Marcos Mobility Element*. In the project study area, Woodland Parkway connects Barham Drive to Rancheros Drive, which provides access to/from westbound SR-78. Between Barham Drive and Rancheros Drive, Woodland Parkway is approximately 400 feet in length, and provides 3 lanes (including turn lanes) in 32 feet of width. The posted speed limit in the study area is 40 mph, and on-street parking is not allowed west.

E. Barham Drive is an east/west facility that is classified within the study area on the *City of San Marcos Mobility Element* as a 4-Lane Arterial w/ Class II or III bicycle facilities from Woodland Parkway east to the San Marcos city limits with Escondido, just west of Meyers Avenue.

E. Barham Drive is currently built as a four-lane roadway undivided roadway (two-way left-turn lane median) from Woodland Parkway to east of La Moree Road, where it transitions to a two-lane undivided roadway with a two-way left turn lane median) to the city limits. The posted speed limit is 35 mph. The four-lane section described provides Class II bicycle lanes while the two-lane section does not provide separate bicycle facilities. On-street parking is generally prohibited

Barham Drive is an east/west facility that is classified as a Collector on the on the *City of Escondido Circulation Element* from the city limits with San Marcos west to Mission Road. From the City limits to Mission Road, Barham Drive is currently constructed as a two-lane roadway with a posted speed limit of 35 mph. On-street parking is generally prohibited, except for a portion of the north side of the roadway, between La Moree Road and the SR-78 on-ramp.

Mission Road is an east/west facility with portions in both San Marcos and Escondido in the study area. Within San Marcos, it is classified on the *City of San Marcos General Plan Mobility Element* as a Four-Lane Arterial with Enhanced Bicycle/Pedestrian Facilities from Woodland Parkway to the city limits at approximately Barham Drive. Within the City of Escondido it is classified as a Major Road on the on the *City of Escondido Circulation Element* eastward from the city limits with San Marcos. In the study area, Mission Road is currently constructed as a four-lane roadway with a raised median to the eastern edge of the study area where it transitions to a two-way left-turn lane median. The posted speed limit 45 mph. Curbside parking is prohibited. Class II bicycle lanes are provided on the San Marcos portion of the roadway within the study area, but do not currently continue on the portions within Escondido.

Nordahl Road is a north/south facility that is classified as a 4-Lane Arterial from SR-78 to the City limits on the *City of San Marcos General Plan Mobility Element*. It is classified as a Major Road on the *City of Escondido Circulation Element* It is currently constructed as a 7 to 8 lane divided roadway depending on the location due to turn pockets and/or the extension of turn pockets. The posted speed limit is 40 mph. Class II bicycle lanes are provided, and on-street parking is not permitted.

Auto Park Way is a north/south facility that is classified as a Major Road on the on the *City of Escondido Circulation Element* southward from the city limits with San Marcos. In the study area, Auto Park Way is currently constructed as a four-to-six-lane roadway with a raised median. The posted speed limit 40 mph. Curbside parking is prohibited, and Class II buffered bicycle lanes are provided.

Meyers Avenue is a two-lane industrial road that is unclassified on the *City of Escondido Circulation Element*. In the study area, Meyers Avenue is constructed as a 48-foot wide two-lane roadway. There are no posted speed limits in the area, and curbside parking is provided in both directions. No sidewalks or bike lanes are provided.

3.2 Existing Transit Conditions

Transit service in the study area is provided by North County Transit District (NCTD). NCTD operates the following services in the vicinity of the Project.

SPRINTER light rail connects Oceanside, Vista, San Marcos, and Escondido serving 15 stations along the SR-78 corridor. The nearest station to the Project is the Nordahl Road station, located south of Mission Road between Barham Drive and Auto Park Way/ Nordahl Road, within ½ mile of the Project site. The SPRINTER runs every 30 minutes in each direction Monday through Friday, from approximately 4 AM to 9 PM. Saturday, Sunday, and holiday trains operate every 30 minutes between 10 AM and 6PM and hourly before 10 AM and after 6 PM.

Route 305 serves Escondido to Vista via Mission Road and S. Santa Fe Avenue. Route 305 operates Monday through Friday approximately 4 AM to 11 PM. Saturday, Sunday, and holiday service is approximately 5 AM to 11 PM. The closest stop to the Project site is located at the Nordahl Road SPRINTER station.

Route 353 serves the Escondido Transit Center and Nordahl Marketplace via Citracado Parkway. Route 353 operates weekdays, weekends, and holidays from approximately 6 AM to 8 PM. The closest stop to the Project site is located at the Nordahl Road SPRINTER station.

3.3 Existing Traffic Volumes

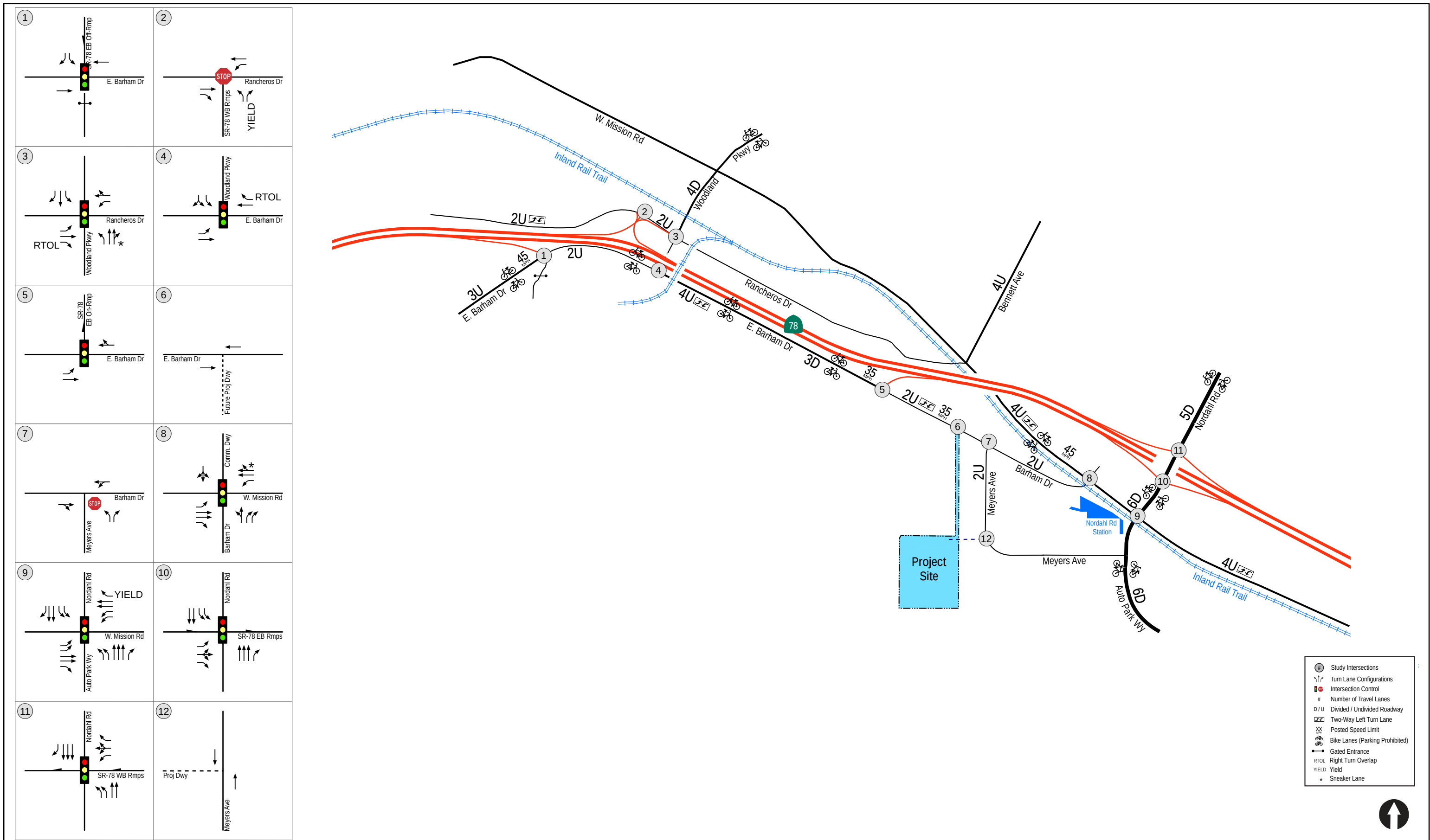
Table 3–1 is a summary of the average daily traffic volumes (ADTs) based on counts taken in Thursday, September 20, 2018 and Wednesday, February 13, 2019, when schools were in session. AM/PM peak hour intersection turning movement counts were also collected on September 20, 2018. **Figure 3–2** shows the Existing Traffic Volumes on both an ADT and peak hour basis. **Appendix A** contains the manual count sheets.

TABLE 3-1
EXISTING TRAFFIC VOLUMES

Street Segment	Jurisdiction	ADT ^a	Date ^b
Rancheros Drive			
1. SR-78 Ramps to Woodland Pkwy	San Marcos	21,140	September 2018
Barham Drive			
2. Woodland Pkwy to SR-78 EB On-Ramp	San Marcos	17,500	September 2018
3. SR-78 EB On-Ramp to Meyers Ave	San Marcos/ Escondido	12,990	September 2018
4. Meyers Ave to Mission Rd	Escondido	8,610	February 2019
Mission Road			
5. Barham Dr to Nordahl Rd	Escondido	29,960	September 2018
Nordahl Road			
6. SR-78 Ramps to Mission Rd	Escondido	41,640	September 2018
Meyers Avenue			
7. Barham Dr to Project Driveway	Escondido	4,740	February 2019

Footnotes:

- a. Average Daily Traffic
- b. Data collection date



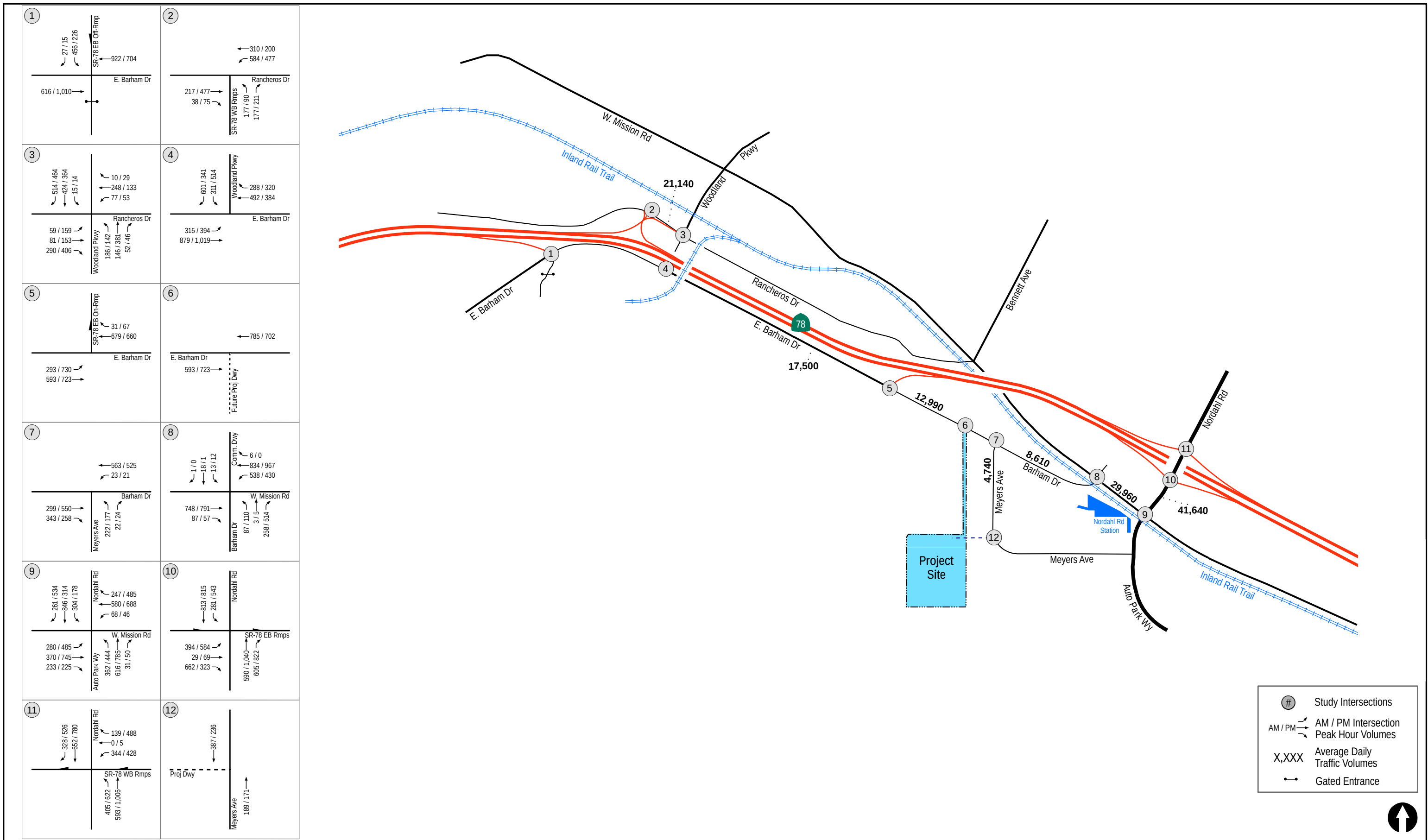


Figure 3-2
Existing Traffic Volumes
SUNRISE RESIDENTIAL

4.0 ANALYSIS APPROACH AND METHODOLOGY

4.1 Analysis Approach

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

TABLE 4–1
ANALYSIS SCENARIOS

Scenario	Analysis Performed
<i>Existing & Near-Term Conditions</i>	
Existing	Peak Hour Intersection Analysis
Existing + Project	Daily Street Segment Analysis
Existing + Cumulative Projects	
Existing + Cumulative Projects + Project	Peak Hour Ramp Meter Analysis
<i>General Plan (Year 2035) Conditions</i>	
Year 2035 Without Project	Peak Hour Intersection Analysis
Year 2035 With Project	Daily Street Segment Analysis
	Peak Hour Ramp Meter Analysis

4.2 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. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level of service designation is reported differently for signalized intersections, unsignalized intersections and roadway segments.

4.2.1 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 6th Edition (HCM 6)*, with the assistance of the *Synchro 10* computer software. The delay values (represented in seconds) were qualified with a corresponding intersection Level of Service (LOS). Location-specific signal timing information was used in the analysis where available.

Unsignalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay and Levels of Service (LOS) was determined based upon the procedures found in Chapter 20 and Chapter 21 of the *HCM 6* with the assistance of the *Synchro 10* computer software.

4.2.2 *Street Segments*

Street segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the City of San Marcos and City of Escondido Roadway Classification, Level of Service, and ADT Tables, depending on which jurisdiction the street segment is located within. These tables provide segment capacities for different street classifications, based on traffic volumes and roadway characteristics. Copies of the City of San Marcos and City of Escondido capacity tables are attached in **Appendix B**.

Street segment #3, Barham Drive from the SR-78 EB On-Ramp to Meyers Avenue, contains portions in both jurisdictions. In this case, the narrowest portion of the roadway, and therefore the lower capacity, is located in the Escondido portion of the segment, and this capacity is used for analysis throughout this report.

4.2.3 *Metered Freeway Ramps*

The measure of effectiveness (MOE) for the metered freeway ramp analysis is delay in minutes. Ramp meter flows characteristically vary throughout the peak hour based on the performance of the freeway mainline. As the mainline becomes more congested, the ramp meter rates decline, allowing fewer vehicles onto the freeway in the same time period.

The metered on-ramps in the study area were analyzed using the Fixed Rate method. With the Fixed Rate method, using the most restrictive flow rate during the peak hour, the total discharge and delay (in minutes) are calculated and the corresponding queue lengths are calculated. The meter rates are dynamic, and fluctuate between the most conservative (restrictive) and most aggressive (permissive) intervals assigned to a metered ramp. The regional standard of practice is to use the longest, restrictive rates to ensure a conservative analysis.

The metering information was obtained from Caltrans for the on-ramp and is included in *Appendix A*.

5.0 SIGNIFICANCE CRITERIA

The project study area includes transportation facilities within the jurisdiction of the cities of San Marcos and Escondido, as well as State facilities under the jurisdiction of Caltrans. Thus, the significance criteria of the jurisdiction within which a transportation facility is located was used to determine significance. The significance criteria for the following jurisdictions are included in this section.

- City of San Marcos
- City of Escondido
- Caltrans

5.1 City of Escondido Criteria

The following is a summary of the City of Escondido's published significance criteria.

In accordance with the SANTEC/ITE Guidelines for Traffic Impact Studies in the San Diego Region, the following thresholds shall be used to identify if a project is of significant traffic impact under any scenario. Based on SANTEC/ITE guidelines, if now or in the future, the Project's traffic impact causes the values in **Table 5-1** to be exceeded in a roadway segment or intersection that is operating at LOS D or worse, it is determined to be a significant impact and the Project shall identify mitigation measures.

TABLE 5-1
PROPOSED THRESHOLDS TO IDENTIFY A PROJECT'S SIGNIFICANT TRAFFIC IMPACT
CITY OF ESCONDIDO

Level of Service with Project	Allowable Change due to Project Impact		
	Roadway Segments		Intersections Delay (sec.)
	V/C	Speed (mph)	
D, E, or F	0.02	1	2

Source: City of Escondido

*No Significant Impact occurs at areas in GP Downtown Specific Area that operates at LOS "D" or better.

*Mitigation measures should also be considered for any segment or intersection operating at LOS "F" subject to less than significant impact.

*V: Volume *C: Capacity (use LOS "E")

Furthermore, according to the City's General Plan, Mobility Element streets and intersections shall be planned and developed to achieve a minimum LOS "C" defined by the Highway Capacity Manual as amended or updated, or such other national standard deemed appropriate by the city. Level of Service "C" may not be feasible in all areas at all times and LOS "D" shall be considered the threshold for determining significant impacts and appropriate mitigation. Per the certified General Plan EIR, a significant impact would result from a General Plan (Year 2035) analysis when a project would "cause the LOS of a General Plan Mobility and Infrastructure Element roadway to

fall below LOS D and/or add more than 200 ADT to a Mobility and Infrastructure Element roadway with an LOS E or F.”

5.2 City of San Marcos Criteria

Within the City of San Marcos, a project is considered to have a significant impact if the new project traffic has decreased the operations of surrounding roadways by a defined threshold. The defined thresholds shown in **Table 5–3** (LOS D accepted), are based on published SANTEC guidelines and the City of San Marcos General Plan. If the project exceeds the thresholds in *Table 5–3*, then the project may be considered to have a significant project impact. A feasible mitigation measure will need to be identified to return the impact within the thresholds (pre-project + allowable increase) or the impact will be considered significant and unmitigated.

For intersections and roadway segments affected by a project, level of service (LOS) D or better is considered acceptable under both direct and cumulative conditions.

If a project exceeds the thresholds in *Table 5–3*, then the project may be considered to have a significant “direct” or “cumulative” project impact. A significant impact can also occur if a project causes the Level of Service to degrade from D to E, even if the allowable increases in *Table 5–3* are not exceeded. A feasible mitigation measure will need to be identified to return the impact within the City thresholds, or the impact will be considered significant and unmitigated.

TABLE 5-3
TRAFFIC IMPACT SIGNIFICANT THRESHOLDS

Level of Service with Project ^a	Allowable Increase Due to Project Impacts ^b					
	Freeways		Roadway Segments		Intersections	Ramp Metering
	V/C	Speed (mph)	V/C	Speed (mph)	Delay (sec.)	Delay (min.)
E & F (or ramp meter delays above 15 minutes)	0.01	1	0.02	1	2	2 ^c

Footnotes:

- a. All level of service measurements are based upon HCM procedures for peak-hour conditions. However, V/C ratios for Roadway Segments may be estimated on an ADT/24-hour traffic volume basis (using Table 2 or a similar LOS chart for each jurisdiction). The acceptable LOS for freeways, roadways, and intersections is generally "D" ("C" for undeveloped or not densely developed locations per jurisdiction definitions). For metered freeway ramps, LOS does not apply. However, ramp meter delays above 15 minutes are considered excessive.
- b. If a proposed project's traffic causes the values shown in the table to be exceeded, the impacts are deemed to be significant. These impact changes may be measured from appropriate computer programs or expanded manual spreadsheets. The project applicant shall then identify feasible mitigations (within the Traffic Impact Analysis [TIA] report) that will maintain the traffic facility at an acceptable LOS. If the LOS with the proposed project becomes unacceptable (see note a above), or if the project adds a significant amount of peak hour trips to cause any traffic queues to exceed on- or off-ramp storage capacities, the project applicant shall be responsible for mitigating significant impact changes.
- c. The impact is only considered significant if the total delay exceeds 15 minutes.

General Notes:

1. V/C = Volume to Capacity Ratio
2. Speed = Arterial speed measured in miles per hour
3. Delay = Average stopped delay per vehicle measured in seconds for intersections, or minutes for ramp meters.
4. LOS = Level of Service
5. HCM = Highway Capacity Manual

5.3 Caltrans Criteria

The SANTEC guidelines shown on *Table 5-3* are also used for Caltrans freeway segments and ramp meters, although Caltrans accepts LOS D operations for urban locations, which San Marcos is considered.

6.0 ANALYSIS OF EXISTING CONDITIONS

The criteria used for determining unacceptable operations are subject to each jurisdiction's standards, as discussed in *Section 5.0* of this report. The City of Escondido considers LOS D the threshold for unacceptable operations, while the City of San Marcos and Caltrans criteria indicate locations operating at LOS E or worse are unacceptable operations. The following section summarizes the existing analysis of study area locations.

6.1 Peak Hour Intersection Levels of Service

Table 6–1 summarizes the existing peak hour intersection operations. As shown, the following intersections are calculated to currently operate at unacceptable LOS based on their respective jurisdiction criteria:

- Intersection #2. Rancheros Drive / SR-78 WB Ramps – LOS F/E in the AM/PM peak hours (*Caltrans*)
- Intersection #7. Barham Drive / Meyers Avenue – LOS F during the AM/PM peak hours (*Escondido*)
- Intersection #9. Mission Road / Nordahl Road – LOS D in the AM/PM peak hours (*Escondido*)

Appendix C contains the Existing peak hour intersection analysis worksheets.

6.2 Daily Street Segment Levels of Service

Table 6–2 summarizes the existing segment operations along the key study area roadways. As noted in *Section 4.2.2*, Segment #3, which crosses the city limits between San Marcos and Escondido, is analyzed based on the narrowest portion of the segment, which is located within Escondido. As shown, the following roadway segments are calculated to currently operate at unacceptable LOS on a daily basis based on their respective jurisdiction criteria:

- Segment #1. Rancheros Drive from SR-78 Ramps to Woodland Parkway – LOS F (*San Marcos*)
- Segment #3. Barham Drive from SR-78 EB On-Ramp to Meyers Avenue – LOS D (*San Marcos/ Escondido*)
- Segment #4. Barham Drive from Meyers Avenue to Mission Road – LOS D (*Escondido*)
- Segment #5. Mission Road from Barham Drive to Nordahl Road – LOS D (*Escondido*)
- Segment #6. Nordahl Road from SR-78 Ramps to Mission Road – LOS E (*Escondido*)

6.3 Peak Hour Freeway Ramp Meter Operations

Table 6–3 summarizes the existing operations of the study area on-ramp meters using the fixed rate analysis methodology. As shown in *Table 6–3*, using this methodology, an existing delay of greater than 15.0 minutes is calculated at the SR-78 WB On-Ramp from Rancheros Drive during the AM and PM peak hours.

TABLE 6-1
EXISTING INTERSECTION OPERATIONS

Intersection	Jurisdiction	Control Type	Peak Hour	Delay ^a	LOS ^b
1. Barham Dr / SR-78 EB Off Ramp	Caltrans	Signal	AM PM	25.9 14.7	C B
2. Rancheros Drive / SR-78 WB Ramps	Caltrans	AWSC ^c	AM PM	61.5 48.6	F E
3. Woodland Pkwy / Rancheros Dr	San Marcos	Signal	AM PM	29.1 24.1	C C
4. Barham Dr / Woodland Pkwy	San Marcos	Signal	AM PM	45.5 41.7	D D
5. Barham Dr / SR-78 EB On Ramp	San Marcos	Signal	AM PM	7.1 32.7	A C
6. Barham Dr / Project Drwy	San Marcos	DNE ^d	AM PM	— —	— —
7. Barham Dr / Meyers Ave	Escondido	MSSC ^e	AM PM	>100.0 >100.0	F F
8. Barham Dr / Mission Rd	San Marcos	Signal	AM PM	27.9 31.9	C C
9. Mission Rd / Nordahl Rd	Escondido	Signal	AM PM	39.2 52.1	D D
10. Nordahl Rd / SR-78 EB Ramps	Caltrans	Signal	AM PM	25.1 39.1	C C
11. Nordahl Rd / SR-78 WB Ramps	Caltrans	Signal	AM PM	23.4 33.4	C C
12. Meyers Avenue / Project Driveway	Escondido	DNE	AM PM	— —	— —

Footnotes:

- a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. AWSC – All-Way Stop Controlled intersection.
d. DNE – Does Not Exist.
e. MSSC – Minor-Street Stop Controlled intersection.

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

TABLE 6-2
EXISTING STREET SEGMENT OPERATIONS

Street Segment	Jurisdiction	Functional Classification	LOS E ^a Capacity	ADT ^b	LOS ^c	V/C ^d
Rancheros Drive						
1. SR-78 WB Ramps to Woodland Pkwy	San Marcos	2-Lane Collector	15,000	21,140	F	1.409
Barham Drive						
2. Woodland Pkwy to SR-78 EB On-Ramp	San Marcos	4-Lane Collector	30,000	17,500	C	0.583
3. SR-78 EB On-Ramp to Meyers Ave	San Marcos/ Escondido	2-Lane Collector (NP)	15,000	12,990	D	0.866
4. Meyers Ave to Mission Rd	Escondido	2-Lane Collector (WP)	10,000	8,610	D	0.861
Mission Road						
5. Barham Dr to Nordahl Rd	Escondido	4-Lane Major Arterial	37,000	29,960	D	0.810
Nordahl Road						
6. SR-78 Ramps to Mission Rd	Escondido	5-Lane Major Arterial	43,500	41,640	E	0.957
Meyers Avenue						
7. Barham Dr to Project Driveway	Escondido	2-Lane Collector (WP)	10,000	4,740	B	0.474

Footnotes:

- a. Capacities based on City of San Marcos and City of Escondido roadway classification tables (See *Appendix B*).
- b. Average Daily Traffic Volumes.
- c. Level of Service.
- d. Volume to capacity ratio.

TABLE 6-3
EXISTING CALTRANS RAMP METER ANALYSIS – FIXED RATE

Location	Peak Hour ^a	Existing						
		Volume		Peak Hour Demand (D) ^b	Meter Rate (R) ^c	Excess Demand (E) (veh)	Delay (min)	Queue (ft) ^d
		SOV	HOV					
Rancheros Drive to SR-78 WB (1 SOV+ 1 HOV)	AM	529	93	529	343	186	> 15.0	4,650
	PM	469	83	469	358	111	>15.0	2,775
Barham Drive to SR-78 EB (1 SOV + 1 HOV)	AM	275	49	275	644	0	0	0
	PM	677	120	677	608	69	6.8	1,725

Footnotes:

- a. Selected peak hour based on period when ramp meter is operating.
- b. Peak hour demand in vehicles/hour/lane for SOV and HOV lanes.
- c. Meter rate “R” is the most restrictive rate at which the ramp meter (signal) discharges traffic onto the freeway (obtained from Caltrans). The discharge rate varies depending on the mainline volumes.
- d. Queue calculated assuming vehicle length of 25 feet.

General Notes:

1. SOV = Single Occupancy Vehicle, HOV = High Occupancy Vehicle
2. Lane utilization factor accounted for in peak hour demand calculation. (Assumed 15% for HOV).

7.0 TRIP GENERATION/DISTRIBUTION/ASSIGNMENT

The following is a discussion of the Project trip generation calculations and the Project traffic distribution and assignment through the local network.

7.1 Trip Generation

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 San Diego Region"* (April 2002). Based on the density of homes proposed by the Project (multi-family residential), SANDAG specifies a residential trip rate of 8 ADT/ unit. A 5% reduction for transit was considered, based on the Project's proximity to the high quality, multi-modal Nordahl Station and the Class I Inland Rail Trail bikeway. However, the distance between the transit station and the Project site slightly exceeds the ¼ mile prescribed by SANDAG guidelines and thus the transit reduction was not applied.

Table 7-1 shows a summary of the Project traffic generation. As tabulated the Project is calculated to generate 1,536 daily trips with 123 total AM peak hour trips (25 inbound/ 98 outbound) and 154 total PM peak hour trips (108 inbound/46 outbound).

7.2 Trip Distribution/Assignment

Trip distribution is the process of determining traffic percentage splits on the regional and local roadway network. Trip distribution is determined based on the characteristics of the Project and upon the general location of other land uses to which Project trips would originate or terminate, such as employment, housing, schools, recreation and shopping. LLG commissioned a SANDAG Select Zone Assignment to establish the regional cordons and distribution.

As discussed in *Section 2.2*, there are numerous opportunities in the Project vicinity to access SR-78. LLG reviewed existing local traffic patterns as well as utilized commercial GIS software (adjusted to reflect peak commute congestion) to determine the local traffic distribution of each freeway on/off-ramp location and the local arterials.

While a modest number of Project trips would use the right-in/right-out secondary Project driveway to Barham Drive, 100% of site traffic was conservatively assumed to use Meyers Avenue to provide a worst-case analysis.

Figures 7-1 depicts the Project trip distribution percentage **Figure 7-2** depicts the assigned Project traffic volumes. **Figure 7-2** depicts Existing + Project traffic volumes.

TABLE 7-1
PROJECT TRIP GENERATION

Land Use	Size	Daily Trip Ends (ADTs)		AM Peak Hour						PM Peak Hour				
				% of ADT	In:Out	Volume			% of ADT	In:Out	Volume			Total
		Rate ^a	Volume		Split	In	Out	Total		Split	In	Out	Total	
Condominium	192 DU	8 /DU	1,536	8%	2:8	25	98	123	10%	7:3	108	46	154	

Footnotes:

- a. Rate is based on SANDAG's (Not so brief) Guide of Vehicular Traffic Generation Rates for the San Diego Region (April 2002).

While the Project is proposing a general plan amendment from industrial to residential zoning, the site could be developed by-right with 282,270 square feet of industrial park use, along with 29 mobile home units. This would result in 2,403 ADT with 260 AM peak hour trips and 287 PM peak hour trips, as shown in **Table 7-2** below. This is an increase over the proposed Project of 867 ADT, 137 AM peak hour trips, 133 PM peak hour trips.

TABLE 7-2
PROJECT TRIP GENERATION COMPARISON
EXISTING GENERAL PLAN USES VS. PROPOSED ZONE CHANGE

Land Use	Size	Daily Trip Ends (ADTs)		AM Peak Hour						PM Peak Hour				
		Rate ^a	Volume	% of ADT	In:Out	Volume			% of ADT	In:Out	Volume			
					Split	In	Out	Total		Split	In	Out	Total	
Proposed Project														
Condominium	192 DU	8 /DU	1,536	8%	2:8	25	98	123	10%	7:3	108	46	154	
General Plan Uses														
Industrial Park	282 KSF	8 /KSF	2,258	11%	9:1	224	24	248	12%	2:8	54	217	271	
Mobile Home	29 DU	5 /DU	145	8%	3:7	3	9	12	11%	6:4	10	6	16	
Subtotal General Plan Uses			2,403			227	33	260			64	223	287	
Difference (General Plan – Proposed Project)			867			202	(65)	137			(44)	177	133	

Footnotes:

- a. Rate is based on SANDAG's (Not so brief) Guide of Vehicular Traffic Generation Rates for the San Diego Region (April 2002).

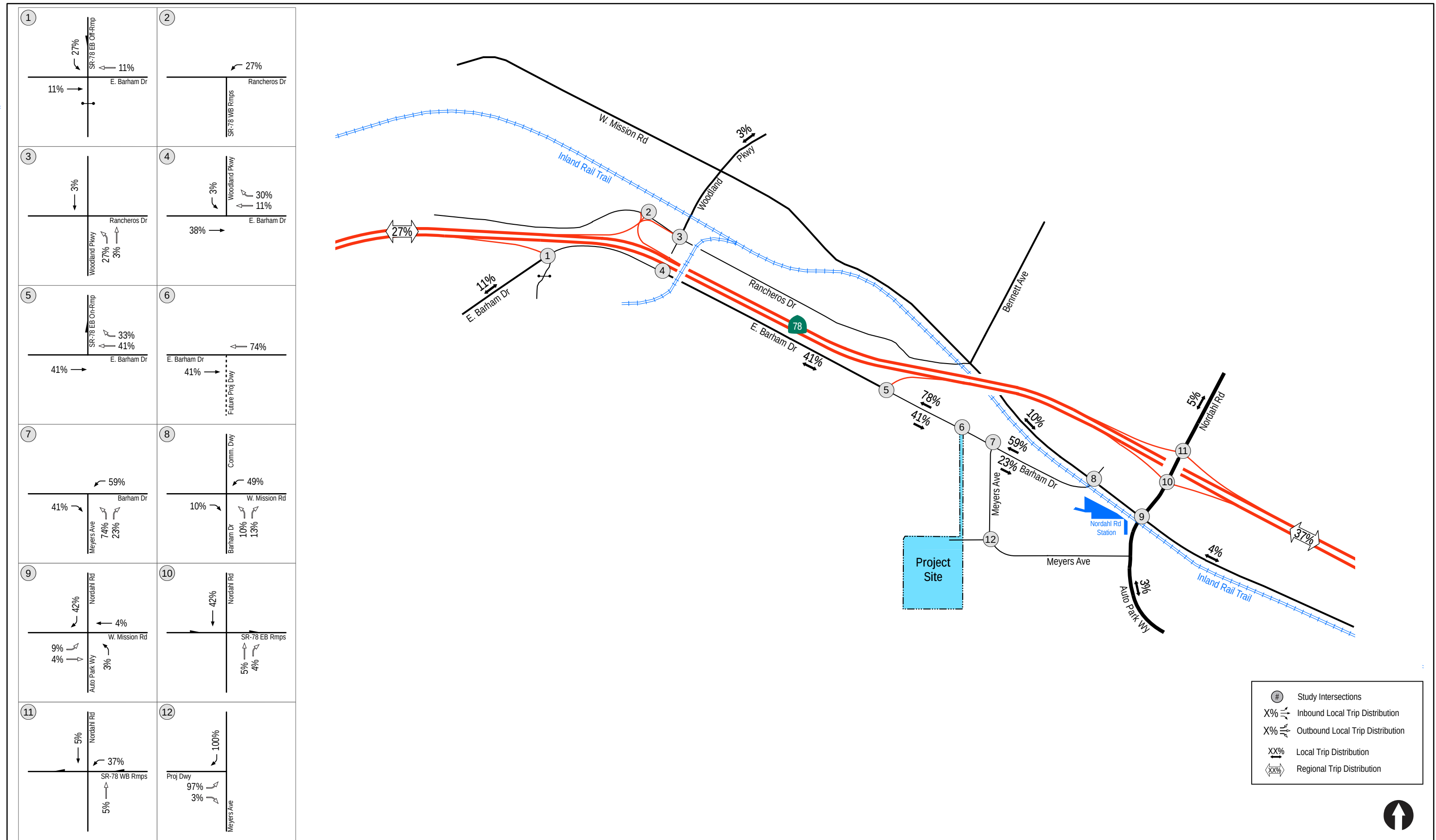
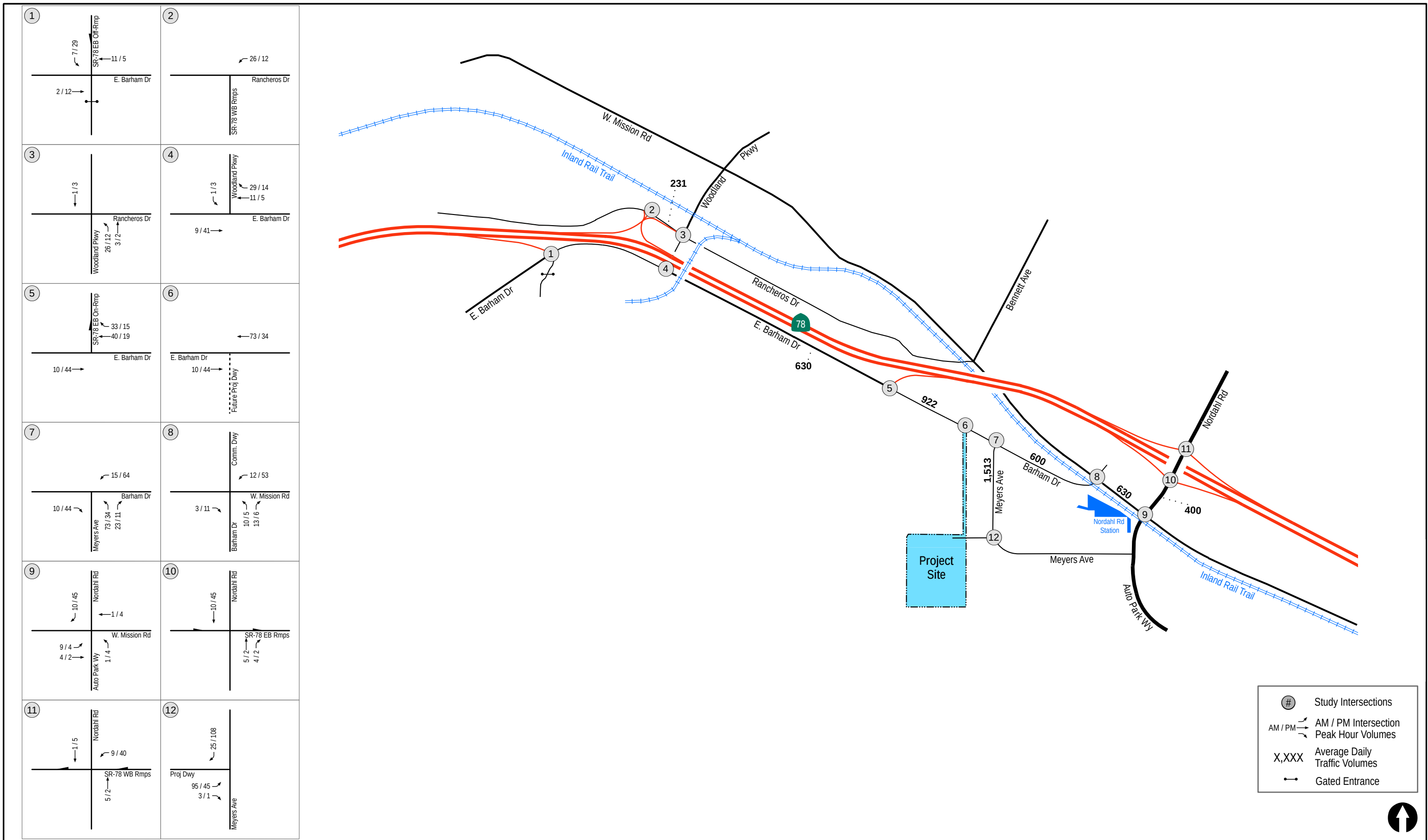
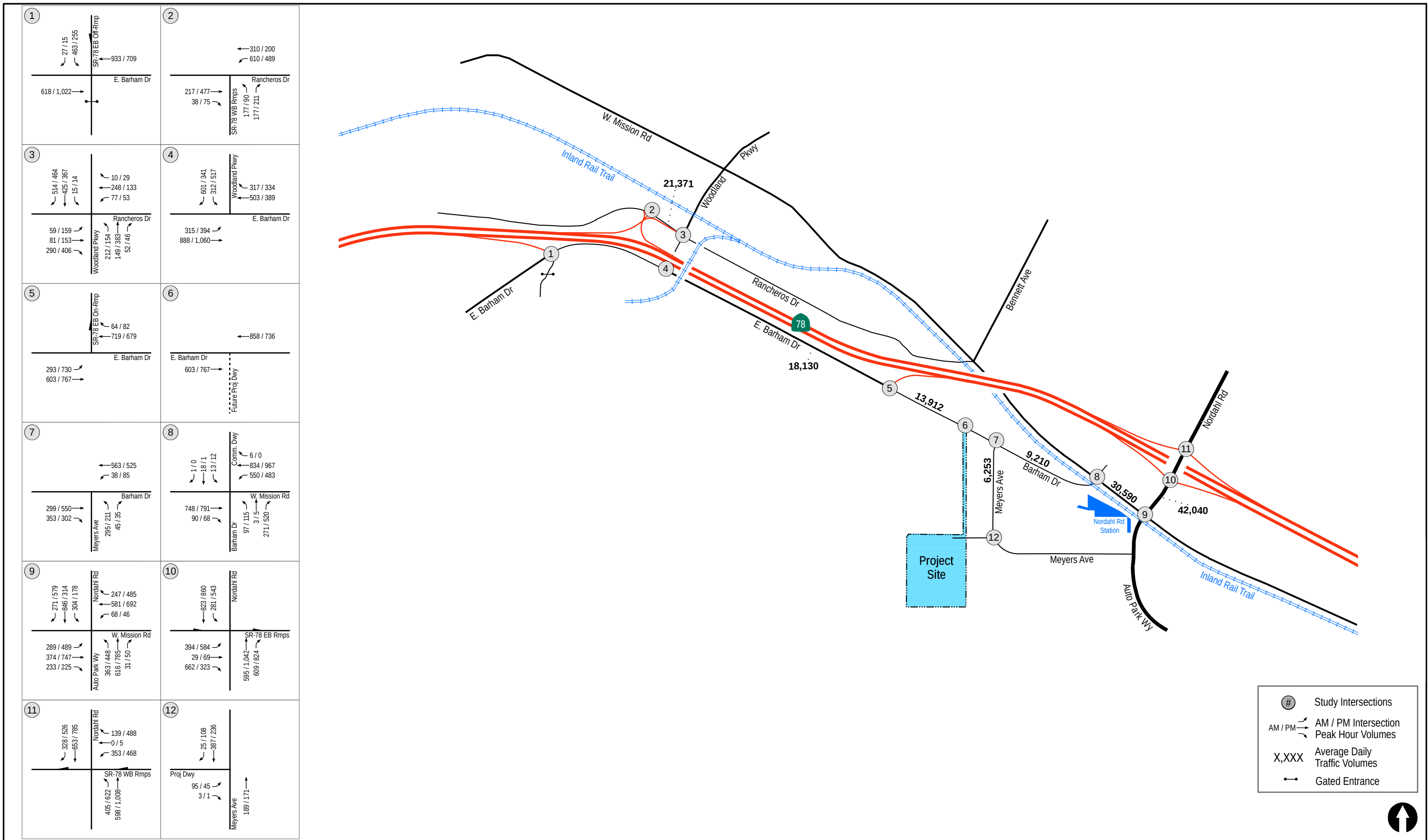


Figure 7-1

Project Traffic Distribution

SUNRISE RESIDENTIAL





8.0 CUMULATIVE PROJECTS

8.1 Summary of Cumulative Projects

Cumulative projects are other projects in the study area that will add traffic to the local circulation system in the near future. Based on research conducted for the cumulative condition and conversations with City and County staff, three (3) City of Escondido projects, three (3) County of San Diego projects, and seven (7) City of San Marcos projects were identified for inclusion in the near-term cumulative analysis. The following is a brief description of each of the cumulative projects in the general vicinity of the Project. **Table 8–1** summarizes the cumulative projects trip generation.

CITY OF ESCONDIDO

1. **Escondido Research and Technology Center Medical Office** is a 74,400 SF medical office building proposed along Citracado Parkway with the ERTC SPA.
2. **Stone Brewery Hotel** proposes to construct a 44-room boutique hotel opposing the existing Stone Brewing World Bistro and Gardens. The project is located along Citracado Parkway within the ERTC SPA.
3. **Pacific Harmony Grove** proposes to construct a combined corporate headquarters and warehouse/distribution center for the Stone Brewing Company, consisting of two buildings. The project is located south of Harmony Grove Road, east of the Harmony Grove Road / Kauana Loa Drive intersection.

COUNTY OF SAN DIEGO

4. **Harmony Grove Village** is a residential project located north of Harmony Grove Road and bound by Country Club Drive and Wilgen Road. The County General Plan Amendment project includes the development of 710 residential single-family units, 32 live/work lofts with 16,500 square-feet of retail, a 25,000-square foot village core, an equestrian park, public and private parks, an institutional site (assumed to be a tack and feed store), and a fire station. The project is currently under construction with approximately 15% of the homes completed and either sold or selling. The trips generated by the completed portion of the project are represented in the existing traffic count data. The remaining 85% of trips were assumed in the near-term cumulative condition. Roadway improvements completed with the project include the new roadway of Harmony Grove Village Parkway, connecting Country Club Drive in the west to Harmony Grove Road and Citracado Parkway/Avenida Del Diablo in the east. Additional network improvements to Harmony Grove Road south of the proposed Project site have also been completed. Based on information from the Harmony Grove Village sales office as of February 2019, 450 homes have been built and are either occupied or for sale. Therefore, the remaining 39% of Harmony Grove Village traffic (742 homes – 450 homes = 292 homes remaining, or 39%) were added into the cumulative condition.

5. **Valiano** is a 334-unit residential development located west of Country Club Drive and south of Hill Valley Road in the County of San Diego, adjacent to the cities of San Marcos and Escondido. This County General Plan Amendment project was approved by the Board of Supervisors.
6. **Harmony Grove Village South** is 453-unit residential development located on 111 acres located east of Country Club Drive and south of Harmony Grove Road in the San Dieguito Planning Community of the County of San Diego. This County General Plan Amendment project was approved by the Board of Supervisors.

CITY OF SAN MARCOS

7. **Montiel Road Partners** is a 9-lot subdivision approved to develop 8 single-family homes located on Montiel Road.
8. **Sandy Lane Estates** is a 9-lot subdivision proposing the development of 8 single-family homes located on Sandy Lane.
9. **JR Legacy II, LLC/Global Carte** is an approved 6-story, 128-room hotel with amenities including a café, fitness center, and pool for guests. The project is located on Montiel Road with access via Leora Lane.
10. **Mission 24** is an approved residential project that will build 24 condominium units located at Mission Road and Avenida Chapala.
11. **Mesa Rim Climbing Gym** is a 28,000 sf recreational climbing gym to be located at 285 Industrial Street.
12. **Montiel Commercial** is a proposed 32,971 sf office development located at 2355/2357 Montiel Road.
13. **University District Block K** is a 68-unit residential housing project consisting of condos, townhomes, and flats, on an approximately 0.52 acre parcel within the larger University District. The project is located on the east side of Campus Way approximately 200 feet south of Carmel Street.

TABLE 8-1
CUMULATIVE DEVELOPMENT PROJECTS SUMMARY

Jur.	No.	Name	Project	ADT ^a	AM		PM		Status
					In	Out	In	Out	
CITY OF ESCONDIDO	1	ERTC Medical Office	74.4 KSF Medical Office	3,720	178	45	123	286	Under Review
	2	Stone Brewery Hotel	44-Room Boutique Hotel	352	11	8	11	27	Under Review
	3	Pacific Harmony Grove	Corporate Headquarters; Warehouse/ Distribution Center	2,261	236	72	115	225	Under Review
COUNTY OF SAN DIEGO	4	Harmony Grove Village <i>(61% Complete; 39% of Remaining Trips Included in Cumulative Analysis)</i>	710 SFDU 32 MFDU 16.5 KSF retail 25 KSF Village Core Equestrian Park Park Space Fire Station	3,623	110	175	227	129	Approved, Under Construction
	5	Valiano	334 DU	3,786	88	216	263	113	Approved
	6	Harmony Grove Village South	453 DU	4,500	108	252	315	135	Approved
CITY OF SAN MARCOS	7	Montiel Rd Partners	8 SFDU	80	2	4	6	2	Approved
	8	Sandy Lane Estates	8 SFDU	80	2	4	6	2	Proposed
	9	JR Legacy II LLC/ Global Carte	128-Room Hotel	896	29	43	49	32	Approved
	10	Mission 24	24 Condominiums	192	3	12	13	6	Approved
	11	Mesa Rim Climbing Gym	Recreation/ Entertainment	840	20	14	46	30	Approved
	12	Montiel Commercial	33 KSF Office	659	83	9	17	69	Proposed
	13	University District Block K	68-unit multi-family residential	408	7	26	26	11	Under Construction
Total Cumulative Projects				21,397	877	880	1,217	1,067	–

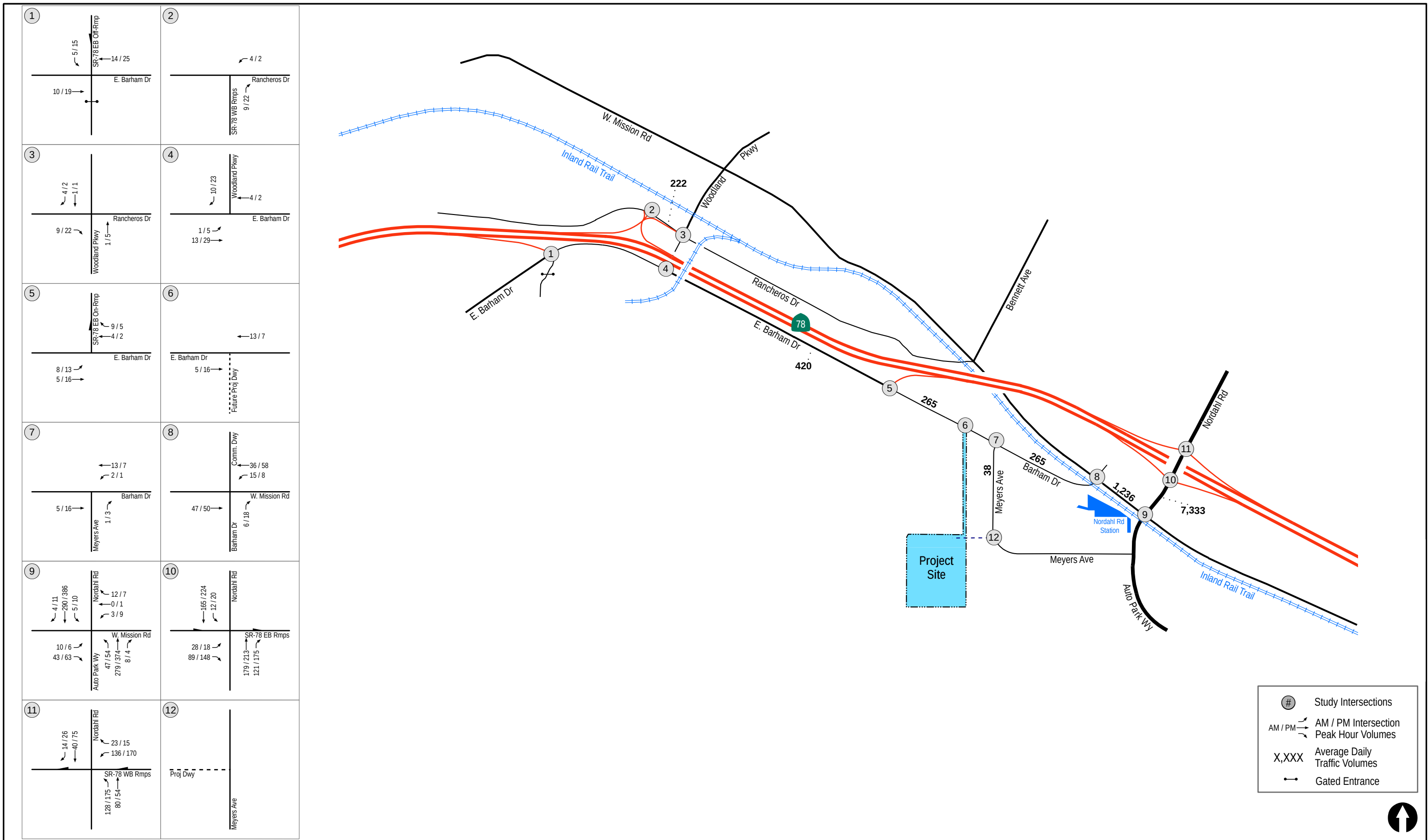
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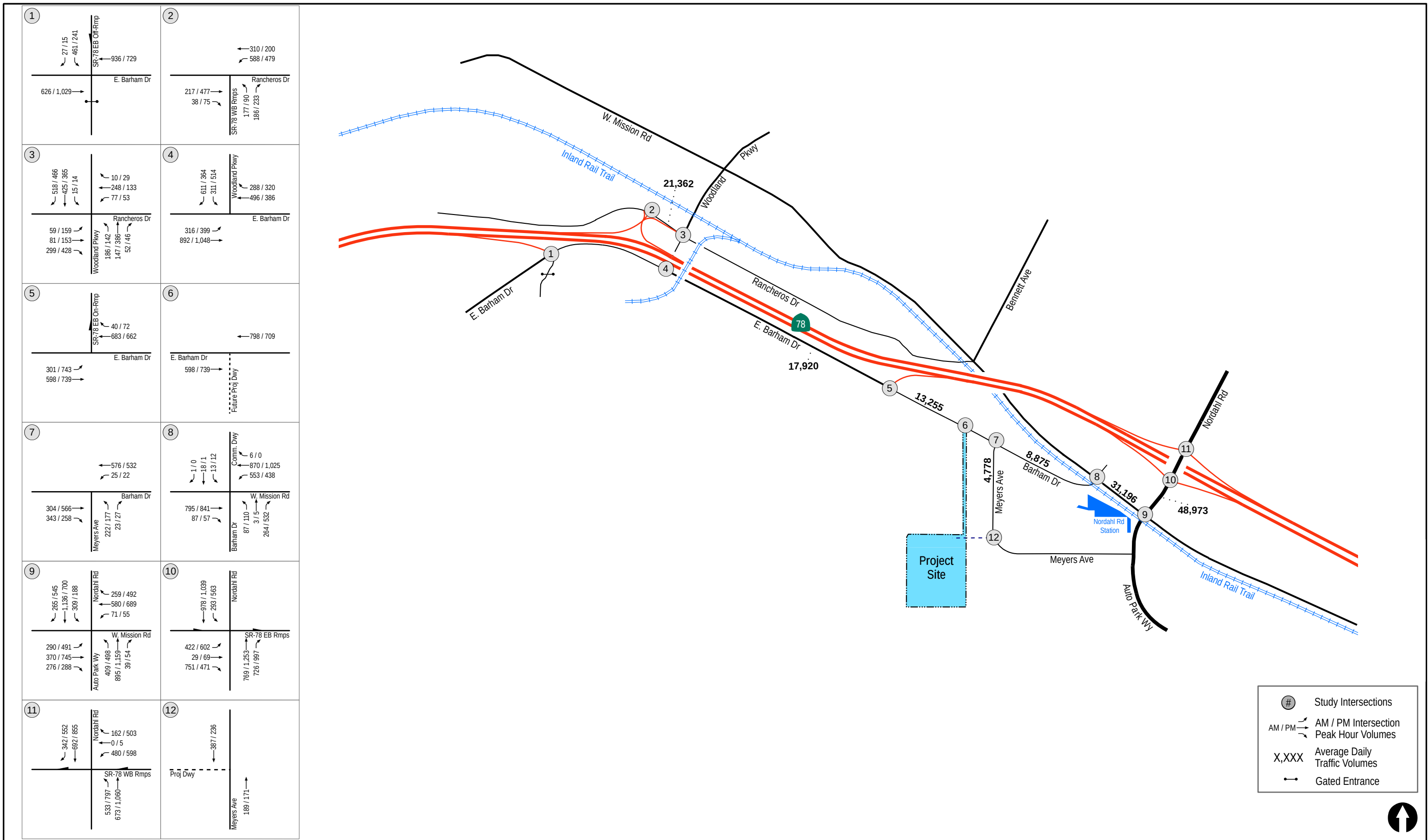
- a. Average daily traffic.

Figure 8-1 depicts the total Cumulative traffic volumes. **Figure 8-2** depicts the Existing + Cumulative traffic volumes. **Figure 8-3** depicts the Existing + Cumulative + Project traffic volumes.

8.2 Network Conditions

No regional roadway network improvements were assumed in the near-term condition.





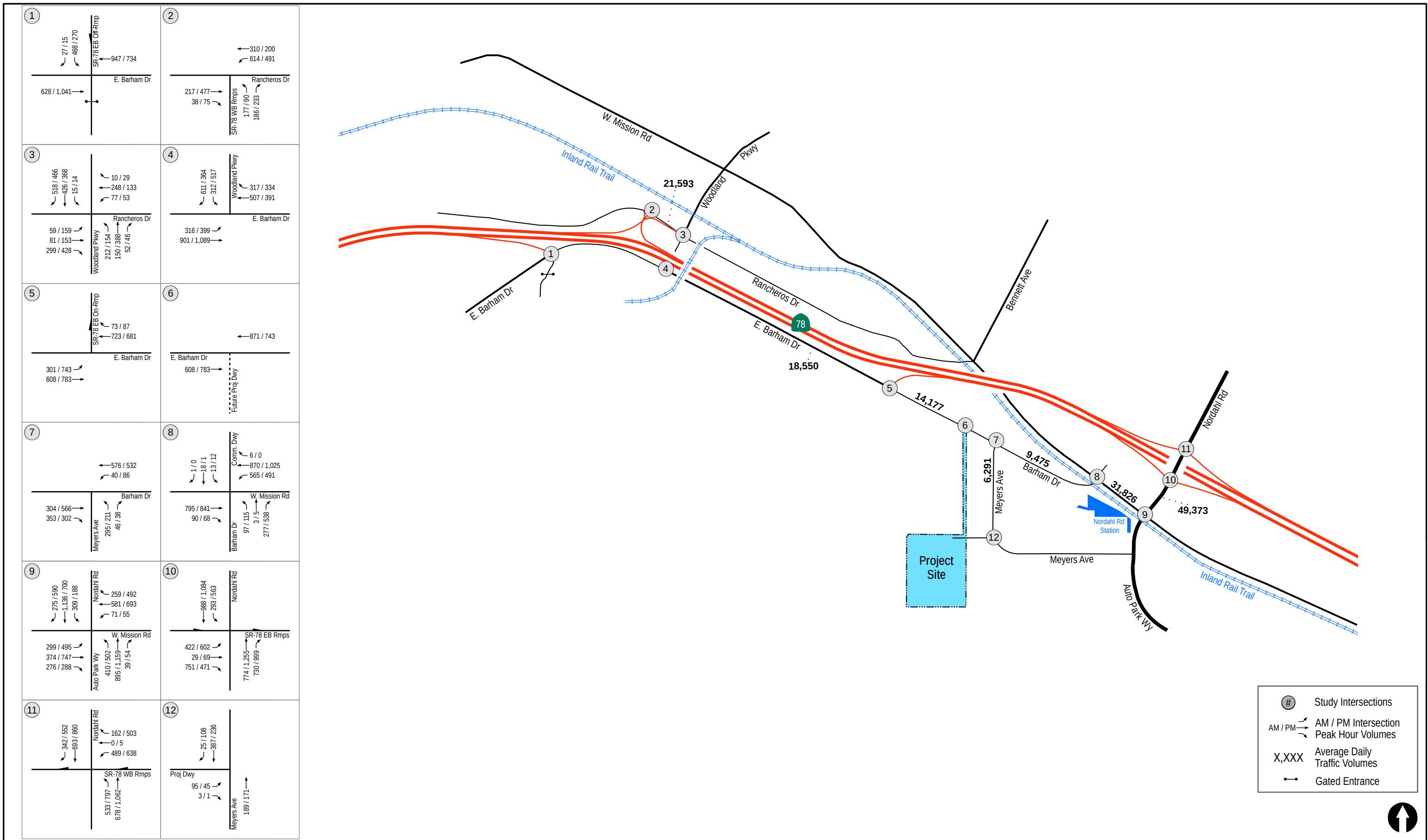


Figure 8-3
Existing + Project + Cumulative Projects Traffic Volumes

9.0 ANALYSIS OF NEAR-TERM SCENARIOS

The following is a summary of the operational analyses for the various street-system components for the near-term traffic scenarios.

9.1 Existing + Project

9.1.1 Intersection Analysis

Table 9–1 summarizes the Existing + Project peak hour intersection operations. While a modest number of Project trips would use the right-in/right-out secondary Project driveway to Barham Drive, 100% of site traffic was conservatively assumed to use Meyers Avenue to provide a worst-case analysis.

As shown in *Table 9–1*, with the addition of Project traffic the following intersections are calculated to operate at unacceptable LOS based on their respective jurisdiction’s criteria:

- **Intersection #2. Rancheros Drive / SR-78 WB Ramps – LOS F in the AM/PM peak hours** (*Caltrans*)
- **Intersection #7. Barham Drive / Meyers Avenue – LOS F in the AM/PM peak hours** (*Escondido*)
- **Intersection #9. Mission Road / Nordahl Road – LOS D/E in the AM/PM peak hours** (*Escondido*)

Significant impacts are calculated at the three (3) intersections listed above in **bold** and underline as the Project-related increase in delay exceeds the significance threshold maximum of 2.0 seconds. Project-related delay at the remaining intersection is below the threshold of significance.

Appendix D contains the Existing + Project peak hour intersection analysis worksheets.

9.1.2 Segment Operations

Table 9–2 summarizes the Existing + Project segment operations along the key study area roadways. As shown, with the addition of Project traffic, all roadway segments are calculated to operate at acceptable LOS on a daily basis except the following:

- Segment #1. Rancheros Drive from SR-78 Ramps to Woodland Parkway – LOS F (*San Marcos*)
- **Segment #3. Barham Drive from SR-78 EB On-Ramp to Meyers Avenue – LOS E** (*San Marcos/ Escondido*)
- **Segment #4. Barham Drive from Meyers Avenue to Mission Road – LOS E** (*Escondido*)
- Segment #5. Mission Road from Barham Drive to Nordahl Road – LOS D (*Escondido*)
- Segment #6. Nordahl Road from SR-78 to Mission Road – LOS E (*Escondido*)

A significant impact is calculated for the two (2) segments **bolded** and underlined above as the Project-related increase in V/C ratio exceeds the significance threshold of 0.02. The project-related increase in V/C ratio on the remaining segments is below the threshold of significance.

9.1.3 Freeway Ramp Meter Operations (Caltrans)

Table 9–3 summarizes the ramp meter analysis for Existing + Project conditions. As shown in *Table 9–3*, with the addition of Project traffic the following ramp meter locations operate unacceptably with calculated delay greater than 15 minutes:

- **Rancheros Drive to SR-78 WB – AM/PM peak hours**

As the project-related increase in delay at this ramp meter exceeds two minutes during the AM peak hour, the project’s impact at this location is considered significant.

9.2 Existing + Cumulative Projects

9.2.1 Intersection Analysis

Table 9–1 summarizes the Existing + Cumulative Projects peak hour intersection operations. As shown in *Table 9–1*, with the addition of Cumulative Projects traffic the following intersections are calculated to operate at unacceptable LOS based on their respective jurisdiction’s criteria:

- Intersection #2. Rancheros Drive / SR-78 WB Ramps – LOS F in the AM/PM peak hours (*Caltrans*)
- Intersection #7. Barham Drive / Meyers Avenue – LOS F in the AM/PM peak hours (*Escondido*)
- Intersection #9. Mission Road / Nordahl Road – LOS D/E in the AM/PM peak hours (*Escondido*)

Appendix E contains the Existing + Cumulative Projects peak hour intersection analysis worksheets

9.2.2 Segment Operations

Table 9–2 summarizes the Existing + Cumulative Projects segment operations along the key study area roadways. As shown, with the addition of Cumulative Projects traffic, all roadway segments are calculated to operate at acceptable LOS on a daily basis except the following:

- Segment #1. Rancheros Drive from SR-78 Ramps to Woodland Parkway – LOS F (*San Marcos*)
- Segment #3. Barham Drive from SR-78 EB On-Ramp to Meyers Avenue – LOS D (*San Marcos/ Escondido*)
- Segment #4. Barham Drive from Meyers Avenue to Mission Road – LOS D (*Escondido*)
- Segment #5. Mission Road from Barham Drive to Nordahl Road – LOS D (*Escondido*)
- Segment #6. Nordahl Road from SR-78 Ramps to Mission Road – LOS F (*Escondido*)

9.2.3 Freeway Ramp Meter Operations (Caltrans)

Table 9–4 summarizes the ramp meter analysis for Existing + Cumulative Projects conditions. As shown in *Table 9–4*, with the addition of Cumulative Projects traffic the following ramp meter locations operate unacceptably with a calculated delay greater than 15 minutes:

- Rancheros Drive to SR-78 WB – AM/PM peak hours

9.3 Existing + Cumulative Projects + Project

9.3.1 Intersection Analysis

Table 9–1 summarizes the Existing + Cumulative Projects + Project peak hour intersection operations. As shown in *Table 9–1*, with the addition of Cumulative Projects and Project traffic the following intersections are calculated to operate at unacceptable LOS based on their respective jurisdiction’s criteria:

- **Intersection #2. Rancheros Drive / SR-78 WB Ramps – LOS F in the AM/PM peak hours** (Caltrans)
- **Intersection #7. Barham Drive / Meyers Avenue – LOS F in the AM/PM peak hours** (Escondido)
- **Intersection #9. Mission Road / Nordahl Road – LOS D/E in the AM/PM peak hours** (Escondido)

Significant impacts are calculated at the three (3) intersections listed above as the Project-related increase in delay exceeds the significance threshold maximum of 2.0 seconds. Project-related delay at the remaining intersection is below the threshold of significance.

Appendix F contains the Existing + Cumulative Projects + Project peak hour intersection analysis worksheets.

9.3.2 Segment Operations

Table 9–2 summarizes the Existing + Cumulative Projects + Project segment operations along the key study area roadways. As shown, with the addition of Cumulative Projects and Project traffic, all roadway segments are calculated to operate at acceptable LOS on a daily basis except the following:

- Segment #1. Rancheros Drive from SR-78 Ramps to Woodland Parkway – LOS F (San Marcos)
- **Segment #3. Barham Drive from SR-78 EB On-Ramp to Meyers Avenue – LOS E** (San Marcos/ Escondido)
- **Segment #4. Barham Drive from Meyers Avenue to Mission Road – LOS E** (Escondido)
- Segment #5. Mission Road from Barham Drive to Nordahl Road – LOS D (Escondido)
- Segment #6. Nordahl Road from SR-78 Ramps to Mission Road – LOS F (Escondido)

A significant impact is calculated for the two (2) segments **bolded** and underlined above as the Project-related increase in V/C ratio exceeds the significance threshold of 0.02. The project-related increase in V/C ratio on the remaining segments is below the threshold of significance.

9.3.3 Freeway Ramp Meter Operations (Caltrans)

Table 9-4 summarizes the ramp meter analysis for Existing + Cumulative Projects + Project conditions. As shown in Table 9-4, with the addition of Cumulative Projects and Project traffic the following ramp meter locations operate unacceptably with a calculated delay greater than 15 minutes:

- **Rancheros Drive to SR-78 WB – AM/PM peak hour**

As the project-related increase in delay at this ramp meter exceeds two minutes during the AM peak hour, the project's impact at this location is considered significant.

**TABLE 9-1
NEAR-TERM INTERSECTION OPERATIONS**

Intersection	Jurisdiction	Control Type	Peak Hour	Existing		Existing + Project			Existing+ Cumulative		Existing + Cumulative + Project			Impact?
				Delay ^a	LOS ^b	Delay	LOS	Δ ^c	Delay	LOS	Delay	LOS	Δ	
1. Barham Dr / SR-78 EB Off-Ramp	Caltrans	Signal	AM	25.9	C	27.5	C	1.6	27.5	C	29.4	C	1.9	No
			PM	14.7	B	17.6	B	2.9	16.9	B	20.5	C	3.6	
2. Rancheros Dr / SR-78 WB Ramps	Caltrans	AWSC ^d	AM	61.5	F	71.1	F	9.6	63.6	F	73.4	F	9.8	Yes
			PM	48.6	E	50.5	F	1.9	50.5	F	53.5	F	3.0	
3. Woodland Pkwy / Rancheros Dr	San Marcos	Signal	AM	29.1	C	31.1	C	2.0	29.7	C	31.7	C	2.0	No
			PM	24.1	C	24.6	C	0.5	24.9	C	25.2	C	0.3	
4. Barham Dr / Woodland Pkwy	San Marcos	Signal	AM	45.5	D	46.6	D	1.1	48.3	D	49.4	D	1.1	No
			PM	41.7	D	45.6	D	3.9	48.5	D	53.4	D	4.9	
5. Barham Dr / SR-78 EB On-Ramp	San Marcos	Signal	AM	7.1	A	8.2	A	1.1	7.3	A	8.8	A	1.5	No
			PM	32.7	C	36.8	D	4.1	35.2	D	38.9	D	3.7	
6. Barham Dr / Project Drwy ^e	San Marcos	MSSC ^f	AM	—	—	—	—	—	—	—	—	—	—	No
			PM	—	—	—	—	—	—	—	—	—	—	
7. Barham Dr / Meyers Ave	Escondido	MSSC	AM	>100.0	F	>100.0	F	>2.0	>100.0	F	>100.0	F	>2.0	Yes
			PM	>100.0	F	>100.0	F	>2.0	>100.0	F	>100.0	F	>2.0	
8. Barham Dr / Mission Rd	San Marcos	Signal	AM	27.9	C	29.4	C	1.5	30.4	C	32.0	C	1.6	No
			PM	31.9	C	36.5	D	4.6	35.0	C	40.3	D	5.3	
9. Mission Rd / Nordahl Rd	Escondido	Signal	AM	39.2	D	39.4	D	0.2	44.5	D	44.9	D	0.4	Yes
			PM	52.1	D	56.3	E	4.2	57.9	E	60.6	E	2.7	
Continued on Next Page														

TABLE 9-1
NEAR-TERM INTERSECTION OPERATIONS

Intersection	Jurisdiction	Control Type	Peak Hour	Existing		Existing + Project			Existing+ Cumulative		Existing + Cumulative + Project			Impact?
				Delay ^a	LOS ^b	Delay	LOS	Δ ^c	Delay	LOS	Delay	LOS	Δ	
Continued from Previous Page														
10. Nordahl Rd / SR-78 EB Ramps	Caltrans	Signal	AM	25.1	C	25.2	C	0.1	35.7	D	36.4	D	0.7	No
			PM	39.1	D	39.1	D	0.0	53.7	D	53.7	D	0.0	
11. Nordahl Rd / SR-78 WB Ramps	Caltrans	Signal	AM	23.4	C	23.5	C	0.1	27.1	C	27.2	C	0.1	No
			PM	33.4	C	33.9	C	0.5	38.4	D	39.8	D	1.4	
12. Meyers Ave / Project Driveway	Escondido	MSSC	AM	—	—	15.6	C	—	—	—	15.6	C	—	No
			PM	—	—	12.5	B	—	—	—	12.5	B	—	

Footnotes:

- a. Average delay expressed in seconds per vehicle.
- b. Level of Service.
- c. Δ denotes an increase in delay due to Project.
- d. AWSC – All-Way Stop Controlled intersection.
- e. The Project driveway at Barham Drive is a right-in/right-out secondary access. 100% of Project traffic was conservatively analyzed at the main driveway to Meyers Avenue (intersection No. 12).
- f. MSSC – Minor street Stop Controlled intersection. Minor street left turn delay is reported.

General Notes:

1. **BOLD** typeface indicates a potentially significant impact.

SIGNALIZED		UNSIGNALIZED	
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 9-2
NEAR-TERM STREET SEGMENT OPERATIONS

Street Segment	Juris.	Capacity ^a	Existing			Existing + Project				Existing + Cumulative Projects			Existing + Cumulative Projects + Project				Impact?
			ADT ^b	LOS ^c	V/C ^d	ADT	LOS	V/C	Δ ^e	ADT	LOS	V/C	ADT	LOS	V/C	Δ	
Rancheros Drive																	
1. SR-78 Ramps to Woodland Pkwy	San Marcos	15,000	21,140	F	1.409	21,371	F	1.425	0.016	21,362	F	1.424	21,593	F	1.440	0.016	No
Barham Drive																	
2. Woodland Pkwy to SR-78 EB On-Ramp	San Marcos	30,000	17,500	C	0.583	18,130	C	0.604	0.021	17,920	C	0.597	18,550	C	0.618	0.021	No
3. SR-78 EB On-Ramp to Meyers Ave	San Marcos/ Escondido	15,000	12,990	D	0.866	13,912	E	0.927	0.061	13,255	D	0.884	14,177	E	0.945	0.061	Yes
4. Meyers Ave to Mission Rd	Escondido	10,000	8,610	D	0.861	9,210	E	0.921	0.060	8,875	D	0.888	9,475	E	0.948	0.060	Yes
Mission Road																	
5. Barham Dr to Nordahl Rd	Escondido	37,000	29,960	D	0.810	30,590	D	0.827	0.017	31,196	D	0.843	31,826	D	0.860	0.017	No
Nordahl Road																	
6. SR-78 Ramps to Mission Rd	Escondido	43,500	41,640	E	0.957	42,040	E	0.966	0.009	48,973	F	1.126	49,373	F	1.135	0.009	No
Meyers Avenue																	
7. Barham Dr to Project Driveway	Escondido	10,000	4,740	B	0.474	6,253	C	0.625	0.151	4,778	B	0.478	6,291	C	0.629	0.151	No

Footnotes:

- a. Capacities based on the City of San Marcos and City of Escondido roadway classification tables (See *Appendix B*).
- b. Average Daily Traffic
- c. Level of Service
- d. Volume to Capacity ratio
- e. Project Attributable increase in V/C.

General Notes:

- 1. **BOLD** typeface indicates a potentially significant impact.

TABLE 9-3
EXISTING + PROJECT RAMP METER ANALYSIS – FIXED RATE

Location	Peak Hour ^a	Near-Term						
		Volume		Peak Hour Demand (D) ^b	Meter Rate (R) ^c	Excess Demand (E) (veh)	Delay (min)	Queue (ft) ^d
		SOV	HOV					
Rancheros Drive to SR-78 WB (1 SOV+1 HOV)								
Existing	AM	529	93	529	343	186	>15.0	4,650
Existing + Project	AM	551	97	551	343	208	>15.0	5,200
Project Increase	AM	22	4	22	—	22	3.9	550
Existing	PM	469	83	469	358	111	>15.0	2,775
Existing + Project	PM	479	85	479	358	121	>15.0	3,025
Project Increase	PM	10	2	10	—	10	1.7	250
Barham Drive to SR-78 EB (1 SOV+1 HOV)								
Existing	AM	275	49	275	644	0	0	0
Existing + Project	AM	303	54	303	644	0	0	0
Project Increase	AM	28	5	28	—	0	0	0
Existing	PM	677	120	677	608	69	6.8	1,725
Existing + Project	PM	690	122	690	608	82	8.1	2,050
Project Increase	PM	13	2	13	—	13	1.3	325

Footnotes:

- a. Selected peak hour based on period when ramp meter is operating.
- b. Peak hour demand in vehicles/hour/lane for SOV and HOV lanes.
- c. Meter rate “R” is the most restrictive rate at which the ramp meter (signal) discharges traffic onto the freeway (obtained from Caltrans). The discharge rate varies during the peak hour depending on the mainline volumes.
- d. Queue calculated assuming vehicle length of 25 feet.

General Notes:

1. **BOLD** typeface indicates a potentially significant impact.
2. SOV = Single Occupancy Vehicle, HOV = High Occupancy Vehicle
3. Lane utilization factor accounted for in peak hour demand calculation. (Assumed 15% for HOV).

TABLE 9-4
NEAR-TERM RAMP METER ANALYSIS – FIXED RATE

Location	Peak Hour ^a	Near-Term						
		Volume		Peak Hour Demand (D) ^b	Meter Rate (R) ^c	Excess Demand (E) (veh)	Delay (min)	Queue (ft) ^d
		SOV	HOV					
Rancheros Drive to SR-78 WB (1 SOV+1 HOV)								
Existing + Cumulative Projects	AM	532	94	532	343	189	>15.0	4,725
Existing + Cumulative Projects + Project	AM	554	98	554	343	211	>15.0	5,275
Project Increase	AM	22	4	22	—	22	3.8	550
Existing + Cumulative Projects	PM	471	83	471	358	113	>15.0	2,825
Existing + Cumulative Projects + Project	PM	481	85	481	358	123	>15.0	3,075
Project Increase	PM	10	2	10	—	10	1.7	250
Barham Drive to SR-78 EB (1 SOV+1 HOV)								
Existing + Cumulative Projects	AM	290	51	290	644	0	0	0
Existing + Cumulative Projects + Project	AM	318	56	318	644	0	0	0
Project Increase	AM	28	5	28	—	0	0	0
Existing + Cumulative Projects	PM	693	122	693	608	85	8.4	2,125
Existing + Cumulative Projects + Project	PM	706	125	706	608	98	9.7	2,450
Project Increase	PM	13	3	13	—	13	1.3	325

Footnotes:

- a. Selected peak hour based on period when ramp meter is operating.
- b. Peak hour demand in vehicles/hour/lane for SOV and HOV lanes.
- c. Meter rate “R” is the most restrictive rate at which the ramp meter (signal) discharges traffic onto the freeway (obtained from Caltrans). The discharge rate varies during the peak hour depending on the mainline volumes.
- d. Queue calculated assuming vehicle length of 25 feet.

General Notes:

1. **BOLD** typeface indicates a potentially significant impact.
2. SOV = Single Occupancy Vehicle, HOV = High Occupancy Vehicle
3. Lane utilization factor accounted for in peak hour demand calculation. (Assumed 15% for HOV).

10.0 GENERAL PLAN (YEAR 2035) CUMULATIVE ANALYSIS

10.1 Land Use and Traffic Volumes

LLG reviewed several recent traffic studies prepared in the City of San Marcos that included buildout traffic volume assumptions. Based on these reports, LLG used the SANDAG Series 12 Year 2035 model to forecast Year 2035 traffic volumes in the study area. This model was adjusted to reflect the general plan amendment projects proposed in the County of San Diego and discussed in Section 8.0.

Future Year 2035 street segment ADTs were taken directly from the model, unless the model indicated a value less than existing, in which case the ADT was manually increased by an appropriate amount to be consistent with growth at adjacent locations.

Peak hour turning movement volumes at study area intersections were estimated from future ADT volumes using the relationship between existing peak hour turning movements and the existing ADT volumes. However, due to substantial changes in future traffic patterns due to planned improvements including the realignment of the Barham Drive / SR-78 EB freeway ramps, described in greater detail below, LLG first redistributed existing traffic volumes as if the future network changes were in place. These rerouted existing volumes were used only as a baseline for future volume forecasting, not in any analysis presented in this report.

10.2 Network Conditions

There are a series of improvements to the SR-78 freeway system in the vicinity of Woodland Parkway that are identified in the City of San Marcos' Capital Improvement Program (CIP) as the "Woodland Parkway Highway 78 Interchange" project (CIP project code no. 88005). These improvements would directly improve substandard locations in the study area. The following is a discussion of these improvements, organized by corridor.

Rancheros Drive Corridor: widen Rancheros Drive to four-lane major street standards from the SR-78 Westbound Ramps to Woodland Parkway, including Class II bike lanes. Signalize the Rancheros Drive/SR-78 Westbound Ramps intersection. Provide dual westbound-to-southbound left-turn lanes from Rancheros Drive to the SR-78 westbound on-ramp. Widen the SR-78 westbound on-ramp from Rancheros Drive to include two SOV and one HOV lanes. Widen the SR-78 westbound off-ramp to Rancheros Drive to include one left-turn lane and two right-turn lanes.

Woodland Parkway Corridor: widen the Woodland Parkway undercrossing at SR-78 from Rancheros Drive to Barham Drive to four-lane major street standards. Provide two-travel lanes in each direction, with back-to-back left-turn lanes at both Barham Drive and Rancheros Drive. Provide Class II bike lanes.

Barham Drive Corridor: realign Barham Drive from west of Warplex Avenue to Woodland Parkway to provide a six -lane prime arterial transitioning to a four-lane major street east of Woodland Parkway. Widen and realign the existing SR-78 eastbound off-ramp to include two

left-turn lanes and one right-turn lane. Construct a new SR-78 eastbound on-ramp from E. Barham Drive to include two SOV and one HOV lanes. Install a traffic signal at the realigned E. Barham Drive/ SR-78 eastbound ramps intersection. Remove the existing on-ramp to eastbound SR-78 located east of La Moree Road, and the associated signalized intersection.

SR-78 Freeway: widen and improve SR-78 to an 8-lane facility with two managed lanes in the median. Provide necessary on-ramp and off-ramp transitions, acceleration lanes and trap lanes, as required to provide the improvements listed above.

The total cost estimate for these improvements is \$36,338,395, as published online in the City's latest FY 2015-16 Proposed CIP Budget. These improvements will be developed in phases, although the timing of delivery of these improvements is unknown. While these improvements were conservatively not assumed in the near-term analysis, they were assumed in place in the long-term.

Additionally, the standard of practice within the City of Escondido is to assume buildout of the street system to its ultimate general plan conditions. For the purposes of this study, that entails the improvement of the City of Escondido portions of Barham Drive from a two-lane collector to a four-lane major roadway. The remainder of the study area falling within the jurisdiction of the City of Escondido is generally built to its ultimate capacity under existing conditions.

The above-listed improvements are assumed in the baseline conditions for Year 2035 analysis of study area intersections and street segments.

Figure 10–1 depicts Year 2035 network conditions. **Figure 10–2** depicts Year 2035 project distribution based on the improved network. **Figure 10–3** depicts Year 2035 Project traffic volumes.

Figure 10–4 depicts Year 2035 Without Project traffic volumes. **Figure 10–5** depicts Year 2035 With Project traffic volumes.

10.3 Year 2035 Without Project Analysis

The criteria used for determining unacceptable operations are subject to each jurisdiction's standards, as discussed in *Section 5.0* of this report. The City of Escondido considers LOS D to be acceptable for General Plan (Year 2035) conditions. Thus, Escondido, San Marcos, and Caltrans each consider LOS E or worse as the threshold for unacceptable operations for the analysis in this section.

10.3.1 Intersection Analysis

Table 10–1 summarizes the Year 2035 without Project peak hour intersection analysis. As shown in **Table 10–1**, the following intersections are calculated to operate at unacceptable LOS based on their respective jurisdiction criteria:

- Intersection #7. Barham Drive / Meyers Avenue – LOS F during the AM/PM peak hours (*Escondido*)
- Intersection #8. Barham Drive / Mission Road – LOS E/F during the AM/PM peak hours (*San Marcos*)

- Intersection #9. Mission Road / Nordahl Road – LOS E during the PM peak hours (*Escondido*)
- Intersection #10. Nordahl Road / SR-78 EB Ramps – LOS E during the PM peak hour (*Escondido*)

Appendix G contains the Year 2035 Without Project peak hour intersection analysis worksheets.

10.3.2 Segment Operations

Table 10–2 summarizes the Year 2035 without Project daily street segment operations. As shown in **Table 10–2**, the following street segments are calculated to operate at unacceptable LOS based on their respective jurisdiction criteria:

- Segment #1. Rancheros Drive from SR-78 Ramps to Woodland Parkway – LOS F (*San Marcos*)
- Segment #5. W. Mission Road from Barham Drive to Nordahl Road – LOS F (*Escondido*)
- Segment #6. Nordahl Road from SR-78 Ramps to Mission Road – LOS F (*Escondido*)

10.3.3 Freeway Ramp Meter Operations (Caltrans)

Table 10–3 summarizes the Year 2035 without Project ramp meter operations. As shown in **Table 10–3**, all study area ramp meter locations are calculated to operate acceptably with total delay less than fifteen minutes under Year 2035 without Project conditions.

10.4 Year 2035 With Project Analysis

10.4.1 Intersection Analysis

Table 10–1 summarizes the Year 2035 with Project peak hour intersection analysis. As shown in **Table 10–1**, with the addition of Project traffic the following intersections are calculated to operate at unacceptable LOS based on their respective jurisdiction criteria:

- **Intersection #7. Barham Drive / Meyers Avenue – LOS F during the AM/PM peak hours** (*Escondido*)
- **Intersection #8. Barham Drive / Mission Road – LOS E/F during the AM/PM peak hours** (*San Marcos*)
- **Intersection #9. Mission Road / Nordahl Road – LOS E/F during the AM/PM peak hour** (*Escondido*)
- Intersection #10. Nordahl Road / SR-78 EB Ramps – LOS E during the PM peak hour (*Escondido*)

A significant impact is calculated at the three (3) intersections **bolded** and underlined above.

Appendix H contains the Year 2035 With Project peak hour intersection analysis worksheets.

10.4.2 Segment Operations

Table 10–2 summarizes the Year 2035 with Project daily street segment operations. As shown in Table 10–2, with the addition of project traffic the following street segments are calculated to operate at unacceptable LOS based on their respective jurisdiction criteria:

- Segment #1. Rancheros Drive from SR-78 Ramps to Woodland Parkway – LOS F (*San Marcos*)
- Segment #5. W. Mission Road from Barham Drive to Nordahl Road – LOS F (*Escondido*)
- Segment #6. Nordahl Road from SR-78 Ramps to Mission Road – LOS F (*Escondido*)

No significant impacts are calculated on the segments listed above as the project-related increase in V/C ratio is less than or equal to the significance threshold maximum of 0.02.

10.4.3 Freeway Ramp Meter Operations (Caltrans)

Table 10–3 summarizes the Year 2035 with Project ramp meter operations. As shown in Table 10–3, all study area ramp meter locations are calculated to operate acceptably with total delay less than fifteen minutes under Year 2035 with Project conditions.

TABLE 10-1
YEAR 2035 INTERSECTION OPERATIONS

Intersection	Jurisdiction	Control Type	Peak Hour	Year 2035		Year 2035 + Project			Impact?
				Delay ^a	LOS ^b	Delay	LOS	Δ ^c	
1. Barham Dr / SR-78 EB Ramps	Caltrans	Signal	AM	22.3	C	22.6	C	0.3	No
			PM	31.3	C	33.3	C	2.0	
2. Rancheros Dr / SR-78 WB Ramps	Caltrans	Signal	AM	14.4	B	14.8	B	0.4	No
			PM	18.7	B	19.0	B	0.3	
3. Woodland Pkwy / Rancheros Dr	San Marcos	Signal	AM	38.2	D	40.4	D	2.2	No
			PM	26.8	C	27.3	C	0.5	
4. Woodland Pkwy / Barham Dr	San Marcos	Signal	AM	24.0	C	25.7	C	1.7	No
			PM	33.4	C	35.9	D	2.5	
5. Barham Dr / SR-78 EB On-Ramp	San Marcos	DNE	AM	—	—	—	—	—	DNE
			PM	—	—	—	—	—	
6. Barham Dr / Project Drwy ^d	San Marcos	MSSC	AM	—	—	—	—	—	No
			PM	—	—	—	—	—	
7. Barham Dr / Meyers Ave	Escondido	MSSC ^e	AM	>100.0	F	>100.0	F	>2.0	Yes
			PM	>100.0	F	>100.0	F	>2.0	
8. Barham Dr / W. Mission Rd	San Marcos	Signal	AM	59.5	E	64.6	E	5.1	Yes
			PM	86.9	F	97.9	F	11.0	
9. Mission Rd / Auto Park Way / Nordahl Rd	Escondido	Signal	AM	54.4	D	56.8	E	2.4	Yes
			PM	76.5	E	86.0	F	9.5	
10. Nordahl Rd / SR-78 EB Ramps	Caltrans	Signal	AM	44.1	D	47.6	D	3.5	No
			PM	74.2	E	75.6	E	1.4	
11. Nordahl Rd / SR-78 WB Ramps	Caltrans	Signal	AM	32.3	C	32.3	C	0.0	No
			PM	44.4	D	46.6	D	2.2	
12. Meyers Avenue / Project Driveway	Escondido	MSSC	AM	—	—	16.5	C	—	No
			PM	—	—	12.8	B	—	

Footnotes:

- a. Average delay expressed in seconds per vehicle.
- b. Level of Service
- c. Δ denotes an increase in delay due to project.
- d. The Project driveway at Barham Drive is a right-in/right-out secondary access. 100% of Project traffic was conservatively analyzed at the main driveway to Meyers Avenue (intersection No. 12).
- e. MSSC –minor-street stop-controlled intersection. Minor street left turn delay is reported.

General Notes:

1. **BOLD** typeface indicates a potentially significant impact.

SIGNALIZED		UNSIGNALIZED	
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
YEAR 2035 STREET SEGMENT OPERATIONS

Street Segment	Jurisdiction	Proposed Classification	LOS E ^a Capacity	Year 2035			Year 2035 + Project				Impact?
				ADT ^b	LOS ^c	V/C ^d	ADT	LOS	V/C	Δ ^e	
Rancheros Drive											
1. SR-78 Ramps to Woodland Pkwy	San Marcos	2-Lane Collector	15,000	22,200	F	1.480	22,431	F	1.495	0.015	No
Barham Drive											
2. Woodland Pkwy to SR-78 EB On-Ramp	San Marcos	<i>4-Lane Arterial</i>	40,000	18,380	B	0.460	19,010	B	0.475	0.015	No
3. SR-78 EB On-Ramp to Meyers Ave	San Marcos/ Escondido	<i>4-Lane Collector</i>	34,200	15,600	B	0.456	16,230	B	0.475	0.019	No
4. Meyers Ave to Mission Rd	Escondido	<i>4-Lane Collector</i>	34,200	15,800	B	0.462	16,691	B	0.488	0.026	No
Mission Road											
5. Barham Dr to Nordahl Rd	Escondido	4-Lane Major	37,000	38,200	F	1.032	38,938	F	1.052	0.020	No
Nordahl Road											
6. SR-78 Ramps to Mission Rd	Escondido	5-Lane Major	43,500	43,800	F	1.007	44,446	F	1.022	0.015	No
Meyers Avenue											
7. Barham Dr to Project Driveway	Escondido	2-Lane Collector	10,000	4,980	B	0.498	6,493	C	0.649	0.151	No

Footnotes:

- a. Capacities based on the City of San Marcos and City of Escondido roadway classification tables (See *Appendix B*)
- b. Average Daily Traffic Volumes.
- c. Level of Service.
- d. Volume to capacity ratio.
- e. Δ = Project-related change in V/C ratio.

General Notes:

1. **BOLD** typeface indicates a potentially significant impact.
2. *Italics* in "Proposed Classification" column indicates capacity increase over existing to buildout conditions per the City's Circulation Element classification.

TABLE 10-3
YEAR 2035 RAMP METER ANALYSIS – FIXED RATE

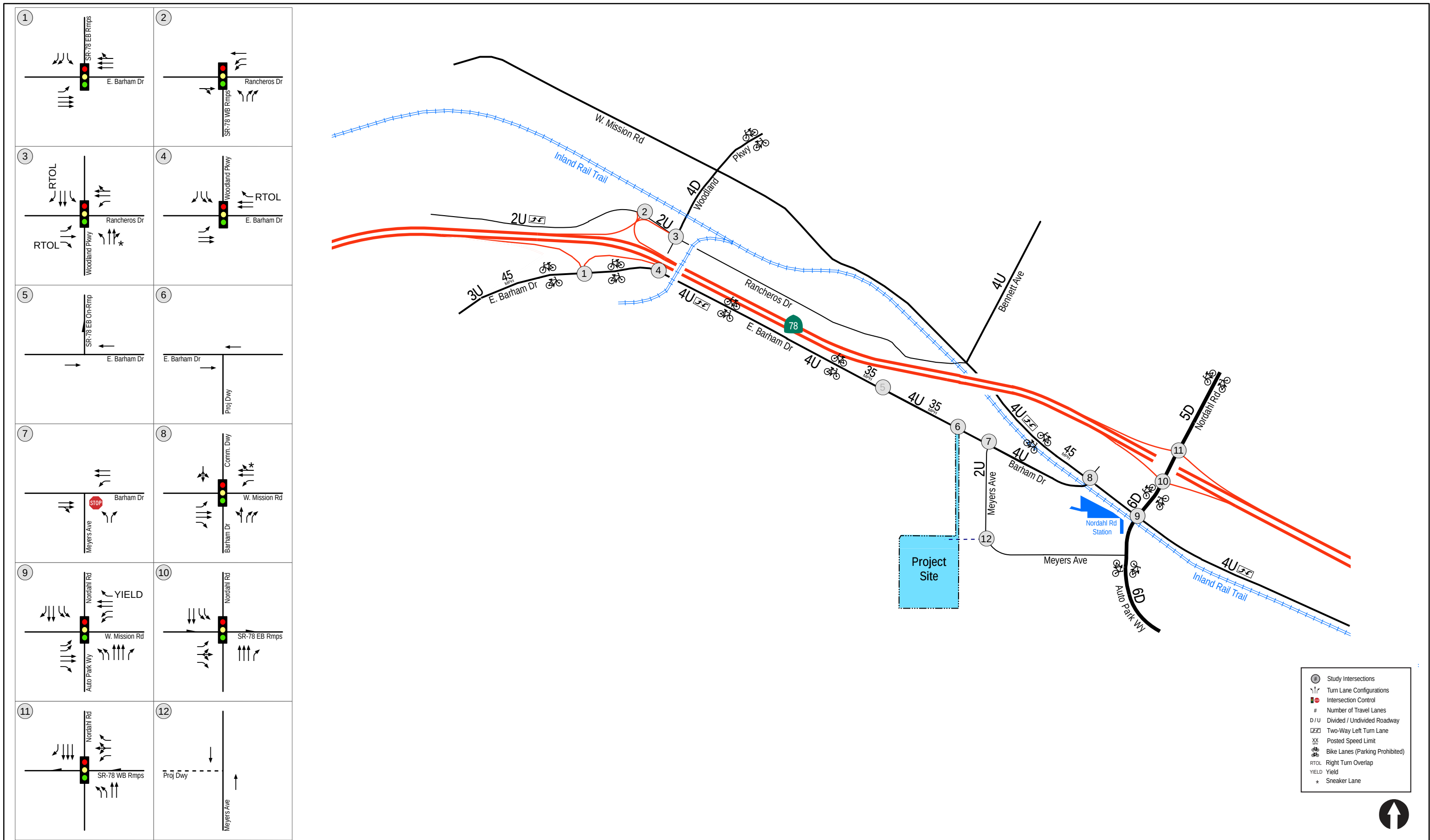
Location	Peak Hour ^a	Year 2035						
		Volume		Peak Hour Demand (D) ^b	Meter Rate (R) ^c	Excess Demand (E) (veh)	Delay (min)	Queue (ft) ^d
		SOV	HOV					
Rancheros Drive to SR-78 WB (2 SOV+1 HOV)								
Year 2035	AM	659	116	329	343	0	0	0
Year 2035 + Project	AM	681	120	341	343	0	0	0
<i>Project Increase</i>	<i>AM</i>	22	4	12	—	0	0	0
Year 2035	PM	582	103	291	358	0	0	0
Year 2035 + Project	PM	592	105	296	358	0	0	0
<i>Project Increase</i>	<i>PM</i>	10	2	5	—	0	0	0
Nordahl Road to SR-78 EB (2 SOV)								
Year 2035	AM	1,120	—	560	559	1	0.1	25
Year 2035 + Project	AM	1,156	—	578	559	19	2.0	475
<i>Project Increase</i>	<i>AM</i>	36	—	18	—	18	1.9	450
Year 2035	PM	1,760	—	880	715	165	13.8	4,125
Year 2035 + Project	PM	1,777	—	889	715	174	14.6	4,350
<i>Project Increase</i>	<i>PM</i>	17	—	9	—	9	0.8	225

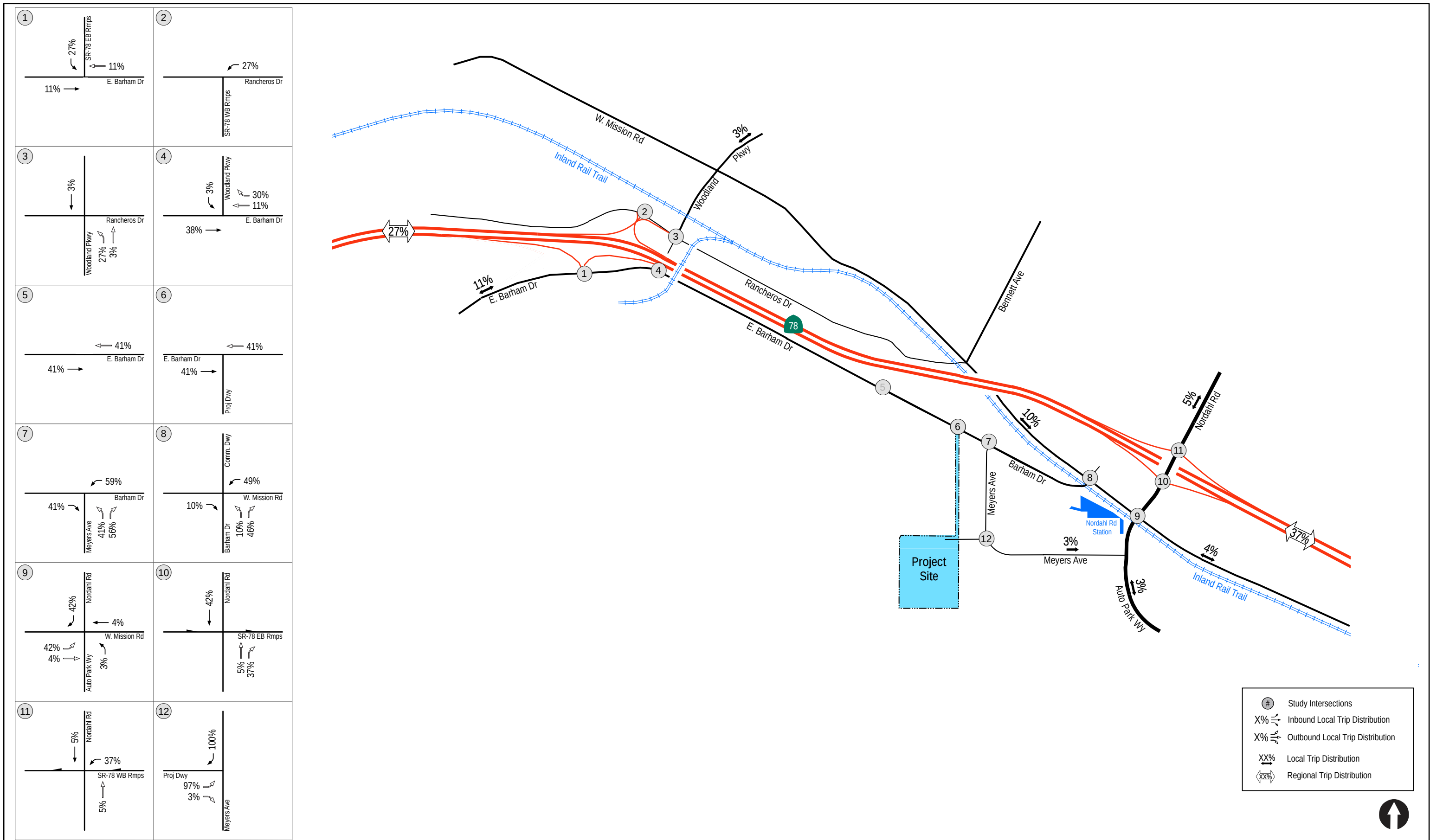
Footnotes:

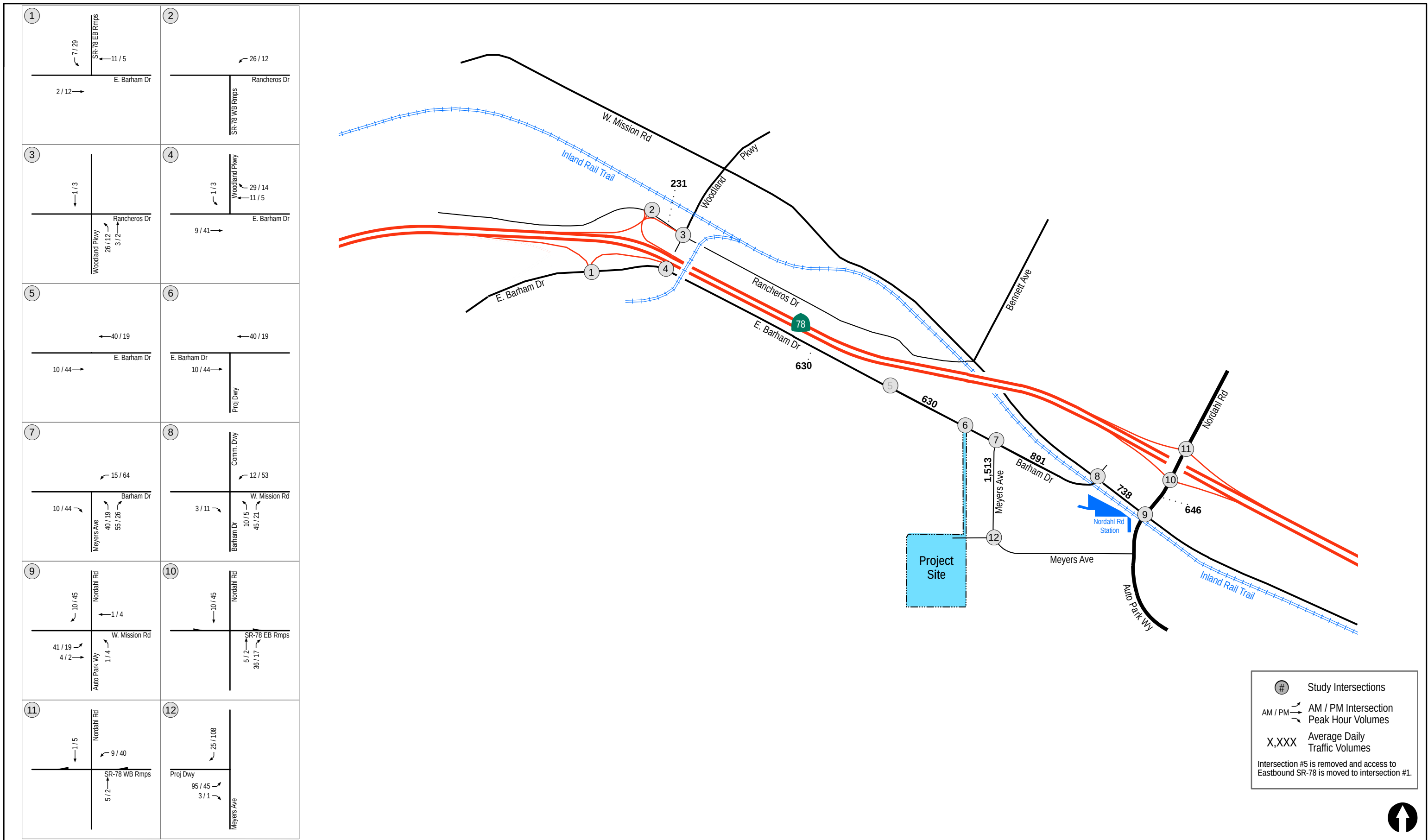
- a. Selected peak hour based on period when ramp meter is operating.
- b. Peak hour demand in vehicles/hour/lane for SOV and HOV lanes.
- c. Meter rate “R” is the most restrictive rate at which the ramp meter (signal) discharges traffic onto the freeway (obtained from Caltrans). The discharge rate varies during the peak hour depending on the mainline volumes.
- d. Queue calculated assuming vehicle length of 25 feet.

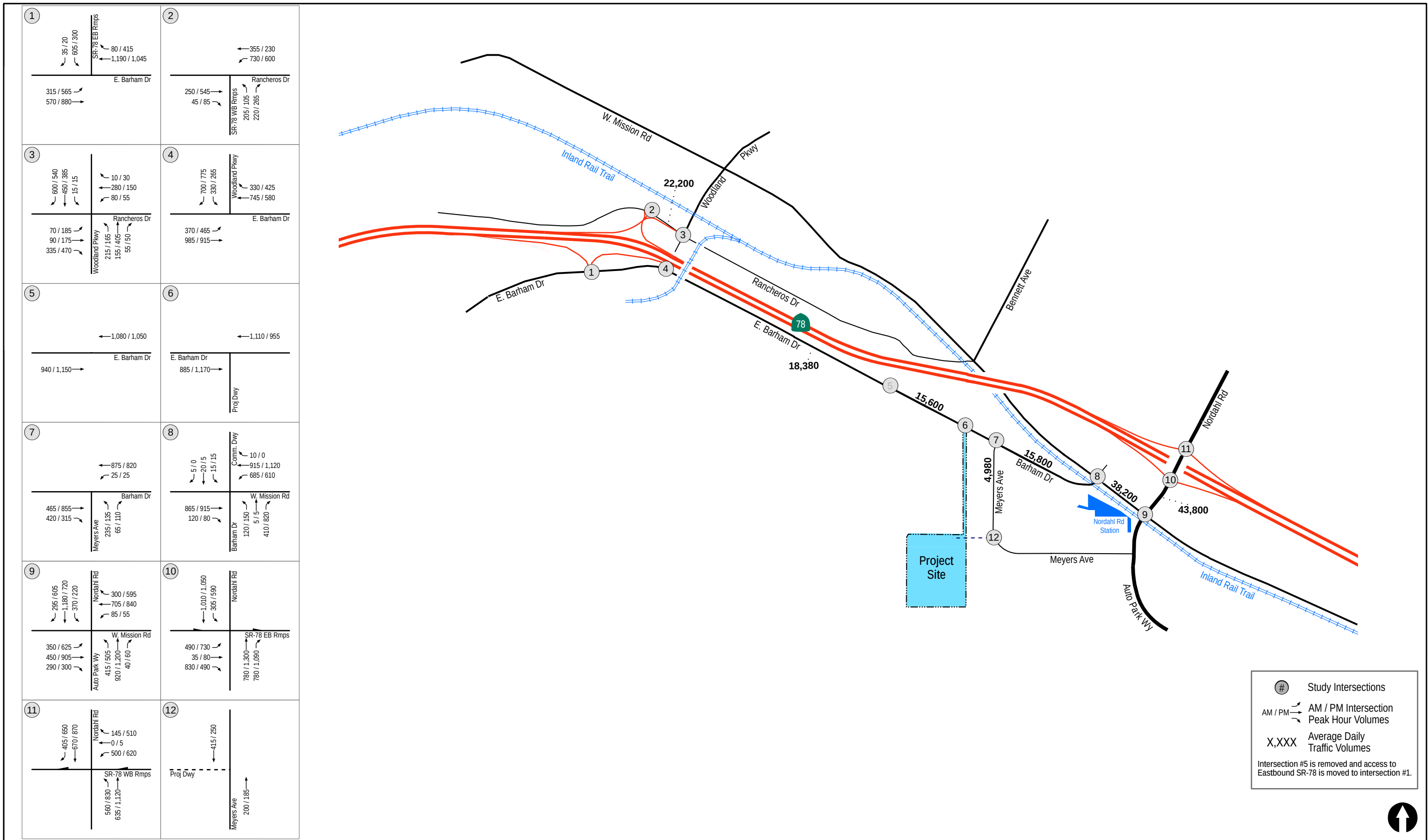
General Notes:

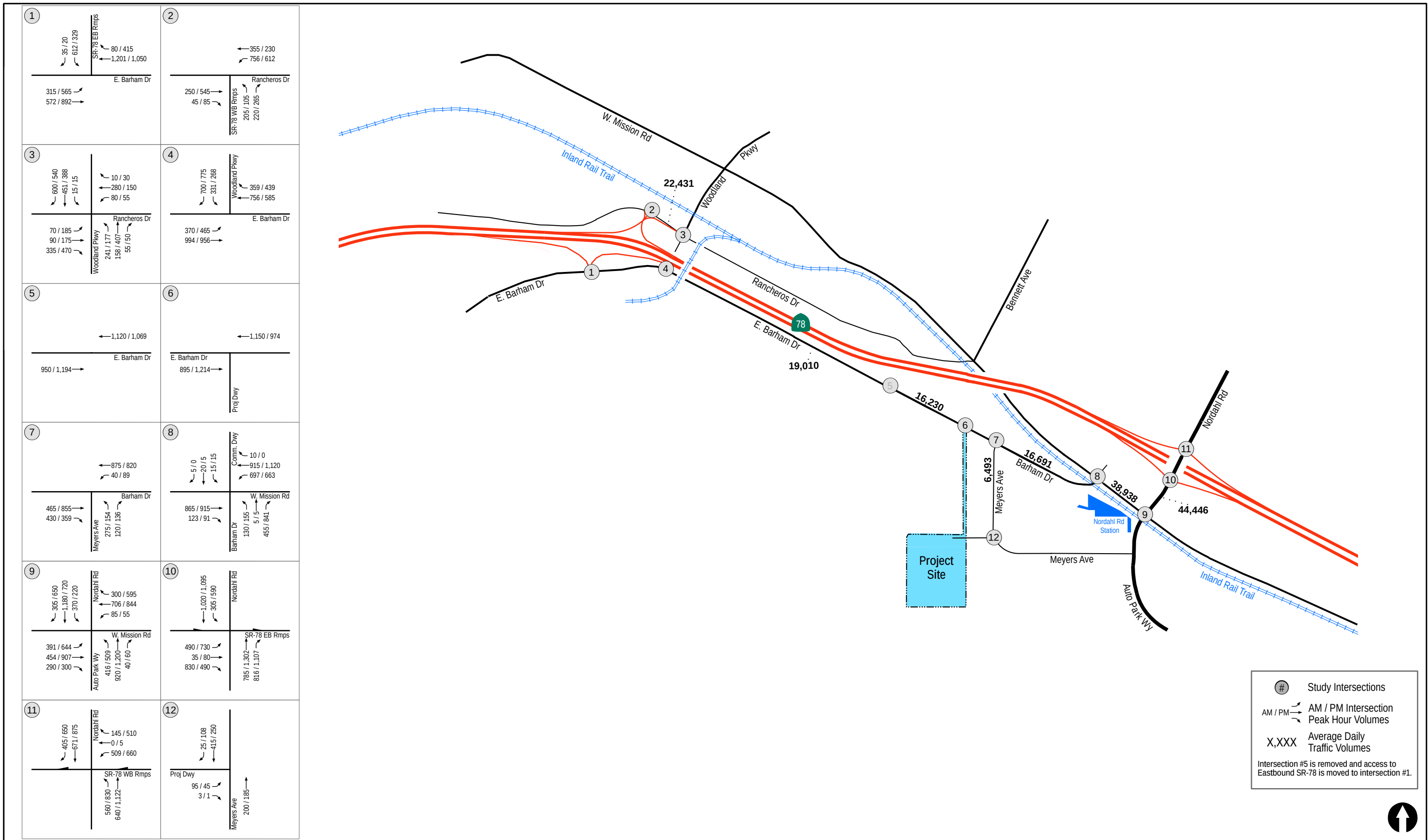
1. SOV = Single Occupancy Vehicle, HOV = High Occupancy Vehicle
2. Lane utilization factor accounted for in peak hour demand calculation. (Assumed 15% for HOV).











11.0 SIGNIFICANCE OF IMPACTS AND MITIGATION MEASURES

Per the City of Escondido, City of San Marcos, and Caltrans significance thresholds and the analysis methodology presented in this report, the following is a summary of the significant near-term direct and cumulative and long-term cumulative impacts. Once implemented, the mitigation measures recommended here would reduce the Project's impacts to less-than-significant.

11.1 Significance of Impacts

11.1.1 Near-Term Significant Direct Impacts

The Project would result in significant near-term direct impacts to each of the following locations:

Intersections

- TRA-1. Intersection #2. Rancheros Drive / SR-78 WB Ramps (*Caltrans*)
- TRA-2. Intersection #7. Barham Drive / Meyers Avenue (*Escondido*)
- TRA-3. Intersection #9. Mission Road / Nordahl Road (*Escondido*)

Street Segments

- TRA-4. Segment #3. Barham Drive: SR-78 EB On-Ramp to Meyers Avenue (*San Marcos/Escondido*)
- TRA-5. Segment #4. Barham Drive: Meyers Avenue to Mission Road (*Escondido*)

Ramp Meters

- TRA-6. Rancheros Drive to SR-78 WB On-Ramp Meter (*Caltrans*)

11.1.2 Near-Term Cumulative Impacts

The Project would result in significant near-term cumulative impacts to each of the following locations:

Intersections

- TRA-7. Intersection #2. Rancheros Drive / SR-78 WB Ramps (*Caltrans*)
- TRA-8. Intersection #7. Barham Drive / Meyers Avenue (*Escondido*)
- TRA-9. Intersection #9. Mission Road / Nordahl Road (*Escondido*)

Street Segments

- TRA-10. Segment #3. Barham Drive: SR-78 EB On-Ramp to Meyers Avenue (*San Marcos/Escondido*)
- TRA-11. Segment #4. Barham Drive: Meyers Avenue to Mission Road (*Escondido*)

Ramp Meters

- TRA-12. Rancheros Drive to SR-78 WB On-Ramp Meter (*Caltrans*)

11.1.3 Long-Term Significant Cumulative Impacts

The Project would result in long-term significant cumulative impacts to the following locations:

Intersections

- TRA-13. Intersection #7. Barham Drive / Meyers Avenue (*Escondido*)
- TRA-14. Intersection #8. Barham Drive / Mission Road (*San Marcos*)
- TRA-15. Intersection #9. Mission Road / Nordahl Road (*Escondido*)

Street Segments

None

11.2 Mitigation Measures

11.2.1 Near-Term Direct Mitigation Measures

The following are mitigation measures that if implemented, would mitigate the significant direct and cumulative impacts to less than significant.

- TRA-1. **Intersection #2. Rancheros Drive / SR-78 WB Ramps** – Prior to the issuance of the first building permit, the Project applicant shall pay the local and regional development fees assessed to address the impact to the City of San Marcos' Woodland Parkway/SR 78 Interchange CIP. This capital improvement project proposes widening of Rancheros Drive at the SR-78 WB Ramps intersection, widening of the on-and-off ramps, construction of a second left-turn lane from Rancheros Drive to SR-78, and installs a traffic signal to control the intersection. The existing traffic conditions at this location are already substandard and warrant a traffic signal. Provision of the traffic signal alone would be sufficient to reduce the Project's near-term direct and long-term cumulative impacts. The Project's traffic generation is consistent with that of the existing General Plan's industrial zoning considered in the CIP so no additional payment is required based on the proposed zone change.

It should be noted that the improvement would be located within the jurisdiction and control of the State of California (Caltrans), and neither the applicant nor the City of San Marcos can assure that Caltrans will permit the improvement to be made. Based on regional standards of practice, the near-term direct project impacts at this location would be considered significant and unavoidable for the purposes of CEQA. However, inter-jurisdictional coordination would be expected to occur to permit the implementation of this mitigation measure.

- TRA-2. **Intersection #7. Barham Drive / Meyers Avenue** – Prior to the issuance of the first permanent certificate of occupancy, the Project applicant shall provide a traffic signal with a dedicated westbound left turn lane and protected left turn phasing on the westbound Barham Drive approach to Meyers Avenue. The westbound left-turn pocket should provide at least 100 feet of storage to accommodate queueing under buildout traffic conditions.

It should be noted that the improvement would be located within the jurisdiction and control of the City of Escondido, and neither the applicant nor the City of San Marcos can assure that the City of Escondido will permit the improvement to be made. Based on regional standards of practice, the near-term direct project impacts at this location would be considered significant and unavoidable for the purposes of CEQA. However, inter-jurisdictional coordination would be expected to occur to permit the implementation of this mitigation measure.

- TRA-3. ***Intersection #9. Mission Road / Nordahl Road*** – Prior to the issuance of the first permanent certificate of occupancy, the Project applicant shall coordinate with the City of Escondido to facilitate the provision of transportation systems management (TSM) improvements such as signal retiming of the corridor or adaptive traffic signal control.

It should be noted that the improvement would be located within the jurisdiction and control of the City of Escondido, and neither the applicant nor the City of San Marcos can assure that the City of Escondido will permit the improvement to be made. Based on regional standards of practice, the near-term direct project impacts at this location would be considered significant and unavoidable for the purposes of CEQA. However, inter-jurisdictional coordination would be expected to occur to permit the implementation of this mitigation measure.

- TRA-4. ***Segment #3. Barham Drive: SR-78 EB On-Ramp to Meyers Avenue*** – Prior to the issuance of the first permanent certificate of occupancy, the Project applicant shall provide half-width improvements along the south side of Barham Drive and any required widening along the north side of Barham Drive between the Project Driveway and Meyers Avenue to achieve a 48-foot cross-section. This would allow for a two-way left-turn (TWLTL) lane to be striped, which would enhance segment operations by allowing vehicles turning to the commercial properties to the north to queue in the TWLTL, out of the through lanes. Currently, this section of Barham Drive, located within the jurisdiction of the City of Escondido, is narrower than the sections adjacent to it. Improvements have been made to the sections adjacent to the listed termini to include curb, gutter and sidewalk. The section currently provides a temporary asphalt curb, gutter and sidewalk.

It should be noted that the half-width improvements required for TRA-4 would be located within the jurisdiction and control of the City of Escondido, and neither the applicant nor the City of San Marcos can assure that the City of Escondido will permit the improvement to be made. Based on regional standards of practice, the near-term direct project impacts at this location would be considered significant and unavoidable for the purposes of CEQA. However, inter-jurisdictional coordination would be expected to occur to permit the implementation of this mitigation measure in full.

Concurrent with this proposed improvement, the Project applicant shall improve the existing +/- 450' section of Barham Drive from Casitas Del Sol to Project Driveway "A" to provide a three-lane cross-section consistent with the existing three-lane (two travel lanes plus TWLTL) segment west of Casitas Del Sol.

- TRA-5. **Segment #4. Barham Drive: Meyers Avenue to [+/- 200' west of] Mission Road** – Prior to the issuance of the first permanent certificate of occupancy, the Project applicant shall improve segment within existing right-of-way on the north side of Barham Drive from Meyers Avenue to approximately 200 feet west of Mission Road to provide for the addition of a two-way left-turn lane, which would enhance segment operations by allowing vehicles turning to commercial properties on the south side of the roadway to queue in the TWLTL, out of the through lanes.

It should be noted that the improvement would be located within the jurisdiction and control of the City of Escondido, and neither the applicant nor the City of San Marcos can assure that the City of Escondido will permit the improvement to be made. Based on regional standards of practice, the near-term direct project impacts at this location would be considered significant and unavoidable for the purposes of CEQA. However, inter-jurisdictional coordination would be expected to occur to permit the implementation of this mitigation measure.

- TRA-6. **Rancheros Drive to SR-78 WB On-Ramp Meter** – Prior to issuance of the first building permit, the Project applicant shall pay the local and regional development fees assessed to address the impact to the City of San Marcos' Woodland Parkway/SR 78 Interchange CIP, indexed to the cost of the westbound on-ramp widening and ramp meter modifications at this location. As discussed above, this capital improvement project proposes widening on-and-off ramps, to include two SOV lanes and one HOV lane. Currently, there is one SOV lane and one HOV lane on the on-ramp. The additional SOV lane on the westbound on-ramp would accommodate traffic that is currently queuing on Rancheros Drive, affecting local city street commuters. The Project's traffic generation is consistent with that of the existing General Plan's industrial zoning considered in the CIP so no additional payment is required based on the proposed zone change.

It should be noted that the improvement would be located within the jurisdiction and control of the State of California (Caltrans), and neither the applicant nor the City of San Marcos can assure that Caltrans will permit the improvement to be made. Based on regional standards of practice, the near-term direct project impacts at this location would be considered significant and unavoidable for the purposes of CEQA. However, inter-jurisdictional coordination would be expected to occur to permit the implementation of this mitigation measure.

11.2.2 Near-Term Cumulative Mitigation Measures

- TRA-7. **Intersection #2. Rancheros Drive / SR-78 WB Ramps** – Contribution of fees to the near-term direct mitigation measure TRA-1 above would mitigate the near-term significant cumulative impact at this intersection and no further mitigation is necessary.
- TRA-8. **Intersection #7. Barham Drive / Meyers Avenue** – Construction of near-term direct mitigation measure TRA-2 above would mitigate the near-term significant cumulative impact at this intersection and no further mitigation is necessary.
- TRA-9. **Intersection #9. Mission Road / Nordahl Road** – Construction of near-term direct mitigation measure TRA-3 above would mitigate the near-term significant cumulative impact at this intersection and no further mitigation is necessary.
- TRA-10. **Segment #3. Barham Drive: City Boundary to Meyers Avenue** – Construction of near-term direct mitigation measure TRA-4 above would mitigate the near-term significant cumulative impact at this intersection and no further mitigation is necessary.
- TRA-11. **Segment #4. Barham Drive: Meyers Avenue to [+/- 200' west of] Mission Road** – Construction of near-term direct mitigation measure TRA-5 above would mitigate the near-term significant cumulative impact at this intersection and no further mitigation is necessary.
- TRA-12. **Rancheros Drive to SR-78 WB On-Ramp Meter** – Contribution of fees to the near-term direct mitigation measure TRA-6 above would mitigate the near-term significant cumulative impact at this intersection and no further mitigation is necessary.

11.2.3 Long-Term Cumulative Mitigation Measures

The Project's fair-share contribution towards the following improvements will mitigate the long-term cumulative impact to less than significant:

- TRA-13. **Intersection #7. Barham Drive / Meyers Avenue** – Construction of near-term direct and cumulative mitigation measures TRA-2 & TRA-8 above would mitigate the long-term significant cumulative impact at this intersection and no further mitigation is necessary.
- TRA-14. **Intersection #8. Barham Drive / Mission Road** – Prior to the issuance of the first permanent certificate of occupancy, the Project applicant shall upgrade the traffic signal equipment to allow for more efficient signal phasing, signal timing, advanced queue detection and coordination with the Sprinter railway crossing. These upgrades shall include traffic signal infrastructure, associated traffic signing, associated traffic striping, and other minor ancillary improvements within the City of San Marcos jurisdiction.

Signal phasing upgrades may include provision of a right-turn overlap (RTOL) phase for the northbound approach to Barham Drive.

- TRA-15. **Intersection #9. Mission Road / Nordahl Road** – Construction of near-term direct and cumulative mitigation measures TRA-3 & TRA-9 above would mitigate the long-term significant cumulative impact at this intersection and no further mitigation is necessary.

Table 11–1 summarizes the intersection impacts and mitigation measures and **Appendix I** contains the post-mitigation intersection analysis worksheets. **Table 11–2** summarizes the street segment impacts and mitigation measures. **Table 11–3** summarizes the ramp meter impact and mitigation measure.

TABLE 11-1
IMPACT / MITIGATION MEASURES SUMMARY - INTERSECTIONS

Jurisdiction	MM#	Intersection	Peak Hour	With (+) Project Operations				Impact Type	Mitigation Measure	Mitigated to Below a Level of Significance
				Without Mitigation		With Mitigation				
				Delay	LOS	Delay	LOS			
Caltrans	TRA-1, 7	#2. Rancheros Drive / SR-78 WB Ramps	AM	73.4	F	18.2	B	Near-Term Direct & Cumulative	Payment of local and regional impact fees to fund the City of San Marcos’ Woodland Parkway/SR 78 Interchange CIP. This project provides widening of Rancheros Drive at the SR-78 WB Ramps intersection and installs a traffic signal.	No ^a
			PM	53.5	F	20.5	C			
Escondido	TRA-2, 8, 13	#7. Barham Drive / Meyers Avenue	AM	>100.0	F	11.2	B	Near-Term Direct & Cumulative/ Long-Term Cumulative	Provide a traffic signal. Widen WB approach to provide dedicated left turn lane. Provide protected WB left turn phasing.	No ^a
			PM	>100.0	F	11.1	B			
San Marcos	TRA-14	#8. Barham Drive / Mission Road	AM	64.6	E	41.2	D	Long-Term Cumulative	Upgrade traffic signal equipment to allow for more efficient signal phasing, signal timing, advanced queue detection and coordination with Sprinter railway crossing within the City of San Marcos, such as provision of NB RTOL phasing.	Yes
			PM	97.9	F	44.3	D			
Escondido	TRA-3, 9, 15	#9. Mission Road / Nordahl Road	AM	56.8	E	49.6	D	Near-Term Direct & Cumulative/ Long-Term Cumulative	Coordinate with the City of Escondido to provide TSM improvements such as corridor signal retiming or adaptive traffic signal control.	No ^a
			PM	86.0	F	66.3	E			

Footnotes:

- a. This mitigation relies on an outside jurisdiction allowing the proposed mitigation measure to be completed, which is not assured. As such, the impact is considered significant and unavoidable for CEQA purposes, although inter-jurisdictional coordination would be expected to occur to permit the implementation proposed mitigation measures.

General Notes:

1. MM# = Mitigation measure number.
2. Pre-mitigation and post-mitigation analysis shown for Direct and Near-term Cumulative-only significant impacts is for the "Existing + Cumulative Projects + Project" conditions. For Long-Term Cumulative significant impacts, the Year 2035 (Buildout) analyses are shown.

TABLE 11-2
IMPACT / MITIGATION MEASURES SUMMARY – STREET SEGMENTS

Jurisdiction	MM#	Street Segment	Capacity	With Project Operations				Impact Type	Mitigation Measure	Mitigated to Below a Level of Significance
				Without Mitigation		With Mitigation				
				LOS	V/C	LOS	V/C			
San Marcos/ Escondido	TRA-4, 10	#3. Barham Drive: SR-78 EB On-Ramp to Meyers Avenue	15,000 ^b	E	0.945	—	—	Near-Term Direct & Cumulative	Provide half-width improvements along the south side of Barham Drive between the Project Driveway and Meyers Avenue and any required widening along the north side to achieve a 48-foot cross section. This will allow for a TWLTL to be provided. Also improve the existing Barham Drive segment from the Project Driveway west to Casitas del Sol (+/- 450 feet) consistent with the existing three-lane segment west of Casitas Del Sol to complete TWLTL through the segment.	No ^a
Escondido	TRA-5, 11	#4. Barham Drive: Meyers Avenue to Mission Road	10,000 ^b	E	0.948	—	—	Near-Term Direct & Cumulative	Provide improvements along the north side of Barham Drive between Meyers Avenue and approximately 200 feet west of Mission Road to accommodate a TWLTL.	No ^a

Footnotes:

- a. This mitigation relies on an outside jurisdiction allowing the proposed mitigation measure to be completed, which is not assured. As such, the impact is considered significant and unavoidable for CEQA purposes, although inter-jurisdictional coordination would be expected to occur to permit the implementation proposed mitigation measures.
- b. Project mitigation would improve this segment with a two-way left-turn lane. While the City of Escondido does not have a specific capacity for roadways with two through lanes and a two-way left-turn lane the County of San Diego analyzes such roadways with a capacity of 19,000 ADT. Thus, the capacity of this segment is increased by approximately 4,000 ADT which more than offsets the ADT generated by the Project and any additional induced demand due to mitigation.

General Notes:

1. MM# = Mitigation measure number.

TABLE 11-3
IMPACT / MITIGATION MEASURES SUMMARY – RAMP METER LOCATIONS

Jurisdiction	MM#	Ramp Meter Location	Capacity	With Project Operations				Impact Type	Mitigation Measure	Mitigated to Below a Level of Significance
				Without Mitigation		With Mitigation				
				Delay (min)	Queue (ft)	Delay (min)	Queue (ft)			
Caltrans	TRA-6, 12	Rancheros Drive to SR-78 WB On-Ramp	1 HOV/1 SOV	>15.0	5,275	0	0	Near-Term Direct & Cumulative	Payment of local and regional impact fees to fund the City of San Marcos’ Woodland Parkway/SR 78 Interchange CIP. This project provides an additional SOV lane to the westbound on ramp	No ^a

Footnotes:

- a. This mitigation relies on an outside jurisdiction allowing the proposed mitigation measure to be completed, which is not assured. As such, the impact is considered significant and unavoidable for CEQA purposes, although inter-jurisdictional coordination would be expected to occur to permit the implementation proposed mitigation measures.

General Notes:

1. MM# = Mitigation measure number.

11.3 Project Mitigation - Local Induced Demand

Under existing conditions, a limited amount of outbound traffic from the Country Club Drive corridor access eastbound SR-78 from Barham Drive, via Meyers Avenue, Corporate Drive, and Progress Place, as an alternative to peak hour congestion on Auto Park Way/Nordahl Road.

It is acknowledged that installation of a traffic signal at Barham Drive / Meyers Avenue will lessen one constraint for this alternative travel pattern by improving service for traffic making a northbound left turn at this intersection, which operates at LOS F under existing peak hour conditions. However, notable sources of delay including the ramp meter from Barham Drive and ramp/freeway mainline congestion will persist and this route adds approximately one mile of out of direction travel.

Based on existing traffic patterns and anticipated future volumes, LLG re-evaluated a limited portion of the Project study area with additional traffic that may be drawn through the area with installation of the traffic signal mitigation at Barham Drive / Meyers Avenue. Existing + Cumulative Projects + Project traffic volumes are used. Under General Plan (Year 2035) conditions the planned “Woodland Parkway Highway 78 Interchange” project is assumed complete. This project will eliminate the existing on-ramp from Barham Drive and use of this route as alternate access to SR-78 will be negligible.

LLG commissioned AM/PM peak hour traffic counts at the Country Club Drive/ Progress Place unsignalized intersection, which would be the first opportunity for potential northbound cut-through traffic to divert from Country Club Drive to the series of local streets that would lead to the Barham Drive/ Meyers Avenue intersection (signalized with Project mitigation) in question. The peak hour northbound through trips (125 AM/ 149 PM) were considered potential candidates for induced diversion. The percentages of eastbound SR-78 traffic volumes the Nordahl Road and Barham Drive eastbound on-ramps were calculated and approximately 9% of trips were estimated to be potential cut-thru trips.

The following locations are re-evaluated:

Intersections:

5. Barham Drive / SR-78 EB On-Ramp
7. Barham Drive / Meyers Avenue
12. Meyers Avenue / Project Driveway

Street Segments:

Barham Drive

- SR-78 EB On-Ramp to Meyers Avenue

Meyers Avenue:

- Barham Drive to Project Driveway

Tables 11–4 and **11–5** on the following page show the results of the intersection and street segment analysis with additional traffic due to induced demand. As shown, the study area locations subject to potential induced demand traffic continue to operate at acceptable levels of service.

TABLE 11-4
NEAR-TERM MITIGATED INTERSECTION OPERATIONS

Intersection	Jurisdiction	Control Type	Peak Hour	Existing + Cumulative + Project		Existing + Cumulative + Project + Induced Demand	
				Delay ^a	LOS ^b	Delay	LOS
5. Barham Dr / SR-78 EB On Ramp	San Marcos	Signal	AM	8.8	A	9.1	A
			PM	38.9	D	41.2	D
7. Barham Dr / Meyers Ave	Escondido	Signal	AM	16.7	B	17.3	B
			PM	19.7	B	21.1	C
12. Meyers Avenue / Project Driveway	Escondido	MSSC ^c	AM	15.6	C	15.9	C
			PM	12.5	B	12.6	B

Footnotes:

- a. Average delay expressed in seconds per vehicle.
- b. Level of Service.
- c. MSSC – Minor-Street Stop Controlled intersection.

SIGNALIZED		UNSIGNALIZED	
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 11-5
NEAR-TERM STREET MITIGATED SEGMENT OPERATIONS

Street Segment	Juris.	Capacity ^a	Existing + Cumulative + Project			Existing + Cumulative + Project + Induced Demand		
			ADT ^b	LOS ^c	V/C ^d	ADT	LOS	V/C
Barham Drive								
3. SR-78 EB On-Ramp to Meyers Ave	San Marcos/ Escondido	15,000 ^e	14,177	—	—	14,327	—	—
Meyers Avenue								
7. Barham Dr to Project Driveway	Escondido	10,000	6,291	C	0.629	6,441	C	0.644

Footnotes:

- a. Capacities based on the City of San Marcos and City of Escondido roadway classification tables (See *Appendix B*).
- b. Average Daily Traffic
- c. Level of Service
- d. Volume to Capacity ratio
- e. Project mitigation would improve this segment with a two-way left-turn lane. While the City of Escondido does not have a specific capacity for roadways with two through lanes and a two-way left-turn lane the County of San Diego analyzes such roadways with a capacity of 19,000 ADT. Thus, the capacity of this segment is increased by approximately 4,000 ADT which more than offsets the ADT generated by the Project and any additional induced demand due to mitigation.

End of Report

TECHNICAL APPENDICES
SUNRISE PROJECT
San Marcos, California
December 4, 2019

LLG Ref. 3-17-2835

APPENDIX A

INTERSECTION AND SEGMENT COUNT SHEETS & CALTRANS RAMP METER RATES

Intersection Turning Movement - Peak Hour Vehicle Count



Location: #01
 Intersection: SR-78 EB Off Ramp & E. Barham Drive & S. Warplex Avenue
 Date of Count: Thursday, September 20, 2018

File Name: ITM-18-129-01
 Project: LLG Ref. 3-18-2835
 San Marcos

AM	SR-78 Eastbound Off Ramp Southbound			East Barham Drive Westbound			South Warplex Avenue Northbound			East Barham Drive Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00	157	0	12	0	245	0	0	0	0	0	99	0	513
7:15	120	0	3	0	261	0	0	0	0	0	191	0	575
7:30	94	0	5	0	240	0	0	0	0	0	157	0	496
7:45	85	0	7	0	176	0	0	0	0	0	169	0	437
8:00	119	0	5	0	218	0	0	0	0	9	118	0	469
8:15	119	0	3	0	256	0	0	0	0	3	108	0	489
8:30	87	0	1	0	228	0	0	0	0	0	135	0	451
8:45	76	0	4	0	164	0	0	0	0	3	70	0	317
Total	857	0	40	0	1788	0	0	0	0	15	1047	0	3747
Approach%	95.5	-	4.5	-	100.0	-	-	-	-	1.4	98.6	-	
Total%	22.9	-	1.1	-	47.7	-	-	-	-	0.4	27.9	-	

AM Intersection Peak Hour: 07:00 to 08:00

Volume	456	-	27	-	922	-	-	-	-	616	-	2,021
Approach%	94.4	-	5.6	-	100.0	-	-	-	-	100.0	-	
Total%	22.6	-	1.3	-	45.6	-	-	-	-	30.5	-	
PHF			0.71		0.88			#DIV/0!		0.81		0.88

PM	SR-78 Eastbound Off Ramp Southbound			East Barham Drive Westbound			South Warplex Avenue Northbound			East Barham Drive Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
16:00	51	0	3	0	133	0	0	0	0	0	266	0	453
16:15	75	0	1	0	116	0	0	0	0	0	259	0	451
16:30	78	0	6	0	142	0	0	0	0	0	247	0	473
16:45	50	0	2	0	185	0	0	0	0	0	268	0	505
17:00	54	0	2	0	187	0	0	0	0	0	264	0	507
17:15	44	0	5	0	190	0	0	0	0	0	231	0	470
17:30	63	0	15	0	160	0	0	0	0	0	192	0	430
17:45	51	0	3	0	153	0	0	0	0	0	244	0	451
Total	466	0	37	0	1266	0	0	0	0	0	1971	0	3740
Approach%	92.6	-	7.4	-	100.0	-	-	-	-	-	100.0	-	
Total%	12.5	-	1.0	-	33.9	-	-	-	-	-	52.7	-	

PM Intersection Peak Hour: 16:30 to 17:30

Volume	226	-	15	-	704	-	-	-	-	1,010	-	1,955
Approach%	93.8	-	6.2	-	100.0	-	-	-	-	100.0	-	
Total%	11.6	-	0.8	-	36.0	-	-	-	-	51.7	-	
PHF			0.72		0.93			#DIV/0!		0.94		0.96

Intersection Turning Movement - Bicycle & Pedestrian Count



Location:	#01	File Name:	ITM-18-129-01
Intersection:	SR-78 EB Off Ramp & E. Barham Drive & S. Warplex Avenue	Project:	LLG Ref. 3-18-2835
Date of Count:	Thursday, September 20, 2018		San Marcos

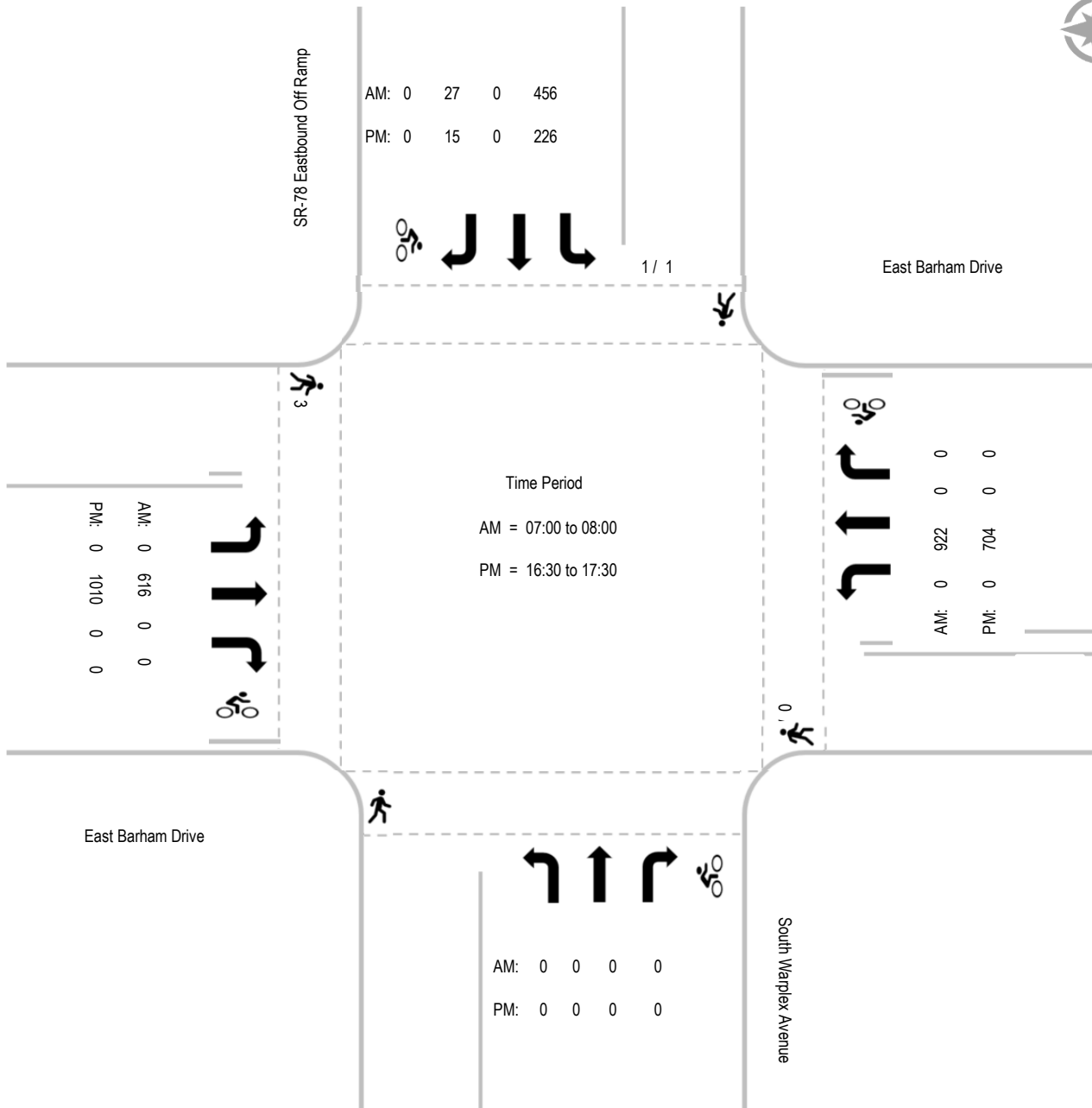
AM	SR-78 Eastbound Off Ramp Southbound				East Barham Drive Westbound				South Warplex Avenue Northbound				East Barham Drive Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
8:45	0	0	0	0	0	0	0	0	0	0	0	0	3	0	0	0	3	0
Ped Total	1				0				0				6				7	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

PM	SR-78 Eastbound Off Ramp Southbound				East Barham Drive Westbound				South Warplex Avenue Northbound				East Barham Drive Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	1				0				0				3				4	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

Intersection Turning Movement - Peak Hour Summary



Location:	#01	File Name:	ITM-18-129-01
Intersection:	SR-78 EB Off Ramp & E. Barham Drive & S. Warplex Avenue	Project:	LLG Ref. 3-18-2835
Date of Count:	Thursday, September 20, 2018		San Marcos



Intersection Turning Movement - Peak Hour Vehicle Count



Location: #02
 Intersection: SR-78 WB On-Off Ramps & Rancheros Drive
 Date of Count: Thursday, September 20, 2018

File Name: ITM-18-129-02
 Project: LLG Ref. 3-18-2835
 San Marcos

AM	SR-78 Westbound On Ramp Southbound			Rancheros Drive Westbound			SR-78 Westbound Off Ramp Northbound			Rancheros Drive Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00	0	0	0	158	48	0	27	0	53	0	29	8	323
7:15	0	0	0	144	49	0	33	0	45	0	59	10	340
7:30	0	0	0	145	44	0	41	0	28	0	71	13	342
7:45	0	0	0	138	45	0	62	0	33	0	65	11	354
8:00	0	0	0	151	88	0	52	0	52	0	59	6	408
8:15	0	0	0	145	79	0	39	0	39	0	49	10	361
8:30	0	0	0	151	64	0	39	0	39	0	50	14	357
8:45	0	0	0	137	79	0	47	0	47	0	59	8	377
Total	0	0	0	1169	496	0	340	0	336	0	441	80	2862
Approach%	-	-	-	70.2	29.8	-	50.3	-	49.7	-	84.6	15.4	
Total%	-	-	-	40.8	17.3	-	11.9	-	11.7	-	15.4	2.8	

AM Intersection Peak Hour: 08:00 to 09:00

Volume	-	-	-	584	310	-	177	-	177	-	217	38	1,503
Approach%	-	-	-	65.3	34.7	-	50.0	-	50.0	-	85.1	14.9	
Total%	-	-	-	38.9	20.6	-	11.8	-	11.8	-	14.4	2.5	
PHF	#DIV/0!					0.94			0.85			0.95	0.92

PM	SR-78 Westbound On Ramp Southbound			Rancheros Drive Westbound			SR-78 Westbound Off Ramp Northbound			Rancheros Drive Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
16:00	0	0	0	115	30	0	28	0	48	0	125	12	358
16:15	0	0	0	122	48	0	32	0	43	0	123	16	384
16:30	0	0	0	117	62	0	27	0	51	0	130	24	411
16:45	0	0	0	111	48	0	22	0	61	0	109	19	370
17:00	0	0	0	122	33	0	19	0	50	0	125	15	364
17:15	0	0	0	127	57	0	22	0	49	0	113	17	385
17:30	0	0	0	127	48	0	18	0	42	0	130	6	371
17:45	0	0	0	132	36	0	29	0	41	0	105	7	350
Total	0	0	0	973	362	0	197	0	385	0	960	116	2993
Approach%	-	-	-	72.9	27.1	-	33.8	-	66.2	-	89.2	10.8	
Total%	-	-	-	32.5	12.1	-	6.6	-	12.9	-	32.1	3.9	

PM Intersection Peak Hour: 16:30 to 17:30

Volume	-	-	-	477	200	-	90	-	211	-	477	75	1,530
Approach%	-	-	-	70.5	29.5	-	29.9	-	70.1	-	86.4	13.6	
Total%	-	-	-	31.2	13.1	-	5.9	-	13.8	-	31.2	4.9	
PHF	#DIV/0!					0.92			0.91			0.90	0.93

Intersection Turning Movement - Bicycle & Pedestrian Count



Location: #02	File Name: ITM-18-129-02
Intersection: SR-78 WB On-Off Ramps & Rancheros Drive	Project: LLG Ref. 3-18-2835
Date of Count: Thursday, September 20, 2018	San Marcos

AM	SR-78 Westbound On Ramp Southbound				Rancheros Drive Westbound				SR-78 Westbound Off Ramp Northbound				Rancheros Drive Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	0				0				0				0				0	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

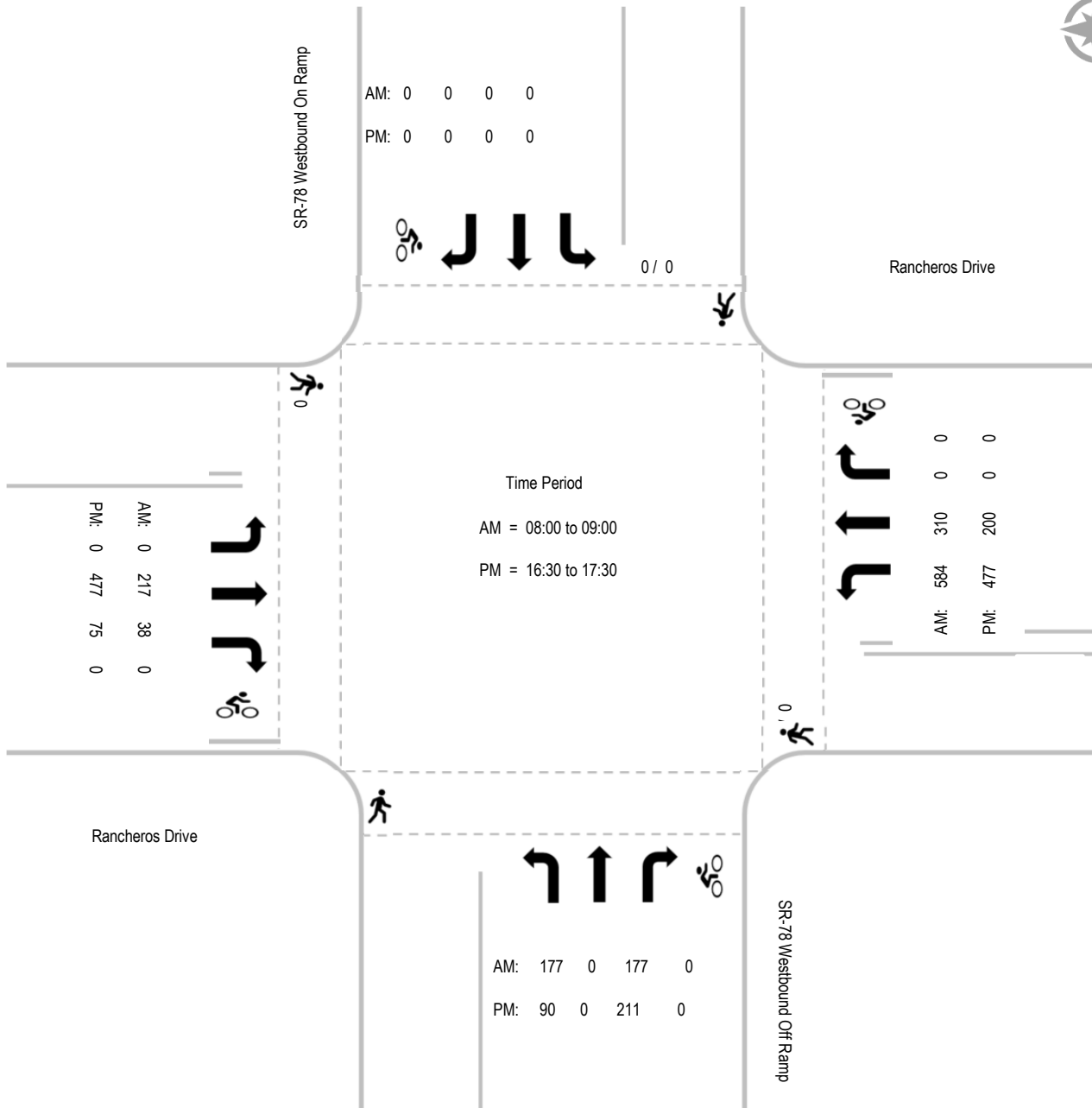
PM	SR-78 Westbound On Ramp Southbound				Rancheros Drive Westbound				SR-78 Westbound Off Ramp Northbound				Rancheros Drive Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	0				0				0				0				0	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

Intersection Turning Movement - Peak Hour Summary



Location: #02
 Intersection: SR-78 WB On-Off Ramps & Rancheros Drive
 Date of Count: Thursday, September 20, 2018

File Name: ITM-18-129-02
 Project: LLG Ref. 3-18-2835
 San Marcos



Intersection Turning Movement - Peak Hour Vehicle Count



Location: #03
 Intersection: Woodland Parkway & Rancheros Drive
 Date of Count: Thursday, September 20, 2018

File Name: ITM-18-129-03
 Project: LLG Ref. 3-18-2835
 San Marcos

AM	Woodland Parkway Southbound			Rancheros Drive Westbound			Woodland Parkway Northbound			Rancheros Drive Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00	5	106	142	20	28	4	22	49	22	18	14	66	496
7:15	1	126	163	12	50	2	24	86	13	15	15	69	576
7:30	3	118	135	19	43	8	28	65	6	32	15	69	541
7:45	6	122	86	28	47	0	29	38	5	19	26	60	466
8:00	4	94	123	18	66	2	55	30	11	15	22	49	489
8:15	3	122	145	15	50	2	42	33	14	12	17	70	525
8:30	3	103	136	27	79	4	40	51	14	18	20	88	583
8:45	5	105	110	17	53	2	49	32	13	14	22	83	505
Total	30	896	1040	156	416	24	289	384	98	143	151	554	4181
Approach%	1.5	45.6	52.9	26.2	69.8	4.0	37.5	49.8	12.7	16.9	17.8	65.3	
Total%	0.7	21.4	24.9	3.7	9.9	0.6	6.9	9.2	2.3	3.4	3.6	13.3	

AM Intersection Peak Hour: 08:00 to 09:00

Volume	15	424	514	77	248	10	186	146	52	59	81	290	2,102
Approach%	1.6	44.5	53.9	23.0	74.0	3.0	48.4	38.0	13.5	13.7	18.8	67.4	
Total%	0.7	20.2	24.5	3.7	11.8	0.5	8.8	6.9	2.5	2.8	3.9	13.8	
PHF			0.88			0.76			0.91			0.85	0.90

PM	Woodland Parkway Southbound			Rancheros Drive Westbound			Woodland Parkway Northbound			Rancheros Drive Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
16:00	11	68	52	20	50	8	44	106	14	64	33	73	543
16:15	6	68	94	15	43	5	35	88	23	46	43	70	536
16:30	10	95	94	20	44	10	36	74	16	56	33	103	591
16:45	2	79	83	7	31	2	41	106	16	40	36	108	551
17:00	2	84	90	15	42	11	31	78	9	43	35	102	542
17:15	4	95	119	17	36	5	42	92	10	30	30	126	606
17:30	5	101	108	12	28	4	43	99	11	48	48	85	592
17:45	3	84	147	9	27	9	26	112	16	38	40	93	604
Total	43	674	787	115	301	54	298	755	115	365	298	760	4565
Approach%	2.9	44.8	52.3	24.5	64.0	11.5	25.5	64.6	9.8	25.7	20.9	53.4	
Total%	0.9	14.8	17.2	2.5	6.6	1.2	6.5	16.5	2.5	8.0	6.5	16.6	

PM Intersection Peak Hour: 17:00 to 18:00

Volume	14	364	464	53	133	29	142	381	46	159	153	406	2,344
Approach%	1.7	43.2	55.1	24.7	61.9	13.5	25.0	67.0	8.1	22.1	21.3	56.5	
Total%	0.6	15.5	19.8	2.3	5.7	1.2	6.1	16.3	2.0	6.8	6.5	17.3	
PHF			0.90			0.79			0.92			0.97	0.97

Intersection Turning Movement - Bicycle & Pedestrian Count



Location: #03	File Name: ITM-18-129-03
Intersection: Woodland Parkway & Rancheros Drive	Project: LLG Ref. 3-18-2835
Date of Count: Thursday, September 20, 2018	San Marcos

AM	Woodland Parkway Southbound				Rancheros Drive Westbound				Woodland Parkway Northbound				Rancheros Drive Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
7:00	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0
7:15	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	5	0
7:30	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
7:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0
8:00	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3	0
8:15	1	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	2	1
8:30	1	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	3	0
8:45	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	4	0
Ped Total	15				10				0				0				25	
Bike Total		0	0	0		0	0	0		0	0	0		1	0	0		1

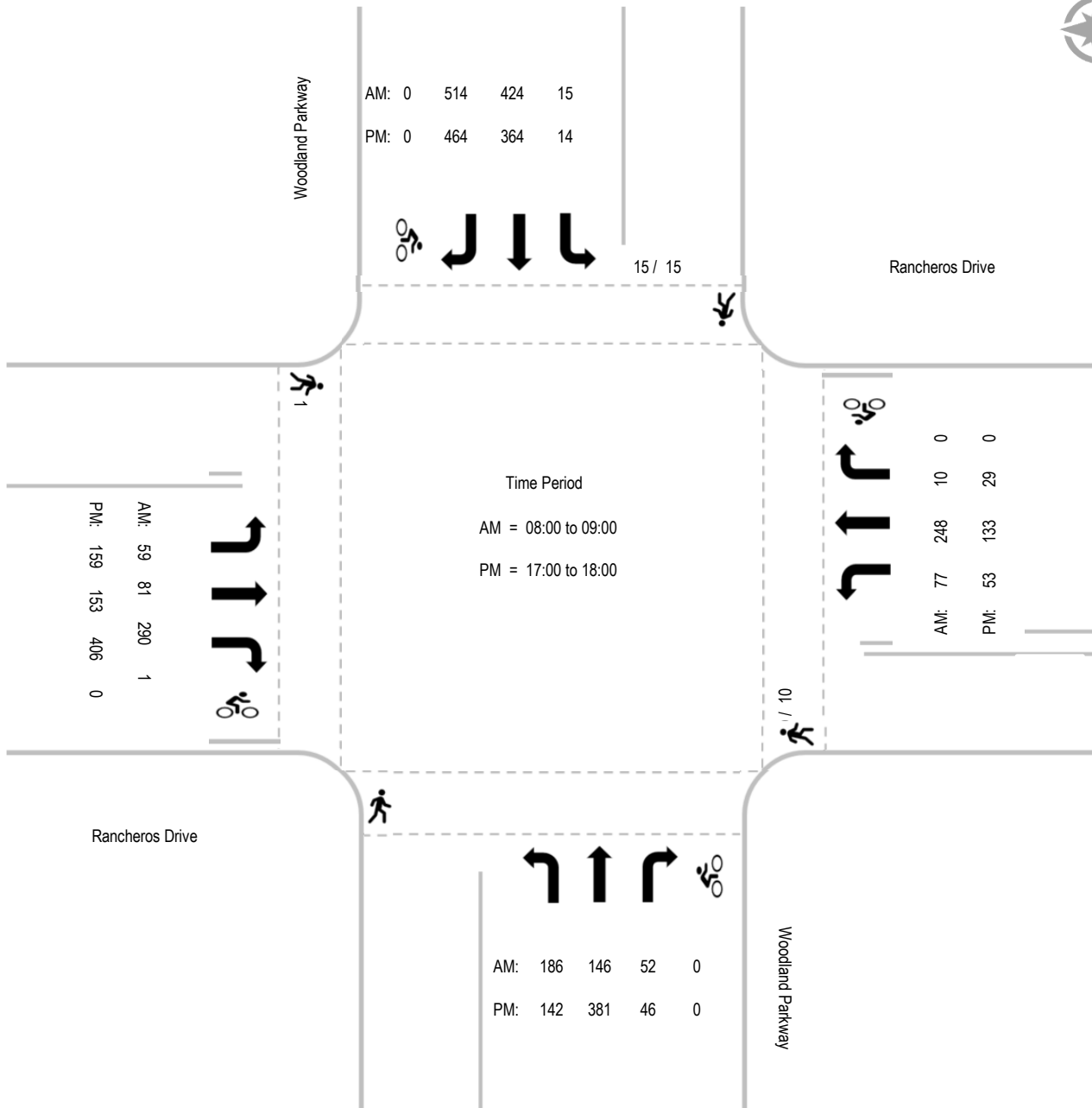
PM	Woodland Parkway Southbound				Rancheros Drive Westbound				Woodland Parkway Northbound				Rancheros Drive Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
16:00	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0
16:15	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0
16:30	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0
16:45	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	3	0
17:00	1	0	0	0	2	0	0	0	1	0	0	0	1	0	0	0	5	0
17:15	4	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	5	0
17:30	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0
17:45	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	4	0
Ped Total	15				10				1				1				27	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

Intersection Turning Movement - Peak Hour Summary



Location: #03
 Intersection: Woodland Parkway & Rancheros Drive
 Date of Count: Thursday, September 20, 2018

File Name: ITM-18-129-03
 Project: LLG Ref. 3-18-2835
 San Marcos



Intersection Turning Movement - Peak Hour Vehicle Count



Location: #04
 Intersection: Woodland Parkway & East Barham Drive
 Date of Count: Thursday, September 20, 2018

File Name: ITM-18-129-04
 Project: LLG Ref. 3-18-2835
 San Marcos

AM	Woodland Parkway Southbound			East Barham Drive Westbound			Woodland Parkway Northbound			East Barham Drive Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00	68	0	167	0	123	39	0	0	0	98	200	0	695
7:15	89	0	147	0	103	67	0	0	0	114	226	0	746
7:30	79	0	128	0	113	94	0	0	0	82	226	0	722
7:45	75	0	159	0	153	88	0	0	0	21	227	0	723
8:00	65	0	113	0	146	52	0	0	0	48	247	0	671
8:15	62	0	145	0	112	55	0	0	0	72	223	0	669
8:30	68	0	171	0	149	74	0	0	0	57	199	0	718
8:45	70	0	138	0	130	53	0	0	0	61	180	0	632
Total	576	0	1168	0	1029	522	0	0	0	553	1728	0	5576
Approach%	33.0	-	67.0	-	66.3	33.7	-	-	-	24.2	75.8	-	
Total%	10.3	-	20.9	-	18.5	9.4	-	-	-	9.9	31.0	-	

AM Intersection Peak Hour: 07:00 to 08:00

Volume	311	-	601	-	492	288	-	-	-	315	879	-	2,886
Approach%	34.1	-	65.9	-	63.1	36.9	-	-	-	26.4	73.6	-	
Total%	10.8	-	20.8	-	17.0	10.0	-	-	-	10.9	30.5	-	
PHF			0.97			0.81			#DIV/0!			0.88	0.97

PM	Woodland Parkway Southbound			East Barham Drive Westbound			Woodland Parkway Northbound			East Barham Drive Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
16:00	129	0	58	0	83	82	0	0	0	112	218	0	682
16:15	92	0	65	0	64	68	0	0	0	121	249	0	659
16:30	131	0	73	0	101	65	0	0	0	92	238	0	700
16:45	121	0	90	0	95	75	0	0	0	139	237	0	757
17:00	118	0	85	0	105	78	0	0	0	69	284	0	739
17:15	144	0	93	0	83	102	0	0	0	94	260	0	776
17:30	107	0	88	0	75	111	0	0	0	94	215	0	690
17:45	114	0	85	0	70	57	0	0	0	127	212	0	665
Total	956	0	637	0	676	638	0	0	0	848	1913	0	5668
Approach%	60.0	-	40.0	-	51.4	48.6	-	-	-	30.7	69.3	-	
Total%	16.9	-	11.2	-	11.9	11.3	-	-	-	15.0	33.8	-	

PM Intersection Peak Hour: 16:30 to 17:30

Volume	514	-	341	-	384	320	-	-	-	394	1,019	-	2,972
Approach%	60.1	-	39.9	-	54.5	45.5	-	-	-	27.9	72.1	-	
Total%	17.3	-	11.5	-	12.9	10.8	-	-	-	13.3	34.3	-	
PHF			0.90			0.95			#DIV/0!			0.94	0.96

Intersection Turning Movement - Bicycle & Pedestrian Count



Location: #04	File Name: ITM-18-129-04
Intersection: Woodland Parkway & East Barham Drive	Project: LLG Ref. 3-18-2835
Date of Count: Thursday, September 20, 2018	San Marcos

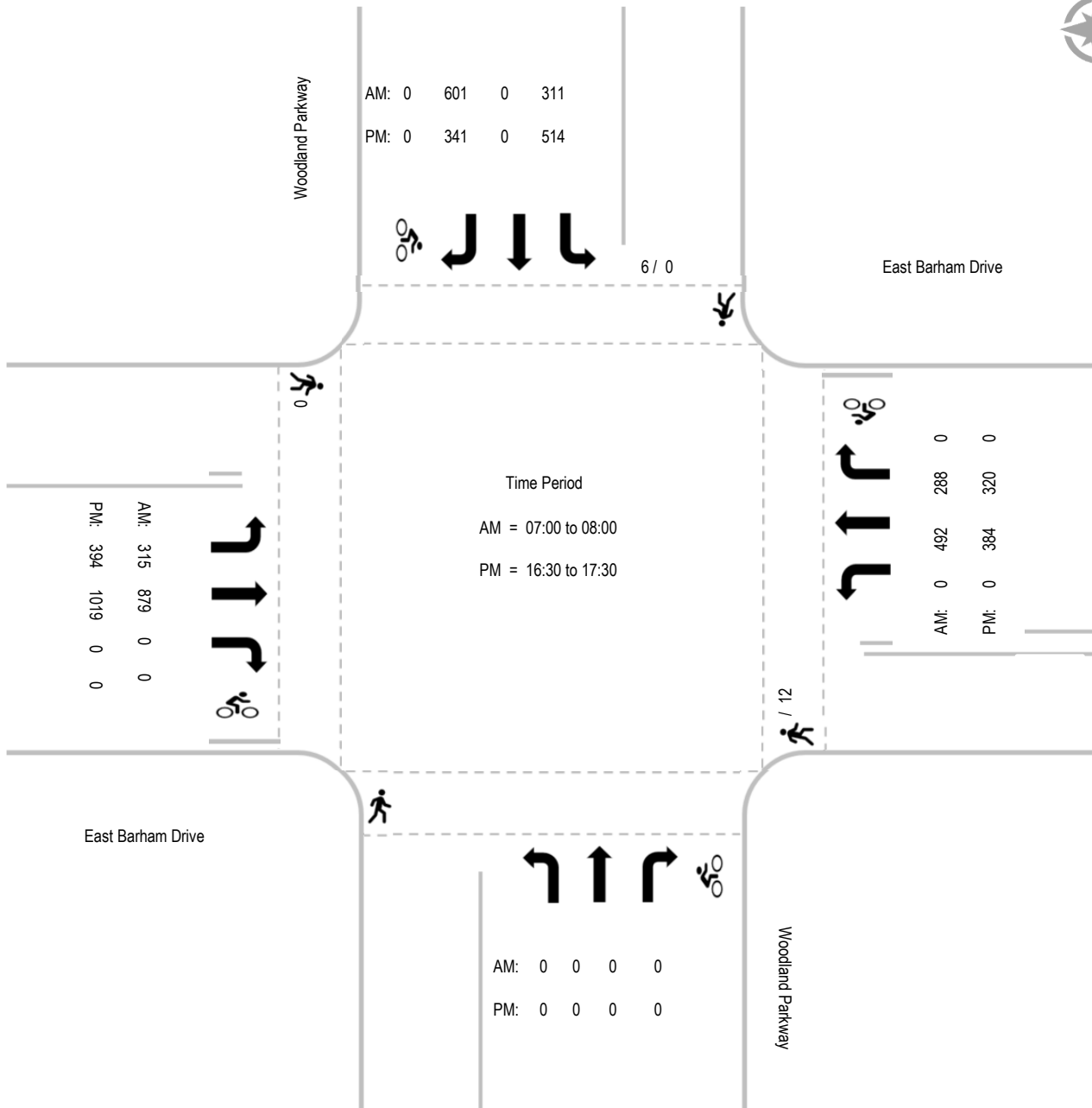
AM	Woodland Parkway Southbound				East Barham Drive Westbound				Woodland Parkway Northbound				East Barham Drive Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15	1	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	4	0
7:30	1	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	5	0
7:45	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2	0
8:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
8:15	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	3	0
8:30	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0
8:45	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
Ped Total	6				11				0				2				19	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

PM	Woodland Parkway Southbound				East Barham Drive Westbound				Woodland Parkway Northbound				East Barham Drive Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
16:45	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
17:00	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	6	0	0	0	0	0	0	0	0	0	0	0	6	0
17:45	0	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0	3	0
Ped Total	0				12				0				0				12	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

Intersection Turning Movement - Peak Hour Summary



Location:	#04	File Name:	ITM-18-129-04
Intersection:	Woodland Parkway & East Barham Drive	Project:	LLG Ref. 3-18-2835
Date of Count:	Thursday, September 20, 2018		San Marcos



Intersection Turning Movement - Peak Hour Vehicle Count



Location: #05
 Intersection: East Barham Drive & SR-78 EB On Ramp
 Date of Count: Thursday, September 20, 2018

File Name: ITM-18-129-05
 Project: LLG Ref. 3-18-2835
 San Marcos

AM	- Southbound			East Barham Drive Westbound			SR-78 Eastbound On Ramp Northbound			East Barham Drive Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00	0	0	0	0	131	5	0	0	0	41	140	0	317
7:15	0	0	0	0	156	3	0	0	0	50	160	0	369
7:30	0	0	0	0	181	2	0	0	0	67	171	0	421
7:45	0	0	0	0	165	17	0	0	0	73	144	0	399
8:00	0	0	0	0	180	8	0	0	0	60	135	0	383
8:15	0	0	0	8	153	4	0	0	0	93	143	0	401
8:30	0	0	0	9	175	6	0	0	0	108	112	0	410
8:45	0	0	0	0	129	8	0	0	0	97	77	0	311
Total	0	0	0	17	1270	53	0	0	0	589	1082	0	3011
Approach%	-	-	-	1.3	94.8	4.0	-	-	-	35.2	64.8	-	
Total%	-	-	-	0.6	42.2	1.8	-	-	-	19.6	35.9	-	

AM Intersection Peak Hour: 07:30 to 08:30

Volume	-	-	-	8	679	31	-	-	-	293	593	-	1,604
Approach%	-	-	-	1.1	94.6	4.3	-	-	-	33.1	66.9	-	
Total%	-	-	-	0.5	42.3	1.9	-	-	-	18.3	37.0	-	
PHF	#DIV/0!					0.95	#DIV/0!					0.93	0.95

PM	- Southbound			East Barham Drive Westbound			SR-78 Eastbound On Ramp Northbound			East Barham Drive Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
16:00	0	0	0	0	129	21	0	0	0	175	233	0	558
16:15	0	0	0	0	144	19	0	0	0	171	215	0	549
16:30	0	0	0	0	155	16	0	0	0	183	164	0	518
16:45	0	0	0	0	149	10	0	0	0	195	155	0	509
17:00	0	0	0	0	172	23	0	0	0	171	171	0	537
17:15	0	0	0	0	174	14	0	0	0	177	177	0	542
17:30	0	0	0	0	165	20	0	0	0	187	220	0	592
17:45	0	0	0	0	133	8	0	0	0	167	195	0	503
Total	0	0	0	0	1221	131	0	0	0	1426	1530	0	4308
Approach%	-	-	-	-	90.3	9.7	-	-	-	48.2	51.8	-	
Total%	-	-	-	-	28.3	3.0	-	-	-	33.1	35.5	-	

PM Intersection Peak Hour: 16:45 to 17:45

Volume	-	-	-	-	660	67	-	-	-	730	723	-	2,180
Approach%	-	-	-	-	90.8	9.2	-	-	-	50.2	49.8	-	
Total%	-	-	-	-	30.3	3.1	-	-	-	33.5	33.2	-	
PHF	#DIV/0!					0.93	#DIV/0!					0.89	0.92

Intersection Turning Movement - Bicycle & Pedestrian Count



Location: #05	File Name: ITM-18-129-05
Intersection: East Barham Drive & SR-78 EB On Ramp	Project: LLG Ref. 3-18-2835
Date of Count: Thursday, September 20, 2018	San Marcos

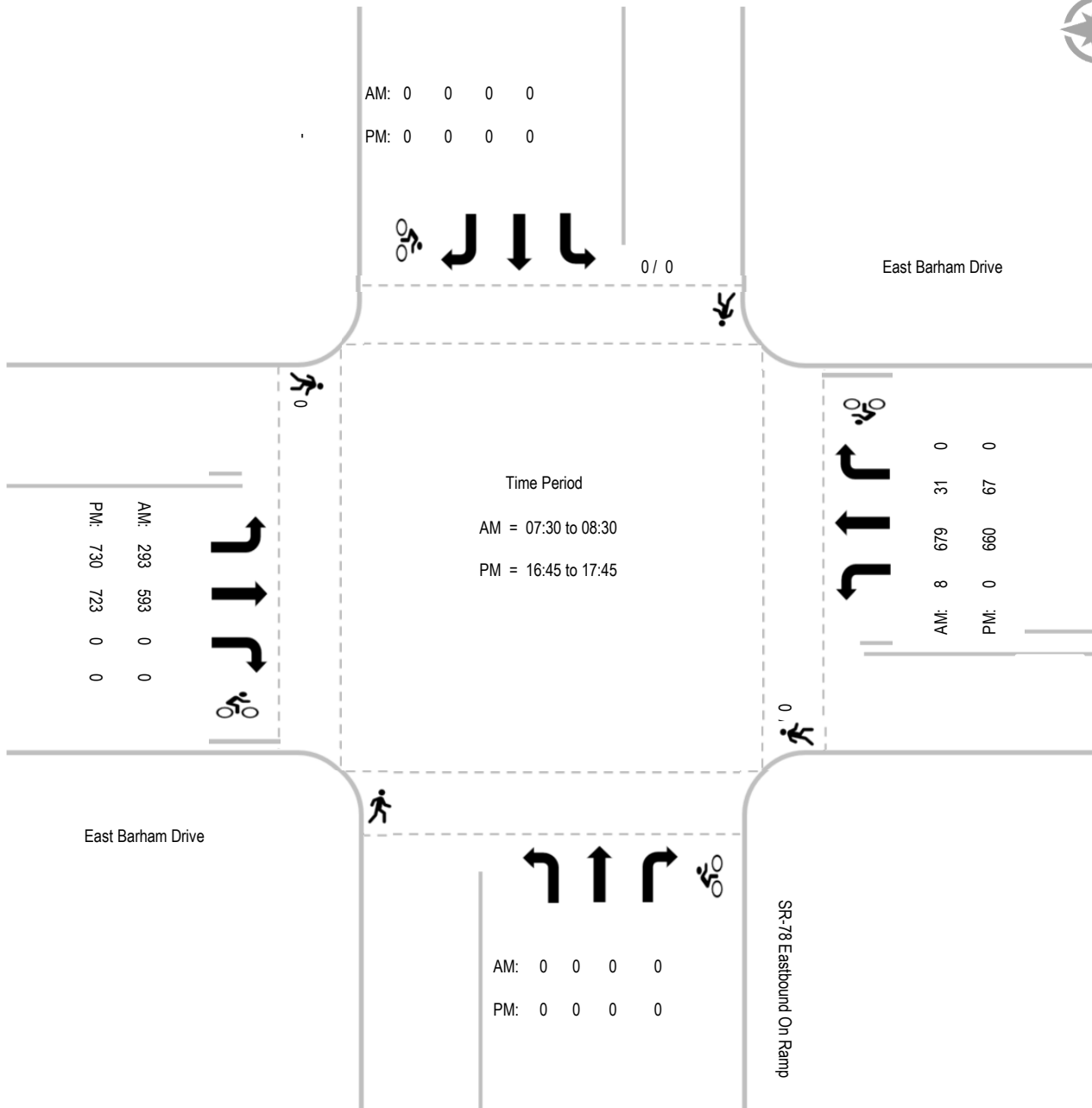
AM	- Southbound				East Barham Drive Westbound				SR-78 Eastbound On Ramp Northbound				East Barham Drive Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	0				0				0				0				0	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

PM	- Southbound				East Barham Drive Westbound				SR-78 Eastbound On Ramp Northbound				East Barham Drive Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	0				0				0				0				0	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

Intersection Turning Movement - Peak Hour Summary



Location:	#05	File Name:	ITM-18-129-05
Intersection:	East Barham Drive & SR-78 EB On Ramp	Project:	LLG Ref. 3-18-2835
Date of Count:	Thursday, September 20, 2018		San Marcos



Intersection Turning Movement - Peak Hour Vehicle Count



Location: #06
 Intersection: Barham Drive & Meyers Avenue
 Date of Count: Thursday, September 20, 2018

File Name: ITM-18-129-06
 Project: LLG Ref. 3-18-2835
 San Marcos

AM	- Southbound			Barham Drive Westbound			Meyers Avenue Northbound			Barham Drive Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00	0	0	0	3	124	0	26	0	1	0	59	85	298
7:15	0	0	0	7	108	0	30	0	2	0	89	77	313
7:30	0	0	0	4	131	0	58	0	3	0	71	78	345
7:45	0	0	0	15	147	0	51	0	6	0	64	110	393
8:00	0	0	0	2	138	0	55	0	5	0	85	79	364
8:15	0	0	0	4	149	0	50	0	5	0	76	76	360
8:30	0	0	0	2	129	0	66	0	6	0	74	78	355
8:45	0	0	0	4	144	0	49	0	4	0	51	76	328
Total	0	0	0	41	1070	0	385	0	32	0	569	659	2756
Approach%	-	-	-	3.7	96.3	-	92.3	-	7.7	-	46.3	53.7	
Total%	-	-	-	1.5	38.8	-	14.0	-	1.2	-	20.6	23.9	

AM Intersection Peak Hour: 07:45 to 08:45

Volume	-	-	-	23	563	-	222	-	22	-	299	343	1,472
Approach%	-	-	-	3.9	96.1	-	91.0	-	9.0	-	46.6	53.4	
Total%	-	-	-	1.6	38.2	-	15.1	-	1.5	-	20.3	23.3	
PHF			#DIV/0!			0.90			0.85			0.92	0.94

PM	- Southbound			Barham Drive Westbound			Meyers Avenue Northbound			Barham Drive Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
16:00	0	0	0	4	81	0	48	0	12	0	143	69	357
16:15	0	0	0	3	128	0	34	0	10	0	143	72	390
16:30	0	0	0	6	109	0	48	0	9	0	140	62	374
16:45	0	0	0	9	131	0	43	0	2	0	145	62	392
17:00	0	0	0	3	157	0	52	0	3	0	122	62	399
17:15	0	0	0	1	110	0	45	0	3	0	139	56	354
17:30	0	0	0	3	78	0	38	0	7	0	125	47	298
17:45	0	0	0	1	96	0	28	0	4	0	108	45	282
Total	0	0	0	30	890	0	336	0	50	0	1065	475	2846
Approach%	-	-	-	3.3	96.7	-	87.0	-	13.0	-	69.2	30.8	
Total%	-	-	-	1.1	31.3	-	11.8	-	1.8	-	37.4	16.7	

PM Intersection Peak Hour: 16:15 to 17:15

Volume	-	-	-	21	525	-	177	-	24	-	550	258	1,555
Approach%	-	-	-	3.8	96.2	-	88.1	-	11.9	-	68.1	31.9	
Total%	-	-	-	1.4	33.8	-	11.4	-	1.5	-	35.4	16.6	
PHF			#DIV/0!			0.85			0.88			0.94	0.97

Intersection Turning Movement - Bicycle & Pedestrian Count



Location: #06	File Name: ITM-18-129-06
Intersection: Barham Drive & Meyers Avenue	Project: LLG Ref. 3-18-2835
Date of Count: Thursday, September 20, 2018	San Marcos

AM	- Southbound				Barham Drive Westbound				Meyers Avenue Northbound				Barham Drive Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
7:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8:15	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
8:30	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0
8:45	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Ped Total	0				0				4				0				4	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

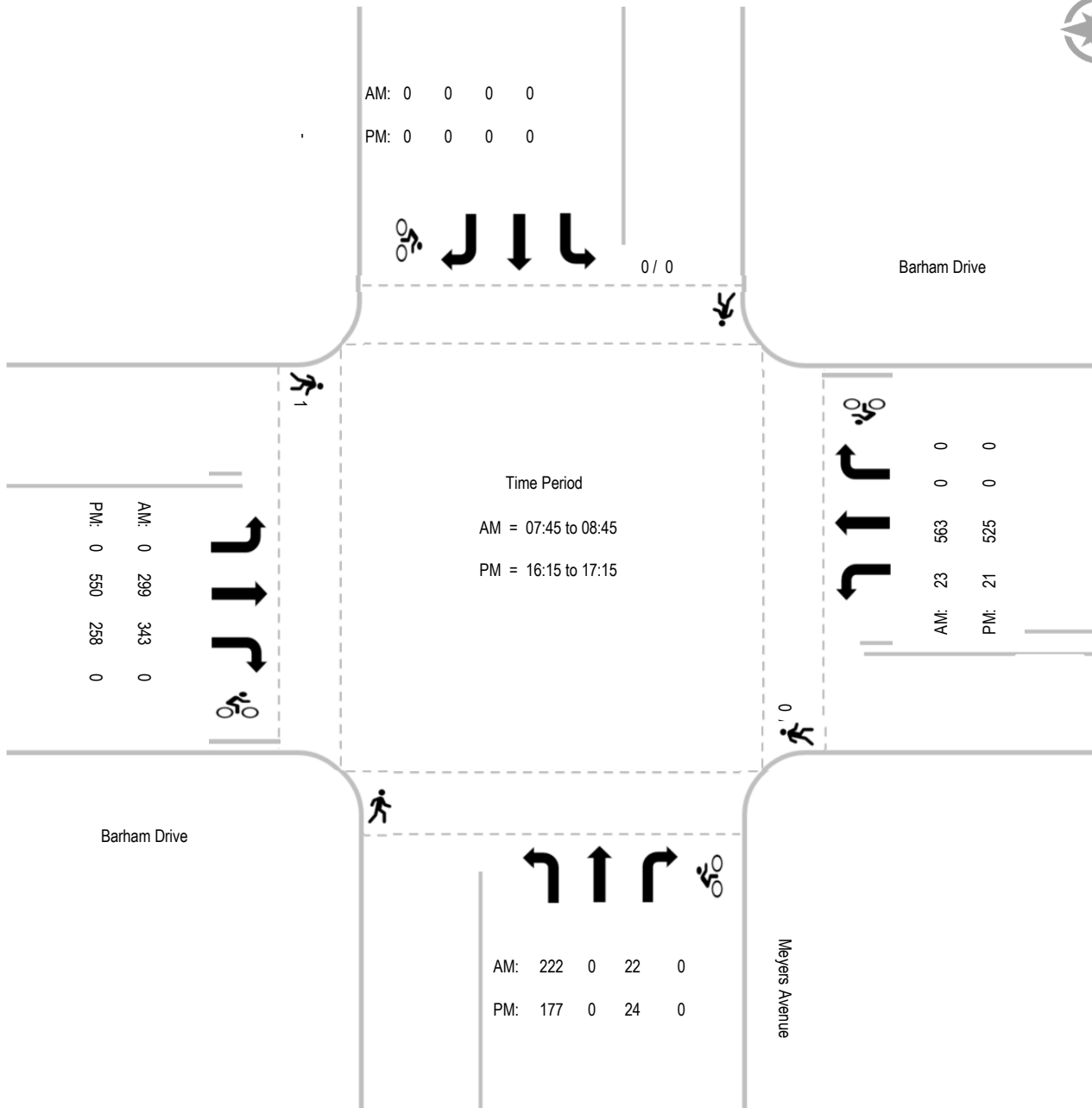
PM	- Southbound				Barham Drive Westbound				Meyers Avenue Northbound				Barham Drive Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
16:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:15	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16:45	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	0				0				3				1				4	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

Intersection Turning Movement - Peak Hour Summary



Location: #06
 Intersection: Barham Drive & Meyers Avenue
 Date of Count: Thursday, September 20, 2018

File Name: ITM-18-129-06
 Project: LLG Ref. 3-18-2835
 San Marcos



Intersection Turning Movement - Peak Hour Vehicle Count



Location: #07
 Intersection: Barham Drive & West Mission Road
 Date of Count: Thursday, September 20, 2018

File Name: ITM-18-129-07
 Project: LLG Ref. 3-18-2835
 San Marcos

AM	Business Driveway Southbound			West Mission Road Westbound			Barham Drive Northbound			West Mission Road Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00	1	0	0	116	129	3	6	1	53	1	177	13	500
7:15	2	0	0	124	196	2	6	0	80	1	177	12	600
7:30	2	1	0	142	207	1	11	0	57	1	189	14	625
7:45	1	7	0	143	230	2	16	0	66	0	227	20	712
8:00	7	6	0	123	180	1	32	3	60	0	202	25	639
8:15	0	3	1	142	214	2	24	0	56	0	145	23	610
8:30	5	2	0	130	210	1	15	0	76	0	174	19	632
8:45	3	5	0	138	189	0	6	0	57	0	174	19	591
Total	21	24	1	1058	1555	12	116	4	505	3	1465	145	4909
Approach%	45.7	52.2	2.2	40.3	59.2	0.5	18.6	0.6	80.8	0.2	90.8	9.0	
Total%	0.4	0.5	0.0	21.6	31.7	0.2	2.4	0.1	10.3	0.1	29.8	3.0	

AM Intersection Peak Hour: 07:45 to 08:45

Volume	13	18	1	538	834	6	87	3	258	-	748	87	2,593
Approach%	40.6	56.3	3.1	39.0	60.5	0.4	25.0	0.9	74.1	-	89.6	10.4	
Total%	0.5	0.7	0.0	20.7	32.2	0.2	3.4	0.1	9.9	-	28.8	3.4	
PHF			0.62			0.92			0.92			0.85	0.91

PM	Business Driveway Southbound			West Mission Road Westbound			Barham Drive Northbound			West Mission Road Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
16:00	8	1	0	82	218	0	24	2	142	0	214	2	693
16:15	6	2	0	119	243	2	22	0	154	0	146	13	707
16:30	0	1	0	99	242	0	20	1	140	0	200	10	713
16:45	0	0	0	122	246	0	15	3	137	0	210	19	752
17:00	6	0	0	110	229	0	37	1	123	0	185	19	710
17:15	6	0	0	99	250	0	38	0	114	0	196	9	712
17:30	3	0	1	82	246	1	32	2	107	1	221	7	703
17:45	0	0	0	90	213	0	19	0	104	1	217	7	651
Total	29	4	1	803	1887	3	207	9	1021	2	1589	86	5641
Approach%	85.3	11.8	2.9	29.8	70.1	0.1	16.7	0.7	82.5	0.1	94.8	5.1	
Total%	0.5	0.1	0.0	14.2	33.5	0.1	3.7	0.2	18.1	0.0	28.2	1.5	

PM Intersection Peak Hour: 16:30 to 17:30

Volume	12	1	-	430	967	-	110	5	514	-	791	57	2,887
Approach%	92.3	7.7	-	30.8	69.2	-	17.5	0.8	81.7	-	93.3	6.7	
Total%	0.4	0.0	-	14.9	33.5	-	3.8	0.2	17.8	-	27.4	2.0	
PHF			0.54			0.95			0.98			0.93	0.96

Intersection Turning Movement - Bicycle & Pedestrian Count



Location: #07	File Name: ITM-18-129-07
Intersection: Barham Drive & West Mission Road	Project: LLG Ref. 3-18-2835
Date of Count: Thursday, September 20, 2018	San Marcos

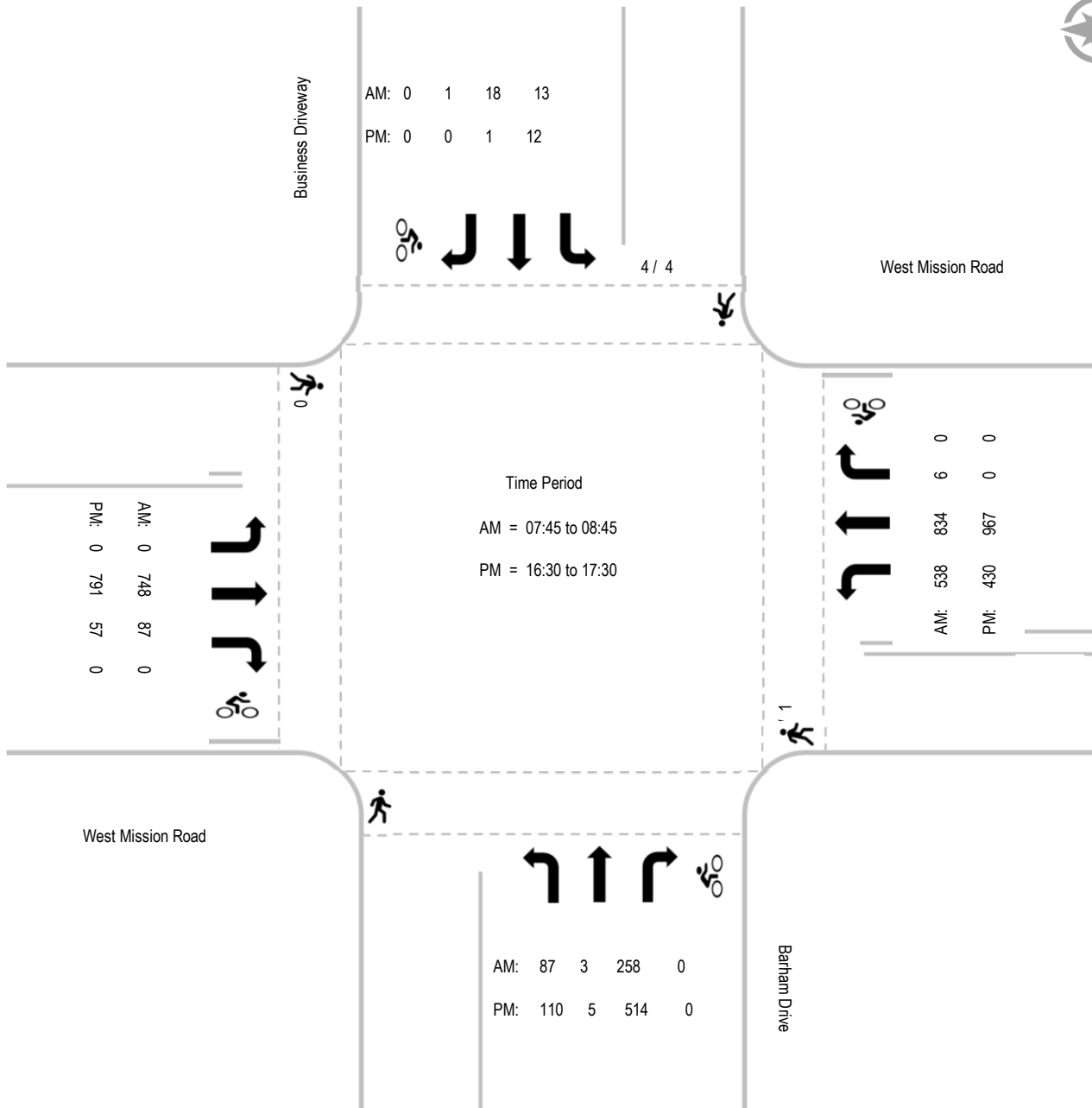
AM	Business Driveway Southbound				West Mission Road Westbound				Barham Drive Northbound				West Mission Road Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
7:00	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2	0
7:15	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0
7:30	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
7:45	1	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	5	0
8:00	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	2	0
8:15	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0
8:30	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
8:45	1	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	4	0
Ped Total	4				4				12				0				20	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

PM	Business Driveway Southbound				West Mission Road Westbound				Barham Drive Northbound				West Mission Road Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
16:00	3	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	4	0
16:15	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	3	0
16:30	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	2	0
16:45	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2	0
17:00	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	7	0
17:15	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	4	0
17:30	0	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	5	0
17:45	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
Ped Total	4				1				23				0				28	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

Intersection Turning Movement - Peak Hour Summary



Location:	#07	File Name:	ITM-18-129-07
Intersection:	Barham Drive & West Mission Road	Project:	LLG Ref. 3-18-2835
Date of Count:	Thursday, September 20, 2018		San Marcos



Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136



Location: Mission Road @ Nordahl Road

Date of Count: Wednesday, March 01, 2017

Analysts: LV/CD

Weather: Sunny

AVC Proj No: 17-0626



Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136



Location: Mission Road @ Nordahl Road

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
7:00 AM	54	194	98	75	85	18	4	92	88	45	84	77	914
7:15 AM	76	136	72	53	156	15	3	110	81	48	94	74	918
7:30 AM	65	183	90	80	160	15	13	196	124	45	106	72	1,149
7:45 AM	60	268	80	60	128	24	6	157	68	77	93	75	1,096
8:00 AM	60	259	62	54	136	14	9	153	89	63	77	59	1,035
8:15 AM	67	166	52	48	119	15	15	117	69	59	63	54	844
8:30 AM	75	198	66	72	83	14	5	130	68	43	75	47	876
8:45 AM	68	223	64	54	84	12	1	97	61	35	71	54	824
Total	525	1,627	584	496	951	127	56	1,052	648	415	663	512	7,656

AM Intersection Peak Hour : **7:15 AM - 8:15 AM**

Intersection PHF : **0.91**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	261	846	304	247	580	68	31	616	362	233	370	280	4,198
PHF	0.86	0.79	0.84	0.77	0.91	0.71	0.60	0.79	0.73	0.76	0.87	0.93	0.91
Movement PHF		0.86			0.88			0.76			0.90		0.91

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
4:00 PM	130	92	51	102	113	7	12	244	85	66	164	119	1,185
4:15 PM	124	80	56	105	126	7	9	284	107	54	163	99	1,214
4:30 PM	145	21	62	128	172	15	9	153	95	43	209	131	1,183
4:45 PM	101	51	41	93	161	6	19	213	93	62	191	115	1,146
5:00 PM	147	131	33	141	176	11	14	225	103	45	171	136	1,333
5:15 PM	141	111	42	123	179	14	8	194	153	75	174	103	1,317
5:30 PM	115	112	28	78	122	10	9	216	80	57	154	154	1,135
5:45 PM	103	79	20	73	87	2	6	211	58	50	135	88	912
Total	1006	677	333	843	1,136	72	86	1,740	774	452	1,361	945	9,425

PM Intersection Peak Hour : **4:30 PM - 5:30 PM**

Intersection PHF : **0.93**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	534	314	178	485	688	46	50	785	444	225	745	485	4979
PHF	0.91	0.599	0.718	0.86	0.961	0.767	0.658	0.872	0.725	0.75	0.891	0.892	0.93
Movement PHF		0.82			0.93			0.90			0.95		0.93

Turn Count Summary

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136



Location: SR-78 EB Ramps @ Nordahl Road

Date of Count: Wednesday, March 01, 2017

Analysts: LV/CD

Weather: Sunny

AVC Proj No: 17-0626



Vehicular Count

Accurate Video Counts Inc
info@accuratevideocounts.com
(619) 987-5136



Location: SR-78 EB Ramps @ Nordahl Road

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
7:00 AM	0	159	63	0	0	0	116	114	0	172	65	73	762
7:15 AM	0	143	71	0	0	0	102	123	0	128	36	48	651
7:30 AM	0	203	65	0	0	0	196	134	0	150	24	78	850
7:45 AM	0	222	40	0	0	0	157	154	0	198	3	117	891
8:00 AM	0	222	82	0	0	0	147	137	0	176	1	128	893
8:15 AM	0	166	94	0	0	0	105	134	0	138	1	71	709
8:30 AM	0	179	74	0	0	0	90	144	0	172	3	99	761
8:45 AM	0	179	71	0	0	0	112	111	0	191	8	118	790
Total	0	1,473	560	0	0	0	1,025	1,051	0	1,325	141	732	6,307

AM Intersection Peak Hour : **7:30 AM - 8:30 AM**

Intersection PHF : **0.94**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	813	281	0	0	0	605	559	0	662	29	394	3,343
PHF	#####	0.92	0.75	#####	#####	#####	0.77	0.91	#####	0.84	0.30	0.77	0.94
Movement PHF		0.90			#DIV/0!			0.88			0.85		0.94

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
4:00 PM	0	215	119	0	0	0	189	294	0	68	9	106	1,000
4:15 PM	0	158	167	0	0	0	200	271	0	89	13	106	1,004
4:30 PM	0	143	134	0	0	0	193	231	0	80	17	140	938
4:45 PM	0	80	148	0	0	0	213	202	0	92	18	142	895
5:00 PM	0	251	142	0	0	0	216	325	0	82	17	151	1,184
5:15 PM	0	230	145	0	0	0	186	265	0	67	14	125	1,032
5:30 PM	0	191	108	0	0	0	207	248	0	82	20	166	1,022
5:45 PM	0	161	130	0	0	0	174	217	0	59	8	112	861
Total	0	1,429	1,093	0	0	0	1,578	2,053	0	619	116	1,048	7,936

PM Intersection Peak Hour : **4:45 PM - 5:45 PM**

Intersection PHF : **0.87**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	752	543	0	0	0	822	1,040	0	323	69	584	4,133
PHF	#####	0.749	0.917	#####	#####	#####	0.951	0.8	#####	0.878	0.863	0.88	0.87
Movement PHF		0.82			#DIV/0!			0.86			0.91		0.87

Intersection Turning Movement - Peak Hour Vehicle Count



Location: #10
 Intersection: Nordahl Road & SR-78 WB On-Off Ramps
 Date of Count: Thursday, September 20, 2018

File Name: ITM-18-129-10
 Project: LLG Ref. 3-18-2835
 San Marcos

AM	Nordahi Road Southbound			SR-78 WB Off Ramp Westbound			Nordahi Road Northbound			SR-78 WB On Ramp Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
7:00	0	136	123	89	0	25	83	87	0	0	0	0	543
7:15	0	170	83	74	0	23	95	89	0	0	0	0	534
7:30	0	191	85	71	0	18	85	118	0	0	0	0	568
7:45	0	170	100	77	0	19	77	142	0	0	0	0	585
8:00	0	160	75	85	0	20	91	146	0	0	0	0	577
8:15	0	165	81	75	0	26	97	151	0	0	0	0	595
8:30	0	166	82	84	0	45	124	147	0	0	0	0	648
8:45	0	161	90	100	0	48	93	149	0	0	0	0	641
Total	0	1319	719	655	0	224	745	1029	0	0	0	0	4691
Approach%	-	64.7	35.3	74.5	-	25.5	42.0	58.0	-	-	-	-	
Total%	-	28.1	15.3	14.0	-	4.8	15.9	21.9	-	-	-	-	

AM Intersection Peak Hour: 08:00 to 09:00

Volume	-	652	328	344	-	139	405	593	-	-	-	-	2,461
Approach%	-	66.5	33.5	71.2	-	28.8	40.6	59.4	-	-	-	-	
Total%	-	26.5	13.3	14.0	-	5.6	16.5	24.1	-	-	-	-	
PHF			0.98			0.82			0.92		#DIV/0!		0.95

PM	Nordahi Road Southbound			SR-78 WB Off Ramp Westbound			Nordahi Road Northbound			SR-78 WB On Ramp Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
16:00	0	223	147	108	0	79	178	259	0	0	0	0	994
16:15	0	186	128	102	0	111	151	213	0	0	0	0	891
16:30	0	170	116	105	0	109	201	272	0	0	0	0	973
16:45	0	182	133	94	4	147	143	234	0	0	0	0	937
17:00	0	211	151	118	0	131	150	250	0	0	0	0	1011
17:15	0	217	126	111	1	101	128	250	0	0	0	0	934
17:30	0	216	125	88	4	106	141	231	0	0	0	0	911
17:45	0	175	150	107	10	120	91	234	0	0	0	0	887
Total	0	1580	1076	833	19	904	1183	1943	0	0	0	0	7538
Approach%	-	59.5	40.5	47.4	1.1	51.5	37.8	62.2	-	-	-	-	
Total%	-	21.0	14.3	11.1	0.3	12.0	15.7	25.8	-	-	-	-	

PM Intersection Peak Hour: 16:30 to 17:30

Volume	-	780	526	428	5	488	622	1,006	-	-	-	-	3,855
Approach%	-	59.7	40.3	46.5	0.5	53.0	38.2	61.8	-	-	-	-	
Total%	-	20.2	13.6	11.1	0.1	12.7	16.1	26.1	-	-	-	-	
PHF			0.90			0.92			0.86		#DIV/0!		0.95

Intersection Turning Movement - Bicycle & Pedestrian Count



Location: #10	File Name: ITM-18-129-10
Intersection: Nordahl Road & SR-78 WB On-Off Ramps	Project: LLG Ref. 3-18-2835
Date of Count: Thursday, September 20, 2018	San Marcos

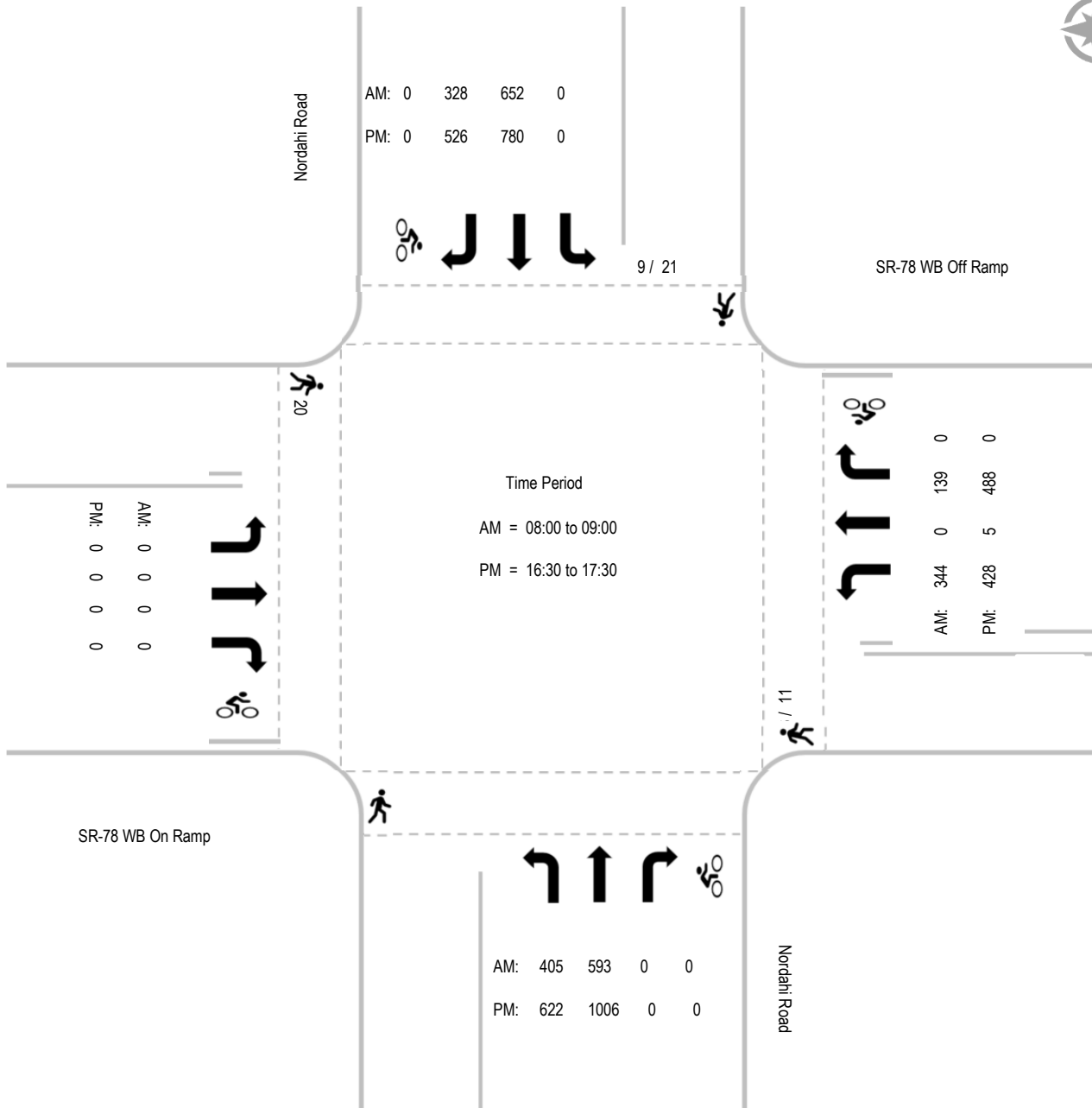
AM	Nordahl Road Southbound				SR-78 WB Off Ramp Westbound				Nordahl Road Northbound				SR-78 WB On Ramp Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
7:00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
7:15	2	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	5	0
7:30	2	0	0	0	5	0	0	0	0	0	0	0	0	0	0	0	7	0
7:45	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
8:00	0	0	0	0	5	0	0	0	4	0	0	0	0	0	0	0	9	0
8:15	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	2	0
8:30	2	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	5	0
8:45	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2	0
Ped Total	9				16				7				0				32	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

PM	Nordahl Road Southbound				SR-78 WB Off Ramp Westbound				Nordahl Road Northbound				SR-78 WB On Ramp Eastbound				Totals	
	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	B-Left	B-Thru	B-Right	Ped	Bicycle
16:00	9	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	10	0
16:15	1	0	0	0	0	0	0	0	0	0	0	0	5	0	0	0	6	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0
16:45	2	0	0	0	2	0	0	0	2	0	0	0	5	0	0	0	11	0
17:00	4	0	0	0	1	0	0	0	0	0	0	0	4	0	0	0	9	0
17:15	3	0	0	0	4	0	0	0	4	0	0	0	5	0	0	0	16	0
17:30	2	0	0	0	4	0	0	0	11	0	0	0	0	0	0	0	17	0
17:45	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ped Total	21				11				18				20				70	
Bike Total		0	0	0		0	0	0		0	0	0		0	0	0		0

Intersection Turning Movement - Peak Hour Summary



Location:	#10	File Name:	ITM-18-129-10
Intersection:	Nordahl Road & SR-78 WB On-Off Ramps	Project:	LLG Ref. 3-18-2835
Date of Count:	Thursday, September 20, 2018		San Marcos



Linscott, Law & Greenspan, Engineers

4542 Ruffner Street, Suite 100, San Diego, CA 92111

Average Daily Traffic

Location: **Rancheros Drive, between SR 78 Ramps and Woodland Parkway**

Date: Thursday, September 20, 2018						Total Daily Volume: 21136						Description: Total Volume											
0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
69	51	80	65	146	490	1042	1695	1889	1495	1075	1119	1221	1176	1319	1473	1581	1695	1427	711	572	389	246	110
16	10	13	13	23	61	181	329	464	434	299	236	289	308	344	345	340	408	419	216	157	122	79	39
18	13	23	7	29	92	216	451	448	404	288	275	301	276	330	305	447	455	319	186	132	109	59	26
16	18	22	21	32	148	313	475	491	355	215	327	306	291	340	421	430	408	393	172	146	90	65	27
19	10	22	24	62	189	332	440	486	302	273	281	325	301	305	402	364	424	296	137	137	68	43	18

Date: Thursday, September 20, 2018						Total Daily Volume: 9414						Description: Eastbound Volume											
0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
44	35	47	32	53	198	350	443	441	591	583	623	688	654	756	661	755	694	475	448	376	255	149	63
11	4	7	8	14	16	68	99	91	128	175	115	163	160	228	143	185	179	136	147	99	82	55	22
10	10	16	4	7	44	90	121	98	135	149	150	177	137	175	160	181	172	106	109	79	62	30	18
11	12	12	9	9	45	99	111	122	155	110	179	169	160	197	163	188	182	115	107	101	55	44	15
12	9	12	11	23	93	93	112	130	173	149	179	179	197	156	195	201	161	118	85	97	56	20	8

Date: Thursday, September 20, 2018						Total Daily Volume: 11722						Description: Westbound Volume											
0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
25	16	33	33	93	292	692	1252	1448	904	492	496	533	522	563	812	826	1001	952	263	196	134	97	47
5	6	6	5	9	45	113	230	373	306	124	121	126	148	116	202	155	229	283	69	58	40	24	17
8	3	7	3	22	48	126	330	350	269	139	125	124	139	155	145	266	283	213	77	53	47	29	8
5	6	10	12	23	103	214	364	369	200	105	148	137	131	143	258	242	226	278	65	45	35	21	12
7	1	10	13	39	96	239	328	356	129	124	102	146	104	149	207	163	263	178	52	40	12	23	10

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4542 Ruffner Street, Suite 100, San Diego, CA 92111

Average Daily Traffic

Location: **E. Barham Drive, between Woodland Parkway and La Moree Road**

Date: Thursday, September 20, 2018						Total Daily Volume: 17502						Description: Total Volume											
0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
39	19	45	42	115	360	926	1936	2162	1276	724	765	824	781	921	1271	1419	1587	1241	381	274	207	116	71
12	7	6	6	13	51	148	377	581	412	208	191	190	220	194	296	310	392	365	99	79	63	29	28
11	3	7	4	29	68	169	475	513	367	187	190	191	197	243	235	389	435	295	108	73	64	34	14
7	7	20	15	27	119	270	570	549	297	153	220	226	199	236	401	410	381	352	93	64	55	24	15
9	2	12	17	46	122	339	514	519	200	176	164	217	165	248	339	310	379	229	81	58	25	29	14

Date: Thursday, September 20, 2018						Total Daily Volume: 5780						Description: Eastbound Volume											
0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
14	3	12	9	22	68	234	684	714	372	232	269	291	259	358	459	593	586	289	118	78	73	19	24
7	1	0	1	4	6	35	147	208	106	84	70	64	72	78	94	155	163	82	30	21	23	5	11
3	0	0	1	7	20	43	145	163	98	48	65	67	58	88	90	123	152	82	31	20	17	5	6
2	1	10	3	4	16	56	206	180	97	48	72	89	68	93	143	168	155	74	28	19	20	3	3
2	1	2	4	7	26	100	186	163	71	52	62	71	61	99	132	147	116	51	29	18	13	6	4

Date: Thursday, September 20, 2018						Total Daily Volume: 11722						Description: Westbound Volume											
0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
25	16	33	33	93	292	692	1252	1448	904	492	496	533	522	563	812	826	1001	952	263	196	134	97	47
5	6	6	5	9	45	113	230	373	306	124	121	126	148	116	202	155	229	283	69	58	40	24	17
8	3	7	3	22	48	126	330	350	269	139	125	124	139	155	145	266	283	213	77	53	47	29	8
5	6	10	12	23	103	214	364	369	200	105	148	137	131	143	258	242	226	278	65	45	35	21	12
7	1	10	13	39	96	239	328	356	129	124	102	146	104	149	207	163	263	178	52	40	12	23	10

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4542 Ruffner Street, Suite 100, San Diego, CA 92111

Average Daily Traffic

Location: **E. Barham Drive, West of Meyers Ave**

Date: Thursday, September 20, 2018						Total Daily Volume: 12985						Description: Total Volume											
0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
41	9	16	12	57	170	628	1306	1359	773	526	585	613	552	821	1235	1454	1309	691	330	226	137	94	41
12	3	1	3	5	23	71	283	355	241	142	131	176	130	170	256	345	393	203	112	65	45	29	15
10	1	5	1	7	34	94	303	352	198	120	141	134	149	174	293	362	337	207	65	63	37	18	10
9	1	7	2	12	41	177	345	328	178	124	153	156	128	245	352	366	287	143	80	51	28	26	12
10	4	3	6	33	72	286	375	324	156	140	160	147	145	232	334	381	292	138	73	47	27	21	4

Date: Thursday, September 20, 2018						Total Daily Volume: 6497						Description: Eastbound Volume											
0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
11	6	2	6	33	100	383	638	576	380	273	282	265	262	387	663	819	694	332	155	115	56	45	14
2	2	1	1	2	8	46	137	170	132	70	63	83	65	70	158	211	182	91	64	32	20	15	6
4	1	0	1	1	19	56	171	144	92	62	65	64	73	77	169	207	189	95	31	36	14	7	3
2	1	0	0	8	24	116	155	130	85	68	82	57	67	119	166	201	166	75	36	27	13	15	4
3	2	1	4	22	49	165	175	132	71	73	72	61	57	121	170	200	157	71	24	20	9	8	1

Date: Thursday, September 20, 2018						Total Daily Volume: 6488						Description: Westbound Volume											
0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
30	3	14	6	24	70	245	668	783	393	253	303	348	290	434	572	635	615	359	175	111	81	49	27
10	1	0	2	3	15	25	146	185	109	72	68	93	65	100	98	134	211	112	48	33	25	14	9
6	0	5	0	6	15	38	132	208	106	58	76	70	76	97	124	155	148	112	34	27	23	11	7
7	0	7	2	4	17	61	190	198	93	56	71	99	61	126	186	165	121	68	44	24	15	11	8
7	2	2	2	11	23	121	200	192	85	67	88	86	88	111	164	181	135	67	49	27	18	13	3

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4542 Ruffner Street, Suite 100, San Diego, CA 92111

Average Daily Traffic

Location: **W. Mission Road, between Barham Drive and Nordahl Road**

Date: Thursday, September 20, 2018						Total Daily Volume: 29959						Description: Total Volume											
0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
91	70	69	81	175	459	1245	2691	2599	1785	1274	1379	1560	1478	2004	2759	3033	2971	1792	953	618	470	254	149
29	18	12	21	33	76	211	543	693	529	362	309	418	386	461	599	700	733	561	297	184	127	69	44
26	19	16	21	41	83	245	675	619	449	299	326	374	364	439	660	774	792	500	233	162	120	54	43
22	12	21	15	44	133	299	714	674	405	289	353	392	368	541	772	758	752	387	236	121	118	83	38
14	21	20	24	57	167	490	759	613	402	324	391	376	360	563	728	801	694	344	187	151	105	48	24

Date: Thursday, September 20, 2018						Total Daily Volume: 13305						Description: Eastbound Volume											
0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
30	30	44	51	92	260	617	1058	953	798	612	697	741	681	889	1258	1349	1311	751	399	284	216	121	63
10	12	11	9	25	45	134	235	278	219	179	169	206	192	201	295	349	329	240	140	80	54	39	18
8	6	7	14	23	44	140	274	198	201	137	173	179	165	200	317	308	332	191	102	82	48	22	20
5	7	12	11	21	81	150	253	247	191	145	166	169	176	242	340	343	323	169	88	54	65	34	15
7	5	14	17	23	90	193	296	230	187	151	189	187	148	246	306	349	327	151	69	68	49	26	10

Date: Thursday, September 20, 2018						Total Daily Volume: 16654						Description: Westbound Volume											
0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
61	40	25	30	83	199	628	1633	1646	987	662	682	819	797	1115	1501	1684	1660	1041	554	334	254	133	86
19	6	1	12	8	31	77	308	415	310	183	140	212	194	260	304	351	404	321	157	104	73	30	26
18	13	9	7	18	39	105	401	421	248	162	153	195	199	239	343	466	460	309	131	80	72	32	23
17	5	9	4	23	52	149	461	427	214	144	187	223	192	299	432	415	429	218	148	67	53	49	23
7	16	6	7	34	77	297	463	383	215	173	202	189	212	317	422	452	367	193	118	83	56	22	14

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Linscott, Law & Greenspan, Engineers

4542 Ruffner Street, Suite 100, San Diego, CA 92111

Average Daily Traffic

Location: **Nordahl Road, SR 78 Ramps and Mission Road**

Date: Thursday, September 20, 2018						Total Daily Volume: 41644						Description: Total Volume											
0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
242	173	186	272	449	1371	2455	2320	2540	2425	2365	2690	2881	2772	2981	3129	3026	2766	2237	1468	1052	883	585	376
64	36	51	69	67	209	496	508	693	569	573	633	808	724	717	736	812	774	600	405	312	247	174	107
68	47	43	65	107	270	615	512	596	545	567	660	671	654	680	762	722	702	581	327	245	218	133	117
56	35	56	65	124	383	636	701	662	613	623	697	694	761	821	856	803	691	575	423	251	216	159	94
54	55	36	73	151	509	708	599	589	698	602	700	708	633	763	775	689	599	481	313	244	202	119	58

Date: Thursday, September 20, 2018						Total Daily Volume: 23039						Description: Northbound Volume											
0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
151	91	112	163	200	491	1075	1233	1384	1292	1279	1488	1555	1435	1641	2006	2014	1790	1195	832	569	488	335	220
37	21	36	34	45	98	249	269	364	296	306	342	464	351	368	451	533	518	341	197	172	135	104	61
37	23	21	45	61	93	259	277	337	304	306	374	363	351	383	473	475	465	300	184	121	108	75	76
38	24	31	43	52	139	248	393	380	303	344	379	372	415	457	569	548	438	296	259	142	134	84	57
39	23	24	41	42	161	319	294	303	389	323	393	356	318	433	513	458	369	258	192	134	111	72	26

Date: Thursday, September 20, 2018						Total Daily Volume: 18605						Description: Southbound Volume											
0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00
91	82	74	109	249	880	1380	1087	1156	1133	1086	1202	1326	1337	1340	1123	1012	976	1042	636	483	395	250	156
27	15	15	35	22	111	247	239	329	273	267	291	344	373	349	285	279	256	259	208	140	112	70	46
31	24	22	20	46	177	356	235	259	241	261	286	308	303	297	289	247	237	281	143	124	110	58	41
18	11	25	22	72	244	388	308	282	310	279	318	322	346	364	287	255	253	279	164	109	82	75	37
15	32	12	32	109	348	389	305	286	309	279	307	352	315	330	262	231	230	223	121	110	91	47	32

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APPENDIX B

CITY OF SAN MARCOS, CITY OF ESCONDIDO ROADWAY CAPACITY TABLES

Table 3.16-2
Daily Roadway Segment Capacity

Street Typology	Typical Lane Configuration	Vehicular Level of Service				
		LOS A	LOS B	LOS C	LOS D	LOS E
Existing Roadway Classifications / Standards						
Prime Arterial	7 to 8 lanes	29,200	40,800	58,300	64,200	70,000
Prime Arterial	6 lanes	25,000	35,000	50,000	55,000	60,000
Major Arterial	5 lanes	18,000	25,000	35,000	40,000	45,000
Major Arterial	4 lanes	15,000	21,000	30,000	35,000	40,000
Secondary Arterial	5 lanes	12,500	17,500	25,000	31,300	37,500
Secondary Arterial	4 lanes	10,000	14,000	20,000	25,000	30,000
Secondary Arterial	3 lanes	7,500	10,500	15,000	18,000	22,500
Collector	2 lanes plus TWLTL	5,000	7,000	10,000	13,000	15,000
Collector	2 lanes	2,500	3,500	5,000	6,500	8,000
General Plan Complete Street Typology Standards						
Arterial	8 lanes	29,200	40,800	58,300	64,200	70,000
Arterial	6 lanes	25,000	35,000	50,000	55,000	60,000
Arterial with Class II or Class III Bike Lanes	4 lanes	15,000	21,000	30,000	35,000	40,000
Arterial with enhanced Bike facilities	4 lanes	15,000	21,000	30,000	35,000	40,000
Multi-Way Boulevard	4 lanes for through trips, two lanes for local serving trips ¹	16,800	25,200	31,500	37,800	42,000
Industrial Collector	4 lanes	10,000	14,000	20,000	25,000	30,000
Collector & Main Street	2 lanes plus TWLTL	5,000	7,000	10,000	13,000	15,000
Collector & Main Street	2 lanes ²	2,500	3,000	5,000	6,500	8,000
Freeway	Mixed-Flow Lane ³	-	-	1,760	1,980	2,200
Freeway	HOV Lanes ³	-	-	1,440	1,620	1,800

Note: These are general capacities for planning purposes. Specific operational characteristics, such as signal coordination, can enhance operations significantly.

1. LOS thresholds were calculated based on V/C ratios of the daily threshold volumes for the corresponding roadway classification. Multi-way boulevard capacity assumes a similar capacity as a 4-lane arterial plus an additional 1,000 ADT capacity per lane for the local service roadway.
2. With fronting commercial or residential property
3. Per lane capacities presented.

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

Table

CITY OF ESCONDIDO PROPOSED LEVEL OF SERVICE STANDARDS

STREET SEGMENT AVERAGE DAILY VEHICLE TRIP THRESHOLDS

Street Classification	Lanes	Cross Sections	Level of Service				
			A	B	C	D	E
Prime Arterial	(8lanes)	116/136 (NP)	23,800	37,800	51,800	62,300	70,000
	(6lanes)	106/126 (NP)	20,400	32,400	44,400	53,400	60,000
Major Road	(6lanes)	90/110 (NP)	17,000	27,000	37,000	44,500	50,000
	(4lanes)	82/102 (NP)	12,600	20,000	27,400	32,900	37,000
Collector	(4lanes)	64/84 (NP)	11,600	18,500	25,300	30,400	34,200
	(4lanes)	(WP)	6,800	10,800	14,800	17,800	20,000
Local Collector	(2lanes)	42/66 (NP)	5,100	8,100	11,100	13,400	15,000
		(WP)	3,400	5,400	7,400	8,900	10,000
Rural collector	(2lanes)						

(NP) No Parking

(WP) With Parking

The following V/C Ratios were utilized for determining Existing and Future Level of Service.

Level of Service

Volume/Capacity
(V/C) Ratio

A-	Less than or Equal to	0.00	to	0.34
B-	Less than or Equal to	0.35	to	0.54
C-	Less than or Equal to	0.55	to	0.74
D-	Less than or Equal to	0.75	to	0.89
E-	Less than or Equal to	0.90	to	1.00

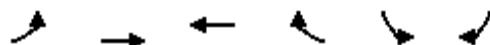
v/c 0.74

APPENDIX C

INTERSECTION ANALYSIS WORKSHEETS – EXISTING

Existing AM
1: Barham Dr & SR-78 EB Off

Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↙	↗
Traffic Volume (veh/h)	0	616	922	0	456	27
Future Volume (veh/h)	0	616	922	0	456	27
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	670	1002	0	496	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	1079	1079	0	539	480
Arrive On Green	0.00	0.58	0.58	0.00	0.30	0.30
Sat Flow, veh/h	0	1870	1870	0	1781	1585
Grp Volume(v), veh/h	0	670	1002	0	496	29
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	17.6	36.5	0.0	20.1	1.0
Cycle Q Clear(g_c), s	0.0	17.6	36.5	0.0	20.1	1.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1079	1079	0	539	480
V/C Ratio(X)	0.00	0.62	0.93	0.00	0.92	0.06
Avail Cap(c_a), veh/h	0	1165	1165	0	585	520
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	10.4	14.4	0.0	25.2	18.5
Incr Delay (d2), s/veh	0.0	0.9	12.3	0.0	19.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.4	16.4	0.0	10.8	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	11.3	26.7	0.0	44.3	18.5
LnGrp LOS	A	B	C	A	D	B
Approach Vol, veh/h		670	1002		525	
Approach Delay, s/veh		11.3	26.7		42.9	
Approach LOS		B	C		D	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		47.6		27.1		47.6
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		46.5		24.5		46.5
Max Q Clear Time (g_c+I1), s		19.6		22.1		38.5
Green Ext Time (p_c), s		5.1		0.5		4.6
Intersection Summary						
HCM 6th Ctrl Delay			25.9			
HCM 6th LOS			C			

Intersection

Intersection Delay, s/veh61.5

Intersection LOS F

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	217	38	584	310	177	177
Future Vol, veh/h	217	38	584	310	177	177
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	236	41	635	337	192	192
Number of Lanes	1	1	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	15.3	93.1	15
HCM LOS	C	F	B

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	177	177	217	38	584	310
LT Vol	177	0	0	0	584	0
Through Vol	0	0	217	0	0	310
RT Vol	0	177	0	38	0	0
Lane Flow Rate	192	192	236	41	635	337
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.418	0.354	0.464	0.073	1.207	0.593
Departure Headway (Hd)	8.14	6.916	7.395	6.676	6.844	6.335
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	444	523	491	540	533	569
Service Time	5.84	4.616	5.095	4.376	4.577	4.068
HCM Lane V/C Ratio	0.432	0.367	0.481	0.076	1.191	0.592
HCM Control Delay	16.6	13.4	16.3	9.9	133	17.9
HCM Lane LOS	C	B	C	A	F	C
HCM 95th-tile Q	2	1.6	2.4	0.2	23.6	3.9

Existing AM
3: Woodland Pkwy & Rancheros Dr

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	81	290	77	248	10	186	146	52	15	424	514
Future Volume (veh/h)	59	81	290	77	248	10	186	146	52	15	424	514
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	64	88	315	84	270	11	202	159	57	16	461	559
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	89	380	538	108	382	16	243	1207	417	34	652	632
Arrive On Green	0.05	0.20	0.20	0.06	0.21	0.21	0.14	0.47	0.47	0.02	0.35	0.35
Sat Flow, veh/h	1781	1870	1585	1781	1785	73	1781	2591	895	1781	1870	1585
Grp Volume(v), veh/h	64	88	315	84	0	281	202	107	109	16	461	559
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1857	1781	1777	1709	1781	1870	1585
Q Serve(g_s), s	2.5	2.8	11.7	3.3	0.0	10.1	7.9	2.5	2.6	0.6	15.3	23.5
Cycle Q Clear(g_c), s	2.5	2.8	11.7	3.3	0.0	10.1	7.9	2.5	2.6	0.6	15.3	23.5
Prop In Lane	1.00		1.00	1.00		0.04	1.00		0.52	1.00		1.00
Lane Grp Cap(c), veh/h	89	380	538	108	0	397	243	828	796	34	652	632
V/C Ratio(X)	0.72	0.23	0.59	0.78	0.00	0.71	0.83	0.13	0.14	0.47	0.71	0.88
Avail Cap(c_a), veh/h	211	511	649	171	0	466	261	828	796	124	652	632
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.5	23.9	19.5	33.2	0.0	26.1	30.2	10.9	10.9	34.8	20.2	20.0
Incr Delay (d2), s/veh	10.1	0.3	1.0	11.3	0.0	4.0	18.9	0.1	0.1	9.8	3.5	14.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	1.2	4.2	1.7	0.0	4.7	4.5	0.9	0.9	0.4	6.8	10.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.7	24.2	20.5	44.5	0.0	30.1	49.1	11.0	11.0	44.7	23.7	34.0
LnGrp LOS	D	C	C	D	A	C	D	B	B	D	C	C
Approach Vol, veh/h	467			365			418			1036		
Approach Delay, s/veh	24.4			33.4			29.4			29.6		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.9	37.9	8.9	19.1	14.3	29.5	8.1	19.8				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	30.5	6.9	19.6	10.5	25.0	8.5	18.0				
Max Q Clear Time (g_c+I), s	12.6	4.6	5.3	13.7	9.9	25.5	4.5	12.1				
Green Ext Time (p_c), s	0.0	1.2	0.0	0.8	0.0	0.0	0.0	0.8				

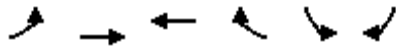
Intersection Summary

HCM 6th Ctrl Delay	29.1
HCM 6th LOS	C

Existing AM
4: Barham Dr & Woodland Pkwy

Sunrise Residential

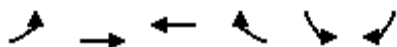
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	315	879	492	288	311	601
Future Volume (veh/h)	315	879	492	288	311	601
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1900
Adj Flow Rate, veh/h	342	955	535	313	338	588
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	380	1094	613	1038	582	527
Arrive On Green	0.21	0.59	0.33	0.33	0.33	0.33
Sat Flow, veh/h	1781	1870	1870	1585	1781	1610
Grp Volume(v), veh/h	342	955	535	313	338	588
Grp Sat Flow(s), veh/h/ln	1781	1870	1870	1585	1781	1610
Q Serve(g_s), s	19.2	44.3	27.6	8.7	16.1	33.5
Cycle Q Clear(g_c), s	19.2	44.3	27.6	8.7	16.1	33.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	380	1094	613	1038	582	527
V/C Ratio(X)	0.90	0.87	0.87	0.30	0.58	1.12
Avail Cap(c_a), veh/h	513	1415	794	1191	582	527
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.2	18.0	32.4	7.6	28.6	34.5
Incr Delay (d2), s/veh	15.2	5.1	8.5	0.2	1.5	75.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.9	18.9	13.6	6.4	7.0	36.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	54.5	23.1	40.9	7.8	30.1	109.8
LnGrp LOS	D	C	D	A	C	F
Approach Vol, veh/h		1297	848		926	
Approach Delay, s/veh		31.4	28.7		80.7	
Approach LOS		C	C		F	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		64.5		38.0	26.3	38.1
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		77.5		33.5	29.5	43.5
Max Q Clear Time (g_c+I1), s		46.3		35.5	21.2	29.6
Green Ext Time (p_c), s		9.3		0.0	0.7	4.0
Intersection Summary						
HCM 6th Ctrl Delay			45.5			
HCM 6th LOS			D			
Notes						
User approved volume balancing among the lanes for turning movement.						

Existing AM
5: Barham Dr & SR-78 EB On

Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	293	593	679	31	0	0
Future Volume (veh/h)	293	593	679	31	0	0
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Work Zone On Approach		No	No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870		
Adj Flow Rate, veh/h	318	645	738	34		
Peak Hour Factor	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2		
Cap, veh/h	407	1649	948	44		
Arrive On Green	0.23	0.88	0.53	0.53		
Sat Flow, veh/h	1781	1870	1774	82		
Grp Volume(v), veh/h	318	645	0	772		
Grp Sat Flow(s), veh/h/ln	1781	1870	0	1856		
Q Serve(g_s), s	6.4	2.4	0.0	12.6		
Cycle Q Clear(g_c), s	6.4	2.4	0.0	12.6		
Prop In Lane	1.00			0.04		
Lane Grp Cap(c), veh/h	407	1649	0	992		
V/C Ratio(X)	0.78	0.39	0.00	0.78		
Avail Cap(c_a), veh/h	774	2734	0	1686		
HCM Platoon Ratio	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	13.8	0.4	0.0	7.0		
Incr Delay (d2), s/veh	3.3	0.2	0.0	1.4		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	2.4	0.1	0.0	3.1		
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.1	0.6	0.0	8.4		
LnGrp LOS	B	A	A	A		
Approach Vol, veh/h		963	772			
Approach Delay, s/veh		6.0	8.4			
Approach LOS		A	A			
Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		38.0			13.2	24.8
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		55.5			16.5	34.5
Max Q Clear Time (g_c+I1), s		4.4			8.4	14.6
Green Ext Time (p_c), s		5.3			0.6	5.7
Intersection Summary						
HCM 6th Ctrl Delay			7.1			
HCM 6th LOS			A			

Intersection						
Int Delay, s/veh	26.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	299	343	23	563	222	22
Future Vol, veh/h	299	343	23	563	222	22
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	80	0
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	325	373	25	612	241	24

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	698
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	898
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	898
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	157
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	203	562	-	-	898	-
HCM Lane V/C Ratio	1.189	0.043	-	-	0.028	-
HCM Control Delay (s)	171.4	11.7	-	-	9.1	0
HCM Lane LOS	F	B	-	-	A	A
HCM 95th %tile Q(veh)	12.2	0.1	-	-	0.1	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Existing AM
8: Barham Dr & Mission Rd

Sunrise Residential
09/16/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	748	87	538	834	6	87	3	258	13	18	1
Future Volume (veh/h)	0	748	87	538	834	6	87	3	258	13	18	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	813	95	585	907	7	95	3	280	14	20	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	2	1006	449	629	2478	19	233	7	375	24	34	2
Arrive On Green	0.00	0.28	0.28	0.35	0.69	0.69	0.13	0.13	0.13	0.03	0.03	0.03
Sat Flow, veh/h	1781	3554	1585	1781	3614	28	1729	55	2790	730	1043	52
Grp Volume(v), veh/h	0	813	95	585	446	468	98	0	280	35	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1865	1784	0	1395	1824	0	0
Q Serve(g_s), s	0.0	19.4	4.2	28.9	9.6	9.6	4.6	0.0	8.8	1.7	0.0	0.0
Cycle Q Clear(g_c), s	0.0	19.4	4.2	28.9	9.6	9.6	4.6	0.0	8.8	1.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.01	0.97		1.00	0.40		0.03
Lane Grp Cap(c), veh/h	2	1006	449	629	1218	1279	240	0	375	59	0	0
V/C Ratio(X)	0.00	0.81	0.21	0.93	0.37	0.37	0.41	0.00	0.75	0.60	0.00	0.00
Avail Cap(c_a), veh/h	98	1257	561	755	1284	1348	508	0	794	100	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	30.4	25.0	28.5	6.0	6.0	36.2	0.0	38.0	43.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	3.2	0.2	16.2	0.2	0.2	1.1	0.0	3.0	9.3	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.5	1.6	14.6	3.1	3.2	2.1	0.0	3.1	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	33.7	25.2	44.7	6.2	6.2	37.3	0.0	41.0	52.9	0.0	0.0
LnGrp LOS	A	C	C	D	A	A	D	A	D	D	A	A
Approach Vol, veh/h		908			1499			378			35	
Approach Delay, s/veh		32.8			21.2			40.0			52.9	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	36.8	30.4		7.4	0.0	67.1		16.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	38.7	32.3		5.0	5.0	66.0		26.0				
Max Q Clear Time (g_c+I1), s	30.9	21.4		3.7	0.0	11.6		10.8				
Green Ext Time (p_c), s	1.4	4.4		0.0	0.0	7.2		1.5				
Intersection Summary												
HCM 6th Ctrl Delay				27.9								
HCM 6th LOS				C								

Existing AM
9: Auto Park Way/Nordahl Rd & Mission Rd

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑	↱	↰↱	↑↑	↱	↰↱	↑↑↑	↱	↰↱	↑↑	↱
Traffic Volume (veh/h)	280	370	233	68	580	247	362	616	31	304	846	261
Future Volume (veh/h)	280	370	233	68	580	247	362	616	31	304	846	261
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	304	402	253	74	630	0	393	670	34	330	920	284
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	361	995	444	132	760		451	2071	643	396	1385	618
Arrive On Green	0.10	0.28	0.28	0.04	0.21	0.00	0.13	0.41	0.41	0.11	0.39	0.39
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	5106	1585	3456	3554	1585
Grp Volume(v), veh/h	304	402	253	74	630	0	393	670	34	330	920	284
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1585	1728	1777	1585
Q Serve(g_s), s	10.4	11.0	16.4	2.5	20.3	0.0	13.4	10.8	1.6	11.2	25.6	16.0
Cycle Q Clear(g_c), s	10.4	11.0	16.4	2.5	20.3	0.0	13.4	10.8	1.6	11.2	25.6	16.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	361	995	444	132	760		451	2071	643	396	1385	618
V/C Ratio(X)	0.84	0.40	0.57	0.56	0.83		0.87	0.32	0.05	0.83	0.66	0.46
Avail Cap(c_a), veh/h	395	1238	552	170	1007		490	2071	643	521	1385	618
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)	0.54	0.54	0.54	1.00	1.00	0.00	1.00	1.00	1.00	0.84	0.84	0.84
Uniform Delay (d), s/veh	52.8	35.1	37.0	56.7	45.1	0.0	51.2	24.4	21.7	52.0	30.1	27.2
Incr Delay (d2), s/veh	8.3	0.1	0.6	3.7	4.5	0.0	14.9	0.4	0.2	7.4	2.1	2.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.9	4.8	6.4	1.2	9.4	0.0	6.7	4.4	0.6	5.3	11.2	6.4
Unsig. Movement Delay, s/veh	0.00											
LnGrp Delay(d),s/veh	61.1	35.2	37.6	60.4	49.6	0.0	66.1	24.8	21.8	59.4	32.3	29.3
LnGrp LOS	E	D	D	E	D	A	E	C	C	E	C	C
Approach Vol, veh/h	959				972		A		1097		1534	
Approach Delay, s/veh	44.1				36.7				39.5		37.6	
Approach LOS	D				D				D		D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.2	38.9	20.3	51.7	17.1	30.9	18.3	53.6				
Change Period (Y+Rc), s	4.6	5.3	4.6	4.9	4.6	5.3	4.6	4.9				
Max Green Setting (Gmax), s	5.9	41.8	17.0	35.9	13.7	34.0	18.1	34.8				
Max Q Clear Time (g_c+I), s	11.5	18.4	15.4	27.6	12.4	22.3	13.2	12.8				
Green Ext Time (p_c), s	0.0	3.6	0.3	4.6	0.2	3.3	0.5	4.9				

Intersection Summary

HCM 6th Ctrl Delay	39.2
HCM 6th LOS	D

Notes

Unsignalized Delay for [WBR] is included in calculations of the approach delay and intersection delay.

Existing AM
10: Nordahl Rd & SR-78 EB Ramps

Sunrise Residential

09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	394	29	662	0	0	0	0	590	605	281	813	0
Future Volume (veh/h)	394	29	662	0	0	0	0	590	605	281	813	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	296	0	811				0	641	593	305	884	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	527	0	937				0	2184	678	384	2100	0
Arrive On Green	0.30	0.00	0.30				0.00	0.43	0.43	0.15	0.79	0.00
Sat Flow, veh/h	1781	0	3170				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	296	0	811				0	641	593	305	884	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	12.6	0.0	21.8				0.0	7.4	30.8	7.7	7.2	0.0
Cycle Q Clear(g_c), s	12.6	0.0	21.8				0.0	7.4	30.8	7.7	7.2	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	527	0	937				0	2184	678	384	2100	0
V/C Ratio(X)	0.56	0.00	0.87				0.00	0.29	0.87	0.79	0.42	0.00
Avail Cap(c_a), veh/h	612	0	1088				0	2184	678	472	2100	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.85	0.85	0.94	0.94	0.00
Uniform Delay (d), s/veh	26.8	0.0	30.0				0.0	16.9	23.5	37.4	4.7	0.0
Incr Delay (d2), s/veh	0.9	0.0	6.7				0.0	0.3	12.8	7.1	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	0.0	8.9				0.0	2.9	13.3	3.5	2.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.7	0.0	36.7				0.0	17.1	36.4	44.4	5.3	0.0
LnGrp LOS	C	A	D				A	B	D	D	A	A
Approach Vol, veh/h	1107						1234			1189		
Approach Delay, s/veh	34.3						26.4			15.3		
Approach LOS	C						C			B		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	4.7	43.6	31.7	58.3								
Change Period (Y+Rc), s	4.7	5.1	5.1	5.1								
Max Green Setting (Gmax), s	12	31.9	30.9	48.9								
Max Q Clear Time (g_c+I), s	19.7	32.8	23.8	9.2								
Green Ext Time (p_c), s	0.3	0.0	2.8	7.7								

Intersection Summary

HCM 6th Ctrl Delay	25.1
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

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

Existing AM
11: Nordahl Rd & SR-78 WB Ramps

Sunrise Residential

09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↰	↰	↰	↰			↰	↰
Traffic Volume (veh/h)	0	0	0	344	0	139	405	593	0	0	652	328
Future Volume (veh/h)	0	0	0	344	0	139	405	593	0	0	652	328
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				421	0	101	440	645	0	0	709	357
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				542	0	241	555	2610	0	0	2664	827
Arrive On Green				0.15	0.00	0.15	0.05	0.24	0.00	0.00	0.52	0.52
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				421	0	101	440	645	0	0	709	357
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				10.2	0.0	5.2	11.3	13.2	0.0	0.0	6.9	12.5
Cycle Q Clear(g_c), s				10.2	0.0	5.2	11.3	13.2	0.0	0.0	6.9	12.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				542	0	241	555	2610	0	0	2664	827
V/C Ratio(X)				0.78	0.00	0.42	0.79	0.25	0.00	0.00	0.27	0.43
Avail Cap(c_a), veh/h				906	0	403	856	2610	0	0	2664	827
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.87	0.87	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				36.7	0.0	34.6	41.1	14.0	0.0	0.0	12.0	13.3
Incr Delay (d2), s/veh				2.4	0.0	1.2	2.5	0.2	0.0	0.0	0.2	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
%ile BackOfQ(50%),veh/ln				4.6	0.0	2.1	5.4	6.2	0.0	0.0	2.5	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				39.1	0.0	35.7	43.6	14.2	0.0	0.0	12.2	14.9
LnGrp LOS				D	A	D	D	B	A	A	B	B
Approach Vol, veh/h					522			1085			1066	
Approach Delay, s/veh					38.5			26.2			13.1	
Approach LOS					D			C			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		71.2			19.2	52.1		18.8				
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1				
Max Green Setting (Gmax), s		56.9			* 22	29.9		22.9				
Max Q Clear Time (g_c+I1), s		15.2			13.3	14.5		12.2				
Green Ext Time (p_c), s		5.1			1.1	5.6		1.5				

Intersection Summary

HCM 6th Ctrl Delay	23.4
HCM 6th LOS	C

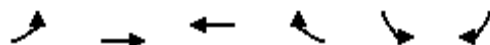
Notes

User approved volume balancing among the lanes for turning movement.

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

Existing PM
1: Barham Dr & SR-78 EB Off

Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↙	↗
Traffic Volume (veh/h)	0	1010	704	0	226	15
Future Volume (veh/h)	0	1010	704	0	226	15
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	1098	765	0	246	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	1192	1192	0	318	283
Arrive On Green	0.00	0.64	0.64	0.00	0.18	0.18
Sat Flow, veh/h	0	1870	1870	0	1781	1585
Grp Volume(v), veh/h	0	1098	765	0	246	16
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	25.2	12.2	0.0	6.4	0.4
Cycle Q Clear(g_c), s	0.0	25.2	12.2	0.0	6.4	0.4
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1192	1192	0	318	283
V/C Ratio(X)	0.00	0.92	0.64	0.00	0.77	0.06
Avail Cap(c_a), veh/h	0	1265	1265	0	657	585
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	7.8	5.4	0.0	19.1	16.6
Incr Delay (d2), s/veh	0.0	10.7	1.0	0.0	4.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.9	3.0	0.0	2.7	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	18.5	6.5	0.0	23.2	16.7
LnGrp LOS	A	B	A	A	C	B
Approach Vol, veh/h		1098	765		262	
Approach Delay, s/veh		18.5	6.5		22.8	
Approach LOS		B	A		C	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		35.6		13.2		35.6
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		33.0		18.0		33.0
Max Q Clear Time (g_c+I1), s		27.2		8.4		14.2
Green Ext Time (p_c), s		3.9		0.5		5.5
Intersection Summary						
HCM 6th Ctrl Delay			14.7			
HCM 6th LOS			B			

Intersection

Intersection Delay, s/veh48.6

Intersection LOS E

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	477	75	477	200	90	211
Future Vol, veh/h	477	75	477	200	90	211
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	518	82	518	217	98	229
Number of Lanes	1	1	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	56	57.4	15.1
HCM LOS	F	F	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	90	211	477	75	477	200
LT Vol	90	0	0	0	477	0
Through Vol	0	0	477	0	0	200
RT Vol	0	211	0	75	0	0
Lane Flow Rate	98	229	518	82	518	217
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.227	0.454	0.99	0.14	1.032	0.402
Departure Headway (Hd)	8.468	7.231	6.982	6.265	7.168	6.657
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	427	502	524	576	503	537
Service Time	6.168	4.931	4.682	3.965	4.968	4.456
HCM Lane V/C Ratio	0.23	0.456	0.989	0.142	1.03	0.404
HCM Control Delay	13.6	15.8	63.2	10	75.7	13.9
HCM Lane LOS	B	C	F	A	F	B
HCM 95th-tile Q	0.9	2.3	13.5	0.5	14.9	1.9

Existing PM
3: Woodland Pkwy & Rancheros Dr

Sunrise Residential
09/16/2019



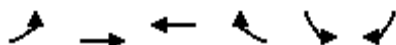
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	153	406	53	133	29	142	381	46	14	364	464
Future Volume (veh/h)	159	153	406	53	133	29	142	381	46	14	364	464
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	173	166	441	58	145	32	154	414	50	15	396	504
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	215	523	615	86	308	68	193	1269	152	32	574	678
Arrive On Green	0.12	0.28	0.28	0.05	0.21	0.21	0.11	0.40	0.40	0.02	0.31	0.31
Sat Flow, veh/h	1781	1870	1585	1781	1484	327	1781	3195	384	1781	1870	1585
Grp Volume(v), veh/h	173	166	441	58	0	177	154	229	235	15	396	504
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1811	1781	1777	1801	1781	1870	1585
Q Serve(g_s), s	6.6	4.9	16.5	2.2	0.0	6.0	5.9	6.3	6.3	0.6	13.1	18.7
Cycle Q Clear(g_c), s	6.6	4.9	16.5	2.2	0.0	6.0	5.9	6.3	6.3	0.6	13.1	18.7
Prop In Lane	1.00		1.00	1.00		0.18	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	215	523	615	86	0	376	193	706	716	32	574	678
V/C Ratio(X)	0.81	0.32	0.72	0.67	0.00	0.47	0.80	0.32	0.33	0.47	0.69	0.74
Avail Cap(c_a), veh/h	292	603	682	175	0	465	257	706	716	127	597	697
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.0	20.0	18.2	32.8	0.0	24.4	30.5	14.6	14.6	34.1	21.4	16.8
Incr Delay (d2), s/veh	11.1	0.3	3.2	8.8	0.0	0.9	12.1	0.3	0.3	10.1	3.2	4.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.4	2.1	6.1	1.1	0.0	2.6	3.1	2.4	2.4	0.3	5.8	6.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.2	20.3	21.4	41.7	0.0	25.3	42.7	14.9	14.9	44.2	24.6	21.1
LnGrp LOS	D	C	C	D	A	C	D	B	B	D	C	C
Approach Vol, veh/h	780			235			618			915		
Approach Delay, s/veh	25.6			29.4			21.8			23.0		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.8	32.4	7.9	24.1	12.1	26.0	13.0	19.1				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.8	27.5	6.9	22.6	10.1	22.4	11.5	18.0				
Max Q Clear Time (g_c+I), s	12.6	8.3	4.2	18.5	7.9	20.7	8.6	8.0				
Green Ext Time (p_c), s	0.0	2.7	0.0	1.1	0.1	0.8	0.1	0.6				

Intersection Summary

HCM 6th Ctrl Delay	24.1
HCM 6th LOS	C

Existing PM
4: Barham Dr & Woodland Pkwy

Sunrise Residential
09/16/2019



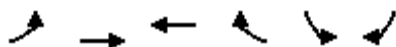
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	394	1019	384	320	514	341
Future Volume (veh/h)	394	1019	384	320	514	341
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1900
Adj Flow Rate, veh/h	428	1108	417	348	447	455
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	467	1167	580	925	487	440
Arrive On Green	0.26	0.62	0.31	0.31	0.27	0.27
Sat Flow, veh/h	1781	1870	1870	1585	1781	1610
Grp Volume(v), veh/h	428	1108	417	348	447	455
Grp Sat Flow(s), veh/h/ln	1781	1870	1870	1585	1781	1610
Q Serve(g_s), s	20.4	47.8	17.3	10.3	21.3	23.9
Cycle Q Clear(g_c), s	20.4	47.8	17.3	10.3	21.3	23.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	467	1167	580	925	487	440
V/C Ratio(X)	0.92	0.95	0.72	0.38	0.92	1.03
Avail Cap(c_a), veh/h	531	1221	580	925	487	440
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.3	15.2	26.8	9.7	30.9	31.8
Incr Delay (d2), s/veh	19.3	14.9	4.3	0.3	22.6	52.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.0	21.8	8.1	6.3	11.9	24.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	50.7	30.1	31.1	10.0	53.4	83.9
LnGrp LOS	D	C	C	A	D	F
Approach Vol, veh/h		1536	765		902	
Approach Delay, s/veh		35.8	21.5		68.8	
Approach LOS		D	C		E	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		59.1		28.4	27.5	31.6
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		57.1		23.9	26.1	26.5
Max Q Clear Time (g_c+I1), s		49.8		25.9	22.4	19.3
Green Ext Time (p_c), s		4.8		0.0	0.5	2.3
Intersection Summary						
HCM 6th Ctrl Delay			41.7			
HCM 6th LOS			D			

Notes

User approved volume balancing among the lanes for turning movement.

Existing PM
5: Barham Dr & SR-78 EB On

Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	730	723	660	67	0	0
Future Volume (veh/h)	730	723	660	67	0	0
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Work Zone On Approach		No	No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870		
Adj Flow Rate, veh/h	793	786	717	73		
Peak Hour Factor	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2		
Cap, veh/h	821	1776	731	74		
Arrive On Green	0.46	0.95	0.44	0.44		
Sat Flow, veh/h	1781	1870	1670	170		
Grp Volume(v), veh/h	793	786	0	790		
Grp Sat Flow(s), veh/h/ln	1781	1870	0	1840		
Q Serve(g_s), s	38.5	3.3	0.0	37.7		
Cycle Q Clear(g_c), s	38.5	3.3	0.0	37.7		
Prop In Lane	1.00			0.09		
Lane Grp Cap(c), veh/h	821	1776	0	806		
V/C Ratio(X)	0.97	0.44	0.00	0.98		
Avail Cap(c_a), veh/h	840	1795	0	806		
HCM Platoon Ratio	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	23.3	0.2	0.0	24.7		
Incr Delay (d2), s/veh	22.7	0.2	0.0	26.9		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	20.1	0.1	0.0	21.3		
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	46.0	0.4	0.0	51.6		
LnGrp LOS	D	A	A	D		
Approach Vol, veh/h		1579	790			
Approach Delay, s/veh		23.3	51.6			
Approach LOS		C	D			
Timer - Assigned Phs		2		5	6	
Phs Duration (G+Y+Rc), s		89.1		45.6	43.5	
Change Period (Y+Rc), s		4.5		4.5	4.5	
Max Green Setting (Gmax), s		85.5		42.0	39.0	
Max Q Clear Time (g_c+I1), s		5.3		40.5	39.7	
Green Ext Time (p_c), s		7.3		0.6	0.0	
Intersection Summary						
HCM 6th Ctrl Delay			32.7			
HCM 6th LOS			C			

Intersection

Int Delay, s/veh 23

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	550	258	21	525	177	24
Future Vol, veh/h	550	258	21	525	177	24
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	80	0
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	598	280	23	571	192	26

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	878
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	769
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	769
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	176.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	158	418	-	-	769	-
HCM Lane V/C Ratio	1.218	0.062	-	-	0.03	-
HCM Control Delay (s)	198.8	14.2	-	-	9.8	0
HCM Lane LOS	F	B	-	-	A	A
HCM 95th %tile Q(veh)	10.9	0.2	-	-	0.1	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Existing PM
8: Barham Dr & Mission Rd

Sunrise Residential
09/16/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	791	57	430	967	0	110	5	514	12	1	0
Future Volume (veh/h)	0	791	57	430	967	0	110	5	514	12	1	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	860	62	467	1051	0	120	5	559	13	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	2	1026	458	507	2197	0	395	16	643	27	2	0
Arrive On Green	0.00	0.29	0.29	0.28	0.62	0.00	0.23	0.23	0.23	0.02	0.02	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3647	0	1713	71	2790	1660	128	0
Grp Volume(v), veh/h	0	860	62	467	1051	0	125	0	559	14	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	0	1785	0	1395	1787	0	0
Q Serve(g_s), s	0.0	22.7	2.9	25.4	16.0	0.0	5.8	0.0	19.3	0.8	0.0	0.0
Cycle Q Clear(g_c), s	0.0	22.7	2.9	25.4	16.0	0.0	5.8	0.0	19.3	0.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.00	0.96		1.00	0.93		0.00
Lane Grp Cap(c), veh/h	2	1026	458	507	2197	0	411	0	643	29	0	0
V/C Ratio(X)	0.00	0.84	0.14	0.92	0.48	0.00	0.30	0.00	0.87	0.49	0.00	0.00
Avail Cap(c_a), veh/h	89	1210	540	633	2295	0	491	0	768	89	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	33.3	26.3	34.6	10.3	0.0	31.8	0.0	37.0	48.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	4.7	0.1	16.6	0.2	0.0	0.4	0.0	9.3	12.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.2	1.1	13.1	5.8	0.0	2.5	0.0	7.3	0.4	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	38.0	26.4	51.3	10.5	0.0	32.2	0.0	46.3	60.9	0.0	0.0
LnGrp LOS	A	D	C	D	B	A	C	A	D	E	A	A
Approach Vol, veh/h		922			1518			684			14	
Approach Delay, s/veh		37.2			23.0			43.7			60.9	
Approach LOS		D			C			D			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	32.9	33.3		6.1	0.0	66.3		27.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	35.5	34.0		5.0	5.0	64.5		27.5				
Max Q Clear Time (g_c+I1), s	27.4	24.7		2.8	0.0	18.0		21.3				
Green Ext Time (p_c), s	1.0	4.2		0.0	0.0	10.0		1.7				
Intersection Summary												
HCM 6th Ctrl Delay			31.9									
HCM 6th LOS			C									

Existing PM
9: Auto Park Way/Nordahl Rd & Mission Rd

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	485	745	225	46	688	485	444	785	50	178	314	534
Future Volume (veh/h)	485	745	225	46	688	485	444	785	50	178	314	534
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	527	810	245	50	748	0	483	853	54	193	341	522
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	507	1268	566	117	867		472	1911	593	254	1105	493
Arrive On Green	0.15	0.36	0.36	0.03	0.24	0.00	0.14	0.37	0.37	0.02	0.10	0.10
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	5106	1585	3456	3554	1585
Grp Volume(v), veh/h	527	810	245	50	748	0	483	853	54	193	341	522
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1585	1728	1777	1585
Q Serve(g_s), s	17.6	22.8	14.1	1.7	24.2	0.0	16.4	15.1	2.6	6.7	10.7	37.3
Cycle Q Clear(g_c), s	17.6	22.8	14.1	1.7	24.2	0.0	16.4	15.1	2.6	6.7	10.7	37.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	507	1268	566	117	867		472	1911	593	254	1105	493
V/C Ratio(X)	1.04	0.64	0.43	0.43	0.86		1.02	0.45	0.09	0.76	0.31	1.06
Avail Cap(c_a), veh/h	507	1377	614	147	1007		472	1911	593	340	1105	493
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.45	0.45	0.45	1.00	1.00	0.00	1.00	1.00	1.00	0.90	0.90	0.90
Uniform Delay (d), s/veh	51.2	32.2	29.4	56.8	43.4	0.0	51.8	28.2	24.3	57.5	41.9	53.8
Incr Delay (d2), s/veh	37.7	0.4	0.2	2.5	7.0	0.0	47.3	0.8	0.3	6.1	0.7	54.9
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	0.2	9.8	5.4	0.8	11.4	0.0	10.2	6.3	1.1	3.2	5.2	23.4
Unsig. Movement Delay, s/veh	0.00											
LnGrp Delay(d),s/veh	88.9	32.6	29.6	59.3	50.4	0.0	99.1	29.0	24.6	63.6	42.5	108.8
LnGrp LOS	F	C	C	E	D	A	F	C	C	E	D	F
Approach Vol, veh/h	1582			1325			1390			1056		
Approach Delay, s/veh	50.9			30.7			53.2			79.1		
Approach LOS	D			C			D			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	48.1	21.0	42.2	22.2	34.6	13.4	49.8					
Change Period (Y+Rc), s	4.6	5.3	4.6	4.9	4.6	5.3	4.6	4.9				
Max Green Setting (Gmax), s	46.5	16.4	32.6	17.6	34.0	11.8	37.2					
Max Q Clear Time (g_c+I), s	24.8	18.4	39.3	19.6	26.2	8.7	17.1					
Green Ext Time (p_c), s	0.0	6.8	0.0	0.0	0.0	3.1	0.2	6.2				

Intersection Summary

HCM 6th Ctrl Delay	52.1
HCM 6th LOS	D

Notes

Unsignalized Delay for [WBR] is included in calculations of the approach delay and intersection delay.

Existing PM
10: Nordahl Rd & SR-78 EB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	584	69	323	0	0	0	0	1040	822	543	815	0
Future Volume (veh/h)	584	69	323	0	0	0	0	1040	822	543	815	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	764	0	236				0	1130	804	590	886	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	832	0	370				0	2348	729	631	2422	0
Arrive On Green	0.23	0.00	0.23				0.00	0.61	0.61	0.37	1.00	0.00
Sat Flow, veh/h	3563	0	1585				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	764	0	236				0	1130	804	590	886	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	25.1	0.0	16.1				0.0	14.6	55.2	19.8	0.0	0.0
Cycle Q Clear(g_c), s	25.1	0.0	16.1				0.0	14.6	55.2	19.8	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	832	0	370				0	2348	729	631	2422	0
V/C Ratio(X)	0.92	0.00	0.64				0.00	0.48	1.10	0.94	0.37	0.00
Avail Cap(c_a), veh/h	864	0	384				0	2348	729	642	2422	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.33	1.33	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.57	0.57	0.82	0.82	0.00
Uniform Delay (d), s/veh	44.9	0.0	41.4				0.0	15.4	23.3	37.4	0.0	0.0
Incr Delay (d2), s/veh	14.4	0.0	3.3				0.0	0.4	58.4	18.1	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	6.6				0.0	5.0	28.9	8.5	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.2	0.0	44.7				0.0	15.8	81.7	55.5	0.4	0.0
LnGrp LOS	E	A	D				A	B	F	E	A	A
Approach Vol, veh/h	1000						1934			1476		
Approach Delay, s/veh	55.8						43.2			22.4		
Approach LOS	E						D			C		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	26.6	60.3	33.1	86.9								
Change Period (Y+Rc), s	4.7	5.1	5.1	5.1								
Max Green Setting (Gmax), s	23	53.7	29.1	80.7								
Max Q Clear Time (g_c+Y), s	21.8	57.2	27.1	2.0								
Green Ext Time (p_c), s	0.2	0.0	0.9	8.0								

Intersection Summary

HCM 6th Ctrl Delay	39.1
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

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

Existing PM
11: Nordahl Rd & SR-78 WB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↰	↰	↰	↰			↰	↰
Traffic Volume (veh/h)	0	0	0	428	5	488	622	1006	0	0	780	526
Future Volume (veh/h)	0	0	0	428	5	488	622	1006	0	0	780	526
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No		No		No		No		
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				642	0	344	676	1093	0	0	848	514
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				886	0	394	758	2367	0	0	2081	646
Arrive On Green				0.25	0.00	0.25	0.22	0.67	0.00	0.00	0.41	0.41
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				642	0	344	676	1093	0	0	848	514
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				19.8	0.0	25.0	22.8	17.8	0.0	0.0	14.2	34.1
Cycle Q Clear(g_c), s				19.8	0.0	25.0	22.8	17.8	0.0	0.0	14.2	34.1
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				886	0	394	758	2367	0	0	2081	646
V/C Ratio(X)				0.72	0.00	0.87	0.89	0.46	0.00	0.00	0.41	0.80
Avail Cap(c_a), veh/h				1095	0	487	901	2367	0	0	2081	646
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.77	0.77	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				41.3	0.0	43.2	45.5	9.7	0.0	0.0	25.2	31.2
Incr Delay (d2), s/veh				1.8	0.0	13.6	7.9	0.5	0.0	0.0	0.6	9.8
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				8.9	0.0	11.2	10.5	6.7	0.0	0.0	5.8	14.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				43.1	0.0	56.8	53.3	10.2	0.0	0.0	25.8	41.0
LnGrp LOS				D	A	E	D	B	A	A	C	D
Approach Vol, veh/h				986			1769				1362	
Approach Delay, s/veh				47.9			26.7				31.5	
Approach LOS				D			C				C	
Timer - Assigned Phs	2			5	6		8					
Phs Duration (G+Y+Rc), s	85.0			31.0	54.0		35.0					
Change Period (Y+Rc), s	5.1			* 4.7	5.1		5.1					
Max Green Setting (Gmax), s	72.9			* 31	36.9		36.9					
Max Q Clear Time (g_c+I1), s	19.8			24.8	36.1		27.0					
Green Ext Time (p_c), s	10.8			1.5	0.6		2.9					

Intersection Summary

HCM 6th Ctrl Delay	33.4
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

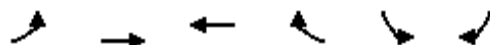
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX D

INTERSECTION ANALYSIS WORKSHEETS – EXISTING + PROJECT

Existing + Proj AM
1: Barham Dr & SR-78 EB Off

Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↙	↗
Traffic Volume (veh/h)	0	618	933	0	463	27
Future Volume (veh/h)	0	618	933	0	463	27
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	672	1014	0	503	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	1080	1080	0	543	483
Arrive On Green	0.00	0.58	0.58	0.00	0.30	0.30
Sat Flow, veh/h	0	1870	1870	0	1781	1585
Grp Volume(v), veh/h	0	672	1014	0	503	29
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	18.1	38.2	0.0	20.9	1.0
Cycle Q Clear(g_c), s	0.0	18.1	38.2	0.0	20.9	1.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1080	1080	0	543	483
V/C Ratio(X)	0.00	0.62	0.94	0.00	0.93	0.06
Avail Cap(c_a), veh/h	0	1141	1141	0	572	509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	10.6	14.9	0.0	25.7	18.8
Incr Delay (d2), s/veh	0.0	1.0	14.0	0.0	20.9	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.7	17.7	0.0	11.5	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	11.6	28.9	0.0	46.6	18.8
LnGrp LOS	A	B	C	A	D	B
Approach Vol, veh/h		672	1014		532	
Approach Delay, s/veh		11.6	28.9		45.1	
Approach LOS		B	C		D	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		48.5		27.7		48.5
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		46.5		24.5		46.5
Max Q Clear Time (g_c+I1), s		20.1		22.9		40.2
Green Ext Time (p_c), s		5.1		0.4		3.9
Intersection Summary						
HCM 6th Ctrl Delay			27.5			
HCM 6th LOS			C			

Intersection

Intersection Delay, s/veh71.1

Intersection LOS F

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	217	38	610	310	177	177
Future Vol, veh/h	217	38	610	310	177	177
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	236	41	663	337	192	192
Number of Lanes	1	1	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	15.4	108.1	15.1
HCM LOS	C	F	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	177	177	217	38	610	310
LT Vol	177	0	0	0	610	0
Through Vol	0	0	217	0	0	310
RT Vol	0	177	0	38	0	0
Lane Flow Rate	192	192	236	41	663	337
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.418	0.354	0.464	0.073	1.261	0.593
Departure Headway (Hd)	8.193	6.968	7.438	6.719	6.844	6.335
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	442	519	488	537	530	569
Service Time	5.893	4.668	5.138	4.419	4.577	4.068
HCM Lane V/C Ratio	0.434	0.37	0.484	0.076	1.251	0.592
HCM Control Delay	16.7	13.4	16.4	9.9	154	17.9
HCM Lane LOS	C	B	C	A	F	C
HCM 95th-tile Q	2	1.6	2.4	0.2	26.4	3.9

Existing + Proj AM
3: Woodland Pkwy & Rancheros Dr

Sunrise Residential
09/16/2019



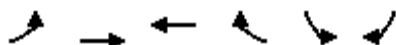
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	81	290	77	248	10	212	149	52	15	425	514
Future Volume (veh/h)	59	81	290	77	248	10	212	149	52	15	425	514
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	64	88	315	84	270	11	230	162	57	16	462	559
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	89	377	549	108	378	15	258	1226	416	34	645	626
Arrive On Green	0.05	0.20	0.20	0.06	0.21	0.21	0.14	0.47	0.47	0.02	0.34	0.34
Sat Flow, veh/h	1781	1870	1585	1781	1785	73	1781	2604	884	1781	1870	1585
Grp Volume(v), veh/h	64	88	315	84	0	281	230	109	110	16	462	559
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1857	1781	1777	1711	1781	1870	1585
Q Serve(g_s), s	2.6	2.9	11.8	3.4	0.0	10.2	9.2	2.5	2.6	0.6	15.6	23.9
Cycle Q Clear(g_c), s	2.6	2.9	11.8	3.4	0.0	10.2	9.2	2.5	2.6	0.6	15.6	23.9
Prop In Lane	1.00		1.00	1.00		0.04	1.00		0.52	1.00		1.00
Lane Grp Cap(c), veh/h	89	377	549	108	0	394	258	836	805	34	645	626
V/C Ratio(X)	0.72	0.23	0.57	0.78	0.00	0.71	0.89	0.13	0.14	0.47	0.72	0.89
Avail Cap(c_a), veh/h	209	506	658	170	0	461	258	836	805	123	645	626
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.9	24.3	19.3	33.6	0.0	26.5	30.4	10.8	10.9	35.2	20.7	20.5
Incr Delay (d2), s/veh	10.3	0.3	1.0	11.3	0.0	4.3	29.6	0.1	0.1	9.9	3.8	15.2
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	1.3	1.3	4.2	1.8	0.0	4.8	5.9	0.9	0.9	0.4	7.0	10.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.3	24.6	20.3	44.8	0.0	30.8	60.0	10.9	10.9	45.1	24.5	35.7
LnGrp LOS	D	C	C	D	A	C	E	B	B	D	C	D
Approach Vol, veh/h	467			365			449			1037		
Approach Delay, s/veh	24.4			34.0			36.1			30.8		
Approach LOS	C			C			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.9	38.6	8.9	19.1	15.0	29.5	8.1	19.9				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	30.5	6.9	19.6	10.5	25.0	8.5	18.0				
Max Q Clear Time (g_c+I), s	12.6	4.6	5.4	13.8	11.2	25.9	4.6	12.2				
Green Ext Time (p_c), s	0.0	1.3	0.0	0.8	0.0	0.0	0.0	0.8				

Intersection Summary

HCM 6th Ctrl Delay	31.1
HCM 6th LOS	C

Existing + Proj AM
4: Barham Dr & Woodland Pkwy

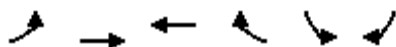
Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	315	888	503	317	312	601
Future Volume (veh/h)	315	888	503	317	312	601
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1900
Adj Flow Rate, veh/h	342	965	547	345	339	588
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	379	1104	624	1041	575	520
Arrive On Green	0.21	0.59	0.33	0.33	0.32	0.32
Sat Flow, veh/h	1781	1870	1870	1585	1781	1610
Grp Volume(v), veh/h	342	965	547	345	339	588
Grp Sat Flow(s), veh/h/ln	1781	1870	1870	1585	1781	1610
Q Serve(g_s), s	19.4	45.3	28.6	9.9	16.5	33.5
Cycle Q Clear(g_c), s	19.4	45.3	28.6	9.9	16.5	33.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	379	1104	624	1041	575	520
V/C Ratio(X)	0.90	0.87	0.88	0.33	0.59	1.13
Avail Cap(c_a), veh/h	507	1398	785	1177	575	520
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	39.8	18.0	32.5	7.8	29.4	35.1
Incr Delay (d2), s/veh	15.7	5.3	9.2	0.2	1.6	80.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	19.4	14.2	7.2	7.2	11.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	55.5	23.3	41.7	8.0	30.9	115.7
LnGrp LOS	E	C	D	A	C	F
Approach Vol, veh/h		1307	892		927	
Approach Delay, s/veh		31.7	28.7		84.7	
Approach LOS		C	C		F	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		65.7		38.0	26.6	39.1
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		77.5		33.5	29.5	43.5
Max Q Clear Time (g_c+I1), s		47.3		35.5	21.4	30.6
Green Ext Time (p_c), s		9.4		0.0	0.7	4.1
Intersection Summary						
HCM 6th Ctrl Delay			46.6			
HCM 6th LOS			D			
Notes						
User approved volume balancing among the lanes for turning movement.						

Existing + Proj AM
5: Barham Dr & SR-78 EB On

Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	293	603	719	64	0	0
Future Volume (veh/h)	293	603	719	64	0	0
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Work Zone On Approach		No	No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870		
Adj Flow Rate, veh/h	318	655	782	70		
Peak Hour Factor	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2		
Cap, veh/h	399	1672	954	85		
Arrive On Green	0.22	0.89	0.56	0.56		
Sat Flow, veh/h	1781	1870	1692	151		
Grp Volume(v), veh/h	318	655	0	852		
Grp Sat Flow(s), veh/h/ln	1781	1870	0	1843		
Q Serve(g_s), s	7.2	2.4	0.0	15.9		
Cycle Q Clear(g_c), s	7.2	2.4	0.0	15.9		
Prop In Lane	1.00			0.08		
Lane Grp Cap(c), veh/h	399	1672	0	1040		
V/C Ratio(X)	0.80	0.39	0.00	0.82		
Avail Cap(c_a), veh/h	691	2442	0	1496		
HCM Platoon Ratio	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	15.6	0.4	0.0	7.5		
Incr Delay (d2), s/veh	3.7	0.1	0.0	2.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	2.8	0.1	0.0	4.3		
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	19.2	0.5	0.0	10.0		
LnGrp LOS	B	A	A	A		
Approach Vol, veh/h		973	852			
Approach Delay, s/veh		6.6	10.0			
Approach LOS		A	A			
Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		42.5			14.0	28.5
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		55.5			16.5	34.5
Max Q Clear Time (g_c+I1), s		4.4			9.2	17.9
Green Ext Time (p_c), s		5.4			0.6	6.1
Intersection Summary						
HCM 6th Ctrl Delay			8.2			
HCM 6th LOS			A			

Intersection

Int Delay, s/veh 0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	603	0	0	858	0	0
Future Vol, veh/h	603	0	0	858	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	655	0	0	933	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	655
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	932
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	932
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

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

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	932	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Intersection						
Int Delay, s/veh	72.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	299	353	38	563	295	45
Future Vol, veh/h	299	353	38	563	295	45
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	80	0
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	325	384	41	612	321	49

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	709
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	890
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	890
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	\$ 337.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	187	558	-	-	890	-
HCM Lane V/C Ratio	1.715	0.088	-	-	0.046	-
HCM Control Delay (s)	\$ 386.8	12.1	-	-	9.2	0
HCM Lane LOS	F	B	-	-	A	A
HCM 95th %tile Q(veh)	22.1	0.3	-	-	0.1	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Existing + Proj AM
8: Barham Dr & Mission Rd

Sunrise Residential
09/16/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	748	90	550	834	6	97	3	271	13	18	1
Future Volume (veh/h)	0	748	90	550	834	6	97	3	271	13	18	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	813	98	598	907	7	105	3	295	14	20	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	2	994	444	638	2479	19	242	7	389	23	33	2
Arrive On Green	0.00	0.28	0.28	0.36	0.69	0.69	0.14	0.14	0.14	0.03	0.03	0.03
Sat Flow, veh/h	1781	3554	1585	1781	3614	28	1734	50	2790	730	1043	52
Grp Volume(v), veh/h	0	813	98	598	446	468	108	0	295	35	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1865	1784	0	1395	1824	0	0
Q Serve(g_s), s	0.0	20.2	4.5	30.6	9.9	9.9	5.2	0.0	9.6	1.8	0.0	0.0
Cycle Q Clear(g_c), s	0.0	20.2	4.5	30.6	9.9	9.9	5.2	0.0	9.6	1.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.01	0.97		1.00	0.40		0.03
Lane Grp Cap(c), veh/h	2	994	444	638	1218	1279	249	0	389	58	0	0
V/C Ratio(X)	0.00	0.82	0.22	0.94	0.37	0.37	0.43	0.00	0.76	0.60	0.00	0.00
Avail Cap(c_a), veh/h	94	1216	542	730	1242	1304	491	0	768	97	0	0
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)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	31.7	26.1	29.3	6.2	6.2	37.2	0.0	39.1	45.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	3.7	0.2	18.3	0.2	0.2	1.2	0.0	3.1	9.7	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	8.9	1.7	15.8	3.2	3.4	2.3	0.0	3.4	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	35.5	26.3	47.5	6.4	6.4	38.4	0.0	42.1	54.8	0.0	0.0
LnGrp LOS	A	D	C	D	A	A	D	A	D	D	A	A
Approach Vol, veh/h		911			1512			403			35	
Approach Delay, s/veh		34.5			22.7			41.1			54.8	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	38.3	30.9		7.5	0.0	69.2		17.7				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	38.7	32.3		5.0	5.0	66.0		26.0				
Max Q Clear Time (g_c+I1), s	32.6	22.2		3.8	0.0	11.9		11.6				
Green Ext Time (p_c), s	1.2	4.2		0.0	0.0	7.2		1.6				
Intersection Summary												
HCM 6th Ctrl Delay			29.4									
HCM 6th LOS			C									

Existing + Proj AM
9: Auto Park Way/Nordahl Rd & Mission Rd

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑	↱	↰↰	↑↑	↱	↰↰	↑↑↑	↱	↰↰	↑↑	↱
Traffic Volume (veh/h)	289	374	233	68	581	247	363	616	31	304	846	271
Future Volume (veh/h)	289	374	233	68	581	247	363	616	31	304	846	271
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	314	407	253	74	632	0	395	670	34	330	920	295
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	370	1007	449	132	762		453	2055	638	396	1371	612
Arrive On Green	0.11	0.28	0.28	0.04	0.21	0.00	0.13	0.40	0.40	0.11	0.39	0.39
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	5106	1585	3456	3554	1585
Grp Volume(v), veh/h	314	407	253	74	632	0	395	670	34	330	920	295
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1585	1728	1777	1585
Q Serve(g_s), s	10.7	11.1	16.3	2.5	20.4	0.0	13.5	10.8	1.6	11.2	25.7	16.9
Cycle Q Clear(g_c), s	10.7	11.1	16.3	2.5	20.4	0.0	13.5	10.8	1.6	11.2	25.7	16.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	370	1007	449	132	762		453	2055	638	396	1371	612
V/C Ratio(X)	0.85	0.40	0.56	0.56	0.83		0.87	0.33	0.05	0.83	0.67	0.48
Avail Cap(c_a), veh/h	400	1244	555	170	1007		492	2055	638	521	1371	612
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.54	0.54	0.54	1.00	1.00	0.00	1.00	1.00	1.00	0.84	0.84	0.84
Uniform Delay (d), s/veh	52.6	34.8	36.7	56.7	45.1	0.0	51.2	24.7	21.9	52.0	30.5	27.8
Incr Delay (d2), s/veh	8.6	0.1	0.6	3.7	4.5	0.0	14.9	0.4	0.2	7.4	2.2	2.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.1	4.8	6.4	1.2	9.4	0.0	6.8	4.5	0.6	5.3	11.3	6.8
Unsig. Movement Delay, s/veh	0.00											
LnGrp Delay(d),s/veh	61.2	34.9	37.3	60.4	49.6	0.0	66.0	25.1	22.1	59.4	32.7	30.1
LnGrp LOS	E	C	D	E	D	A	E	C	C	E	C	C
Approach Vol, veh/h	974				974		A		1099		1545	
Approach Delay, s/veh	44.0				36.8				39.7		37.9	
Approach LOS	D				D				D		D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.2	39.3	20.3	51.2	17.5	31.0	18.3	53.2				
Change Period (Y+Rc), s	4.6	5.3	4.6	4.9	4.6	5.3	4.6	4.9				
Max Green Setting (Gmax), s	5.9	42.0	17.1	35.6	13.9	34.0	18.1	34.6				
Max Q Clear Time (g_c+I), s	14.5	18.3	15.5	27.7	12.7	22.4	13.2	12.8				
Green Ext Time (p_c), s	0.0	3.7	0.3	4.4	0.1	3.3	0.5	4.9				

Intersection Summary

HCM 6th Ctrl Delay	39.4
HCM 6th LOS	D

Notes

Unsignalized Delay for [WBR] is included in calculations of the approach delay and intersection delay.

Existing + Proj AM
10: Nordahl Rd & SR-78 EB Ramps

Sunrise Residential

09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  		 	 	
Traffic Volume (veh/h)	394	29	662	0	0	0	0	595	609	281	823	0
Future Volume (veh/h)	394	29	662	0	0	0	0	595	609	281	823	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	296	0	811				0	647	597	305	895	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	527	0	937				0	2184	678	384	2100	0
Arrive On Green	0.30	0.00	0.30				0.00	0.43	0.43	0.15	0.79	0.00
Sat Flow, veh/h	1781	0	3170				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	296	0	811				0	647	597	305	895	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	12.6	0.0	21.8				0.0	7.5	31.1	7.7	7.3	0.0
Cycle Q Clear(g_c), s	12.6	0.0	21.8				0.0	7.5	31.1	7.7	7.3	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	527	0	937				0	2184	678	384	2100	0
V/C Ratio(X)	0.56	0.00	0.87				0.00	0.30	0.88	0.79	0.43	0.00
Avail Cap(c_a), veh/h	612	0	1088				0	2184	678	472	2100	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.85	0.85	0.93	0.93	0.00
Uniform Delay (d), s/veh	26.8	0.0	30.0				0.0	16.9	23.6	37.4	4.7	0.0
Incr Delay (d2), s/veh	0.9	0.0	6.7				0.0	0.3	13.3	7.0	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.4	0.0	8.9				0.0	2.9	13.5	3.5	2.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	27.7	0.0	36.7				0.0	17.2	37.0	44.3	5.3	0.0
LnGrp LOS	C	A	D				A	B	D	D	A	A
Approach Vol, veh/h	1107						1244			1200		
Approach Delay, s/veh	34.3						26.7			15.2		
Approach LOS	C						C			B		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	4.7	43.6	31.7		58.3							
Change Period (Y+Rc), s	4.7	5.1	5.1		5.1							
Max Green Setting (Gmax), s	12	31.9	30.9		48.9							
Max Q Clear Time (g_c+I), s	19.7	33.1	23.8		9.3							
Green Ext Time (p_c), s	0.3	0.0	2.8		7.8							

Intersection Summary

HCM 6th Ctrl Delay	25.2
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

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

Existing + Proj AM
11: Nordahl Rd & SR-78 WB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↱	↰	↰	↱			↱	↰
Traffic Volume (veh/h)	0	0	0	353	0	139	405	598	0	0	653	328
Future Volume (veh/h)	0	0	0	353	0	139	405	598	0	0	653	328
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				431	0	101	440	650	0	0	710	357
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				552	0	246	555	2600	0	0	2649	822
Arrive On Green				0.15	0.00	0.15	0.05	0.24	0.00	0.00	0.52	0.52
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				431	0	101	440	650	0	0	710	357
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				10.5	0.0	5.2	11.3	13.3	0.0	0.0	7.0	12.6
Cycle Q Clear(g_c), s				10.5	0.0	5.2	11.3	13.3	0.0	0.0	7.0	12.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				552	0	246	555	2600	0	0	2649	822
V/C Ratio(X)				0.78	0.00	0.41	0.79	0.25	0.00	0.00	0.27	0.43
Avail Cap(c_a), veh/h				906	0	403	856	2600	0	0	2649	822
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.87	0.87	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				36.6	0.0	34.3	41.1	14.2	0.0	0.0	12.1	13.4
Incr Delay (d2), s/veh				2.4	0.0	1.1	2.5	0.2	0.0	0.0	0.2	1.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				4.7	0.0	2.0	5.4	6.3	0.0	0.0	2.6	4.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				39.0	0.0	35.4	43.6	14.4	0.0	0.0	12.3	15.1
LnGrp LOS				D	A	D	D	B	A	A	B	B
Approach Vol, veh/h					532			1090			1067	
Approach Delay, s/veh					38.3			26.2			13.3	
Approach LOS					D			C			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		71.0			19.2	51.8		19.0				
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1				
Max Green Setting (Gmax), s		56.9			* 22	29.9		22.9				
Max Q Clear Time (g_c+I1), s		15.3			13.3	14.6		12.5				
Green Ext Time (p_c), s		5.2			1.1	5.6		1.5				

Intersection Summary

HCM 6th Ctrl Delay	23.5
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

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

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	95	3	0	189	387	25
Future Vol, veh/h	95	3	0	189	387	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
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	103	3	0	205	421	27

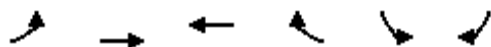
Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	640	435	448
Stage 1	435	-	-
Stage 2	205	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	440	621	1112
Stage 1	653	-	-
Stage 2	829	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	440	621	1112
Mov Cap-2 Maneuver	440	-	-
Stage 1	653	-	-
Stage 2	829	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1112	-	444	-	-
HCM Lane V/C Ratio	-	-	0.24	-	-
HCM Control Delay (s)	0	-	15.6	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.9	-	-

Existing + Proj PM
1: Barham Dr & SR-78 EB Off

Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↙	↗
Traffic Volume (veh/h)	0	1022	709	0	255	15
Future Volume (veh/h)	0	1022	709	0	255	15
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	1111	771	0	277	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	1175	1175	0	348	310
Arrive On Green	0.00	0.63	0.63	0.00	0.20	0.20
Sat Flow, veh/h	0	1870	1870	0	1781	1585
Grp Volume(v), veh/h	0	1111	771	0	277	16
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	27.8	13.3	0.0	7.6	0.4
Cycle Q Clear(g_c), s	0.0	27.8	13.3	0.0	7.6	0.4
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1175	1175	0	348	310
V/C Ratio(X)	0.00	0.95	0.66	0.00	0.80	0.05
Avail Cap(c_a), veh/h	0	1208	1208	0	627	558
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	8.7	6.0	0.0	19.6	16.7
Incr Delay (d2), s/veh	0.0	14.5	1.3	0.0	4.2	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.3	3.5	0.0	3.2	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	23.2	7.3	0.0	23.8	16.8
LnGrp LOS	A	C	A	A	C	B
Approach Vol, veh/h		1111	771		293	
Approach Delay, s/veh		23.2	7.3		23.4	
Approach LOS		C	A		C	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		36.6		14.5		36.6
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		33.0		18.0		33.0
Max Q Clear Time (g_c+I1), s		29.8		9.6		15.3
Green Ext Time (p_c), s		2.3		0.6		5.4
Intersection Summary						
HCM 6th Ctrl Delay			17.6			
HCM 6th LOS			B			

Intersection

Intersection Delay, s/veh50.5

Intersection LOS F

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	477	75	489	200	90	211
Future Vol, veh/h	477	75	489	200	90	211
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	518	82	532	217	98	229
Number of Lanes	1	1	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	53.6	63.4	15.1
HCM LOS	F	F	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	90	211	477	75	489	200
LT Vol	90	0	0	0	489	0
Through Vol	0	0	477	0	0	200
RT Vol	0	211	0	75	0	0
Lane Flow Rate	98	229	518	82	532	217
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.224	0.448	0.978	0.138	1.06	0.402
Departure Headway (Hd)	8.48	7.243	6.989	6.272	7.176	6.665
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	426	500	524	576	505	539
Service Time	6.18	4.943	4.689	3.972	4.939	4.427
HCM Lane V/C Ratio	0.23	0.458	0.989	0.142	1.053	0.403
HCM Control Delay	13.6	15.7	60.4	10	83.7	13.9
HCM Lane LOS	B	C	F	A	F	B
HCM 95th-tile Q	0.8	2.3	13.1	0.5	16	1.9

Existing + Proj PM
3: Woodland Pkwy & Rancheros Dr

Sunrise Residential
09/16/2019



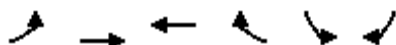
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	153	406	53	133	29	154	383	46	14	367	464
Future Volume (veh/h)	159	153	406	53	133	29	154	383	46	14	367	464
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	173	166	441	58	145	32	167	416	50	15	399	504
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	214	518	623	85	304	67	207	1290	154	32	571	675
Arrive On Green	0.12	0.28	0.28	0.05	0.20	0.20	0.12	0.40	0.40	0.02	0.31	0.31
Sat Flow, veh/h	1781	1870	1585	1781	1484	327	1781	3196	382	1781	1870	1585
Grp Volume(v), veh/h	173	166	441	58	0	177	167	230	236	15	399	504
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1811	1781	1777	1802	1781	1870	1585
Q Serve(g_s), s	6.7	5.0	16.6	2.3	0.0	6.1	6.5	6.3	6.4	0.6	13.4	19.0
Cycle Q Clear(g_c), s	6.7	5.0	16.6	2.3	0.0	6.1	6.5	6.3	6.4	0.6	13.4	19.0
Prop In Lane	1.00		1.00	1.00		0.18	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	214	518	623	85	0	371	207	717	727	32	571	675
V/C Ratio(X)	0.81	0.32	0.71	0.68	0.00	0.48	0.81	0.32	0.32	0.47	0.70	0.75
Avail Cap(c_a), veh/h	288	595	688	173	0	459	253	717	727	125	590	691
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.4	20.4	18.1	33.3	0.0	24.9	30.6	14.5	14.5	34.5	21.8	17.2
Incr Delay (d2), s/veh	11.6	0.4	3.0	9.0	0.0	1.0	14.6	0.3	0.3	10.2	3.5	4.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	2.1	6.1	1.2	0.0	2.6	3.5	2.4	2.5	0.3	6.0	7.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.0	20.7	21.1	42.3	0.0	25.9	45.2	14.8	14.8	44.7	25.3	21.5
LnGrp LOS	D	C	C	D	A	C	D	B	B	D	C	C
Approach Vol, veh/h	780			235			633			918		
Approach Delay, s/veh	25.7			29.9			22.8			23.5		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.8	33.2	7.9	24.2	12.7	26.2	13.0	19.0				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.8	27.5	6.9	22.6	10.1	22.4	11.5	18.0				
Max Q Clear Time (g_c+I), s	12.6	8.4	4.3	18.6	8.5	21.0	8.7	8.1				
Green Ext Time (p_c), s	0.0	2.7	0.0	1.1	0.1	0.7	0.1	0.6				

Intersection Summary

HCM 6th Ctrl Delay	24.6
HCM 6th LOS	C

Existing + Proj PM
4: Barham Dr & Woodland Pkwy

Sunrise Residential
09/16/2019



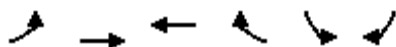
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	394	1060	389	334	517	341
Future Volume (veh/h)	394	1060	389	334	517	341
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1900
Adj Flow Rate, veh/h	428	1152	423	363	448	456
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	466	1182	600	932	476	430
Arrive On Green	0.26	0.63	0.32	0.32	0.27	0.27
Sat Flow, veh/h	1781	1870	1870	1585	1781	1610
Grp Volume(v), veh/h	428	1152	423	363	448	456
Grp Sat Flow(s), veh/h/ln	1781	1870	1870	1585	1781	1610
Q Serve(g_s), s	20.9	52.8	17.8	11.0	22.0	23.9
Cycle Q Clear(g_c), s	20.9	52.8	17.8	11.0	22.0	23.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	466	1182	600	932	476	430
V/C Ratio(X)	0.92	0.97	0.71	0.39	0.94	1.06
Avail Cap(c_a), veh/h	520	1194	600	932	476	430
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.1	15.8	26.7	9.9	32.1	32.8
Incr Delay (d2), s/veh	20.4	20.0	3.8	0.3	27.1	60.1
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.4	25.3	8.3	6.7	12.8	7.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	52.5	35.7	30.4	10.1	59.2	92.9
LnGrp LOS	D	D	C	B	E	F
Approach Vol, veh/h		1580	786		904	
Approach Delay, s/veh		40.3	21.1		76.2	
Approach LOS		D	C		E	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		61.0		28.4	27.9	33.2
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		57.1		23.9	26.1	26.5
Max Q Clear Time (g_c+I1), s		54.8		25.9	22.9	19.8
Green Ext Time (p_c), s		1.8		0.0	0.5	2.3
Intersection Summary						
HCM 6th Ctrl Delay			45.6			
HCM 6th LOS			D			

Notes

User approved volume balancing among the lanes for turning movement.

Existing + Proj PM
5: Barham Dr & SR-78 EB On

Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	730	767	679	82	0	0
Future Volume (veh/h)	730	767	679	82	0	0
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Work Zone On Approach		No	No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870		
Adj Flow Rate, veh/h	793	834	738	89		
Peak Hour Factor	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2		
Cap, veh/h	821	1776	717	86		
Arrive On Green	0.46	0.95	0.44	0.44		
Sat Flow, veh/h	1781	1870	1637	197		
Grp Volume(v), veh/h	793	834	0	827		
Grp Sat Flow(s), veh/h/ln	1781	1870	0	1835		
Q Serve(g_s), s	38.5	3.6	0.0	39.0		
Cycle Q Clear(g_c), s	38.5	3.6	0.0	39.0		
Prop In Lane	1.00			0.11		
Lane Grp Cap(c), veh/h	821	1776	0	803		
V/C Ratio(X)	0.97	0.47	0.00	1.03		
Avail Cap(c_a), veh/h	840	1795	0	803		
HCM Platoon Ratio	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	23.3	0.2	0.0	25.0		
Incr Delay (d2), s/veh	22.7	0.2	0.0	39.5		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	20.1	0.1	0.0	24.6		
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	46.0	0.4	0.0	64.6		
LnGrp LOS	D	A	A	F		
Approach Vol, veh/h		1627	827			
Approach Delay, s/veh		22.6	64.6			
Approach LOS		C	E			
Timer - Assigned Phs		2		5	6	
Phs Duration (G+Y+Rc), s		89.1		45.6	43.5	
Change Period (Y+Rc), s		4.5		4.5	4.5	
Max Green Setting (Gmax), s		85.5		42.0	39.0	
Max Q Clear Time (g_c+I1), s		5.6		40.5	41.0	
Green Ext Time (p_c), s		8.2		0.6	0.0	
Intersection Summary						
HCM 6th Ctrl Delay			36.8			
HCM 6th LOS			D			

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	767	0	0	736	0	0
Future Vol, veh/h	767	0	0	736	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	834	0	0	800	0	0
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	834	0	1634	834
Stage 1	-	-	-	-	834	-
Stage 2	-	-	-	-	800	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	799	-	111	368
Stage 1	-	-	-	-	426	-
Stage 2	-	-	-	-	442	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	799	-	111	368
Mov Cap-2 Maneuver	-	-	-	-	111	-
Stage 1	-	-	-	-	426	-
Stage 2	-	-	-	-	442	-
Approach	EB		WB		NB	
HCM Control Delay, s	0		0		0	
HCM LOS					A	
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	-	-	-	799	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	-	0	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	-	-	-	0	-	

Intersection						
Int Delay, s/veh	76.2					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	550	302	85	525	211	35
Future Vol, veh/h	550	302	85	525	211	35
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	80	0
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	598	328	92	571	229	38

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	926
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	738
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	738
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	\$ 525.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	107	405	-	-	738	-
HCM Lane V/C Ratio	2.143	0.094	-	-	0.125	-
HCM Control Delay (s)	\$ 610	14.8	-	-	10.6	0
HCM Lane LOS	F	B	-	-	B	A
HCM 95th %tile Q(veh)	19.7	0.3	-	-	0.4	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Existing + Proj PM
8: Barham Dr & Mission Rd

Sunrise Residential
09/16/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	791	68	483	967	0	115	5	520	12	1	0
Future Volume (veh/h)	0	791	68	483	967	0	115	5	520	12	1	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	860	74	525	1051	0	125	5	565	13	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	2	988	441	558	2250	0	387	15	629	26	2	0
Arrive On Green	0.00	0.28	0.28	0.31	0.63	0.00	0.23	0.23	0.23	0.02	0.02	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3647	0	1716	69	2790	1660	128	0
Grp Volume(v), veh/h	0	860	74	525	1051	0	130	0	565	14	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	0	1785	0	1395	1787	0	0
Q Serve(g_s), s	0.0	24.8	3.8	30.9	16.6	0.0	6.5	0.0	21.2	0.8	0.0	0.0
Cycle Q Clear(g_c), s	0.0	24.8	3.8	30.9	16.6	0.0	6.5	0.0	21.2	0.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.00	0.96		1.00	0.93		0.00
Lane Grp Cap(c), veh/h	2	988	441	558	2250	0	403	0	629	28	0	0
V/C Ratio(X)	0.00	0.87	0.17	0.94	0.47	0.00	0.32	0.00	0.90	0.49	0.00	0.00
Avail Cap(c_a), veh/h	83	1090	486	621	2250	0	439	0	687	83	0	0
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)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	37.0	29.4	36.0	10.3	0.0	34.8	0.0	40.5	52.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	7.3	0.2	21.5	0.2	0.0	0.5	0.0	13.9	12.6	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	11.6	1.5	16.5	6.1	0.0	2.9	0.0	8.4	0.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	44.3	29.6	57.4	10.4	0.0	35.3	0.0	54.4	65.1	0.0	0.0
LnGrp LOS	A	D	C	E	B	A	D	A	D	E	A	A
Approach Vol, veh/h		934			1576			695			14	
Approach Delay, s/veh		43.1			26.1			50.8			65.1	
Approach LOS		D			C			D			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	38.2	34.4		6.2	0.0	72.6		28.8				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	37.5	33.0		5.0	5.0	65.5		26.5				
Max Q Clear Time (g_c+I1), s	32.9	26.8		2.8	0.0	18.6		23.2				
Green Ext Time (p_c), s	0.8	3.1		0.0	0.0	10.0		1.1				
Intersection Summary												
HCM 6th Ctrl Delay			36.5									
HCM 6th LOS			D									

Existing + Proj PM
9: Auto Park Way/Nordahl Rd & Mission Rd

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰	↑↑	↱	↰	↑↑	↱	↰	↑↑↑	↱	↰	↑↑	↱
Traffic Volume (veh/h)	489	747	225	46	692	485	448	785	50	178	314	579
Future Volume (veh/h)	489	747	225	46	692	485	448	785	50	178	314	579
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No		No				No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	532	812	245	50	752	0	487	853	54	193	341	566
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	507	1271	567	117	870		472	1906	592	254	1102	492
Arrive On Green	0.15	0.36	0.36	0.03	0.24	0.00	0.14	0.37	0.37	0.02	0.10	0.10
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	5106	1585	3456	3554	1585
Grp Volume(v), veh/h	532	812	245	50	752	0	487	853	54	193	341	566
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1585	1728	1777	1585
Q Serve(g_s), s	17.6	22.8	14.1	1.7	24.3	0.0	16.4	15.1	2.7	6.7	10.7	37.2
Cycle Q Clear(g_c), s	17.6	22.8	14.1	1.7	24.3	0.0	16.4	15.1	2.7	6.7	10.7	37.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	507	1271	567	117	870		472	1906	592	254	1102	492
V/C Ratio(X)	1.05	0.64	0.43	0.43	0.86		1.03	0.45	0.09	0.76	0.31	1.15
Avail Cap(c_a), veh/h	507	1377	614	147	1007		472	1906	592	340	1102	492
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.39	0.39	0.39	1.00	1.00	0.00	1.00	1.00	1.00	0.89	0.89	0.89
Uniform Delay (d), s/veh	51.2	32.1	29.3	56.8	43.4	0.0	51.8	28.3	24.4	57.5	41.9	53.9
Incr Delay (d2), s/veh	39.1	0.3	0.2	2.5	7.1	0.0	49.6	0.8	0.3	6.1	0.6	87.4
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	10.3	9.8	5.4	0.8	11.5	0.0	10.3	6.3	1.1	3.2	5.2	27.8
Unsig. Movement Delay, s/veh	0.00											
LnGrp Delay(d),s/veh	90.3	32.4	29.5	59.3	50.5	0.0	101.4	29.1	24.7	63.6	42.6	141.3
LnGrp LOS	F	C	C	E	D	A	F	C	C	E	D	F
Approach Vol, veh/h	1589				1329		A		1394		1100	
Approach Delay, s/veh	51.3				30.8				54.2		97.1	
Approach LOS	D				C				D		F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	48.2	21.0	42.1	22.2	34.7	13.4	49.7					
Change Period (Y+Rc), s	4.6	5.3	4.6	4.9	4.6	5.3	4.6	4.9				
Max Green Setting (Gmax), s	46.5	16.4	32.6	17.6	34.0	11.8	37.2					
Max Q Clear Time (g_c+I), s	24.8	18.4	39.2	19.6	26.3	8.7	17.1					
Green Ext Time (p_c), s	0.0	6.9	0.0	0.0	0.0	3.1	0.2	6.2				

Intersection Summary

HCM 6th Ctrl Delay	56.3
HCM 6th LOS	E

Notes

Unsignalized Delay for [WBR] is included in calculations of the approach delay and intersection delay.

Existing + Proj PM
10: Nordahl Rd & SR-78 EB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	584	69	323	0	0	0	0	1042	824	543	860	0
Future Volume (veh/h)	584	69	323	0	0	0	0	1042	824	543	860	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	764	0	236				0	1133	807	590	935	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	832	0	370				0	2348	729	631	2422	0
Arrive On Green	0.23	0.00	0.23				0.00	0.61	0.61	0.37	1.00	0.00
Sat Flow, veh/h	3563	0	1585				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	764	0	236				0	1133	807	590	935	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	25.1	0.0	16.1				0.0	14.7	55.2	19.8	0.0	0.0
Cycle Q Clear(g_c), s	25.1	0.0	16.1				0.0	14.7	55.2	19.8	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	832	0	370				0	2348	729	631	2422	0
V/C Ratio(X)	0.92	0.00	0.64				0.00	0.48	1.11	0.94	0.39	0.00
Avail Cap(c_a), veh/h	864	0	384				0	2348	729	642	2422	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.33	1.33	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.56	0.56	0.81	0.81	0.00
Uniform Delay (d), s/veh	44.9	0.0	41.4				0.0	15.4	23.3	37.4	0.0	0.0
Incr Delay (d2), s/veh	14.4	0.0	3.3				0.0	0.4	59.8	18.0	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	6.6				0.0	5.0	29.2	8.5	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.2	0.0	44.7				0.0	15.8	83.1	55.4	0.4	0.0
LnGrp LOS	E	A	D				A	B	F	E	A	A
Approach Vol, veh/h	1000						1940			1525		
Approach Delay, s/veh	55.8						43.8			21.7		
Approach LOS	E						D			C		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	26.6	60.3	33.1	86.9								
Change Period (Y+Rc), s	4.7	5.1	5.1	5.1								
Max Green Setting (Gmax), s	23	53.7	29.1	80.7								
Max Q Clear Time (g_c+Y), s	21.8	57.2	27.1	2.0								
Green Ext Time (p_c), s	0.2	0.0	0.9	8.7								

Intersection Summary

HCM 6th Ctrl Delay	38.9
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

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

Existing + Proj PM
11: Nordahl Rd & SR-78 WB Ramps

Sunrise Residential

09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↱	↱	↰	↱			↱	↰
Traffic Volume (veh/h)	0	0	0	468	5	488	622	1008	0	0	785	526
Future Volume (veh/h)	0	0	0	468	5	488	622	1008	0	0	785	526
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				679	0	352	676	1096	0	0	853	514
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				905	0	403	758	2349	0	0	2055	638
Arrive On Green				0.25	0.00	0.25	0.22	0.66	0.00	0.00	0.40	0.40
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				679	0	352	676	1096	0	0	853	514
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				21.1	0.0	25.6	22.8	18.1	0.0	0.0	14.4	34.4
Cycle Q Clear(g_c), s				21.1	0.0	25.6	22.8	18.1	0.0	0.0	14.4	34.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				905	0	403	758	2349	0	0	2055	638
V/C Ratio(X)				0.75	0.00	0.87	0.89	0.47	0.00	0.00	0.42	0.81
Avail Cap(c_a), veh/h				1095	0	487	901	2349	0	0	2055	638
HCM Platoon Ratio				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.77	0.77	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				41.3	0.0	42.9	45.5	10.0	0.0	0.0	25.7	31.7
Incr Delay (d2), s/veh				2.4	0.0	14.1	7.9	0.5	0.0	0.0	0.6	10.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				9.5	0.0	11.5	10.5	6.8	0.0	0.0	5.9	14.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				43.6	0.0	57.0	53.3	10.5	0.0	0.0	26.3	42.2
LnGrp LOS				D	A	E	D	B	A	A	C	D
Approach Vol, veh/h					1031			1772			1367	
Approach Delay, s/veh					48.2			26.8			32.3	
Approach LOS					D			C			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		84.4			31.0	53.4		35.6				
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1				
Max Green Setting (Gmax), s		72.9			* 31	36.9		36.9				
Max Q Clear Time (g_c+I1), s		20.1			24.8	36.4		27.6				
Green Ext Time (p_c), s		10.9			1.5	0.4		2.9				

Intersection Summary

HCM 6th Ctrl Delay	33.9
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

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

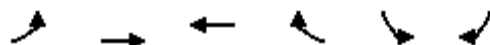
Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	45	1	0	171	236	108
Future Vol, veh/h	45	1	0	171	236	108
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
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	49	1	0	186	257	117
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	502	316	374	0	-	0
Stage 1	316	-	-	-	-	-
Stage 2	186	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	529	724	1184	-	-	-
Stage 1	739	-	-	-	-	-
Stage 2	846	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	529	724	1184	-	-	-
Mov Cap-2 Maneuver	529	-	-	-	-	-
Stage 1	739	-	-	-	-	-
Stage 2	846	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.5	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1184	-	532	-	-	
HCM Lane V/C Ratio	-	-	0.094	-	-	
HCM Control Delay (s)	0	-	12.5	-	-	
HCM Lane LOS	A	-	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.3	-	-	

APPENDIX E

INTERSECTION ANALYSIS WORKSHEETS – EXISTING + CUMULATIVE PROJECTS

Near-Term AM
1: Barham Dr & SR-78 EB Off

Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↙	↗
Traffic Volume (veh/h)	0	626	936	0	461	27
Future Volume (veh/h)	0	626	936	0	461	27
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	680	1017	0	501	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	1082	1082	0	541	481
Arrive On Green	0.00	0.58	0.58	0.00	0.30	0.30
Sat Flow, veh/h	0	1870	1870	0	1781	1585
Grp Volume(v), veh/h	0	680	1017	0	501	29
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	18.4	38.3	0.0	20.8	1.0
Cycle Q Clear(g_c), s	0.0	18.4	38.3	0.0	20.8	1.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1082	1082	0	541	481
V/C Ratio(X)	0.00	0.63	0.94	0.00	0.93	0.06
Avail Cap(c_a), veh/h	0	1140	1140	0	572	509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	10.7	14.9	0.0	25.7	18.8
Incr Delay (d2), s/veh	0.0	1.0	14.2	0.0	20.7	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	6.8	17.7	0.0	11.4	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	11.7	29.1	0.0	46.5	18.9
LnGrp LOS	A	B	C	A	D	B
Approach Vol, veh/h		680	1017		530	
Approach Delay, s/veh		11.7	29.1		45.0	
Approach LOS		B	C		D	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		48.6		27.7		48.6
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		46.5		24.5		46.5
Max Q Clear Time (g_c+I1), s		20.4		22.8		40.3
Green Ext Time (p_c), s		5.2		0.4		3.8
Intersection Summary						
HCM 6th Ctrl Delay			27.5			
HCM 6th LOS			C			

Near-Term AM
2: SR-78 WB Ramps & Rancheros Dr

Sunrise Residential

09/16/2019

Intersection

Intersection Delay, s/veh63.6

Intersection LOS F

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	217	38	588	310	177	186
Future Vol, veh/h	217	38	588	310	177	186
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	236	41	639	337	192	202
Number of Lanes	1	1	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	15.5	96.9	15.1
HCM LOS	C	F	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	177	186	217	38	588	310
LT Vol	177	0	0	0	588	0
Through Vol	0	0	217	0	0	310
RT Vol	0	186	0	38	0	0
Lane Flow Rate	192	202	236	41	639	337
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.418	0.372	0.466	0.074	1.221	0.596
Departure Headway (Hd)	8.157	6.933	7.436	6.718	6.875	6.365
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	444	522	488	537	530	566
Service Time	5.857	4.633	5.136	4.418	4.608	4.099
HCM Lane V/C Ratio	0.432	0.387	0.484	0.076	1.206	0.595
HCM Control Delay	16.6	13.7	16.5	10	138.5	18.1
HCM Lane LOS	C	B	C	A	F	C
HCM 95th-tile Q	2	1.7	2.4	0.2	24.2	3.9

Near-Term AM
3: Woodland Pkwy & Rancheros Dr

Sunrise Residential
09/16/2019



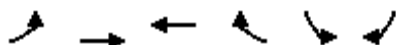
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	81	299	77	248	10	186	147	52	15	425	518
Future Volume (veh/h)	59	81	299	77	248	10	186	147	52	15	425	518
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	64	88	325	84	270	11	202	160	57	16	462	563
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	89	389	546	108	390	16	243	1202	413	34	647	628
Arrive On Green	0.05	0.21	0.21	0.06	0.22	0.22	0.14	0.46	0.46	0.02	0.35	0.35
Sat Flow, veh/h	1781	1870	1585	1781	1785	73	1781	2595	892	1781	1870	1585
Grp Volume(v), veh/h	64	88	325	84	0	281	202	108	109	16	462	563
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1857	1781	1777	1710	1781	1870	1585
Q Serve(g_s), s	2.6	2.8	12.2	3.4	0.0	10.1	8.0	2.5	2.6	0.6	15.5	24.0
Cycle Q Clear(g_c), s	2.6	2.8	12.2	3.4	0.0	10.1	8.0	2.5	2.6	0.6	15.5	24.0
Prop In Lane	1.00		1.00	1.00		0.04	1.00		0.52	1.00		1.00
Lane Grp Cap(c), veh/h	89	389	546	108	0	406	243	823	792	34	647	628
V/C Ratio(X)	0.72	0.23	0.60	0.78	0.00	0.69	0.83	0.13	0.14	0.47	0.71	0.90
Avail Cap(c_a), veh/h	210	507	646	170	0	463	259	823	792	123	647	628
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.8	23.8	19.5	33.5	0.0	26.0	30.4	11.1	11.1	35.1	20.5	20.4
Incr Delay (d2), s/veh	10.3	0.3	1.1	11.3	0.0	3.7	19.3	0.1	0.1	9.9	3.7	15.6
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	1.2	4.4	1.7	0.0	4.7	4.6	0.9	0.9	0.4	7.0	10.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.1	24.1	20.6	44.7	0.0	29.7	49.7	11.2	11.2	45.0	24.2	36.1
LnGrp LOS	D	C	C	D	A	C	D	B	B	D	C	D
Approach Vol, veh/h	477			365			419			1041		
Approach Delay, s/veh	24.4			33.2			29.7			31.0		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.9	38.0	8.9	19.5	14.3	29.5	8.1	20.3				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	30.5	6.9	19.6	10.5	25.0	8.5	18.0				
Max Q Clear Time (g_c+I), s	12.6	4.6	5.4	14.2	10.0	26.0	4.6	12.1				
Green Ext Time (p_c), s	0.0	1.2	0.0	0.8	0.0	0.0	0.0	0.8				

Intersection Summary

HCM 6th Ctrl Delay	29.7
HCM 6th LOS	C

Near-Term AM
4: Barham Dr & Woodland Pkwy

Sunrise Residential
09/16/2019



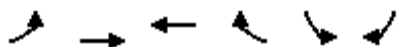
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	316	892	496	288	311	611
Future Volume (veh/h)	316	892	496	288	311	611
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1900
Adj Flow Rate, veh/h	343	970	539	313	338	596
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	382	1109	623	1031	565	511
Arrive On Green	0.21	0.59	0.33	0.33	0.32	0.32
Sat Flow, veh/h	1781	1870	1870	1585	1781	1610
Grp Volume(v), veh/h	343	970	539	313	338	596
Grp Sat Flow(s), veh/h/ln	1781	1870	1870	1585	1781	1610
Q Serve(g_s), s	18.7	43.8	27.0	8.6	16.0	31.7
Cycle Q Clear(g_c), s	18.7	43.8	27.0	8.6	16.0	31.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	382	1109	623	1031	565	511
V/C Ratio(X)	0.90	0.87	0.86	0.30	0.60	1.17
Avail Cap(c_a), veh/h	526	1484	848	1221	565	511
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.2	17.2	31.2	7.6	28.8	34.1
Incr Delay (d2), s/veh	14.3	4.8	7.1	0.2	1.7	94.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	18.4	13.1	6.1	7.0	37.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	52.5	22.0	38.3	7.8	30.5	128.9
LnGrp LOS	D	C	D	A	C	F
Approach Vol, veh/h		1313	852		934	
Approach Delay, s/veh		30.0	27.1		93.3	
Approach LOS		C	C		F	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		63.8		36.2	25.9	37.8
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		79.3		31.7	29.5	45.3
Max Q Clear Time (g_c+I1), s		45.8		33.7	20.7	29.0
Green Ext Time (p_c), s		9.8		0.0	0.7	4.3
Intersection Summary						
HCM 6th Ctrl Delay			48.3			
HCM 6th LOS			D			

Notes

User approved volume balancing among the lanes for turning movement.

Near-Term AM
5: Barham Dr & SR-78 EB On

Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	301	598	683	40	0	0
Future Volume (veh/h)	301	598	683	40	0	0
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Work Zone On Approach		No	No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870		
Adj Flow Rate, veh/h	327	650	742	43		
Peak Hour Factor	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2		
Cap, veh/h	415	1656	941	55		
Arrive On Green	0.23	0.89	0.54	0.54		
Sat Flow, veh/h	1781	1870	1751	101		
Grp Volume(v), veh/h	327	650	0	785		
Grp Sat Flow(s), veh/h/ln	1781	1870	0	1852		
Q Serve(g_s), s	6.8	2.4	0.0	13.3		
Cycle Q Clear(g_c), s	6.8	2.4	0.0	13.3		
Prop In Lane	1.00			0.05		
Lane Grp Cap(c), veh/h	415	1656	0	996		
V/C Ratio(X)	0.79	0.39	0.00	0.79		
Avail Cap(c_a), veh/h	749	2647	0	1629		
HCM Platoon Ratio	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	14.1	0.4	0.0	7.3		
Incr Delay (d2), s/veh	3.4	0.2	0.0	1.4		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	2.6	0.1	0.0	3.3		
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	17.5	0.5	0.0	8.7		
LnGrp LOS	B	A	A	A		
Approach Vol, veh/h		977	785			
Approach Delay, s/veh		6.2	8.7			
Approach LOS		A	A			
Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		39.2			13.6	25.6
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		55.5			16.5	34.5
Max Q Clear Time (g_c+I1), s		4.4			8.8	15.3
Green Ext Time (p_c), s		5.3			0.6	5.8
Intersection Summary						
HCM 6th Ctrl Delay			7.3			
HCM 6th LOS			A			

Intersection						
Int Delay, s/veh	28.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	304	343	25	576	222	23
Future Vol, veh/h	304	343	25	576	222	23
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	80	0
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	330	373	27	626	241	25

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	703
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	895
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	895
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	172.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	196	558	-	-	895	-
HCM Lane V/C Ratio	1.231	0.045	-	-	0.03	-
HCM Control Delay (s)	188.9	11.8	-	-	9.1	0
HCM Lane LOS	F	B	-	-	A	A
HCM 95th %tile Q(veh)	12.8	0.1	-	-	0.1	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Near-Term AM
8: Barham Dr & Mission Rd

Sunrise Residential
09/16/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	795	87	553	870	6	87	3	264	13	18	1
Future Volume (veh/h)	0	795	87	553	870	6	87	3	264	13	18	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	864	95	601	946	7	95	3	287	14	20	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	2	1029	459	638	2510	19	233	7	376	23	33	2
Arrive On Green	0.00	0.29	0.29	0.36	0.69	0.69	0.13	0.13	0.13	0.03	0.03	0.03
Sat Flow, veh/h	1781	3554	1585	1781	3616	27	1729	55	2790	730	1043	52
Grp Volume(v), veh/h	0	864	95	601	465	488	98	0	287	35	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1866	1784	0	1395	1824	0	0
Q Serve(g_s), s	0.0	22.1	4.4	31.7	10.5	10.5	4.9	0.0	9.6	1.8	0.0	0.0
Cycle Q Clear(g_c), s	0.0	22.1	4.4	31.7	10.5	10.5	4.9	0.0	9.6	1.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.01	0.97		1.00	0.40		0.03
Lane Grp Cap(c), veh/h	2	1029	459	638	1234	1295	241	0	376	57	0	0
V/C Ratio(X)	0.00	0.84	0.21	0.94	0.38	0.38	0.41	0.00	0.76	0.61	0.00	0.00
Avail Cap(c_a), veh/h	92	1192	532	708	1234	1295	479	0	749	94	0	0
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)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	32.3	26.0	30.1	6.1	6.1	38.4	0.0	40.4	46.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	4.9	0.2	19.9	0.2	0.2	1.1	0.0	3.2	10.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.0	1.7	16.6	3.4	3.6	2.2	0.0	3.4	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	37.2	26.2	50.0	6.3	6.3	39.5	0.0	43.6	56.3	0.0	0.0
LnGrp LOS	A	D	C	D	A	A	D	A	D	E	A	A
Approach Vol, veh/h		959			1554			385			35	
Approach Delay, s/veh		36.1			23.2			42.6			56.3	
Approach LOS		D			C			D			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	39.2	32.6		7.6	0.0	71.8		17.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	38.5	32.5		5.0	5.0	66.0		26.0				
Max Q Clear Time (g_c+I1), s	33.7	24.1		3.8	0.0	12.5		11.6				
Green Ext Time (p_c), s	1.0	4.0		0.0	0.0	7.7		1.5				
Intersection Summary												
HCM 6th Ctrl Delay				30.4								
HCM 6th LOS				C								

Near-Term AM
9: Auto Park Way/Nordahl Rd & Mission Rd

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑↑	↗	↔↔	↑↑	↗
Traffic Volume (veh/h)	290	370	276	71	580	259	409	895	39	309	1136	265
Future Volume (veh/h)	290	370	276	71	580	259	409	895	39	309	1136	265
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	315	402	300	77	630	0	445	973	42	336	1235	288
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	305	937	418	133	760		443	2145	666	402	1450	647
Arrive On Green	0.09	0.26	0.26	0.04	0.21	0.00	0.13	0.42	0.42	0.12	0.41	0.41
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	5106	1585	3456	3554	1585
Grp Volume(v), veh/h	315	402	300	77	630	0	445	973	42	336	1235	288
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1585	1728	1777	1585
Q Serve(g_s), s	10.6	11.3	20.6	2.6	20.3	0.0	15.4	16.4	1.9	11.4	37.8	15.8
Cycle Q Clear(g_c), s	10.6	11.3	20.6	2.6	20.3	0.0	15.4	16.4	1.9	11.4	37.8	15.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	305	937	418	133	760		443	2145	666	402	1450	647
V/C Ratio(X)	1.03	0.43	0.72	0.58	0.83		1.00	0.45	0.06	0.84	0.85	0.45
Avail Cap(c_a), veh/h	305	1125	502	190	1007		443	2145	666	521	1450	647
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)	0.50	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	0.75	0.75	0.75
Uniform Delay (d), s/veh	54.7	36.7	40.1	56.7	45.1	0.0	52.3	24.9	20.7	51.9	32.2	25.7
Incr Delay (d2), s/veh	44.9	0.2	2.0	3.9	4.5	0.0	43.6	0.7	0.2	7.0	5.0	1.7
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	6.5	4.9	8.2	1.2	9.4	0.0	9.3	6.7	0.7	5.3	17.0	6.2
Unsig. Movement Delay, s/veh	0.00											
LnGrp Delay(d),s/veh	99.6	36.8	42.1	60.7	49.6	0.0	95.9	25.6	20.9	58.9	37.2	27.4
LnGrp LOS	F	D	D	E	D	A	F	C	C	E	D	C
Approach Vol, veh/h	1017				989		A		1460		1859	
Approach Delay, s/veh	57.8				36.3				46.9		39.6	
Approach LOS	E				D				D		D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.2	36.9	20.0	53.9	15.2	30.9	18.5	55.3				
Change Period (Y+Rc), s	4.6	5.3	4.6	4.9	4.6	5.3	4.6	4.9				
Max Green Setting (Gmax), s	6.6	38.0	15.4	40.6	10.6	34.0	18.1	37.9				
Max Q Clear Time (g_c+I), s	14.6	22.6	17.4	39.8	12.6	22.3	13.4	18.4				
Green Ext Time (p_c), s	0.0	3.3	0.0	0.6	0.0	3.3	0.5	7.0				

Intersection Summary

HCM 6th Ctrl Delay	44.5
HCM 6th LOS	D

Notes

Unsignalized Delay for [WBR] is included in calculations of the approach delay and intersection delay.

Near-Term AM
10: Nordahl Rd & SR-78 EB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	422	29	751	0	0	0	0	769	726	293	978	0
Future Volume (veh/h)	422	29	751	0	0	0	0	769	726	293	978	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	317	0	908				0	836	711	318	1063	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	564	0	1003				0	2068	642	391	2026	0
Arrive On Green	0.32	0.00	0.32				0.00	0.40	0.40	0.15	0.76	0.00
Sat Flow, veh/h	1781	0	3170				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	317	0	908				0	836	711	318	1063	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	13.3	0.0	24.7				0.0	10.5	36.4	8.0	10.8	0.0
Cycle Q Clear(g_c), s	13.3	0.0	24.7				0.0	10.5	36.4	8.0	10.8	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	564	0	1003				0	2068	642	391	2026	0
V/C Ratio(X)	0.56	0.00	0.91				0.00	0.40	1.11	0.81	0.52	0.00
Avail Cap(c_a), veh/h	596	0	1060				0	2068	642	434	2026	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.75	0.75	0.88	0.88	0.00
Uniform Delay (d), s/veh	25.6	0.0	29.5				0.0	19.1	26.8	37.3	6.0	0.0
Incr Delay (d2), s/veh	1.1	0.0	10.6				0.0	0.4	64.7	9.3	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	0.0	10.5				0.0	4.1	24.5	3.7	3.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.7	0.0	40.1				0.0	19.5	91.5	46.6	6.8	0.0
LnGrp LOS	C	A	D				A	B	F	D	A	A
Approach Vol, veh/h	1225						1547			1381		
Approach Delay, s/veh	36.6						52.6			16.0		
Approach LOS	D						D			B		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	41.9	41.5	33.6	56.4								
Change Period (Y+Rc), s	4.7	5.1	5.1	5.1								
Max Green Setting (Gmax), s	33.7	33.7	30.1	49.7								
Max Q Clear Time (g_c+I10), s	38.4	38.4	26.7	12.8								
Green Ext Time (p_c), s	0.2	0.0	1.8	9.8								

Intersection Summary

HCM 6th Ctrl Delay	35.7
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

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

Near-Term AM
11: Nordahl Rd & SR-78 WB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↱	↱	↰	↱			↱	↰
Traffic Volume (veh/h)	0	0	0	480	0	162	533	673	0	0	692	342
Future Volume (veh/h)	0	0	0	480	0	162	533	673	0	0	692	342
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				577	0	117	579	732	0	0	752	372
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				712	0	317	702	2441	0	0	2203	684
Arrive On Green				0.20	0.00	0.20	0.07	0.23	0.00	0.00	0.43	0.43
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				577	0	117	579	732	0	0	752	372
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				13.9	0.0	5.7	14.9	15.4	0.0	0.0	8.8	15.7
Cycle Q Clear(g_c), s				13.9	0.0	5.7	14.9	15.4	0.0	0.0	8.8	15.7
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				712	0	317	702	2441	0	0	2203	684
V/C Ratio(X)				0.81	0.00	0.37	0.82	0.30	0.00	0.00	0.34	0.54
Avail Cap(c_a), veh/h				1065	0	474	933	2441	0	0	2203	684
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.83	0.83	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				34.4	0.0	31.1	40.4	16.8	0.0	0.0	17.1	19.0
Incr Delay (d2), s/veh				2.9	0.0	0.7	3.9	0.3	0.0	0.0	0.4	3.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.2	0.0	2.2	7.2	7.3	0.0	0.0	3.4	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				37.3	0.0	31.8	44.3	17.1	0.0	0.0	17.5	22.1
LnGrp LOS				D	A	C	D	B	A	A	B	C
Approach Vol, veh/h				694			1311				1124	
Approach Delay, s/veh				36.4			29.1				19.0	
Approach LOS				D			C				B	
Timer - Assigned Phs	2			5	6		8					
Phs Duration (G+Y+Rc), s	66.9			23.0	43.9		23.1					
Change Period (Y+Rc), s	5.1			* 4.7	5.1		5.1					
Max Green Setting (Gmax), s	52.9			* 24	23.9		26.9					
Max Q Clear Time (g_c+I1), s	17.4			16.9	17.7		15.9					
Green Ext Time (p_c), s	5.9			1.4	3.3		2.1					

Intersection Summary

HCM 6th Ctrl Delay	27.1
HCM 6th LOS	C

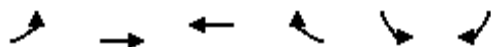
Notes

User approved volume balancing among the lanes for turning movement.

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

Near-Term PM
1: Barham Dr & SR-78 EB Off

Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↘
Traffic Volume (veh/h)	0	1029	729	0	241	15
Future Volume (veh/h)	0	1029	729	0	241	15
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	1118	792	0	262	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	1187	1187	0	333	296
Arrive On Green	0.00	0.63	0.63	0.00	0.19	0.19
Sat Flow, veh/h	0	1870	1870	0	1781	1585
Grp Volume(v), veh/h	0	1118	792	0	262	16
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	27.4	13.5	0.0	7.1	0.4
Cycle Q Clear(g_c), s	0.0	27.4	13.5	0.0	7.1	0.4
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1187	1187	0	333	296
V/C Ratio(X)	0.00	0.94	0.67	0.00	0.79	0.05
Avail Cap(c_a), veh/h	0	1224	1224	0	636	566
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	8.4	5.8	0.0	19.5	16.8
Incr Delay (d2), s/veh	0.0	13.9	1.3	0.0	4.1	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.8	3.5	0.0	3.0	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	22.3	7.2	0.0	23.7	16.9
LnGrp LOS	A	C	A	A	C	B
Approach Vol, veh/h		1118	792		278	
Approach Delay, s/veh		22.3	7.2		23.3	
Approach LOS		C	A		C	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		36.5		13.9		36.5
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		33.0		18.0		33.0
Max Q Clear Time (g_c+I1), s		29.4		9.1		15.5
Green Ext Time (p_c), s		2.6		0.6		5.6
Intersection Summary						
HCM 6th Ctrl Delay			16.9			
HCM 6th LOS			B			

Near-Term PM
2: SR-78 WB Ramps & Rancheros Dr

Sunrise Residential
09/16/2019

Intersection

Intersection Delay, s/veh 50.5

Intersection LOS F

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	477	75	479	200	90	233
Future Vol, veh/h	477	75	479	200	90	233
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	518	82	521	217	98	253
Number of Lanes	1	1	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	56.4	62.2	16
HCM LOS	F	F	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	90	233	477	75	479	200
LT Vol	90	0	0	0	479	0
Through Vol	0	0	477	0	0	200
RT Vol	0	233	0	75	0	0
Lane Flow Rate	98	253	518	82	521	217
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.224	0.495	0.99	0.14	1.053	0.409
Departure Headway (Hd)	8.489	7.252	7.08	6.362	7.278	6.766
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	426	501	518	567	500	530
Service Time	6.189	4.952	4.78	4.062	5.05	4.538
HCM Lane V/C Ratio	0.23	0.505	1	0.145	1.042	0.409
HCM Control Delay	13.6	16.9	63.7	10.1	82.2	14.2
HCM Lane LOS	B	C	F	B	F	B
HCM 95th-tile Q	0.8	2.7	13.4	0.5	15.6	2

Near-Term PM
3: Woodland Pkwy & Rancheros Dr

Sunrise Residential
09/16/2019



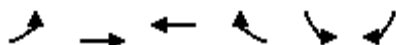
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	153	428	53	133	29	142	386	46	14	365	466
Future Volume (veh/h)	159	153	428	53	133	29	142	386	46	14	365	466
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	173	166	465	58	145	32	154	420	50	15	397	507
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	214	541	629	85	321	71	192	1264	150	32	570	674
Arrive On Green	0.12	0.29	0.29	0.05	0.22	0.22	0.11	0.39	0.39	0.02	0.30	0.30
Sat Flow, veh/h	1781	1870	1585	1781	1484	327	1781	3200	379	1781	1870	1585
Grp Volume(v), veh/h	173	166	465	58	0	177	154	232	238	15	397	507
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1811	1781	1777	1802	1781	1870	1585
Q Serve(g_s), s	6.8	5.0	18.0	2.3	0.0	6.1	6.1	6.5	6.6	0.6	13.5	19.4
Cycle Q Clear(g_c), s	6.8	5.0	18.0	2.3	0.0	6.1	6.1	6.5	6.6	0.6	13.5	19.4
Prop In Lane	1.00		1.00	1.00		0.18	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	214	541	629	85	0	392	192	702	712	32	570	674
V/C Ratio(X)	0.81	0.31	0.74	0.68	0.00	0.45	0.80	0.33	0.33	0.47	0.70	0.75
Avail Cap(c_a), veh/h	285	588	669	171	0	453	250	702	712	124	583	684
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.8	19.9	18.5	33.7	0.0	24.5	31.3	15.1	15.2	35.0	22.1	17.5
Incr Delay (d2), s/veh	12.0	0.3	4.1	9.2	0.0	0.8	13.0	0.3	0.3	10.2	3.5	4.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	2.1	6.7	1.2	0.0	2.6	3.2	2.5	2.6	0.3	6.1	7.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.8	20.3	22.6	42.9	0.0	25.3	44.3	15.4	15.4	45.2	25.6	22.1
LnGrp LOS	D	C	C	D	A	C	D	B	B	D	C	C
Approach Vol, veh/h	804			235			624			919		
Approach Delay, s/veh	26.5			29.6			22.6			24.0		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.8	32.9	7.9	25.3	12.3	26.4	13.1	20.1				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.8	27.5	6.9	22.6	10.1	22.4	11.5	18.0				
Max Q Clear Time (g_c+I), s	12.6	8.6	4.3	20.0	8.1	21.4	8.8	8.1				
Green Ext Time (p_c), s	0.0	2.7	0.0	0.8	0.1	0.5	0.1	0.6				

Intersection Summary

HCM 6th Ctrl Delay	24.9
HCM 6th LOS	C

Near-Term PM
4: Barham Dr & Woodland Pkwy

Sunrise Residential
09/16/2019



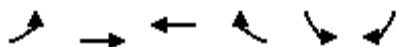
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	399	1048	386	320	514	364
Future Volume (veh/h)	399	1048	386	320	514	364
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1900
Adj Flow Rate, veh/h	434	1139	420	348	458	465
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	472	1195	604	922	461	416
Arrive On Green	0.26	0.64	0.32	0.32	0.26	0.26
Sat Flow, veh/h	1781	1870	1870	1585	1781	1610
Grp Volume(v), veh/h	434	1139	420	348	458	465
Grp Sat Flow(s), veh/h/ln	1781	1870	1870	1585	1781	1610
Q Serve(g_s), s	20.8	49.4	17.2	10.3	22.5	22.7
Cycle Q Clear(g_c), s	20.8	49.4	17.2	10.3	22.5	22.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	472	1195	604	922	461	416
V/C Ratio(X)	0.92	0.95	0.70	0.38	0.99	1.12
Avail Cap(c_a), veh/h	521	1242	604	922	461	416
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.4	14.6	26.0	9.9	32.5	32.5
Incr Delay (d2), s/veh	20.6	15.4	3.5	0.3	40.4	79.8
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.3	22.3	8.0	6.1	14.5	26.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	52.0	30.0	29.4	10.1	72.9	112.4
LnGrp LOS	D	C	C	B	E	F
Approach Vol, veh/h		1573	768		923	
Approach Delay, s/veh		36.1	20.7		92.8	
Approach LOS		D	C		F	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		60.6		27.2	27.7	32.8
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		58.3		22.7	25.7	28.1
Max Q Clear Time (g_c+I1), s		51.4		24.7	22.8	19.2
Green Ext Time (p_c), s		4.7		0.0	0.5	2.7
Intersection Summary						
HCM 6th Ctrl Delay			48.5			
HCM 6th LOS			D			

Notes

User approved volume balancing among the lanes for turning movement.

Near-Term PM
5: Barham Dr & SR-78 EB On

Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	743	739	662	72	0	0
Future Volume (veh/h)	743	739	662	72	0	0
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Work Zone On Approach		No	No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870		
Adj Flow Rate, veh/h	808	803	720	78		
Peak Hour Factor	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2		
Cap, veh/h	821	1777	728	79		
Arrive On Green	0.46	0.95	0.44	0.44		
Sat Flow, veh/h	1781	1870	1658	180		
Grp Volume(v), veh/h	808	803	0	798		
Grp Sat Flow(s), veh/h/ln	1781	1870	0	1838		
Q Serve(g_s), s	40.3	3.4	0.0	38.7		
Cycle Q Clear(g_c), s	40.3	3.4	0.0	38.7		
Prop In Lane	1.00			0.10		
Lane Grp Cap(c), veh/h	821	1777	0	807		
V/C Ratio(X)	0.98	0.45	0.00	0.99		
Avail Cap(c_a), veh/h	821	1777	0	807		
HCM Platoon Ratio	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	23.9	0.2	0.0	25.0		
Incr Delay (d2), s/veh	27.3	0.2	0.0	28.9		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	21.9	0.1	0.0	22.2		
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	51.2	0.4	0.0	54.0		
LnGrp LOS	D	A	A	D		
Approach Vol, veh/h		1611	798			
Approach Delay, s/veh		25.9	54.0			
Approach LOS		C	D			
Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		90.0			46.0	44.0
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		85.5			41.5	39.5
Max Q Clear Time (g_c+I1), s		5.4			42.3	40.7
Green Ext Time (p_c), s		7.6			0.0	0.0
Intersection Summary						
HCM 6th Ctrl Delay			35.2			
HCM 6th LOS			D			

Intersection

Int Delay, s/veh 24.9

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	566	258	22	532	177	27
Future Vol, veh/h	566	258	22	532	177	27
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	80	0
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	615	280	24	578	192	29

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	895
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	758
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	758
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	192
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	152	409	-	-	758	-
HCM Lane V/C Ratio	1.266	0.072	-	-	0.032	-
HCM Control Delay (s)	219.1	14.5	-	-	9.9	0
HCM Lane LOS	F	B	-	-	A	A
HCM 95th %tile Q(veh)	11.4	0.2	-	-	0.1	-

Notes

~: Volume exceeds capacity \$: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Near-Term PM
8: Barham Dr & Mission Rd

Sunrise Residential
09/16/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	841	57	438	1025	0	110	5	532	12	1	0
Future Volume (veh/h)	0	841	57	438	1025	0	110	5	532	12	1	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	914	62	476	1114	0	120	5	578	13	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	2	1045	466	512	2217	0	398	17	649	26	2	0
Arrive On Green	0.00	0.29	0.29	0.29	0.62	0.00	0.23	0.23	0.23	0.02	0.02	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3647	0	1713	71	2790	1660	128	0
Grp Volume(v), veh/h	0	914	62	476	1114	0	125	0	578	14	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	0	1785	0	1395	1787	0	0
Q Serve(g_s), s	0.0	25.8	3.0	27.5	18.2	0.0	6.1	0.0	21.2	0.8	0.0	0.0
Cycle Q Clear(g_c), s	0.0	25.8	3.0	27.5	18.2	0.0	6.1	0.0	21.2	0.8	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.00	0.96		1.00	0.93		0.00
Lane Grp Cap(c), veh/h	2	1045	466	512	2217	0	415	0	649	28	0	0
V/C Ratio(X)	0.00	0.87	0.13	0.93	0.50	0.00	0.30	0.00	0.89	0.49	0.00	0.00
Avail Cap(c_a), veh/h	84	1143	510	598	2217	0	464	0	726	85	0	0
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)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	35.5	27.4	36.6	10.9	0.0	33.5	0.0	39.3	51.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	7.3	0.1	19.6	0.2	0.0	0.4	0.0	12.4	12.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.0	1.2	14.5	6.7	0.0	2.7	0.0	8.3	0.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	42.8	27.5	56.3	11.1	0.0	33.9	0.0	51.6	64.1	0.0	0.0
LnGrp LOS	A	D	C	E	B	A	C	A	D	E	A	A
Approach Vol, veh/h		976			1590			703			14	
Approach Delay, s/veh		41.8			24.6			48.5			64.1	
Approach LOS		D			C			D			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	34.9	35.6		6.2	0.0	70.4		29.1				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	35.5	34.0		5.0	5.0	64.5		27.5				
Max Q Clear Time (g_c+I1), s	29.5	27.8		2.8	0.0	20.2		23.2				
Green Ext Time (p_c), s	0.9	3.2		0.0	0.0	10.8		1.4				
Intersection Summary												
HCM 6th Ctrl Delay			35.0									
HCM 6th LOS			C									

Near-Term PM
9: Auto Park Way/Nordahl Rd & Mission Rd

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑↑	↗	↔↔	↑↑	↗
Traffic Volume (veh/h)	491	745	288	55	689	492	498	1159	54	188	700	545
Future Volume (veh/h)	491	745	288	55	689	492	498	1159	54	188	700	545
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	534	810	313	60	749	0	541	1260	59	204	761	533
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	472	1225	547	125	868		472	1951	606	260	1140	509
Arrive On Green	0.14	0.34	0.34	0.04	0.24	0.00	0.14	0.38	0.38	0.02	0.11	0.11
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	5106	1585	3456	3554	1585
Grp Volume(v), veh/h	534	810	313	60	749	0	541	1260	59	204	761	533
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1585	1728	1777	1585
Q Serve(g_s), s	16.4	23.2	19.3	2.0	24.2	0.0	16.4	24.3	2.9	7.0	24.7	38.5
Cycle Q Clear(g_c), s	16.4	23.2	19.3	2.0	24.2	0.0	16.4	24.3	2.9	7.0	24.7	38.5
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	472	1225	547	125	868		472	1951	606	260	1140	509
V/C Ratio(X)	1.13	0.66	0.57	0.48	0.86		1.15	0.65	0.10	0.78	0.67	1.05
Avail Cap(c_a), veh/h	472	1333	594	156	1007		472	1951	606	265	1140	509
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.39	0.39	0.39	1.00	1.00	0.00	1.00	1.00	1.00	0.80	0.80	0.80
Uniform Delay (d), s/veh	51.8	33.4	32.1	56.7	43.4	0.0	51.8	30.4	23.8	57.5	47.5	53.6
Incr Delay (d2), s/veh	69.7	0.4	0.4	2.9	7.0	0.0	87.8	1.7	0.3	11.4	2.5	48.9
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	1.6	10.0	7.5	0.9	11.4	0.0	12.8	10.2	1.1	3.6	12.2	23.3
Unsig. Movement Delay, s/veh	0.00											
LnGrp Delay(d),s/veh	121.5	33.8	32.5	59.6	50.5	0.0	139.6	32.1	24.1	69.0	50.0	102.6
LnGrp LOS	F	C	C	E	D	A	F	C	C	E	D	F
Approach Vol, veh/h	1657			1344			1860			1498		
Approach Delay, s/veh	61.8			30.8			63.1			71.3		
Approach LOS	E			C			E			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	46.7	21.0	43.4	21.0	34.6	13.6	50.8				
Change Period (Y+Rc), s	4.6	5.3	4.6	4.9	4.6	5.3	4.6	4.9				
Max Green Setting (Gmax), s	5.4	45.0	16.4	33.8	16.4	34.0	9.2	41.0				
Max Q Clear Time (g_c+I), s	14.0	25.2	18.4	40.5	18.4	26.2	9.0	26.3				
Green Ext Time (p_c), s	0.0	6.9	0.0	0.0	0.0	3.1	0.0	7.9				

Intersection Summary

HCM 6th Ctrl Delay	57.9											
HCM 6th LOS	E											

Notes

Unsignalized Delay for [WBR] is included in calculations of the approach delay and intersection delay.

Near-Term PM
10: Nordahl Rd & SR-78 EB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  		 	 	
Traffic Volume (veh/h)	602	69	471	0	0	0	0	1253	997	563	1039	0
Future Volume (veh/h)	602	69	471	0	0	0	0	1253	997	563	1039	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	828	0	332				0	1362	976	612	1129	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	864	0	384				0	2387	741	573	2390	0
Arrive On Green	0.24	0.00	0.24				0.00	0.93	0.93	0.33	1.00	0.00
Sat Flow, veh/h	3563	0	1585				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	828	0	332				0	1362	976	612	1129	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	27.5	0.0	24.1				0.0	4.5	56.1	19.9	0.0	0.0
Cycle Q Clear(g_c), s	27.5	0.0	24.1				0.0	4.5	56.1	19.9	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	864	0	384				0	2387	741	573	2390	0
V/C Ratio(X)	0.96	0.00	0.86				0.00	0.57	1.32	1.07	0.47	0.00
Avail Cap(c_a), veh/h	864	0	384				0	2387	741	573	2390	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	2.00	2.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.39	0.39	0.67	0.67	0.00
Uniform Delay (d), s/veh	44.9	0.0	43.6				0.0	2.2	3.9	40.1	0.0	0.0
Incr Delay (d2), s/veh	21.1	0.0	18.0				0.0	0.4	146.5	50.6	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	11.3				0.0	0.9	31.6	11.1	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.0	0.0	61.6				0.0	2.6	150.4	90.7	0.5	0.0
LnGrp LOS	E	A	E				A	A	F	F	A	A
Approach Vol, veh/h	1160						2338			1741		
Approach Delay, s/veh	64.7						64.3			32.2		
Approach LOS	E						E			C		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	24.6	61.2	34.2	85.8								
Change Period (Y+Rc), s	4.7	5.1	5.1	5.1								
Max Green Setting (Gmax), s	20	56.1	29.1	80.7								
Max Q Clear Time (g_c+21), s	21.9	58.1	29.5	2.0								
Green Ext Time (p_c), s	0.0	0.0	0.0	11.7								

Intersection Summary

HCM 6th Ctrl Delay	53.7
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

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

Near-Term PM
11: Nordahl Rd & SR-78 WB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↱	↱	↰	↱			↱	↰
Traffic Volume (veh/h)	0	0	0	598	5	503	797	1060	0	0	855	552
Future Volume (veh/h)	0	0	0	598	5	503	797	1060	0	0	855	552
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				822	0	366	866	1152	0	0	929	542
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				947	0	421	939	2307	0	0	1727	536
Arrive On Green				0.27	0.00	0.27	0.36	0.86	0.00	0.00	0.34	0.34
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				822	0	366	866	1152	0	0	929	542
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				26.4	0.0	26.5	28.8	9.3	0.0	0.0	17.7	40.6
Cycle Q Clear(g_c), s				26.4	0.0	26.5	28.8	9.3	0.0	0.0	17.7	40.6
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				947	0	421	939	2307	0	0	1727	536
V/C Ratio(X)				0.87	0.00	0.87	0.92	0.50	0.00	0.00	0.54	1.01
Avail Cap(c_a), veh/h				1125	0	501	1045	2307	0	0	1727	536
HCM Platoon Ratio				1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.66	0.66	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				42.0	0.0	42.1	37.1	3.5	0.0	0.0	32.1	39.7
Incr Delay (d2), s/veh				6.5	0.0	13.3	8.7	0.5	0.0	0.0	1.2	41.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				12.4	0.0	11.8	12.5	2.4	0.0	0.0	7.5	21.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				48.6	0.0	55.4	45.8	4.0	0.0	0.0	33.3	81.4
LnGrp LOS				D	A	E	D	A	A	A	C	F
Approach Vol, veh/h					1188			2018			1471	
Approach Delay, s/veh					50.7			22.0			51.0	
Approach LOS					D			C			D	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		83.0			37.3	45.7		37.0				
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1				
Max Green Setting (Gmax), s		71.9			* 36	30.9		37.9				
Max Q Clear Time (g_c+I1), s		11.3			30.8	42.6		28.5				
Green Ext Time (p_c), s		11.9			1.8	0.0		3.4				

Intersection Summary

HCM 6th Ctrl Delay	38.4
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

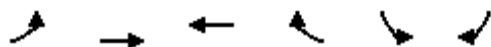
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX F

INTERSECTION ANALYSIS WORKSHEETS – EXISTING + CUMULATIVE PROJECTS + PROJECT

Near-Term + Proj AM
1: Barham Dr & SR-78 EB Off

Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↙	↗
Traffic Volume (veh/h)	0	628	947	0	468	27
Future Volume (veh/h)	0	628	947	0	468	27
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	683	1029	0	509	29
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	1082	1082	0	545	485
Arrive On Green	0.00	0.58	0.58	0.00	0.31	0.31
Sat Flow, veh/h	0	1870	1870	0	1781	1585
Grp Volume(v), veh/h	0	683	1029	0	509	29
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	18.9	40.1	0.0	21.6	1.0
Cycle Q Clear(g_c), s	0.0	18.9	40.1	0.0	21.6	1.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1082	1082	0	545	485
V/C Ratio(X)	0.00	0.63	0.95	0.00	0.93	0.06
Avail Cap(c_a), veh/h	0	1118	1118	0	561	499
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	10.9	15.4	0.0	26.2	19.1
Incr Delay (d2), s/veh	0.0	1.1	16.3	0.0	22.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.0	19.2	0.0	12.0	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	12.0	31.7	0.0	48.8	19.1
LnGrp LOS	A	B	C	A	D	B
Approach Vol, veh/h		683	1029		538	
Approach Delay, s/veh		12.0	31.7		47.2	
Approach LOS		B	C		D	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		49.5		28.3		49.5
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		46.5		24.5		46.5
Max Q Clear Time (g_c+I1), s		20.9		23.6		42.1
Green Ext Time (p_c), s		5.2		0.2		2.9
Intersection Summary						
HCM 6th Ctrl Delay			29.4			
HCM 6th LOS			C			

Intersection

Intersection Delay, s/veh73.4

Intersection LOS F

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↘	↑	↗	↘
Traffic Vol, veh/h	217	38	614	310	177	186
Future Vol, veh/h	217	38	614	310	177	186
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	236	41	667	337	192	202
Number of Lanes	1	1	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	15.5	112.3	15.2
HCM LOS	C	F	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	177	186	217	38	614	310
LT Vol	177	0	0	0	614	0
Through Vol	0	0	217	0	0	310
RT Vol	0	186	0	38	0	0
Lane Flow Rate	192	202	236	41	667	337
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.418	0.372	0.466	0.074	1.275	0.596
Departure Headway (Hd)	8.209	6.985	7.48	6.761	6.875	6.365
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	441	518	486	533	534	566
Service Time	5.909	4.685	5.18	4.461	4.608	4.099
HCM Lane V/C Ratio	0.435	0.39	0.486	0.077	1.249	0.595
HCM Control Delay	16.7	13.8	16.5	10	159.8	18.1
HCM Lane LOS	C	B	C	A	F	C
HCM 95th-tile Q	2	1.7	2.4	0.2	27.1	3.9

Near-Term + Proj AM
3: Woodland Pkwy & Rancheros Dr

Sunrise Residential
09/16/2019



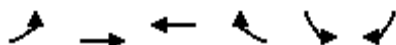
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	59	81	299	77	248	10	212	150	52	15	426	518
Future Volume (veh/h)	59	81	299	77	248	10	212	150	52	15	426	518
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	64	88	325	84	270	11	230	163	57	16	463	563
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	89	384	567	108	385	16	271	1215	410	34	622	606
Arrive On Green	0.05	0.21	0.21	0.06	0.22	0.22	0.15	0.47	0.47	0.02	0.33	0.33
Sat Flow, veh/h	1781	1870	1585	1781	1785	73	1781	2608	881	1781	1870	1585
Grp Volume(v), veh/h	64	88	325	84	0	281	230	109	111	16	463	563
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1857	1781	1777	1712	1781	1870	1585
Q Serve(g_s), s	2.6	2.8	12.0	3.4	0.0	10.1	9.1	2.5	2.7	0.6	15.8	24.0
Cycle Q Clear(g_c), s	2.6	2.8	12.0	3.4	0.0	10.1	9.1	2.5	2.7	0.6	15.8	24.0
Prop In Lane	1.00		1.00	1.00		0.04	1.00		0.51	1.00		1.00
Lane Grp Cap(c), veh/h	89	384	567	108	0	401	271	828	797	34	622	606
V/C Ratio(X)	0.72	0.23	0.57	0.78	0.00	0.70	0.85	0.13	0.14	0.47	0.74	0.93
Avail Cap(c_a), veh/h	210	508	672	170	0	463	284	828	797	123	622	606
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.8	23.9	18.7	33.4	0.0	26.2	29.8	11.0	11.0	35.0	21.4	21.3
Incr Delay (d2), s/veh	10.2	0.3	0.9	11.3	0.0	3.9	20.1	0.1	0.1	9.9	4.8	20.8
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	1.3	1.2	4.2	1.7	0.0	4.7	5.2	0.9	0.9	0.4	7.3	11.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.0	24.2	19.7	44.7	0.0	30.1	49.9	11.0	11.1	44.9	26.2	42.1
LnGrp LOS	D	C	B	D	A	C	D	B	B	D	C	D
Approach Vol, veh/h	477			365			450			1042		
Approach Delay, s/veh	23.8			33.4			30.9			35.1		
Approach LOS	C			C			C			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.9	38.1	8.9	19.3	15.5	28.5	8.1	20.1				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	30.5	6.9	19.6	11.5	24.0	8.5	18.0				
Max Q Clear Time (g_c+I), s	12.6	4.7	5.4	14.0	11.1	26.0	4.6	12.1				
Green Ext Time (p_c), s	0.0	1.3	0.0	0.8	0.0	0.0	0.0	0.8				

Intersection Summary

HCM 6th Ctrl Delay	31.7
HCM 6th LOS	C

Near-Term + Proj AM
4: Barham Dr & Woodland Pkwy

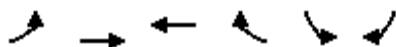
Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	316	901	507	317	312	611
Future Volume (veh/h)	316	901	507	317	312	611
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1900
Adj Flow Rate, veh/h	343	979	551	345	339	596
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	381	1119	635	1034	558	504
Arrive On Green	0.21	0.60	0.34	0.34	0.31	0.31
Sat Flow, veh/h	1781	1870	1870	1585	1781	1610
Grp Volume(v), veh/h	343	979	551	345	339	596
Grp Sat Flow(s), veh/h/ln	1781	1870	1870	1585	1781	1610
Q Serve(g_s), s	19.0	44.7	27.9	9.8	16.3	31.7
Cycle Q Clear(g_c), s	19.0	44.7	27.9	9.8	16.3	31.7
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	381	1119	635	1034	558	504
V/C Ratio(X)	0.90	0.88	0.87	0.33	0.61	1.18
Avail Cap(c_a), veh/h	519	1465	837	1205	558	504
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	38.7	17.2	31.3	7.8	29.5	34.8
Incr Delay (d2), s/veh	14.8	5.0	7.7	0.2	1.9	100.9
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.7	18.8	13.6	7.0	7.2	38.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	53.6	22.1	39.0	8.0	31.4	135.7
LnGrp LOS	D	C	D	A	C	F
Approach Vol, veh/h		1322	896		935	
Approach Delay, s/veh		30.3	27.0		97.9	
Approach LOS		C	C		F	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		65.1		36.2	26.2	38.9
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		79.3		31.7	29.5	45.3
Max Q Clear Time (g_c+I1), s		46.7		33.7	21.0	29.9
Green Ext Time (p_c), s		9.9		0.0	0.7	4.4
Intersection Summary						
HCM 6th Ctrl Delay			49.4			
HCM 6th LOS			D			
Notes						
User approved volume balancing among the lanes for turning movement.						

Near-Term + Proj AM
5: Barham Dr & SR-78 EB On

Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	301	608	723	73	0	0
Future Volume (veh/h)	301	608	723	73	0	0
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Work Zone On Approach		No	No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870		
Adj Flow Rate, veh/h	327	661	786	79		
Peak Hour Factor	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2		
Cap, veh/h	403	1680	953	96		
Arrive On Green	0.23	0.90	0.57	0.57		
Sat Flow, veh/h	1781	1870	1672	168		
Grp Volume(v), veh/h	327	661	0	865		
Grp Sat Flow(s), veh/h/ln	1781	1870	0	1840		
Q Serve(g_s), s	7.7	2.5	0.0	16.8		
Cycle Q Clear(g_c), s	7.7	2.5	0.0	16.8		
Prop In Lane	1.00			0.09		
Lane Grp Cap(c), veh/h	403	1680	0	1049		
V/C Ratio(X)	0.81	0.39	0.00	0.82		
Avail Cap(c_a), veh/h	605	2352	0	1501		
HCM Platoon Ratio	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	16.2	0.4	0.0	7.7		
Incr Delay (d2), s/veh	5.1	0.2	0.0	2.6		
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%),veh/ln	8.2	0.1	0.0	4.7		
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	21.2	0.5	0.0	10.3		
LnGrp LOS	C	A	A	B		
Approach Vol, veh/h		988	865			
Approach Delay, s/veh		7.4	10.3			
Approach LOS		A	B			
Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		44.1			14.5	29.6
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		55.5			15.0	36.0
Max Q Clear Time (g_c+I1), s		4.5			9.7	18.8
Green Ext Time (p_c), s		5.5			0.5	6.3
Intersection Summary						
HCM 6th Ctrl Delay			8.8			
HCM 6th LOS			A			

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	608	0	0	871	0	0
Future Vol, veh/h	608	0	0	871	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	661	0	0	947	0	0
Major/Minor	Major1	Major2		Minor1		
Conflicting Flow All	0	0	661	0	1608	661
Stage 1	-	-	-	-	661	-
Stage 2	-	-	-	-	947	-
Critical Hdwy	-	-	4.12	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	-	-	2.218	-	3.518	3.318
Pot Cap-1 Maneuver	-	-	927	-	115	462
Stage 1	-	-	-	-	514	-
Stage 2	-	-	-	-	377	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	927	-	115	462
Mov Cap-2 Maneuver	-	-	-	-	115	-
Stage 1	-	-	-	-	514	-
Stage 2	-	-	-	-	377	-
Approach	EB	WB		NB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT	
Capacity (veh/h)	-	-	-	927	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	-	0	-	
HCM Lane LOS	A	-	-	A	-	
HCM 95th %tile Q(veh)	-	-	-	0	-	

Intersection						
Int Delay, s/veh	76.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	304	353	40	576	295	46
Future Vol, veh/h	304	353	40	576	295	46
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	80	0
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	330	384	43	626	321	50

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	714
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	886
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	886
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.6	\$ 358.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	181	555	-	-	886	-
HCM Lane V/C Ratio	1.772	0.09	-	-	0.049	-
HCM Control Delay (s)	\$ 413	12.1	-	-	9.3	0
HCM Lane LOS	F	B	-	-	A	A
HCM 95th %tile Q(veh)	22.7	0.3	-	-	0.2	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Near-Term + Proj AM
8: Barham Dr & Mission Rd

Sunrise Residential
09/16/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	795	90	565	870	6	97	3	277	13	18	1
Future Volume (veh/h)	0	795	90	565	870	6	97	3	277	13	18	1
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	864	98	614	946	7	105	3	301	14	20	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	2	1016	453	646	2509	19	242	7	389	23	32	2
Arrive On Green	0.00	0.29	0.29	0.36	0.69	0.69	0.14	0.14	0.14	0.03	0.03	0.03
Sat Flow, veh/h	1781	3554	1585	1781	3616	27	1734	50	2790	730	1043	52
Grp Volume(v), veh/h	0	864	98	614	465	488	108	0	301	35	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1866	1784	0	1395	1824	0	0
Q Serve(g_s), s	0.0	22.9	4.7	33.4	10.8	10.8	5.5	0.0	10.4	1.9	0.0	0.0
Cycle Q Clear(g_c), s	0.0	22.9	4.7	33.4	10.8	10.8	5.5	0.0	10.4	1.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.01	0.97		1.00	0.40		0.03
Lane Grp Cap(c), veh/h	2	1016	453	646	1233	1295	249	0	389	57	0	0
V/C Ratio(X)	0.00	0.85	0.22	0.95	0.38	0.38	0.43	0.00	0.77	0.62	0.00	0.00
Avail Cap(c_a), veh/h	89	1154	515	689	1233	1295	465	0	727	91	0	0
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)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	33.6	27.1	30.9	6.3	6.3	39.3	0.0	41.4	47.7	0.0	0.0
Incr Delay (d2), s/veh	0.0	5.6	0.2	22.1	0.2	0.2	1.2	0.0	3.3	10.4	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.4	1.8	17.8	3.6	3.8	2.5	0.0	3.7	1.0	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	39.2	27.3	53.0	6.5	6.5	40.5	0.0	44.7	58.1	0.0	0.0
LnGrp LOS	A	D	C	D	A	A	D	A	D	E	A	A
Approach Vol, veh/h		962			1567			409			35	
Approach Delay, s/veh		38.0			24.7			43.6			58.1	
Approach LOS		D			C			D			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	40.7	33.0		7.6	0.0	73.7		18.4				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	38.6	32.4		5.0	5.0	66.0		26.0				
Max Q Clear Time (g_c+I1), s	35.4	24.9		3.9	0.0	12.8		12.4				
Green Ext Time (p_c), s	0.8	3.7		0.0	0.0	7.7		1.5				
Intersection Summary												
HCM 6th Ctrl Delay			32.0									
HCM 6th LOS			C									

Near-Term + Proj AM
9: Auto Park Way/Nordahl Rd & Mission Rd

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑↑	↗	↔↔	↑↑	↗
Traffic Volume (veh/h)	299	374	276	71	581	259	410	895	39	309	1136	275
Future Volume (veh/h)	299	374	276	71	581	259	410	895	39	309	1136	275
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No		No				No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	325	407	300	77	632	0	446	973	42	336	1235	299
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	311	945	421	133	762		443	2133	662	402	1442	643
Arrive On Green	0.09	0.27	0.27	0.04	0.21	0.00	0.13	0.42	0.42	0.12	0.41	0.41
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	5106	1585	3456	3554	1585
Grp Volume(v), veh/h	325	407	300	77	632	0	446	973	42	336	1235	299
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1585	1728	1777	1585
Q Serve(g_s), s	10.8	11.4	20.6	2.6	20.4	0.0	15.4	16.4	1.9	11.4	38.0	16.6
Cycle Q Clear(g_c), s	10.8	11.4	20.6	2.6	20.4	0.0	15.4	16.4	1.9	11.4	38.0	16.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	311	945	421	133	762		443	2133	662	402	1442	643
V/C Ratio(X)	1.04	0.43	0.71	0.58	0.83		1.01	0.46	0.06	0.84	0.86	0.46
Avail Cap(c_a), veh/h	311	1131	505	190	1007		443	2133	662	521	1442	643
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)	0.50	0.50	0.50	1.00	1.00	0.00	1.00	1.00	1.00	0.75	0.75	0.75
Uniform Delay (d), s/veh	54.6	36.5	39.9	56.7	45.1	0.0	52.3	25.1	20.9	51.9	32.5	26.1
Incr Delay (d2), s/veh	48.4	0.2	1.9	3.9	4.5	0.0	44.2	0.7	0.2	7.0	5.2	1.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.8	5.0	8.2	1.2	9.4	0.0	9.4	6.8	0.7	5.3	17.1	6.6
Unsig. Movement Delay, s/veh	0.00											
LnGrp Delay(d),s/veh	103.0	36.7	41.8	60.7	49.6	0.0	96.5	25.8	21.1	58.9	37.7	27.9
LnGrp LOS	F	D	D	E	D	A	F	C	C	E	D	C
Approach Vol, veh/h	1032				991		A		1461		1870	
Approach Delay, s/veh	59.0				36.3				47.3		39.9	
Approach LOS	E				D				D		D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.2	37.2	20.0	53.6	15.4	31.0	18.5	55.0				
Change Period (Y+Rc), s	4.6	5.3	4.6	4.9	4.6	5.3	4.6	4.9				
Max Green Setting (Gmax), s	6.6	38.2	15.4	40.4	10.8	34.0	18.1	37.7				
Max Q Clear Time (g_c+I), s	14.6	22.6	17.4	40.0	12.8	22.4	13.4	18.4				
Green Ext Time (p_c), s	0.0	3.4	0.0	0.3	0.0	3.3	0.5	7.0				

Intersection Summary

HCM 6th Ctrl Delay 44.9
HCM 6th LOS D

Notes

Unsignalized Delay for [WBR] is included in calculations of the approach delay and intersection delay.

Near-Term + Proj AM
10: Nordahl Rd & SR-78 EB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	422	29	751	0	0	0	0	774	730	293	988	0
Future Volume (veh/h)	422	29	751	0	0	0	0	774	730	293	988	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	317	0	908				0	841	715	318	1074	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	569	0	1013				0	2052	637	391	2016	0
Arrive On Green	0.32	0.00	0.32				0.00	0.40	0.40	0.15	0.75	0.00
Sat Flow, veh/h	1781	0	3170				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	317	0	908				0	841	715	318	1074	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	13.3	0.0	24.6				0.0	10.6	36.2	8.0	11.2	0.0
Cycle Q Clear(g_c), s	13.3	0.0	24.6				0.0	10.6	36.2	8.0	11.2	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	569	0	1013				0	2052	637	391	2016	0
V/C Ratio(X)	0.56	0.00	0.90				0.00	0.41	1.12	0.81	0.53	0.00
Avail Cap(c_a), veh/h	612	0	1088				0	2052	637	434	2016	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.33	1.33	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.74	0.74	0.88	0.88	0.00
Uniform Delay (d), s/veh	25.4	0.0	29.2				0.0	19.3	26.9	37.3	6.2	0.0
Incr Delay (d2), s/veh	1.0	0.0	9.5				0.0	0.4	70.1	9.3	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.6	0.0	10.3				0.0	4.1	25.3	3.7	3.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	26.3	0.0	38.7				0.0	19.7	97.0	46.6	7.0	0.0
LnGrp LOS	C	A	D				A	B	F	D	A	A
Approach Vol, veh/h	1225						1556			1392		
Approach Delay, s/veh	35.5						55.2			16.1		
Approach LOS	D						E			B		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	41.9	41.3	33.9	56.1								
Change Period (Y+Rc), s	4.7	5.1	5.1	5.1								
Max Green Setting (Gmax), s	31.5	32.9	30.9	48.9								
Max Q Clear Time (g_c+I10), s	41.0	38.2	26.6	13.2								
Green Ext Time (p_c), s	0.2	0.0	2.2	9.8								

Intersection Summary

HCM 6th Ctrl Delay	36.4
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

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

Near-Term + Proj AM
11: Nordahl Rd & SR-78 WB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↱	↰	↰	↱			↱	↰
Traffic Volume (veh/h)	0	0	0	489	0	162	533	678	0	0	693	342
Future Volume (veh/h)	0	0	0	489	0	162	533	678	0	0	693	342
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				587	0	117	579	737	0	0	753	372
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				722	0	321	702	2431	0	0	2188	679
Arrive On Green				0.20	0.00	0.20	0.07	0.23	0.00	0.00	0.43	0.43
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				587	0	117	579	737	0	0	753	372
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				14.2	0.0	5.7	14.9	15.5	0.0	0.0	8.9	15.8
Cycle Q Clear(g_c), s				14.2	0.0	5.7	14.9	15.5	0.0	0.0	8.9	15.8
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				722	0	321	702	2431	0	0	2188	679
V/C Ratio(X)				0.81	0.00	0.36	0.82	0.30	0.00	0.00	0.34	0.55
Avail Cap(c_a), veh/h				1065	0	474	933	2431	0	0	2188	679
HCM Platoon Ratio				1.00	1.00	1.00	0.33	0.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.83	0.83	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				34.3	0.0	30.9	40.4	17.0	0.0	0.0	17.2	19.2
Incr Delay (d2), s/veh				3.1	0.0	0.7	3.9	0.3	0.0	0.0	0.4	3.2
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				6.3	0.0	2.2	7.2	7.4	0.0	0.0	3.4	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				37.4	0.0	31.6	44.3	17.3	0.0	0.0	17.7	22.4
LnGrp LOS				D	A	C	D	B	A	A	B	C
Approach Vol, veh/h					704			1316			1125	
Approach Delay, s/veh					36.4			29.1			19.2	
Approach LOS					D			C			B	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		66.7			23.0	43.7		23.3				
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1				
Max Green Setting (Gmax), s		52.9			* 24	23.9		26.9				
Max Q Clear Time (g_c+I1), s		17.5			16.9	17.8		16.2				
Green Ext Time (p_c), s		5.9			1.4	3.3		2.1				

Intersection Summary

HCM 6th Ctrl Delay	27.2
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

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

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	95	3	0	189	387	25
Future Vol, veh/h	95	3	0	189	387	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
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	103	3	0	205	421	27

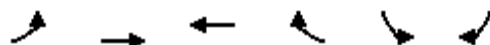
Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	640	435	448
Stage 1	435	-	-
Stage 2	205	-	-
Critical Hdwy	6.42	6.22	4.12
Critical Hdwy Stg 1	5.42	-	-
Critical Hdwy Stg 2	5.42	-	-
Follow-up Hdwy	3.518	3.318	2.218
Pot Cap-1 Maneuver	440	621	1112
Stage 1	653	-	-
Stage 2	829	-	-
Platoon blocked, %			
Mov Cap-1 Maneuver	440	621	1112
Mov Cap-2 Maneuver	440	-	-
Stage 1	653	-	-
Stage 2	829	-	-

Approach	EB	NB	SB
HCM Control Delay, s	15.6	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1112	-	444	-	-
HCM Lane V/C Ratio	-	-	0.24	-	-
HCM Control Delay (s)	0	-	15.6	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	0.9	-	-

Near-Term + Proj PM
1: Barham Dr & SR-78 EB Off

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Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↘	↗
Traffic Volume (veh/h)	0	1041	734	0	270	15
Future Volume (veh/h)	0	1041	734	0	270	15
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1870	1870	0	1870	1870
Adj Flow Rate, veh/h	0	1132	798	0	293	16
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	0	2	2
Cap, veh/h	0	1169	1169	0	363	323
Arrive On Green	0.00	0.62	0.62	0.00	0.20	0.20
Sat Flow, veh/h	0	1870	1870	0	1781	1585
Grp Volume(v), veh/h	0	1132	798	0	293	16
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	30.2	14.7	0.0	8.2	0.4
Cycle Q Clear(g_c), s	0.0	30.2	14.7	0.0	8.2	0.4
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1169	1169	0	363	323
V/C Ratio(X)	0.00	0.97	0.68	0.00	0.81	0.05
Avail Cap(c_a), veh/h	0	1175	1175	0	610	543
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	9.4	6.4	0.0	19.9	16.8
Incr Delay (d2), s/veh	0.0	19.0	1.6	0.0	4.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.6	4.1	0.0	3.5	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	28.4	8.1	0.0	24.2	16.9
LnGrp LOS	A	C	A	A	C	B
Approach Vol, veh/h		1132	798		309	
Approach Delay, s/veh		28.4	8.1		23.8	
Approach LOS		C	A		C	
Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		37.3		15.2		37.3
Change Period (Y+Rc), s		4.5		4.5		4.5
Max Green Setting (Gmax), s		33.0		18.0		33.0
Max Q Clear Time (g_c+I1), s		32.2		10.2		16.7
Green Ext Time (p_c), s		0.6		0.6		5.4
Intersection Summary						
HCM 6th Ctrl Delay			20.5			
HCM 6th LOS			C			

Intersection

Intersection Delay, s/veh53.5

Intersection LOS F

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Vol, veh/h	477	75	491	200	90	233
Future Vol, veh/h	477	75	491	200	90	233
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	518	82	534	217	98	253
Number of Lanes	1	1	1	1	1	1

Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	56.8	68.4	16
HCM LOS	F	F	C

Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2
Vol Left, %	100%	0%	0%	0%	100%	0%
Vol Thru, %	0%	0%	100%	0%	0%	100%
Vol Right, %	0%	100%	0%	100%	0%	0%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	90	233	477	75	491	200
LT Vol	90	0	0	0	491	0
Through Vol	0	0	477	0	0	200
RT Vol	0	233	0	75	0	0
Lane Flow Rate	98	253	518	82	534	217
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.224	0.496	0.991	0.14	1.08	0.409
Departure Headway (Hd)	8.514	7.276	7.104	6.386	7.287	6.775
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	425	499	513	565	496	530
Service Time	6.214	4.976	4.804	4.086	5.053	4.541
HCM Lane V/C Ratio	0.231	0.507	1.01	0.145	1.077	0.409
HCM Control Delay	13.7	16.9	64.1	10.1	90.5	14.2
HCM Lane LOS	B	C	F	B	F	B
HCM 95th-tile Q	0.8	2.7	13.4	0.5	16.7	2

Near-Term + Proj PM
3: Woodland Pkwy & Rancheros Dr

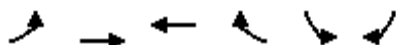
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09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	159	153	428	53	133	29	154	388	46	14	368	466
Future Volume (veh/h)	159	153	428	53	133	29	154	388	46	14	368	466
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	173	166	465	58	145	32	167	422	50	15	400	507
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	214	537	640	85	319	70	207	1269	150	32	557	663
Arrive On Green	0.12	0.29	0.29	0.05	0.21	0.21	0.12	0.40	0.40	0.02	0.30	0.30
Sat Flow, veh/h	1781	1870	1585	1781	1484	327	1781	3202	377	1781	1870	1585
Grp Volume(v), veh/h	173	166	465	58	0	177	167	233	239	15	400	507
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1811	1781	1777	1802	1781	1870	1585
Q Serve(g_s), s	6.8	5.0	17.8	2.3	0.0	6.1	6.6	6.5	6.6	0.6	13.7	19.6
Cycle Q Clear(g_c), s	6.8	5.0	17.8	2.3	0.0	6.1	6.6	6.5	6.6	0.6	13.7	19.6
Prop In Lane	1.00		1.00	1.00		0.18	1.00		0.21	1.00		1.00
Lane Grp Cap(c), veh/h	214	537	640	85	0	389	207	704	715	32	557	663
V/C Ratio(X)	0.81	0.31	0.73	0.68	0.00	0.46	0.81	0.33	0.33	0.47	0.72	0.76
Avail Cap(c_a), veh/h	285	589	683	171	0	454	275	704	715	124	557	663
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	30.8	20.0	18.1	33.7	0.0	24.5	30.9	15.1	15.1	34.9	22.5	17.9
Incr Delay (d2), s/veh	11.9	0.3	3.6	9.2	0.0	0.8	12.1	0.3	0.3	10.2	4.4	5.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	2.1	6.6	1.2	0.0	2.6	3.4	2.5	2.6	0.3	6.4	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.7	20.3	21.7	42.9	0.0	25.4	43.0	15.3	15.3	45.1	26.9	23.2
LnGrp LOS	D	C	C	D	A	C	D	B	B	D	C	C
Approach Vol, veh/h	804		235			639			922			
Approach Delay, s/veh	25.9		29.7			22.6			25.2			
Approach LOS	C		C			C			C			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.8	33.0	7.9	25.1	12.9	25.9	13.1	19.9				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.8	27.5	6.9	22.6	11.1	21.4	11.5	18.0				
Max Q Clear Time (g_c+I), s	12.6	8.6	4.3	19.8	8.6	21.6	8.8	8.1				
Green Ext Time (p_c), s	0.0	2.7	0.0	0.8	0.1	0.0	0.1	0.6				
Intersection Summary												
HCM 6th Ctrl Delay			25.2									
HCM 6th LOS			C									

Near-Term + Proj PM
4: Barham Dr & Woodland Pkwy

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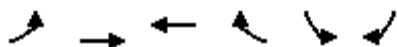
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	399	1089	391	334	517	364
Future Volume (veh/h)	399	1089	391	334	517	364
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1900
Adj Flow Rate, veh/h	434	1184	425	363	459	467
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	0
Cap, veh/h	472	1212	623	926	448	405
Arrive On Green	0.27	0.65	0.33	0.33	0.25	0.25
Sat Flow, veh/h	1781	1870	1870	1585	1781	1610
Grp Volume(v), veh/h	434	1184	425	363	459	467
Grp Sat Flow(s), veh/h/ln	1781	1870	1870	1585	1781	1610
Q Serve(g_s), s	21.2	54.3	17.6	11.1	22.5	22.5
Cycle Q Clear(g_c), s	21.2	54.3	17.6	11.1	22.5	22.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	472	1212	623	926	448	405
V/C Ratio(X)	0.92	0.98	0.68	0.39	1.03	1.15
Avail Cap(c_a), veh/h	533	1222	623	926	448	405
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.0	15.1	25.8	10.0	33.5	33.5
Incr Delay (d2), s/veh	19.8	20.2	3.1	0.3	49.2	94.0
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	1.4	25.7	8.1	6.5	15.5	10.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	51.8	35.3	28.8	10.3	82.7	127.5
LnGrp LOS	D	D	C	B	F	F
Approach Vol, veh/h		1618	788		926	
Approach Delay, s/veh		39.7	20.3		105.3	
Approach LOS		D	C		F	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		62.5		27.0	28.2	34.3
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		58.5		22.5	26.8	27.2
Max Q Clear Time (g_c+I1), s		56.3		24.5	23.2	19.6
Green Ext Time (p_c), s		1.7		0.0	0.5	2.5
Intersection Summary						
HCM 6th Ctrl Delay			53.4			
HCM 6th LOS			D			

Notes

User approved volume balancing among the lanes for turning movement.

Near-Term + Proj PM
5: Barham Dr & SR-78 EB On

Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	743	783	681	87	0	0
Future Volume (veh/h)	743	783	681	87	0	0
Initial Q (Qb), veh	0	0	0	0		
Ped-Bike Adj(A_pbT)	1.00			1.00		
Parking Bus, Adj	1.00	1.00	1.00	1.00		
Work Zone On Approach		No	No			
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870		
Adj Flow Rate, veh/h	808	851	740	95		
Peak Hour Factor	0.92	0.92	0.92	0.92		
Percent Heavy Veh, %	2	2	2	2		
Cap, veh/h	802	1777	731	94		
Arrive On Green	0.45	0.95	0.45	0.45		
Sat Flow, veh/h	1781	1870	1624	209		
Grp Volume(v), veh/h	808	851	0	835		
Grp Sat Flow(s), veh/h/ln	1781	1870	0	1833		
Q Serve(g_s), s	40.5	3.8	0.0	40.5		
Cycle Q Clear(g_c), s	40.5	3.8	0.0	40.5		
Prop In Lane	1.00			0.11		
Lane Grp Cap(c), veh/h	802	1777	0	825		
V/C Ratio(X)	1.01	0.48	0.00	1.01		
Avail Cap(c_a), veh/h	802	1777	0	825		
HCM Platoon Ratio	1.00	1.00	1.00	1.00		
Upstream Filter(I)	1.00	1.00	0.00	1.00		
Uniform Delay (d), s/veh	24.8	0.2	0.0	24.8		
Incr Delay (d2), s/veh	33.8	0.2	0.0	34.4		
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0		
%ile BackOfQ(50%), veh	28.3	0.1	0.0	24.2		
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	58.5	0.4	0.0	59.2		
LnGrp LOS	F	A	A	F		
Approach Vol, veh/h		1659	835			
Approach Delay, s/veh		28.7	59.2			
Approach LOS		C	E			
Timer - Assigned Phs		2			5	6
Phs Duration (G+Y+Rc), s		90.0			45.0	45.0
Change Period (Y+Rc), s		4.5			4.5	4.5
Max Green Setting (Gmax), s		85.5			40.5	40.5
Max Q Clear Time (g_c+I1), s		5.8			42.5	42.5
Green Ext Time (p_c), s		8.5			0.0	0.0
Intersection Summary						
HCM 6th Ctrl Delay			38.9			
HCM 6th LOS			D			

Intersection						
Int Delay, s/veh	0					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↱		↱	↱	↱	↱
Traffic Vol, veh/h	783	0	0	743	0	0
Future Vol, veh/h	783	0	0	743	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	0	100
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	851	0	0	808	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	851
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	788
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	788
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

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

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	788	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Intersection						
Int Delay, s/veh	81.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	566	302	86	532	211	38
Future Vol, veh/h	566	302	86	532	211	38
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	80	0
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	615	328	93	578	229	41

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	943
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.12
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.218
Pot Cap-1 Maneuver	-	-	727
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	727
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.5	\$ 561.4
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	102	396	-	-	727	-
HCM Lane V/C Ratio	2.249	0.104	-	-	0.129	-
HCM Control Delay (s)	\$ 659.8	15.1	-	-	10.7	0
HCM Lane LOS	F	C	-	-	B	A
HCM 95th %tile Q(veh)	20.2	0.3	-	-	0.4	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Near-Term + Proj PM
8: Barham Dr & Mission Rd

Sunrise Residential
09/16/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	841	68	491	1025	0	115	5	538	12	1	0
Future Volume (veh/h)	0	841	68	491	1025	0	115	5	538	12	1	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	914	74	534	1114	0	125	5	585	13	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	2	1002	447	562	2264	0	390	16	634	26	2	0
Arrive On Green	0.00	0.28	0.28	0.32	0.64	0.00	0.23	0.23	0.23	0.02	0.02	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3647	0	1716	69	2790	1660	128	0
Grp Volume(v), veh/h	0	914	74	534	1114	0	130	0	585	14	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	0	1785	0	1395	1787	0	0
Q Serve(g_s), s	0.0	28.0	4.0	33.1	18.7	0.0	6.8	0.0	23.1	0.9	0.0	0.0
Cycle Q Clear(g_c), s	0.0	28.0	4.0	33.1	18.7	0.0	6.8	0.0	23.1	0.9	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.00	0.96		1.00	0.93		0.00
Lane Grp Cap(c), veh/h	2	1002	447	562	2264	0	406	0	634	28	0	0
V/C Ratio(X)	0.00	0.91	0.17	0.95	0.49	0.00	0.32	0.00	0.92	0.50	0.00	0.00
Avail Cap(c_a), veh/h	79	1040	464	592	2264	0	419	0	655	79	0	0
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)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	39.2	30.5	37.7	10.8	0.0	36.3	0.0	42.6	55.1	0.0	0.0
Incr Delay (d2), s/veh	0.0	11.7	0.2	24.7	0.2	0.0	0.5	0.0	18.4	13.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.7	1.5	18.0	6.9	0.0	3.0	0.0	9.5	0.5	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	50.9	30.7	62.4	11.0	0.0	36.8	0.0	61.0	68.0	0.0	0.0
LnGrp LOS	A	D	C	E	B	A	D	A	E	E	A	A
Approach Vol, veh/h		988			1648			715			14	
Approach Delay, s/veh		49.3			27.6			56.6			68.0	
Approach LOS		D			C			E			E	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	40.1	36.3		6.3	0.0	76.4		30.1				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	37.5	33.0		5.0	5.0	65.5		26.5				
Max Q Clear Time (g_c+I1), s	35.1	30.0		2.9	0.0	20.7		25.1				
Green Ext Time (p_c), s	0.5	1.8		0.0	0.0	10.9		0.5				
Intersection Summary												
HCM 6th Ctrl Delay			40.3									
HCM 6th LOS			D									

Near-Term + Proj PM
9: Auto Park Way/Nordahl Rd & Mission Rd

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑	↗	↔↔	↑↑	↗	↔↔	↑↑↑	↗	↔↔	↑↑	↗
Traffic Volume (veh/h)	495	747	288	55	693	492	502	1159	54	188	700	590
Future Volume (veh/h)	495	747	288	55	693	492	502	1159	54	188	700	590
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	538	812	313	60	753	0	546	1260	59	204	761	577
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	472	1229	548	125	871		501	1946	604	260	1107	494
Arrive On Green	0.14	0.35	0.35	0.04	0.25	0.00	0.14	0.38	0.38	0.02	0.10	0.10
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	5106	1585	3456	3554	1585
Grp Volume(v), veh/h	538	812	313	60	753	0	546	1260	59	204	761	577
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1585	1728	1777	1585
Q Serve(g_s), s	16.4	23.3	19.3	2.0	24.4	0.0	17.4	24.3	2.9	7.0	24.8	37.4
Cycle Q Clear(g_c), s	16.4	23.3	19.3	2.0	24.4	0.0	17.4	24.3	2.9	7.0	24.8	37.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	472	1229	548	125	871		501	1946	604	260	1107	494
V/C Ratio(X)	1.14	0.66	0.57	0.48	0.86		1.09	0.65	0.10	0.78	0.69	1.17
Avail Cap(c_a), veh/h	472	1333	594	156	1007		501	1946	604	265	1107	494
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.33	0.33	0.33
Upstream Filter(I)	0.32	0.32	0.32	1.00	1.00	0.00	1.00	1.00	1.00	0.78	0.78	0.78
Uniform Delay (d), s/veh	51.8	33.3	32.0	56.7	43.4	0.0	51.3	30.5	23.9	57.5	48.2	53.8
Incr Delay (d2), s/veh	71.4	0.4	0.4	2.9	7.1	0.0	66.7	1.7	0.3	11.2	2.7	92.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.8	10.0	7.4	0.9	11.5	0.0	12.1	10.2	1.1	3.6	12.3	28.6
Unsig. Movement Delay, s/veh	0.00											
LnGrp Delay(d),s/veh	123.2	33.6	32.4	59.6	50.5	0.0	118.0	32.2	24.2	68.7	50.9	145.8
LnGrp LOS	F	C	C	E	D	A	F	C	C	E	D	F
Approach Vol, veh/h	1663			1348			1865			1542		
Approach Delay, s/veh	62.4			30.9			57.1			88.8		
Approach LOS	E			C			E			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.9	46.8	22.0	42.3	21.0	34.7	13.6	50.6				
Change Period (Y+Rc), s	4.6	5.3	4.6	4.9	4.6	5.3	4.6	4.9				
Max Green Setting (Gmax), s	5.4	45.0	17.4	32.8	16.4	34.0	9.2	41.0				
Max Q Clear Time (g_c+I), s	14.0	25.3	19.4	39.4	18.4	26.4	9.0	26.3				
Green Ext Time (p_c), s	0.0	6.9	0.0	0.0	0.0	3.1	0.0	7.9				

Intersection Summary

HCM 6th Ctrl Delay 60.6
HCM 6th LOS E

Notes

Unsignalized Delay for [WBR] is included in calculations of the approach delay and intersection delay.

Near-Term + Proj PM
10: Nordahl Rd & SR-78 EB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	602	69	471	0	0	0	0	1255	999	563	1084	0
Future Volume (veh/h)	602	69	471	0	0	0	0	1255	999	563	1084	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	828	0	332				0	1364	978	612	1178	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	864	0	384				0	2387	741	573	2390	0
Arrive On Green	0.24	0.00	0.24				0.00	0.93	0.93	0.33	1.00	0.00
Sat Flow, veh/h	3563	0	1585				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	828	0	332				0	1364	978	612	1178	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	27.5	0.0	24.1				0.0	4.5	56.1	19.9	0.0	0.0
Cycle Q Clear(g_c), s	27.5	0.0	24.1				0.0	4.5	56.1	19.9	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	864	0	384				0	2387	741	573	2390	0
V/C Ratio(X)	0.96	0.00	0.86				0.00	0.57	1.32	1.07	0.49	0.00
Avail Cap(c_a), veh/h	864	0	384				0	2387	741	573	2390	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	2.00	2.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.39	0.39	0.65	0.65	0.00
Uniform Delay (d), s/veh	44.9	0.0	43.6				0.0	2.2	3.9	40.1	0.0	0.0
Incr Delay (d2), s/veh	21.1	0.0	18.0				0.0	0.4	147.7	50.1	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	11.3				0.0	0.9	31.8	11.1	0.2	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.0	0.0	61.6				0.0	2.6	151.6	90.2	0.5	0.0
LnGrp LOS	E	A	E				A	A	F	F	A	A
Approach Vol, veh/h	1160						2342			1790		
Approach Delay, s/veh	64.7						64.8			31.2		
Approach LOS	E						E			C		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	24.6	61.2	34.2	85.8								
Change Period (Y+Rc), s	4.7	5.1	5.1	5.1								
Max Green Setting (Gmax), s	20	56.1	29.1	80.7								
Max Q Clear Time (g_c+Y), s	21.9	58.1	29.5	2.0								
Green Ext Time (p_c), s	0.0	0.0	0.0	12.6								

Intersection Summary

HCM 6th Ctrl Delay 53.4
HCM 6th LOS D

Notes

User approved volume balancing among the lanes for turning movement.

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

Near-Term + Proj PM
11: Nordahl Rd & SR-78 WB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↰	↰	↰	↰			↰	↰
Traffic Volume (veh/h)	0	0	0	638	5	503	797	1062	0	0	860	552
Future Volume (veh/h)	0	0	0	638	5	503	797	1062	0	0	860	552
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				865	0	366	866	1154	0	0	935	542
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				983	0	437	939	2271	0	0	1675	520
Arrive On Green				0.28	0.00	0.28	0.36	0.85	0.00	0.00	0.33	0.33
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				865	0	366	866	1154	0	0	935	542
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				27.9	0.0	26.1	28.8	10.3	0.0	0.0	18.1	39.4
Cycle Q Clear(g_c), s				27.9	0.0	26.1	28.8	10.3	0.0	0.0	18.1	39.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				983	0	437	939	2271	0	0	1675	520
V/C Ratio(X)				0.88	0.00	0.84	0.92	0.51	0.00	0.00	0.56	1.04
Avail Cap(c_a), veh/h				1125	0	501	1045	2271	0	0	1675	520
HCM Platoon Ratio				1.00	1.00	1.00	1.33	1.33	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.66	0.66	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				41.5	0.0	40.9	37.1	4.0	0.0	0.0	33.2	40.3
Incr Delay (d2), s/veh				7.5	0.0	10.7	8.7	0.5	0.0	0.0	1.3	51.0
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				13.2	0.0	11.4	12.5	2.7	0.0	0.0	7.7	22.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				49.1	0.0	51.6	45.8	4.6	0.0	0.0	34.5	91.3
LnGrp LOS				D	A	D	D	A	A	A	C	F
Approach Vol, veh/h					1231			2020			1477	
Approach Delay, s/veh					49.8			22.2			55.3	
Approach LOS					D			C			E	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		81.8			37.3	44.5		38.2				
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1				
Max Green Setting (Gmax), s		71.9			* 36	30.9		37.9				
Max Q Clear Time (g_c+I1), s		12.3			30.8	41.4		29.9				
Green Ext Time (p_c), s		11.9			1.8	0.0		3.3				

Intersection Summary

HCM 6th Ctrl Delay	39.8
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

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

Intersection

Int Delay, s/veh 1

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations 

Traffic Vol, veh/h 45 1 0 171 236 108

Future Vol, veh/h 45 1 0 171 236 108

Conflicting Peds, #/hr 0 0 0 0 0 0

Sign Control Stop Stop Free Free Free Free

RT Channelized - None - None - None

Storage Length 0 - - - - -

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 49 1 0 186 257 117

Major/Minor Minor2 Major1 Major2

Conflicting Flow All 502 316 374 0 - 0

Stage 1 316 - - - - -

Stage 2 186 - - - - -

Critical Hdwy 6.42 6.22 4.12 - - -

Critical Hdwy Stg 1 5.42 - - - - -

Critical Hdwy Stg 2 5.42 - - - - -

Follow-up Hdwy 3.518 3.318 2.218 - - -

Pot Cap-1 Maneuver 529 724 1184 - - -

Stage 1 739 - - - - -

Stage 2 846 - - - - -

Platoon blocked, % - - -

Mov Cap-1 Maneuver 529 724 1184 - - -

Mov Cap-2 Maneuver 529 - - - - -

Stage 1 739 - - - - -

Stage 2 846 - - - - -

Approach EB NB SB

HCM Control Delay, s 12.5 0 0

HCM LOS B

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h) 1184 - 532 - -

HCM Lane V/C Ratio - - 0.094 - -

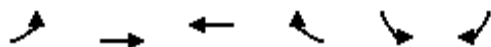
HCM Control Delay (s) 0 - 12.5 - -

HCM Lane LOS A - B - -

HCM 95th %tile Q(veh) 0 - 0.3 - -

APPENDIX G

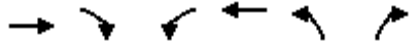
INTERSECTION ANALYSIS WORKSHEETS – YEAR 2035 WITHOUT PROJECT



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations	↰	↑↑↑	↑↑↑		↰	↰
Traffic Volume (veh/h)	315	570	1190	80	605	35
Future Volume (veh/h)	315	570	1190	80	605	35
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	342	620	1293	87	658	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	395	3178	1606	108	806	370
Arrive On Green	0.22	0.62	0.33	0.33	0.23	0.23
Sat Flow, veh/h	1781	5274	5055	329	3456	1585
Grp Volume(v), veh/h	342	620	901	479	658	38
Grp Sat Flow(s),veh/h/ln	1781	1702	1702	1811	1728	1585
Q Serve(g_s), s	11.5	3.3	15.1	15.1	11.2	1.2
Cycle Q Clear(g_c), s	11.5	3.3	15.1	15.1	11.2	1.2
Prop In Lane	1.00			0.18	1.00	1.00
Lane Grp Cap(c), veh/h	395	3178	1119	595	806	370
V/C Ratio(X)	0.87	0.20	0.81	0.81	0.82	0.10
Avail Cap(c_a), veh/h	471	3512	1195	636	1003	460
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.4	5.1	19.1	19.1	22.6	18.8
Incr Delay (d2), s/veh	13.7	0.0	3.9	7.1	4.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	0.9	6.0	6.9	4.7	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	37.0	5.1	23.0	26.2	27.0	18.9
LnGrp LOS	D	A	C	C	C	B
Approach Vol, veh/h		962	1380		696	
Approach Delay, s/veh		16.4	24.1		26.6	
Approach LOS		B	C		C	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		43.3		19.0	18.3	25.0
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		42.9		18.1	16.5	21.9
Max Q Clear Time (g_c+I1), s		5.3		13.2	13.5	17.1
Green Ext Time (p_c), s		4.9		1.3	0.3	3.4
Intersection Summary						
HCM 6th Ctrl Delay			22.3			
HCM 6th LOS			C			

Year 2035 AM
2: SR-78 WB Ramps & Rancheros Dr

Sunrise Residential
09/16/2019



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩		↩↩	↩	↩	↩↩
Traffic Volume (veh/h)	250	45	730	355	205	220
Future Volume (veh/h)	250	45	730	355	205	220
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	272	49	793	386	223	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	363	65	1039	1189	292	
Arrive On Green	0.24	0.24	0.30	0.64	0.16	0.00
Sat Flow, veh/h	1542	278	3456	1870	1781	2790
Grp Volume(v), veh/h	0	321	793	386	223	0
Grp Sat Flow(s), veh/h/ln	0	1820	1728	1870	1781	1395
Q Serve(g_s), s	0.0	7.4	9.4	4.3	5.4	0.0
Cycle Q Clear(g_c), s	0.0	7.4	9.4	4.3	5.4	0.0
Prop In Lane		0.15	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	0	428	1039	1189	292	
V/C Ratio(X)	0.00	0.75	0.76	0.32	0.76	
Avail Cap(c_a), veh/h	0	729	1514	1755	745	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	16.0	14.3	3.8	18.0	0.0
Incr Delay (d2), s/veh	0.0	2.7	1.4	0.2	4.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	2.9	3.2	0.9	2.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	18.6	15.7	3.9	22.1	0.0
LnGrp LOS	A	B	B	A	C	
Approach Vol, veh/h	321			1179	223	A
Approach Delay, s/veh	18.6			11.8	22.1	
Approach LOS	B			B	C	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		11.9	18.0	15.1		33.1
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		18.8	19.7	18.0		42.2
Max Q Clear Time (g_c+I1), s		7.4	11.4	9.4		6.3
Green Ext Time (p_c), s		0.5	2.2	1.2		2.6
Intersection Summary						
HCM 6th Ctrl Delay			14.4			
HCM 6th LOS			B			

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Year 2035 AM
3: Woodland Pkwy & Rancheros Dr

Sunrise Residential
09/16/2019



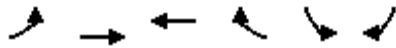
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	90	335	80	280	10	215	155	55	15	450	600
Future Volume (veh/h)	70	90	335	80	280	10	215	155	55	15	450	600
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	76	98	364	87	304	11	234	168	60	16	489	587
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	100	439	624	113	846	31	284	1104	381	34	1015	542
Arrive On Green	0.06	0.23	0.23	0.06	0.24	0.24	0.16	0.43	0.43	0.02	0.29	0.29
Sat Flow, veh/h	1781	1870	1585	1781	3498	126	1781	2592	894	1781	3554	1585
Grp Volume(v), veh/h	76	98	364	87	154	161	234	113	115	16	489	587
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1777	1848	1781	1777	1709	1781	1777	1585
Q Serve(g_s), s	2.9	3.0	12.7	3.4	5.0	5.1	8.9	2.7	2.9	0.6	8.0	20.0
Cycle Q Clear(g_c), s	2.9	3.0	12.7	3.4	5.0	5.1	8.9	2.7	2.9	0.6	8.0	20.0
Prop In Lane	1.00		1.00	1.00		0.07	1.00		0.52	1.00		1.00
Lane Grp Cap(c), veh/h	100	439	624	113	430	447	284	757	728	34	1015	542
V/C Ratio(X)	0.76	0.22	0.58	0.77	0.36	0.36	0.83	0.15	0.16	0.47	0.48	1.08
Avail Cap(c_a), veh/h	674	908	1022	267	457	475	445	825	794	127	1015	542
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	32.6	21.6	16.7	32.3	22.0	22.0	28.5	12.3	12.4	34.0	20.7	23.0
Incr Delay (d2), s/veh	11.1	0.3	0.9	10.5	0.5	0.5	7.0	0.1	0.1	9.8	0.4	63.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	1.3	4.3	1.7	2.1	2.1	4.2	1.0	1.0	0.4	3.2	17.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.6	21.9	17.6	42.8	22.5	22.5	35.5	12.4	12.5	43.7	21.1	86.1
LnGrp LOS	D	C	B	D	C	C	D	B	B	D	C	F
Approach Vol, veh/h	538			402			462			1092		
Approach Delay, s/veh	22.0			26.9			24.1			56.3		
Approach LOS	C			C			C			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.8	34.3	8.9	20.9	15.6	24.5	8.4	21.4				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.8	32.5	10.5	34.0	17.5	20.0	26.5	18.0				
Max Q Clear Time (g_c+I), s	12.6	4.9	5.4	14.7	10.9	22.0	4.9	7.1				
Green Ext Time (p_c), s	0.0	1.3	0.1	1.8	0.4	0.0	0.2	1.3				

Intersection Summary

HCM 6th Ctrl Delay	38.2
HCM 6th LOS	D

Year 2035 AM
4: Barham Dr & Woodland Pkwy

Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	370	985	745	330	330	700
Future Volume (veh/h)	370	985	745	330	330	700
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	402	1071	810	359	359	685
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	449	2120	985	865	479	750
Arrive On Green	0.25	0.60	0.28	0.28	0.27	0.27
Sat Flow, veh/h	1781	3647	3647	1585	1781	2790
Grp Volume(v), veh/h	402	1071	810	359	359	685
Grp Sat Flow(s), veh/h/ln	1781	1777	1777	1585	1781	1395
Q Serve(g_s), s	14.6	11.6	14.3	8.9	12.3	15.9
Cycle Q Clear(g_c), s	14.6	11.6	14.3	8.9	12.3	15.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	449	2120	985	865	479	750
V/C Ratio(X)	0.90	0.51	0.82	0.41	0.75	0.91
Avail Cap(c_a), veh/h	493	2286	1063	900	480	751
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.1	7.8	22.6	8.9	22.4	23.7
Incr Delay (d2), s/veh	17.7	0.2	5.0	0.3	6.5	15.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.9	3.6	6.2	5.0	5.7	1.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	41.8	8.0	27.6	9.2	28.9	39.3
LnGrp LOS	D	A	C	A	C	D
Approach Vol, veh/h		1473	1169		1044	
Approach Delay, s/veh		17.2	21.9		35.7	
Approach LOS		B	C		D	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		44.4		22.5	21.3	23.0
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		43.0		18.0	18.5	20.0
Max Q Clear Time (g_c+I1), s		13.6		17.9	16.6	16.3
Green Ext Time (p_c), s		9.3		0.0	0.3	2.3
Intersection Summary						
HCM 6th Ctrl Delay			24.0			
HCM 6th LOS			C			

Intersection						
Int Delay, s/veh	42.3					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	↑
Traffic Vol, veh/h	465	420	25	875	235	65
Future Vol, veh/h	465	420	25	875	235	65
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	80	0
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	505	457	27	951	255	71

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	962
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.22
Pot Cap-1 Maneuver	-	-	711
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	711
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	292.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	155	531	-	-	711	-
HCM Lane V/C Ratio	1.648	0.133	-	-	0.038	-
HCM Control Delay (s)	\$ 370.2	12.8	-	-	10.3	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	17.9	0.5	-	-	0.1	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	865	120	685	915	10	120	5	410	15	20	5
Future Volume (veh/h)	0	865	120	685	915	10	120	5	410	15	20	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	940	130	745	995	11	130	5	446	16	22	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1	940	419	734	2544	28	296	11	480	21	28	6
Arrive On Green	0.00	0.26	0.26	0.41	0.71	0.71	0.17	0.17	0.17	0.03	0.03	0.03
Sat Flow, veh/h	1781	3554	1585	1781	3600	40	1718	66	2790	669	921	209
Grp Volume(v), veh/h	0	940	130	745	491	515	135	0	446	43	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1863	1784	0	1395	1799	0	0
Q Serve(g_s), s	0.0	39.5	9.8	61.5	16.7	16.7	10.1	0.0	23.5	3.5	0.0	0.0
Cycle Q Clear(g_c), s	0.0	39.5	9.8	61.5	16.7	16.7	10.1	0.0	23.5	3.5	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	0.96		1.00	0.37		0.12
Lane Grp Cap(c), veh/h	1	940	419	734	1256	1317	307	0	480	56	0	0
V/C Ratio(X)	0.00	1.00	0.31	1.02	0.39	0.39	0.44	0.00	0.93	0.77	0.00	0.00
Avail Cap(c_a), veh/h	60	940	419	734	1256	1317	311	0	486	60	0	0
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)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	54.9	44.0	43.9	8.9	8.9	55.4	0.0	60.9	71.8	0.0	0.0
Incr Delay (d2), s/veh	0.0	29.3	0.4	37.1	0.2	0.2	1.0	0.0	24.4	42.9	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	21.5	4.0	34.4	6.4	6.7	4.7	0.0	10.0	2.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	84.2	44.4	81.0	9.1	9.1	56.4	0.0	85.3	114.8	0.0	0.0
LnGrp LOS	A	F	D	F	A	A	E	A	F	F	A	A
Approach Vol, veh/h		1070			1751			581			43	
Approach Delay, s/veh		79.3			39.7			78.6			114.8	
Approach LOS		E			D			E			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	66.0	44.0		9.1	0.0	110.0		30.2				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	61.5	39.5		5.0	5.0	96.0		26.0				
Max Q Clear Time (g_c+I1), s	63.5	41.5		5.5	0.0	18.7		25.5				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	8.5		0.2				
Intersection Summary												
HCM 6th Ctrl Delay			59.5									
HCM 6th LOS			E									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	350	450	290	85	705	300	415	920	40	370	1180	295
Future Volume (veh/h)	350	450	290	85	705	300	415	920	40	370	1180	295
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	380	489	315	92	766	0	451	1000	43	402	1283	321
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	328	1073	479	142	882		386	1848	574	461	1363	608
Arrive On Green	0.09	0.30	0.30	0.04	0.25	0.00	0.11	0.36	0.36	0.13	0.38	0.38
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	5106	1585	3456	3554	1585
Grp Volume(v), veh/h	380	489	315	92	766	0	451	1000	43	402	1283	321
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1585	1728	1777	1585
Q Serve(g_s), s	11.4	13.4	20.8	3.1	24.8	0.0	13.4	18.7	2.1	13.7	41.8	18.8
Cycle Q Clear(g_c), s	11.4	13.4	20.8	3.1	24.8	0.0	13.4	18.7	2.1	13.7	41.8	18.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	328	1073	479	142	882		386	1848	574	461	1363	608
V/C Ratio(X)	1.16	0.46	0.66	0.65	0.87		1.17	0.54	0.07	0.87	0.94	0.53
Avail Cap(c_a), veh/h	328	1134	506	204	1007		386	1848	574	507	1363	608
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)	0.16	0.16	0.16	1.00	1.00	0.00	1.00	1.00	1.00	0.74	0.74	0.74
Uniform Delay (d), s/veh	54.3	33.9	36.5	56.7	43.2	0.0	53.3	30.4	25.1	51.0	35.7	28.6
Incr Delay (d2), s/veh	76.8	0.0	0.5	4.8	7.5	0.0	100.4	1.1	0.3	11.2	11.0	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.5	5.8	8.1	1.5	11.7	0.0	11.2	7.8	0.9	6.6	19.8	7.5
Unsig. Movement Delay, s/veh	0.00											
LnGrp Delay(d),s/veh	131.1	34.0	37.0	61.5	50.7	0.0	153.7	31.5	25.4	62.2	46.7	31.0
LnGrp LOS	F	C	D	E	D	A	F	C	C	E	D	C
Approach Vol, veh/h	1184			1184			1494			2006		
Approach Delay, s/veh	65.9			37.6			68.2			47.3		
Approach LOS	E			D			E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.5	41.5	18.0	50.9	16.0	35.1	20.6	48.3				
Change Period (Y+Rc), s	4.6	5.3	4.6	4.9	4.6	5.3	4.6	4.9				
Max Green Setting (Gmax), s	38.3	13.4	41.8	11.4	34.0	17.6	37.6					
Max Q Clear Time (g_c+1/9), s	22.8	15.4	43.8	13.4	26.8	15.7	20.7					
Green Ext Time (p_c), s	0.0	4.0	0.0	0.0	0.0	3.0	0.3	6.8				

Intersection Summary

HCM 6th Ctrl Delay 54.4

HCM 6th LOS D

Notes

Unsignalized Delay for [WBR] is included in calculations of the approach delay and intersection delay.

Year 2035 AM
10: Nordahl Rd & SR-78 EB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  		 	 	
Traffic Volume (veh/h)	490	35	830	0	0	0	0	780	780	305	1010	0
Future Volume (veh/h)	490	35	830	0	0	0	0	780	780	305	1010	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	368	0	1014				0	848	763	332	1098	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	621	0	1106				0	2265	703	375	2073	0
Arrive On Green	0.35	0.00	0.35				0.00	0.44	0.44	0.22	1.00	0.00
Sat Flow, veh/h	1781	0	3170				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	368	0	1014				0	848	763	332	1098	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	25.4	0.0	45.9				0.0	16.6	66.5	14.0	0.0	0.0
Cycle Q Clear(g_c), s	25.4	0.0	45.9				0.0	16.6	66.5	14.0	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	621	0	1106				0	2265	703	375	2073	0
V/C Ratio(X)	0.59	0.00	0.92				0.00	0.37	1.09	0.89	0.53	0.00
Avail Cap(c_a), veh/h	688	0	1224				0	2265	703	422	2073	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.63	0.63	0.90	0.90	0.00
Uniform Delay (d), s/veh	40.1	0.0	46.8				0.0	27.9	41.7	57.8	0.0	0.0
Incr Delay (d2), s/veh	1.1	0.0	10.3				0.0	0.3	53.2	16.9	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	0.0	19.7				0.0	6.9	36.0	6.4	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.2	0.0	57.1				0.0	28.2	95.0	74.7	0.9	0.0
LnGrp LOS	D	A	E				A	C	F	E	A	A
Approach Vol, veh/h	1382						1611			1430		
Approach Delay, s/veh	52.9						59.8			18.0		
Approach LOS	D						E			B		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	31.0	71.6	57.4	92.6								
Change Period (Y+Rc), s	4.7	5.1	5.1	5.1								
Max Green Setting (Gmax), s	58.9	58.9	57.9	81.9								
Max Q Clear Time (g_c+1/10), s	68.5	68.5	47.9	2.0								
Green Ext Time (p_c), s	0.3	0.0	4.4	11.2								

Intersection Summary

HCM 6th Ctrl Delay	44.1
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

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

Year 2035 AM
11: Nordahl Rd & SR-78 WB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↱	↱	↰	↱			↱	↰
Traffic Volume (veh/h)	0	0	0	500	0	145	560	635	0	0	670	405
Future Volume (veh/h)	0	0	0	500	0	145	560	635	0	0	670	405
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				592	0	105	609	690	0	0	728	440
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				681	0	303	670	2633	0	0	2633	817
Arrive On Green				0.19	0.00	0.19	0.39	1.00	0.00	0.00	0.52	0.52
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				592	0	105	609	690	0	0	728	440
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				24.2	0.0	8.6	25.0	0.0	0.0	0.0	12.1	27.9
Cycle Q Clear(g_c), s				24.2	0.0	8.6	25.0	0.0	0.0	0.0	12.1	27.9
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				681	0	303	670	2633	0	0	2633	817
V/C Ratio(X)				0.87	0.00	0.35	0.91	0.26	0.00	0.00	0.28	0.54
Avail Cap(c_a), veh/h				1066	0	474	975	2633	0	0	2633	817
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.83	0.83	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				58.8	0.0	52.5	44.7	0.0	0.0	0.0	20.5	24.4
Incr Delay (d2), s/veh				4.9	0.0	0.7	7.7	0.2	0.0	0.0	0.3	2.5
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.4	0.0	3.5	10.0	0.1	0.0	0.0	5.0	11.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				63.8	0.0	53.2	52.4	0.2	0.0	0.0	20.8	26.9
LnGrp LOS				E	A	D	D	A	A	A	C	C
Approach Vol, veh/h					697			1299			1168	
Approach Delay, s/veh					62.2			24.7			23.1	
Approach LOS					E			C			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		116.2			33.8	82.5		33.8				
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1				
Max Green Setting (Gmax), s		94.9			* 42	47.9		44.9				
Max Q Clear Time (g_c+I1), s		2.0			27.0	29.9		26.2				
Green Ext Time (p_c), s		5.7			2.1	6.5		2.5				

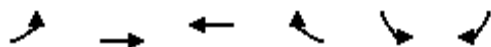
Intersection Summary

HCM 6th Ctrl Delay	32.3
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

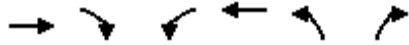
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	565	880	1045	415	300	20
Future Volume (veh/h)	565	880	1045	415	300	20
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	614	957	1136	451	326	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	653	3887	1216	482	436	200
Arrive On Green	0.37	0.76	0.34	0.34	0.13	0.13
Sat Flow, veh/h	1781	5274	3761	1425	3456	1585
Grp Volume(v), veh/h	614	957	1076	511	326	22
Grp Sat Flow(s),veh/h/ln	1781	1702	1702	1614	1728	1585
Q Serve(g_s), s	26.7	4.4	24.5	24.5	7.3	1.0
Cycle Q Clear(g_c), s	26.7	4.4	24.5	24.5	7.3	1.0
Prop In Lane	1.00			0.88	1.00	1.00
Lane Grp Cap(c), veh/h	653	3887	1153	546	436	200
V/C Ratio(X)	0.94	0.25	0.93	0.93	0.75	0.11
Avail Cap(c_a), veh/h	697	4019	1157	548	777	356
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.5	2.8	25.6	25.6	33.7	31.0
Incr Delay (d2), s/veh	20.2	0.0	13.5	23.4	2.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.2	1.0	11.5	12.4	3.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	44.7	2.8	39.1	49.0	36.3	31.2
LnGrp LOS	D	A	D	D	D	C
Approach Vol, veh/h		1571	1587		348	
Approach Delay, s/veh		19.2	42.3		36.0	
Approach LOS		B	D		D	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		65.4		14.6	33.8	31.6
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		63.0		18.0	31.3	27.2
Max Q Clear Time (g_c+I1), s		6.4		9.3	28.7	26.5
Green Ext Time (p_c), s		8.7		0.8	0.7	0.6
Intersection Summary						
HCM 6th Ctrl Delay			31.3			
HCM 6th LOS			C			

Year 2035 PM
2: SR-78 WB Ramps & Rancheros Dr

Sunrise Residential
09/16/2019



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	545	85	600	230	105	265
Future Volume (veh/h)	545	85	600	230	105	265
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	592	92	652	250	114	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	704	109	824	1424	151	
Arrive On Green	0.45	0.45	0.24	0.76	0.08	0.00
Sat Flow, veh/h	1581	246	3456	1870	1781	2790
Grp Volume(v), veh/h	0	684	652	250	114	0
Grp Sat Flow(s), veh/h/ln	0	1826	1728	1870	1781	1395
Q Serve(g_s), s	0.0	19.4	10.3	2.1	3.6	0.0
Cycle Q Clear(g_c), s	0.0	19.4	10.3	2.1	3.6	0.0
Prop In Lane		0.13	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	0	814	824	1424	151	
V/C Ratio(X)	0.00	0.84	0.79	0.18	0.76	
Avail Cap(c_a), veh/h	0	1218	1156	2018	553	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	14.3	20.8	1.9	26.1	0.0
Incr Delay (d2), s/veh	0.0	3.5	2.6	0.1	7.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.5	4.1	0.3	1.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	17.8	23.4	2.0	33.6	0.0
LnGrp LOS	A	B	C	A	C	
Approach Vol, veh/h	684			902	114	A
Approach Delay, s/veh	17.8			17.5	33.6	
Approach LOS	B			B	C	
Timer - Assigned Phs	1	2		6	8	
Phs Duration (G+Y+Rc), s	30.5			48.9	9.4	
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	
Max Green Setting (Gmax), s	38.9			62.9	18.1	
Max Q Clear Time (g_c+1/2), s	21.4			4.1	5.6	
Green Ext Time (p_c), s	1.6	4.6		1.6	0.2	

Intersection Summary

HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Year 2035 PM
3: Woodland Pkwy & Rancheros Dr

Sunrise Residential
09/16/2019



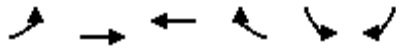
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	185	175	470	55	150	30	165	405	50	15	385	540
Future Volume (veh/h)	185	175	470	55	150	30	165	405	50	15	385	540
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	201	190	511	60	163	33	179	440	54	16	418	587
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	247	591	699	85	665	132	222	1195	146	34	956	647
Arrive On Green	0.14	0.32	0.32	0.05	0.23	0.23	0.12	0.37	0.37	0.02	0.27	0.27
Sat Flow, veh/h	1781	1870	1585	1781	2956	586	1781	3188	389	1781	3554	1585
Grp Volume(v), veh/h	201	190	511	60	97	99	179	244	250	16	418	587
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1777	1765	1781	1777	1800	1781	1777	1585
Q Serve(g_s), s	8.1	5.7	19.8	2.5	3.3	3.4	7.3	7.4	7.5	0.7	7.2	20.0
Cycle Q Clear(g_c), s	8.1	5.7	19.8	2.5	3.3	3.4	7.3	7.4	7.5	0.7	7.2	20.0
Prop In Lane	1.00		1.00	1.00		0.33	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	247	591	699	85	400	397	222	666	675	34	956	647
V/C Ratio(X)	0.81	0.32	0.73	0.70	0.24	0.25	0.81	0.37	0.37	0.47	0.44	0.91
Avail Cap(c_a), veh/h	443	702	793	206	430	428	372	729	739	120	956	647
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.1	19.3	17.1	34.9	23.6	23.6	31.6	16.8	16.9	36.1	22.5	20.7
Incr Delay (d2), s/veh	6.3	0.3	3.0	10.1	0.3	0.3	6.7	0.3	0.3	10.0	0.3	16.7
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	8.8	2.4	7.1	1.3	1.4	1.4	3.4	2.9	3.0	0.4	2.9	11.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.4	19.7	20.2	45.0	23.9	24.0	38.4	17.2	17.2	46.1	22.8	37.4
LnGrp LOS	D	B	C	D	C	C	D	B	B	D	C	D
Approach Vol, veh/h	902			256			673			1021		
Approach Delay, s/veh	23.9			28.9			22.8			31.6		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.9	32.4	8.1	28.0	13.8	24.5	14.8	21.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	30.5	8.6	27.9	15.5	20.0	18.5	18.0				
Max Q Clear Time (g_c+I), s	12.7	9.5	4.5	21.8	9.3	22.0	10.1	5.4				
Green Ext Time (p_c), s	0.0	2.9	0.0	1.7	0.2	0.0	0.3	0.8				

Intersection Summary

HCM 6th Ctrl Delay	26.8
HCM 6th LOS	C

Year 2035 PM
4: Barham Dr & Woodland Pkwy

Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	465	915	580	425	265	775
Future Volume (veh/h)	465	915	580	425	265	775
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	505	995	630	462	288	757
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	557	2223	893	798	449	703
Arrive On Green	0.31	0.63	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1781	3647	3647	1585	1781	2790
Grp Volume(v), veh/h	505	995	630	462	288	757
Grp Sat Flow(s), veh/h/ln	1781	1777	1777	1585	1781	1395
Q Serve(g_s), s	20.0	10.7	11.8	15.0	10.6	18.5
Cycle Q Clear(g_c), s	20.0	10.7	11.8	15.0	10.6	18.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	557	2223	893	798	449	703
V/C Ratio(X)	0.91	0.45	0.71	0.58	0.64	1.08
Avail Cap(c_a), veh/h	691	2541	944	820	449	703
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.2	7.2	25.0	12.8	24.5	27.5
Incr Delay (d2), s/veh	13.6	0.1	2.3	1.0	3.1	56.6
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.0	3.3	5.0	8.3	4.6	5.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	37.8	7.3	27.3	13.8	27.6	84.1
LnGrp LOS	D	A	C	B	C	F
Approach Vol, veh/h		1500	1092		1045	
Approach Delay, s/veh		17.6	21.6		68.5	
Approach LOS		B	C		E	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		50.4		23.0	27.5	23.0
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		52.5		18.5	28.5	19.5
Max Q Clear Time (g_c+I1), s		12.7		20.5	22.0	17.0
Green Ext Time (p_c), s		9.0		0.0	1.0	1.5
Intersection Summary						
HCM 6th Ctrl Delay			33.4			
HCM 6th LOS			C			

Intersection						
Int Delay, s/veh	24.4					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	↑
Traffic Vol, veh/h	855	315	25	820	135	110
Future Vol, veh/h	855	315	25	820	135	110
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	80	0
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	929	342	27	891	147	120

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	1271
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.22
Pot Cap-1 Maneuver	-	-	542
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	542
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	223.9
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	92	421	-	-	542	-
HCM Lane V/C Ratio	1.595	0.284	-	-	0.05	-
HCM Control Delay (s)	\$ 392.5	16.9	-	-	12	-
HCM Lane LOS	F	C	-	-	B	-
HCM 95th %tile Q(veh)	11.6	1.2	-	-	0.2	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Year 2035 PM
8: Barham Dr & Mission Rd

Sunrise Residential

09/16/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		 			 				 		 	
Traffic Volume (veh/h)	0	915	80	610	1120	0	150	5	820	15	5	0
Future Volume (veh/h)	0	915	80	610	1120	0	150	5	820	15	5	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	995	87	663	1217	0	163	5	891	16	5	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1	937	418	560	2163	0	486	15	783	27	8	0
Arrive On Green	0.00	0.26	0.26	0.31	0.61	0.00	0.28	0.28	0.28	0.02	0.02	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3647	0	1731	53	2790	1373	429	0
Grp Volume(v), veh/h	0	995	87	663	1217	0	168	0	891	21	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	0	1784	0	1395	1802	0	0
Q Serve(g_s), s	0.0	39.0	6.3	46.5	30.2	0.0	11.1	0.0	41.5	1.7	0.0	0.0
Cycle Q Clear(g_c), s	0.0	39.0	6.3	46.5	30.2	0.0	11.1	0.0	41.5	1.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.00	0.97		1.00	0.76		0.00
Lane Grp Cap(c), veh/h	1	937	418	560	2163	0	501	0	783	35	0	0
V/C Ratio(X)	0.00	1.06	0.21	1.18	0.56	0.00	0.34	0.00	1.14	0.60	0.00	0.00
Avail Cap(c_a), veh/h	60	937	418	560	2163	0	501	0	783	61	0	0
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)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	54.4	42.4	50.7	17.2	0.0	42.2	0.0	53.2	71.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	47.2	0.2	99.8	0.3	0.0	0.4	0.0	77.4	15.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	23.5	2.5	36.2	12.3	0.0	5.0	0.0	22.9	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	101.7	42.7	150.5	17.6	0.0	42.6	0.0	130.6	87.0	0.0	0.0
LnGrp LOS	A	F	D	F	B	A	D	A	F	F	A	A
Approach Vol, veh/h		1082			1880			1059			21	
Approach Delay, s/veh		96.9			64.5			116.6			87.0	
Approach LOS		F			E			F			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	51.0	43.5		7.4	0.0	94.5		46.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	46.5	39.0		5.0	5.0	80.5		41.5				
Max Q Clear Time (g_c+I1), s	48.5	41.0		3.7	0.0	32.2		43.5				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	12.6		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			86.9									
HCM 6th LOS			F									



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	625	905	300	55	840	595	505	1200	60	220	720	605
Future Volume (veh/h)	625	905	300	55	840	595	505	1200	60	220	720	605
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	679	984	326	60	913	0	549	1304	65	239	783	609
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	542	1385	618	118	949		545	1747	542	293	957	427
Arrive On Green	0.16	0.39	0.39	0.03	0.27	0.00	0.16	0.34	0.34	0.06	0.18	0.18
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	5106	1585	3456	3554	1585
Grp Volume(v), veh/h	679	984	326	60	913	0	549	1304	65	239	783	609
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1585	1728	1777	1585
Q Serve(g_s), s	20.4	30.4	20.5	2.2	32.9	0.0	20.5	29.3	3.7	8.9	27.5	35.0
Cycle Q Clear(g_c), s	20.4	30.4	20.5	2.2	32.9	0.0	20.5	29.3	3.7	8.9	27.5	35.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	542	1385	618	118	949		545	1747	542	293	957	427
V/C Ratio(X)	1.25	0.71	0.53	0.51	0.96		1.01	0.75	0.12	0.82	0.82	1.43
Avail Cap(c_a), veh/h	542	1385	618	138	949		545	1747	542	332	957	427
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	0.00	1.00	1.00	1.00	0.76	0.76	0.76
Uniform Delay (d), s/veh	54.8	33.5	30.5	61.7	47.0	0.0	54.7	37.8	29.3	60.3	50.2	53.3
Incr Delay (d2), s/veh	114.9	0.2	0.1	3.4	20.6	0.0	40.4	3.0	0.5	10.3	6.0	202.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	13.1	7.9	1.0	17.2	0.0	12.0	12.7	1.5	4.4	13.5	38.4
Unsig. Movement Delay, s/veh	0.00											
LnGrp Delay(d),s/veh	169.7	33.6	30.5	65.1	67.6	0.0	95.2	40.7	29.8	70.6	56.2	255.6
LnGrp LOS	F	C	C	E	E	A	F	D	C	E	E	F
Approach Vol, veh/h	1989			1620			1918			1631		
Approach Delay, s/veh	79.6			40.5			55.9			132.8		
Approach LOS	E			D			E			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.0	56.0	25.1	39.9	25.0	40.0	15.6	49.4				
Change Period (Y+Rc), s	4.6	5.3	4.6	4.9	4.6	5.3	4.6	4.9				
Max Green Setting (Gmax), s	5.2	49.9	20.5	35.0	20.4	34.7	12.5	43.0				
Max Q Clear Time (g_c+I1), s	14.2	32.4	22.5	37.0	22.4	34.9	10.9	31.3				
Green Ext Time (p_c), s	0.0	7.9	0.0	0.0	0.0	0.0	0.1	7.0				

Intersection Summary

HCM 6th Ctrl Delay 76.5

HCM 6th LOS E

Notes

Unsignalized Delay for [WBR] is included in calculations of the approach delay and intersection delay.

Year 2035 PM
10: Nordahl Rd & SR-78 EB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  		 	 	
Traffic Volume (veh/h)	730	80	490	0	0	0	0	1300	1090	590	1050	0
Future Volume (veh/h)	730	80	490	0	0	0	0	1300	1090	590	1050	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	977	0	349				0	1413	1067	641	1141	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	902	0	401				0	2431	755	891	2747	0
Arrive On Green	0.25	0.00	0.25				0.00	0.48	0.48	0.52	1.00	0.00
Sat Flow, veh/h	3563	0	1585				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	977	0	349				0	1413	1067	641	1141	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	32.9	0.0	27.4				0.0	26.1	61.9	18.6	0.0	0.0
Cycle Q Clear(g_c), s	32.9	0.0	27.4				0.0	26.1	61.9	18.6	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	902	0	401				0	2431	755	891	2747	0
V/C Ratio(X)	1.08	0.00	0.87				0.00	0.58	1.41	0.72	0.42	0.00
Avail Cap(c_a), veh/h	902	0	401				0	2431	755	891	2747	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.13	0.13	0.68	0.68	0.00
Uniform Delay (d), s/veh	48.5	0.0	46.5				0.0	24.7	34.0	27.9	0.0	0.0
Incr Delay (d2), s/veh	55.2	0.0	18.2				0.0	0.1	187.2	1.9	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.4	0.0	12.8				0.0	10.5	62.3	6.2	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	103.8	0.0	64.7				0.0	24.8	221.3	29.8	0.3	0.0
LnGrp LOS	F	A	E				A	C	F	C	A	A
Approach Vol, veh/h	1326						2480			1782		
Approach Delay, s/veh	93.5						109.3			10.9		
Approach LOS	F						F			B		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	39.0	67.0	38.0	106.0								
Change Period (Y+Rc), s	5.1	* 5.1	5.1	5.1								
Max Green Setting (Gmax), s	20.3	* 62	32.9	86.9								
Max Q Clear Time (g_c+20.6)	20.6	63.9	34.9	2.0								
Green Ext Time (p_c), s	0.0	0.0	0.0	12.0								

Intersection Summary

HCM 6th Ctrl Delay	74.2
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

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

Year 2035 PM
11: Nordahl Rd & SR-78 WB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↰	↰	↰	↰			↰	↰
Traffic Volume (veh/h)	0	0	0	620	5	510	830	1120	0	0	870	650
Future Volume (veh/h)	0	0	0	620	5	510	830	1120	0	0	870	650
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				831	0	334	902	1217	0	0	946	636
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				936	0	416	943	2341	0	0	1786	554
Arrive On Green				0.26	0.00	0.26	0.55	1.00	0.00	0.00	0.35	0.35
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				831	0	334	902	1217	0	0	946	636
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				29.2	0.0	25.6	32.3	0.0	0.0	0.0	19.2	45.5
Cycle Q Clear(g_c), s				29.2	0.0	25.6	32.3	0.0	0.0	0.0	19.2	45.5
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				936	0	416	943	2341	0	0	1786	554
V/C Ratio(X)				0.89	0.00	0.80	0.96	0.52	0.00	0.00	0.53	1.15
Avail Cap(c_a), veh/h				1066	0	474	992	2341	0	0	1786	554
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.61	0.61	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				46.1	0.0	44.8	28.8	0.0	0.0	0.0	33.7	42.3
Incr Delay (d2), s/veh				8.5	0.0	8.6	13.2	0.5	0.0	0.0	1.1	85.7
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				14.0	0.0	11.0	11.8	0.2	0.0	0.0	8.2	30.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				54.6	0.0	53.3	42.0	0.5	0.0	0.0	34.9	128.0
LnGrp LOS				D	A	D	D	A	A	A	C	F
Approach Vol, veh/h					1165			2119			1582	
Approach Delay, s/veh					54.2			18.2			72.3	
Approach LOS					D			B			E	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		90.7			40.2	50.6		39.3				
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1				
Max Green Setting (Gmax), s		80.9			* 37	38.9		38.9				
Max Q Clear Time (g_c+I1), s		2.0			34.3	47.5		31.2				
Green Ext Time (p_c), s		13.3			1.2	0.0		3.0				

Intersection Summary

HCM 6th Ctrl Delay	44.4
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

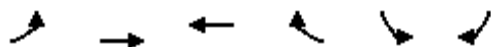
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

APPENDIX H

INTERSECTION ANALYSIS WORKSHEETS – YEAR 2035 WITH PROJECT

Year 2035 + Proj AM
1: Barham Dr & SR-78 EB Off

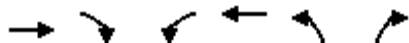
Sunrise Residential
09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	315	572	1201	80	612	35
Future Volume (veh/h)	315	572	1201	80	612	35
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	342	622	1305	87	665	38
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	395	3175	1607	107	811	372
Arrive On Green	0.22	0.62	0.33	0.33	0.23	0.23
Sat Flow, veh/h	1781	5274	5058	326	3456	1585
Grp Volume(v), veh/h	342	622	908	484	665	38
Grp Sat Flow(s),veh/h/ln	1781	1702	1702	1812	1728	1585
Q Serve(g_s), s	11.6	3.3	15.3	15.3	11.4	1.2
Cycle Q Clear(g_c), s	11.6	3.3	15.3	15.3	11.4	1.2
Prop In Lane	1.00			0.18	1.00	1.00
Lane Grp Cap(c), veh/h	395	3175	1119	595	811	372
V/C Ratio(X)	0.87	0.20	0.81	0.81	0.82	0.10
Avail Cap(c_a), veh/h	469	3493	1189	633	997	457
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	23.5	5.1	19.3	19.3	22.7	18.8
Incr Delay (d2), s/veh	13.9	0.0	4.2	7.6	4.6	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	0.9	6.1	7.1	4.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	37.4	5.1	23.5	26.8	27.3	18.9
LnGrp LOS	D	A	C	C	C	B
Approach Vol, veh/h		964	1392		703	
Approach Delay, s/veh		16.6	24.6		26.9	
Approach LOS		B	C		C	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		43.5		19.2	18.4	25.1
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		42.9		18.1	16.5	21.9
Max Q Clear Time (g_c+I1), s		5.3		13.4	13.6	17.3
Green Ext Time (p_c), s		4.9		1.3	0.3	3.3
Intersection Summary						
HCM 6th Ctrl Delay			22.6			
HCM 6th LOS			C			

Year 2035 + Proj AM
2: SR-78 WB Ramps & Rancheros Dr

Sunrise Residential
09/16/2019



Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩		↩↩	↑	↩	↩↩
Traffic Volume (veh/h)	250	45	756	355	205	220
Future Volume (veh/h)	250	45	756	355	205	220
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	272	49	822	386	223	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	361	65	1062	1196	291	
Arrive On Green	0.23	0.23	0.31	0.64	0.16	0.00
Sat Flow, veh/h	1542	278	3456	1870	1781	2790
Grp Volume(v), veh/h	0	321	822	386	223	0
Grp Sat Flow(s), veh/h/ln	0	1820	1728	1870	1781	1395
Q Serve(g_s), s	0.0	7.5	9.9	4.3	5.5	0.0
Cycle Q Clear(g_c), s	0.0	7.5	9.9	4.3	5.5	0.0
Prop In Lane		0.15	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	0	426	1062	1196	291	
V/C Ratio(X)	0.00	0.75	0.77	0.32	0.77	
Avail Cap(c_a), veh/h	0	717	1489	1726	732	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	16.3	14.4	3.7	18.3	0.0
Incr Delay (d2), s/veh	0.0	2.7	1.7	0.2	4.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.0	3.4	0.9	2.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	19.0	16.1	3.9	22.5	0.0
LnGrp LOS	A	B	B	A	C	
Approach Vol, veh/h	321			1208	223	A
Approach Delay, s/veh	19.0			12.2	22.5	
Approach LOS	B			B	C	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		12.0	18.5	15.2		33.7
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5
Max Green Setting (Gmax), s		18.8	19.7	18.0		42.2
Max Q Clear Time (g_c+I1), s		7.5	11.9	9.5		6.3
Green Ext Time (p_c), s		0.5	2.2	1.2		2.6
Intersection Summary						
HCM 6th Ctrl Delay			14.8			
HCM 6th LOS			B			

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Year 2035 + Proj AM
3: Woodland Pkwy & Rancheros Dr

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	70	90	335	80	280	10	241	158	55	15	451	600
Future Volume (veh/h)	70	90	335	80	280	10	241	158	55	15	451	600
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	76	98	364	87	304	11	262	172	60	16	490	587
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	100	431	642	113	830	30	311	1136	383	34	995	533
Arrive On Green	0.06	0.23	0.23	0.06	0.24	0.24	0.17	0.44	0.44	0.02	0.28	0.28
Sat Flow, veh/h	1781	1870	1585	1781	3498	126	1781	2609	880	1781	3554	1585
Grp Volume(v), veh/h	76	98	364	87	154	161	262	115	117	16	490	587
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1777	1848	1781	1777	1712	1781	1777	1585
Q Serve(g_s), s	3.0	3.0	12.7	3.4	5.2	5.2	10.2	2.8	3.0	0.6	8.2	20.0
Cycle Q Clear(g_c), s	3.0	3.0	12.7	3.4	5.2	5.2	10.2	2.8	3.0	0.6	8.2	20.0
Prop In Lane	1.00		1.00	1.00		0.07	1.00		0.51	1.00		1.00
Lane Grp Cap(c), veh/h	100	431	642	113	422	439	311	774	745	34	995	533
V/C Ratio(X)	0.76	0.23	0.57	0.77	0.37	0.37	0.84	0.15	0.16	0.47	0.49	1.10
Avail Cap(c_a), veh/h	661	890	1031	262	448	466	436	808	779	125	995	533
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	33.2	22.3	16.4	32.9	22.7	22.8	28.5	12.2	12.2	34.7	21.5	23.7
Incr Delay (d2), s/veh	11.1	0.3	0.8	10.5	0.5	0.5	10.2	0.1	0.1	9.8	0.4	69.7
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	1.6	1.3	4.3	1.8	2.1	2.2	5.0	1.0	1.1	0.4	3.3	18.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.3	22.6	17.2	43.5	23.3	23.3	38.7	12.3	12.3	44.5	21.9	93.4
LnGrp LOS	D	C	B	D	C	C	D	B	B	D	C	F
Approach Vol, veh/h	538			402			494			1093		
Approach Delay, s/veh	22.0			27.6			26.3			60.6		
Approach LOS	C			C			C			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.9	35.6	9.0	21.0	17.0	24.5	8.5	21.5				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	32.5	10.5	34.0	17.5	20.0	26.5	18.0				
Max Q Clear Time (g_c+I), s	12.6	5.0	5.4	14.7	12.2	22.0	5.0	7.2				
Green Ext Time (p_c), s	0.0	1.4	0.1	1.8	0.4	0.0	0.2	1.3				

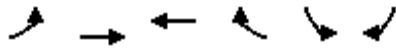
Intersection Summary

HCM 6th Ctrl Delay	40.4
HCM 6th LOS	D

Year 2035 + Proj AM
4: Barham Dr & Woodland Pkwy

Sunrise Residential

09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	370	994	756	359	331	700
Future Volume (veh/h)	370	994	756	359	331	700
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	402	1080	822	390	360	718
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	449	2124	991	867	478	748
Arrive On Green	0.25	0.60	0.28	0.28	0.27	0.27
Sat Flow, veh/h	1781	3647	3647	1585	1781	2790
Grp Volume(v), veh/h	402	1080	822	390	360	718
Grp Sat Flow(s), veh/h/ln	1781	1777	1777	1585	1781	1395
Q Serve(g_s), s	14.6	11.8	14.6	9.9	12.4	17.0
Cycle Q Clear(g_c), s	14.6	11.8	14.6	9.9	12.4	17.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	449	2124	991	867	478	748
V/C Ratio(X)	0.90	0.51	0.83	0.45	0.75	0.96
Avail Cap(c_a), veh/h	491	2276	1059	897	478	748
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.3	7.8	22.7	9.1	22.5	24.2
Incr Delay (d2), s/veh	17.9	0.2	5.4	0.4	6.7	23.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	3.6	6.4	5.6	5.7	2.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	42.2	8.0	28.1	9.5	29.2	47.7
LnGrp LOS	D	A	C	A	C	D
Approach Vol, veh/h		1482	1212		1078	
Approach Delay, s/veh		17.3	22.1		41.5	
Approach LOS		B	C		D	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		44.6		22.5	21.4	23.2
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		43.0		18.0	18.5	20.0
Max Q Clear Time (g_c+I1), s		13.8		19.0	16.6	16.6
Green Ext Time (p_c), s		9.3		0.0	0.3	2.2
Intersection Summary						
HCM 6th Ctrl Delay			25.7			
HCM 6th LOS			C			

Intersection						
Int Delay, s/veh	70.6					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	↑
Traffic Vol, veh/h	465	430	40	875	275	120
Future Vol, veh/h	465	430	40	875	275	120
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	80	0
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	505	467	43	951	299	130

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	972
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.22
Pot Cap-1 Maneuver	-	-	705
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	705
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	\$ 393
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	144	527	-	-	705	-
HCM Lane V/C Ratio	2.076	0.248	-	-	0.062	-
HCM Control Delay (s)	\$ 558.3	14.1	-	-	10.4	-
HCM Lane LOS	F	B	-	-	B	-
HCM 95th %tile Q(veh)	24	1	-	-	0.2	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Year 2035 + Proj AM
8: Barham Dr & Mission Rd

Sunrise Residential
09/16/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	865	123	697	915	10	130	5	455	15	20	5
Future Volume (veh/h)	0	865	123	697	915	10	130	5	455	15	20	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	940	134	758	995	11	141	5	495	16	22	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1	936	417	732	2536	28	301	11	487	21	28	6
Arrive On Green	0.00	0.26	0.26	0.41	0.70	0.70	0.17	0.17	0.17	0.03	0.03	0.03
Sat Flow, veh/h	1781	3554	1585	1781	3600	40	1723	61	2790	669	921	209
Grp Volume(v), veh/h	0	940	134	758	491	515	146	0	495	43	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1863	1784	0	1395	1799	0	0
Q Serve(g_s), s	0.0	39.4	10.2	61.5	16.9	16.9	11.0	0.0	26.1	3.6	0.0	0.0
Cycle Q Clear(g_c), s	0.0	39.4	10.2	61.5	16.9	16.9	11.0	0.0	26.1	3.6	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	0.97		1.00	0.37		0.12
Lane Grp Cap(c), veh/h	1	936	417	732	1252	1313	311	0	487	56	0	0
V/C Ratio(X)	0.00	1.00	0.32	1.04	0.39	0.39	0.47	0.00	1.02	0.77	0.00	0.00
Avail Cap(c_a), veh/h	60	936	417	732	1252	1313	311	0	487	60	0	0
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)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	55.1	44.3	44.1	9.0	9.0	55.5	0.0	61.8	72.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	30.5	0.4	42.7	0.2	0.2	1.1	0.0	45.2	43.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	21.6	4.1	35.5	6.5	6.8	5.1	0.0	12.3	2.3	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	85.6	44.8	86.8	9.2	9.2	56.6	0.0	107.0	115.1	0.0	0.0
LnGrp LOS	A	F	D	F	A	A	E	A	F	F	A	A
Approach Vol, veh/h		1074			1764			641			43	
Approach Delay, s/veh		80.5			42.5			95.5			115.1	
Approach LOS		F			D			F			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	66.0	43.9		9.1	0.0	109.9		30.6				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	61.5	39.4		5.0	5.0	95.9		26.1				
Max Q Clear Time (g_c+I1), s	63.5	41.4		5.6	0.0	18.9		28.1				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	8.5		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			64.6									
HCM 6th LOS			E									

Year 2035 + Proj AM
9: Auto Park Way/Nordahl Rd & Mission Rd

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↰	↑↑	↱	↰↰	↑↑	↱	↰↰	↑↑↑	↱	↰↰	↑↑	↱
Traffic Volume (veh/h)	391	454	290	85	706	300	416	920	40	370	1180	305
Future Volume (veh/h)	391	454	290	85	706	300	416	920	40	370	1180	305
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No				No				No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	425	493	315	92	767	0	452	1000	43	402	1283	332
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	357	1103	492	142	883		386	1806	561	460	1333	594
Arrive On Green	0.10	0.31	0.31	0.04	0.25	0.00	0.11	0.35	0.35	0.13	0.37	0.37
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	5106	1585	3456	3554	1585
Grp Volume(v), veh/h	425	493	315	92	767	0	452	1000	43	402	1283	332
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1585	1728	1777	1585
Q Serve(g_s), s	12.4	13.3	20.5	3.1	24.8	0.0	13.4	18.9	2.2	13.7	42.4	19.9
Cycle Q Clear(g_c), s	12.4	13.3	20.5	3.1	24.8	0.0	13.4	18.9	2.2	13.7	42.4	19.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	357	1103	492	142	883		386	1806	561	460	1333	594
V/C Ratio(X)	1.19	0.45	0.64	0.65	0.87		1.17	0.55	0.08	0.87	0.96	0.56
Avail Cap(c_a), veh/h	357	1164	519	204	1007		386	1806	561	498	1333	594
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)	0.09	0.09	0.09	1.00	1.00	0.00	1.00	1.00	1.00	0.73	0.73	0.73
Uniform Delay (d), s/veh	53.8	33.1	35.6	56.7	43.2	0.0	53.3	31.2	25.8	51.0	36.7	29.6
Incr Delay (d2), s/veh	88.3	0.0	0.2	4.8	7.5	0.0	101.4	1.2	0.3	11.5	13.9	2.8
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	9.8	5.8	7.9	1.5	11.8	0.0	11.2	7.9	0.9	6.7	20.6	8.0
Unsig. Movement Delay, s/veh	0.00											
LnGrp Delay(d),s/veh	142.1	33.1	35.8	61.5	50.8	0.0	154.7	32.4	26.0	62.6	50.6	32.4
LnGrp LOS	F	C	D	E	D	A	F	C	C	E	D	C
Approach Vol, veh/h	1233				1185		A		1495		2017	
Approach Delay, s/veh	71.4				37.6				69.2		50.0	
Approach LOS	E				D				E		D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.5	42.6	18.0	49.9	17.0	35.1	20.6	47.3				
Change Period (Y+Rc), s	4.6	5.3	4.6	4.9	4.6	5.3	4.6	4.9				
Max Green Setting (Gmax), s	39.3	13.4	40.8	12.4	34.0	17.3	36.9					
Max Q Clear Time (g_c+1/9), s	22.5	15.4	44.4	14.4	26.8	15.7	20.9					
Green Ext Time (p_c), s	0.0	4.1	0.0	0.0	0.0	3.0	0.3	6.6				

Intersection Summary

HCM 6th Ctrl Delay	56.8
HCM 6th LOS	E

Notes

Unsignalized Delay for [WBR] is included in calculations of the approach delay and intersection delay.

Year 2035 + Proj AM
10: Nordahl Rd & SR-78 EB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	490	35	830	0	0	0	0	785	816	305	1020	0
Future Volume (veh/h)	490	35	830	0	0	0	0	785	816	305	1020	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	368	0	1014				0	853	798	332	1109	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	619	0	1101				0	2272	705	375	2078	0
Arrive On Green	0.35	0.00	0.35				0.00	0.44	0.44	0.22	1.00	0.00
Sat Flow, veh/h	1781	0	3170				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	368	0	1014				0	853	798	332	1109	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	25.5	0.0	46.0				0.0	16.7	66.7	14.0	0.0	0.0
Cycle Q Clear(g_c), s	25.5	0.0	46.0				0.0	16.7	66.7	14.0	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	619	0	1101				0	2272	705	375	2078	0
V/C Ratio(X)	0.59	0.00	0.92				0.00	0.38	1.13	0.89	0.53	0.00
Avail Cap(c_a), veh/h	676	0	1203				0	2272	705	422	2078	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.59	0.59	0.90	0.90	0.00
Uniform Delay (d), s/veh	40.3	0.0	47.0				0.0	27.7	41.6	57.8	0.0	0.0
Incr Delay (d2), s/veh	1.2	0.0	11.0				0.0	0.3	70.2	16.9	0.9	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	19.8				0.0	7.0	39.5	6.4	0.3	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.5	0.0	57.9				0.0	28.0	111.8	74.7	0.9	0.0
LnGrp LOS	D	A	E				A	C	F	E	A	A
Approach Vol, veh/h	1382						1651			1441		
Approach Delay, s/veh	53.5						68.5			17.9		
Approach LOS	D						E			B		
Timer - Assigned Phs	1	2	4		6							
Phs Duration (G+Y+Rc), s	31.0	71.8	57.2		92.8							
Change Period (Y+Rc), s	4.7	5.1	5.1		5.1							
Max Green Setting (Gmax), s	18	59.9	56.9		82.9							
Max Q Clear Time (g_c+11g), s	110	68.7	48.0		2.0							
Green Ext Time (p_c), s	0.3	0.0	4.1		11.4							

Intersection Summary

HCM 6th Ctrl Delay	47.6
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

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

Year 2035 + Proj AM
11: Nordahl Rd & SR-78 WB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↰	↰	↰	↰			↰	↰
Traffic Volume (veh/h)	0	0	0	509	0	145	560	640	0	0	671	405
Future Volume (veh/h)	0	0	0	509	0	145	560	640	0	0	671	405
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				602	0	105	609	696	0	0	729	397
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				692	0	308	670	2622	0	0	2617	813
Arrive On Green				0.19	0.00	0.19	0.39	1.00	0.00	0.00	0.51	0.51
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				602	0	105	609	696	0	0	729	397
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				24.6	0.0	8.6	25.0	0.0	0.0	0.0	12.2	24.4
Cycle Q Clear(g_c), s				24.6	0.0	8.6	25.0	0.0	0.0	0.0	12.2	24.4
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				692	0	308	670	2622	0	0	2617	813
V/C Ratio(X)				0.87	0.00	0.34	0.91	0.27	0.00	0.00	0.28	0.49
Avail Cap(c_a), veh/h				1090	0	485	975	2622	0	0	2617	813
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.82	0.82	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				58.6	0.0	52.2	44.7	0.0	0.0	0.0	20.8	23.8
Incr Delay (d2), s/veh				4.8	0.0	0.7	7.7	0.2	0.0	0.0	0.3	2.1
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				11.6	0.0	3.5	10.0	0.1	0.0	0.0	5.0	9.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				63.4	0.0	52.8	52.3	0.2	0.0	0.0	21.0	25.9
LnGrp LOS				E	A	D	D	A	A	A	C	C
Approach Vol, veh/h					707			1305			1126	
Approach Delay, s/veh					61.8			24.5			22.7	
Approach LOS					E			C			C	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		115.8			33.8	82.0		34.2				
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1				
Max Green Setting (Gmax), s		93.9			* 42	46.9		45.9				
Max Q Clear Time (g_c+I1), s		2.0			27.0	26.4		26.6				
Green Ext Time (p_c), s		5.8			2.1	6.7		2.6				

Intersection Summary

HCM 6th Ctrl Delay	32.3
HCM 6th LOS	C

Notes

User approved volume balancing among the lanes for turning movement.

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

Intersection						
Int Delay, s/veh	2.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	95	3	0	200	415	25
Future Vol, veh/h	95	3	0	200	415	25
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
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	103	3	0	217	451	27

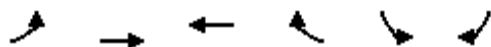
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	682	465	478	0	-	0
Stage 1	465	-	-	-	-	-
Stage 2	217	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	415	597	1084	-	-	-
Stage 1	632	-	-	-	-	-
Stage 2	819	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	415	597	1084	-	-	-
Mov Cap-2 Maneuver	415	-	-	-	-	-
Stage 1	632	-	-	-	-	-
Stage 2	819	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	16.5	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1084	-	419	-	-
HCM Lane V/C Ratio	-	-	0.254	-	-
HCM Control Delay (s)	0	-	16.5	-	-
HCM Lane LOS	A	-	C	-	-
HCM 95th %tile Q(veh)	0	-	1	-	-

Year 2035 + Proj PM
1: Barham Dr & SR-78 EB Off

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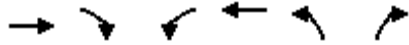


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	565	892	1050	415	329	20
Future Volume (veh/h)	565	892	1050	415	329	20
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	614	970	1141	451	358	22
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	651	3852	1202	474	467	214
Arrive On Green	0.37	0.75	0.33	0.33	0.14	0.14
Sat Flow, veh/h	1781	5274	3766	1421	3456	1585
Grp Volume(v), veh/h	614	970	1079	513	358	22
Grp Sat Flow(s),veh/h/ln	1781	1702	1702	1615	1728	1585
Q Serve(g_s), s	27.2	4.7	25.2	25.2	8.1	1.0
Cycle Q Clear(g_c), s	27.2	4.7	25.2	25.2	8.1	1.0
Prop In Lane	1.00			0.88	1.00	1.00
Lane Grp Cap(c), veh/h	651	3852	1137	539	467	214
V/C Ratio(X)	0.94	0.25	0.95	0.95	0.77	0.10
Avail Cap(c_a), veh/h	685	3949	1137	539	764	350
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	25.0	3.0	26.5	26.5	34.0	30.9
Incr Delay (d2), s/veh	21.2	0.0	16.1	26.8	2.7	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	14.6	1.1	12.2	13.2	3.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	46.2	3.1	42.5	53.3	36.7	31.1
LnGrp LOS	D	A	D	D	D	C
Approach Vol, veh/h		1584	1592		380	
Approach Delay, s/veh		19.8	46.0		36.3	
Approach LOS		B	D		D	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		65.9		15.5	34.2	31.7
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		63.0		18.0	31.3	27.2
Max Q Clear Time (g_c+I1), s		6.7		10.1	29.2	27.2
Green Ext Time (p_c), s		8.9		0.9	0.5	0.0
Intersection Summary						
HCM 6th Ctrl Delay			33.3			
HCM 6th LOS			C			

Year 2035 + Proj PM
2: SR-78 WB Ramps & Rancheros Dr

Sunrise Residential

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Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↩		↩↩	↩	↩	↩↩
Traffic Volume (veh/h)	545	85	612	230	105	265
Future Volume (veh/h)	545	85	612	230	105	265
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	592	92	665	250	114	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	703	109	834	1426	151	
Arrive On Green	0.44	0.44	0.24	0.76	0.08	0.00
Sat Flow, veh/h	1581	246	3456	1870	1781	2790
Grp Volume(v), veh/h	0	684	665	250	114	0
Grp Sat Flow(s), veh/h/ln	0	1826	1728	1870	1781	1395
Q Serve(g_s), s	0.0	19.6	10.6	2.2	3.7	0.0
Cycle Q Clear(g_c), s	0.0	19.6	10.6	2.2	3.7	0.0
Prop In Lane		0.13	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	0	812	834	1426	151	
V/C Ratio(X)	0.00	0.84	0.80	0.18	0.76	
Avail Cap(c_a), veh/h	0	1207	1145	2000	548	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	0.0	14.5	21.0	1.9	26.3	0.0
Incr Delay (d2), s/veh	0.0	3.6	2.8	0.1	7.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	7.6	4.2	0.3	1.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	18.1	23.8	2.0	33.9	0.0
LnGrp LOS	A	B	C	A	C	
Approach Vol, veh/h	684			915	114	A
Approach Delay, s/veh	18.1			17.8	33.9	
Approach LOS	B			B	C	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	30.7	30.7			49.4	9.5
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	38.9	38.9			62.9	18.1
Max Q Clear Time (g_c+1/2), s	21.6	21.6			4.2	5.7
Green Ext Time (p_c), s	1.6	4.6			1.6	0.2

Intersection Summary

HCM 6th Ctrl Delay	19.0
HCM 6th LOS	B

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Year 2035 + Proj PM
3: Woodland Pkwy & Rancheros Dr

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Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	185	175	470	55	150	30	177	407	50	15	388	540
Future Volume (veh/h)	185	175	470	55	150	30	177	407	50	15	388	540
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	201	190	511	60	163	33	192	442	54	16	422	587
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	247	586	706	85	657	130	236	1212	147	34	948	643
Arrive On Green	0.14	0.31	0.31	0.05	0.22	0.22	0.13	0.38	0.38	0.02	0.27	0.27
Sat Flow, veh/h	1781	1870	1585	1781	2956	586	1781	3190	388	1781	3554	1585
Grp Volume(v), veh/h	201	190	511	60	97	99	192	245	251	16	422	587
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1777	1765	1781	1777	1801	1781	1777	1585
Q Serve(g_s), s	8.2	5.8	19.8	2.5	3.4	3.5	7.9	7.4	7.5	0.7	7.4	20.0
Cycle Q Clear(g_c), s	8.2	5.8	19.8	2.5	3.4	3.5	7.9	7.4	7.5	0.7	7.4	20.0
Prop In Lane	1.00		1.00	1.00		0.33	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	247	586	706	85	395	392	236	675	684	34	948	643
V/C Ratio(X)	0.81	0.32	0.72	0.71	0.24	0.25	0.81	0.36	0.37	0.48	0.45	0.91
Avail Cap(c_a), veh/h	439	696	799	204	427	424	368	723	732	119	948	643
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	31.4	19.7	17.0	35.2	24.0	24.0	31.6	16.7	16.7	36.4	22.9	21.1
Incr Delay (d2), s/veh	6.4	0.3	2.8	10.3	0.3	0.3	7.7	0.3	0.3	10.0	0.3	17.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.8	2.5	7.1	1.3	1.4	1.4	3.8	2.9	3.0	0.4	3.0	12.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.8	20.0	19.8	45.5	24.3	24.4	39.3	17.0	17.1	46.5	23.2	38.7
LnGrp LOS	D	B	B	D	C	C	D	B	B	D	C	D
Approach Vol, veh/h	902			256			688			1025		
Approach Delay, s/veh	23.9			29.3			23.3			32.4		
Approach LOS	C			C			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.9	33.0	8.1	28.0	14.4	24.5	14.9	21.2				
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5				
Max Green Setting (Gmax), s	5.0	30.5	8.6	27.9	15.5	20.0	18.5	18.0				
Max Q Clear Time (g_c+I), s	12.7	9.5	4.5	21.8	9.9	22.0	10.2	5.5				
Green Ext Time (p_c), s	0.0	3.0	0.0	1.7	0.2	0.0	0.3	0.8				

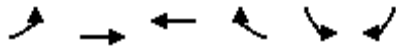
Intersection Summary

HCM 6th Ctrl Delay	27.3
HCM 6th LOS	C

Year 2035 + Proj PM
4: Barham Dr & Woodland Pkwy

Sunrise Residential

09/16/2019



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	465	956	585	439	268	775
Future Volume (veh/h)	465	956	585	439	268	775
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	505	1039	636	477	291	775
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	557	2232	905	800	446	698
Arrive On Green	0.31	0.63	0.25	0.25	0.25	0.25
Sat Flow, veh/h	1781	3647	3647	1585	1781	2790
Grp Volume(v), veh/h	505	1039	636	477	291	775
Grp Sat Flow(s), veh/h/ln	1781	1777	1777	1585	1781	1395
Q Serve(g_s), s	20.1	11.4	12.0	15.8	10.8	18.5
Cycle Q Clear(g_c), s	20.1	11.4	12.0	15.8	10.8	18.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	557	2232	905	800	446	698
V/C Ratio(X)	0.91	0.47	0.70	0.60	0.65	1.11
Avail Cap(c_a), veh/h	687	2524	937	815	446	698
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	24.4	7.2	25.0	13.0	24.8	27.7
Incr Delay (d2), s/veh	13.9	0.2	2.3	1.2	3.4	68.4
Initial Q Delay(d3), s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%), veh/ln	0.1	3.6	5.1	8.7	4.8	6.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d), s/veh	38.3	7.4	27.3	14.1	28.2	96.1
LnGrp LOS	D	A	C	B	C	F
Approach Vol, veh/h		1544	1113		1066	
Approach Delay, s/veh		17.5	21.7		77.6	
Approach LOS		B	C		E	
Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		50.9		23.0	27.6	23.3
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		52.5		18.5	28.5	19.5
Max Q Clear Time (g_c+I1), s		13.4		20.5	22.1	17.8
Green Ext Time (p_c), s		9.6		0.0	1.0	1.1
Intersection Summary						
HCM 6th Ctrl Delay			35.9			
HCM 6th LOS			D			

Intersection						
Int Delay, s/veh	61.1					
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↑	↑↑	↑	↑
Traffic Vol, veh/h	855	359	89	820	154	136
Future Vol, veh/h	855	359	89	820	154	136
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	100	-	80	0
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	929	390	97	891	167	148

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	0	0	1319
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	-	-	4.14
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	-	-	2.22
Pot Cap-1 Maneuver	-	-	520
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	520
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	NB
HCM Control Delay, s	0	1.3	\$ 504.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	61	406	-	-	520	-
HCM Lane V/C Ratio	2.744	0.364	-	-	0.186	-
HCM Control Delay (s)	\$ 932.8	18.9	-	-	13.5	-
HCM Lane LOS	F	C	-	-	B	-
HCM 95th %tile Q(veh)	17	1.6	-	-	0.7	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Year 2035 + Proj PM
8: Barham Dr & Mission Rd

Sunrise Residential
09/16/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	915	91	663	1120	0	155	5	841	15	5	0
Future Volume (veh/h)	0	915	91	663	1120	0	155	5	841	15	5	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	995	99	721	1217	0	168	5	914	16	5	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1	937	418	560	2163	0	486	14	783	27	8	0
Arrive On Green	0.00	0.26	0.26	0.31	0.61	0.00	0.28	0.28	0.28	0.02	0.02	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3647	0	1732	52	2790	1373	429	0
Grp Volume(v), veh/h	0	995	99	721	1217	0	173	0	914	21	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	0	1784	0	1395	1802	0	0
Q Serve(g_s), s	0.0	39.0	7.3	46.5	30.2	0.0	11.4	0.0	41.5	1.7	0.0	0.0
Cycle Q Clear(g_c), s	0.0	39.0	7.3	46.5	30.2	0.0	11.4	0.0	41.5	1.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.00	0.97		1.00	0.76		0.00
Lane Grp Cap(c), veh/h	1	937	418	560	2163	0	501	0	783	35	0	0
V/C Ratio(X)	0.00	1.06	0.24	1.29	0.56	0.00	0.35	0.00	1.17	0.60	0.00	0.00
Avail Cap(c_a), veh/h	60	937	418	560	2163	0	501	0	783	61	0	0
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)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	54.4	42.8	50.7	17.2	0.0	42.4	0.0	53.2	71.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	47.2	0.3	142.4	0.3	0.0	0.4	0.0	89.0	15.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	23.5	2.9	42.8	12.3	0.0	5.2	0.0	24.2	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	101.7	43.0	193.1	17.6	0.0	42.8	0.0	142.2	87.0	0.0	0.0
LnGrp LOS	A	F	D	F	B	A	D	A	F	F	A	A
Approach Vol, veh/h		1094			1938			1087			21	
Approach Delay, s/veh		96.4			82.9			126.4			87.0	
Approach LOS		F			F			F			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	51.0	43.5		7.4	0.0	94.5		46.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	46.5	39.0		5.0	5.0	80.5		41.5				
Max Q Clear Time (g_c+I1), s	48.5	41.0		3.7	0.0	32.2		43.5				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	12.6		0.0				
Intersection Summary												
HCM 6th Ctrl Delay				97.9								
HCM 6th LOS				F								



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	644	907	300	55	844	595	509	1200	60	220	720	650
Future Volume (veh/h)	644	907	300	55	844	595	509	1200	60	220	720	650
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	700	986	326	60	917	0	553	1304	65	239	783	658
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	516	1358	606	118	949		436	1788	555	292	1096	489
Arrive On Green	0.15	0.38	0.38	0.03	0.27	0.00	0.13	0.35	0.35	0.06	0.21	0.21
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	5106	1585	3456	3554	1585
Grp Volume(v), veh/h	700	986	326	60	917	0	553	1304	65	239	783	658
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1702	1585	1728	1777	1585
Q Serve(g_s), s	19.4	30.8	20.8	2.2	33.1	0.0	16.4	29.0	3.6	8.9	26.7	40.1
Cycle Q Clear(g_c), s	19.4	30.8	20.8	2.2	33.1	0.0	16.4	29.0	3.6	8.9	26.7	40.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	516	1358	606	118	949		436	1788	555	292	1096	489
V/C Ratio(X)	1.36	0.73	0.54	0.51	0.97		1.27	0.73	0.12	0.82	0.71	1.35
Avail Cap(c_a), veh/h	516	1358	606	149	949		436	1788	555	316	1096	489
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.67	0.67	0.67
Upstream Filter(I)	0.09	0.09	0.09	1.00	1.00	0.00	1.00	1.00	1.00	0.74	0.74	0.74
Uniform Delay (d), s/veh	55.3	34.3	31.2	61.7	47.1	0.0	56.8	36.9	28.6	60.3	46.2	51.6
Incr Delay (d2), s/veh	162.0	0.2	0.1	3.4	21.5	0.0	137.9	2.7	0.4	11.2	3.0	165.6
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	20.0	13.3	8.0	1.0	17.4	0.0	15.5	12.5	1.5	4.5	12.7	38.9
Unsig. Movement Delay, s/veh	0.00											
LnGrp Delay(d),s/veh	217.3	34.5	31.3	65.1	68.6	0.0	194.7	39.5	29.1	71.5	49.2	217.1
LnGrp LOS	F	C	C	E	E	A	F	D	C	E	D	F
Approach Vol, veh/h	2012			1624			1922			1680		
Approach Delay, s/veh	97.6			41.1			83.8			118.2		
Approach LOS	F			D			F			F		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.0	55.0	21.0	45.0	24.0	40.0	15.6	50.4				
Change Period (Y+Rc), s	4.6	5.3	4.6	4.9	4.6	5.3	4.6	4.9				
Max Green Setting (Gmax), s	5.6	48.5	16.4	40.1	19.4	34.7	11.9	44.6				
Max Q Clear Time (g_c+I), s	14.2	32.8	18.4	42.1	21.4	35.1	10.9	31.0				
Green Ext Time (p_c), s	0.0	7.4	0.0	0.0	0.0	0.0	0.1	7.8				

Intersection Summary

HCM 6th Ctrl Delay	86.0
HCM 6th LOS	F

Notes

Unsignalized Delay for [WBR] is included in calculations of the approach delay and intersection delay.

Year 2035 + Proj PM
10: Nordahl Rd & SR-78 EB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations								  		 		
Traffic Volume (veh/h)	730	80	490	0	0	0	0	1302	1107	590	1095	0
Future Volume (veh/h)	730	80	490	0	0	0	0	1302	1107	590	1095	0
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No						No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870				0	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	977	0	349				0	1415	1082	641	1190	0
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2				0	2	2	2	2	0
Cap, veh/h	902	0	401				0	2431	755	891	2747	0
Arrive On Green	0.25	0.00	0.25				0.00	0.48	0.48	0.52	1.00	0.00
Sat Flow, veh/h	3563	0	1585				0	5274	1585	3456	3647	0
Grp Volume(v), veh/h	977	0	349				0	1415	1082	641	1190	0
Grp Sat Flow(s),veh/h/ln	1781	0	1585				0	1702	1585	1728	1777	0
Q Serve(g_s), s	32.9	0.0	27.4				0.0	26.1	61.9	18.6	0.0	0.0
Cycle Q Clear(g_c), s	32.9	0.0	27.4				0.0	26.1	61.9	18.6	0.0	0.0
Prop In Lane	1.00		1.00				0.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	902	0	401				0	2431	755	891	2747	0
V/C Ratio(X)	1.08	0.00	0.87				0.00	0.58	1.43	0.72	0.43	0.00
Avail Cap(c_a), veh/h	902	0	401				0	2431	755	891	2747	0
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	2.00	2.00	1.00
Upstream Filter(I)	1.00	0.00	1.00				0.00	0.09	0.09	0.65	0.65	0.00
Uniform Delay (d), s/veh	48.5	0.0	46.5				0.0	24.7	34.0	27.9	0.0	0.0
Incr Delay (d2), s/veh	55.2	0.0	18.2				0.0	0.1	195.8	1.9	0.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.4	0.0	12.8				0.0	10.5	64.1	6.2	0.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	103.8	0.0	64.7				0.0	24.8	229.9	29.7	0.3	0.0
LnGrp LOS	F	A	E				A	C	F	C	A	A
Approach Vol, veh/h	1326						2497			1831		
Approach Delay, s/veh	93.5						113.7			10.6		
Approach LOS	F						F			B		
Timer - Assigned Phs	1	2	4	6								
Phs Duration (G+Y+Rc), s	39.0	67.0	38.0	106.0								
Change Period (Y+Rc), s	5.1	* 5.1	5.1	5.1								
Max Green Setting (Gmax), s	20.3	* 62	32.9	86.9								
Max Q Clear Time (g_c+20.6), s	20.6	63.9	34.9	2.0								
Green Ext Time (p_c), s	0.0	0.0	0.0	12.9								

Intersection Summary

HCM 6th Ctrl Delay	75.6
HCM 6th LOS	E

Notes

User approved volume balancing among the lanes for turning movement.

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

Year 2035 + Proj PM
11: Nordahl Rd & SR-78 WB Ramps

Sunrise Residential
09/16/2019



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations				↰	↰	↰	↰	↰			↰	↰
Traffic Volume (veh/h)	0	0	0	660	5	510	830	1122	0	0	875	650
Future Volume (veh/h)	0	0	0	660	5	510	830	1122	0	0	875	650
Initial Q (Qb), veh				0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)				1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj				1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach				No			No			No		
Adj Sat Flow, veh/h/ln				1870	1870	1870	1870	1870	0	0	1870	1870
Adj Flow Rate, veh/h				874	0	334	902	1220	0	0	951	636
Peak Hour Factor				0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %				2	2	2	2	2	0	0	2	2
Cap, veh/h				977	0	435	943	2300	0	0	1727	536
Arrive On Green				0.27	0.00	0.27	0.55	1.00	0.00	0.00	0.34	0.34
Sat Flow, veh/h				3563	0	1585	3456	3647	0	0	5274	1585
Grp Volume(v), veh/h				874	0	334	902	1220	0	0	951	636
Grp Sat Flow(s),veh/h/ln				1781	0	1585	1728	1777	0	0	1702	1585
Q Serve(g_s), s				30.7	0.0	25.2	32.3	0.0	0.0	0.0	19.7	44.0
Cycle Q Clear(g_c), s				30.7	0.0	25.2	32.3	0.0	0.0	0.0	19.7	44.0
Prop In Lane				1.00		1.00	1.00		0.00	0.00		1.00
Lane Grp Cap(c), veh/h				977	0	435	943	2300	0	0	1727	536
V/C Ratio(X)				0.89	0.00	0.77	0.96	0.53	0.00	0.00	0.55	1.19
Avail Cap(c_a), veh/h				1093	0	486	992	2300	0	0	1727	536
HCM Platoon Ratio				1.00	1.00	1.00	2.00	2.00	1.00	1.00	1.00	1.00
Upstream Filter(I)				1.00	0.00	1.00	0.61	0.61	0.00	0.00	1.00	1.00
Uniform Delay (d), s/veh				45.4	0.0	43.4	28.8	0.0	0.0	0.0	35.0	43.0
Incr Delay (d2), s/veh				9.0	0.0	6.6	13.2	0.5	0.0	0.0	1.3	101.4
Initial Q Delay(d3),s/veh				0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln				14.7	0.0	10.7	11.8	0.2	0.0	0.0	8.4	32.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh				54.4	0.0	49.9	42.0	0.5	0.0	0.0	36.2	144.4
LnGrp LOS				D	A	D	D	A	A	A	D	F
Approach Vol, veh/h					1208			2122			1587	
Approach Delay, s/veh					53.1			18.2			79.6	
Approach LOS					D			B			E	
Timer - Assigned Phs		2			5	6		8				
Phs Duration (G+Y+Rc), s		89.2			40.2	49.1		40.8				
Change Period (Y+Rc), s		5.1			* 4.7	5.1		5.1				
Max Green Setting (Gmax), s		79.9			* 37	37.9		39.9				
Max Q Clear Time (g_c+I1), s		2.0			34.3	46.0		32.7				
Green Ext Time (p_c), s		13.4			1.2	0.0		3.0				

Intersection Summary

HCM 6th Ctrl Delay	46.6
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

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

Intersection

Int Delay, s/veh 1

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations 

Traffic Vol, veh/h 45 1 0 185 250 108

Future Vol, veh/h 45 1 0 185 250 108

Conflicting Peds, #/hr 0 0 0 0 0 0

Sign Control Stop Stop Free Free Free Free

RT Channelized - None - None - None

Storage Length 0 - - - - -

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 49 1 0 201 272 117

Major/Minor Minor2 Major1 Major2

Conflicting Flow All 532 331 389 0 - 0

Stage 1 331 - - - - -

Stage 2 201 - - - - -

Critical Hdwy 6.42 6.22 4.12 - - -

Critical Hdwy Stg 1 5.42 - - - - -

Critical Hdwy Stg 2 5.42 - - - - -

Follow-up Hdwy 3.518 3.318 2.218 - - -

Pot Cap-1 Maneuver 508 711 1170 - - -

Stage 1 728 - - - - -

Stage 2 833 - - - - -

Platoon blocked, % - - -

Mov Cap-1 Maneuver 508 711 1170 - - -

Mov Cap-2 Maneuver 508 - - - - -

Stage 1 728 - - - - -

Stage 2 833 - - - - -

Approach EB NB SB

HCM Control Delay, s 12.8 0 0

HCM LOS B

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h) 1170 - 511 - -

HCM Lane V/C Ratio - - 0.098 - -

HCM Control Delay (s) 0 - 12.8 - -

HCM Lane LOS A - B - -

HCM 95th %tile Q(veh) 0 - 0.3 - -

APPENDIX I

INTERSECTION ANALYSIS WORKSHEETS – POST-MITIGATION

Near-Term + Proj AM (Mitigated)
2: SR-78 WB Ramps & Rancheros Dr

Sunrise Residential
09/17/2019

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	217	38	614	310	177	186
Future Volume (veh/h)	217	38	614	310	177	186
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	236	41	667	337	192	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	329	278	749	1274	264	
Arrive On Green	0.18	0.18	0.42	0.68	0.15	0.00
Sat Flow, veh/h	1870	1585	1781	1870	1781	1585
Grp Volume(v), veh/h	236	41	667	337	192	0
Grp Sat Flow(s),veh/h/ln	1870	1585	1781	1870	1781	1585
Q Serve(g_s), s	6.3	1.2	18.3	3.7	5.4	0.0
Cycle Q Clear(g_c), s	6.3	1.2	18.3	3.7	5.4	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	329	278	749	1274	264	
V/C Ratio(X)	0.72	0.15	0.89	0.26	0.73	
Avail Cap(c_a), veh/h	639	541	1031	1881	608	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	20.5	18.4	14.2	3.3	21.4	0.0
Incr Delay (d2), s/veh	3.0	0.2	7.6	0.1	3.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.4	7.5	0.8	2.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	23.4	18.6	21.8	3.4	25.3	0.0
LnGrp LOS	C	B	C	A	C	
Approach Vol, veh/h	277			1004	192	A
Approach Delay, s/veh	22.7			15.6	25.3	
Approach LOS	C			B	C	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	26.6	13.8			40.4	12.3
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	30.5	18.0			53.0	18.0
Max Q Clear Time (g_c+I1), s	20.3	8.3			5.7	7.4
Green Ext Time (p_c), s	1.9	1.0			2.3	0.4
Intersection Summary						
HCM 6th Ctrl Delay			18.2			
HCM 6th LOS			B			

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

Near-Term + Proj PM (Mitigated)
2: SR-78 WB Ramps & Rancheros Dr

Sunrise Residential
09/17/2019

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	477	75	491	200	90	233
Future Volume (veh/h)	477	75	491	200	90	233
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	518	82	534	217	98	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	639	541	602	1415	160	
Arrive On Green	0.34	0.34	0.34	0.76	0.09	0.00
Sat Flow, veh/h	1870	1585	1781	1870	1781	1585
Grp Volume(v), veh/h	518	82	534	217	98	0
Grp Sat Flow(s),veh/h/ln	1870	1585	1781	1870	1781	1585
Q Serve(g_s), s	14.8	2.1	16.6	1.9	3.1	0.0
Cycle Q Clear(g_c), s	14.8	2.1	16.6	1.9	3.1	0.0
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	639	541	602	1415	160	
V/C Ratio(X)	0.81	0.15	0.89	0.15	0.61	
Avail Cap(c_a), veh/h	1021	866	806	2011	547	
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	17.6	13.4	18.3	2.0	25.7	0.0
Incr Delay (d2), s/veh	2.7	0.1	9.3	0.0	3.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.1	0.7	7.6	0.3	1.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	20.2	13.5	27.6	2.0	29.4	0.0
LnGrp LOS	C	B	C	A	C	
Approach Vol, veh/h	600			751	98	A
Approach Delay, s/veh	19.3			20.2	29.4	
Approach LOS	B			C	C	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	24.3	24.5			48.8	9.8
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	26.5	32.0			63.0	18.0
Max Q Clear Time (g_c+I1), s	18.6	16.8			3.9	5.1
Green Ext Time (p_c), s	1.2	3.2			1.4	0.2

Intersection Summary

HCM 6th Ctrl Delay	20.5
HCM 6th LOS	C

Notes

Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	↗
Traffic Volume (veh/h)	465	430	40	875	275	120
Future Volume (veh/h)	465	430	40	875	275	120
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	505	467	43	951	299	130
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	687	613	85	1942	407	363
Arrive On Green	0.39	0.39	0.05	0.55	0.23	0.23
Sat Flow, veh/h	1870	1585	1781	3647	1781	1585
Grp Volume(v), veh/h	505	467	43	951	299	130
Grp Sat Flow(s),veh/h/ln	1777	1585	1781	1777	1781	1585
Q Serve(g_s), s	9.8	10.3	0.9	6.6	6.2	2.8
Cycle Q Clear(g_c), s	9.8	10.3	0.9	6.6	6.2	2.8
Prop In Lane		1.00	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	687	613	85	1942	407	363
V/C Ratio(X)	0.73	0.76	0.51	0.49	0.73	0.36
Avail Cap(c_a), veh/h	816	728	227	2485	801	712
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	10.5	10.7	18.6	5.6	14.3	13.0
Incr Delay (d2), s/veh	2.9	4.0	4.7	0.2	2.6	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.3	3.3	0.4	1.5	2.3	0.9
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	13.4	14.6	23.3	5.8	16.9	13.6
LnGrp LOS	B	B	C	A	B	B
Approach Vol, veh/h	972			994	429	
Approach Delay, s/veh	14.0			6.6	15.9	
Approach LOS	B			A	B	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	6.4	20.0			26.4	13.7
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	5.1	18.4			28.0	18.0
Max Q Clear Time (g_c+I1), s	2.9	12.3			8.6	8.2
Green Ext Time (p_c), s	0.0	3.2			6.8	1.0
Intersection Summary						
HCM 6th Ctrl Delay			11.2			
HCM 6th LOS			B			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	865	123	697	915	10	130	5	455	15	20	5
Future Volume (veh/h)	0	865	123	697	915	10	130	5	455	15	20	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	940	134	758	995	11	141	5	495	16	22	5
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1	993	443	776	2689	30	216	8	1565	21	28	6
Arrive On Green	0.00	0.28	0.28	0.44	0.75	0.75	0.13	0.13	0.13	0.03	0.03	0.03
Sat Flow, veh/h	1781	3554	1585	1781	3600	40	1723	61	2790	669	921	209
Grp Volume(v), veh/h	0	940	134	758	491	515	146	0	495	43	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1863	1784	0	1395	1799	0	0
Q Serve(g_s), s	0.0	36.2	9.3	58.4	13.5	13.5	10.9	0.0	13.2	3.3	0.0	0.0
Cycle Q Clear(g_c), s	0.0	36.2	9.3	58.4	13.5	13.5	10.9	0.0	13.2	3.3	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.02	0.97		1.00	0.37		0.12
Lane Grp Cap(c), veh/h	1	993	443	776	1327	1392	224	0	1565	56	0	0
V/C Ratio(X)	0.00	0.95	0.30	0.98	0.37	0.37	0.65	0.00	0.32	0.77	0.00	0.00
Avail Cap(c_a), veh/h	64	1003	447	785	1327	1392	334	0	1736	64	0	0
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)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	49.3	39.6	38.7	6.2	6.2	58.1	0.0	16.4	67.2	0.0	0.0
Incr Delay (d2), s/veh	0.0	17.1	0.4	26.4	0.2	0.2	3.2	0.0	0.1	38.5	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	18.4	3.7	30.8	4.8	5.0	5.1	0.0	4.3	2.1	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	66.3	40.0	65.1	6.3	6.3	61.3	0.0	16.5	105.7	0.0	0.0
LnGrp LOS	A	E	D	E	A	A	E	A	B	F	A	A
Approach Vol, veh/h		1074			1764			641			43	
Approach Delay, s/veh		63.1			31.6			26.7			105.7	
Approach LOS		E			C			C			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	65.3	43.5		8.8	0.0	108.8		22.0				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	61.5	39.4		5.0	5.0	95.9		26.1				
Max Q Clear Time (g_c+I1), s	60.4	38.2		5.3	0.0	15.5		15.2				
Green Ext Time (p_c), s	0.4	0.8		0.0	0.0	8.5		2.3				
Intersection Summary												
HCM 6th Ctrl Delay			41.2									
HCM 6th LOS			D									

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	391	454	290	85	706	300	416	920	40	370	1180	305
Future Volume (veh/h)	391	454	290	85	706	300	416	920	40	370	1180	305
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	2057	1870	1870	2057	1870
Adj Flow Rate, veh/h	425	493	315	92	767	0	452	1000	43	402	1283	332
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	418	1166	520	142	883		438	1869	527	472	1339	543
Arrive On Green	0.12	0.33	0.33	0.04	0.25	0.00	0.13	0.33	0.33	0.14	0.34	0.34
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	5617	1585	3456	3909	1585
Grp Volume(v), veh/h	425	493	315	92	767	0	452	1000	43	402	1283	332
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1872	1585	1728	1955	1585
Q Serve(g_s), s	14.5	13.0	20.0	3.1	24.8	0.0	15.2	17.3	2.2	13.6	38.5	20.9
Cycle Q Clear(g_c), s	14.5	13.0	20.0	3.1	24.8	0.0	15.2	17.3	2.2	13.6	38.5	20.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	418	1166	520	142	883		438	1869	527	472	1339	543
V/C Ratio(X)	1.02	0.42	0.61	0.65	0.87		1.03	0.54	0.08	0.85	0.96	0.61
Avail Cap(c_a), veh/h	418	1226	547	204	1007		438	1869	527	608	1339	543
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)	0.62	0.62	0.62	1.00	1.00	0.00	1.00	1.00	1.00	0.73	0.73	0.73
Uniform Delay (d), s/veh	52.8	31.5	33.8	56.7	43.2	0.0	52.4	32.5	27.5	50.6	38.6	32.8
Incr Delay (d2), s/veh	39.2	0.2	1.1	4.8	7.5	0.0	51.7	1.1	0.3	6.8	13.2	3.7
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	8.5	5.6	7.8	1.5	11.8	0.0	9.7	8.0	0.9	6.3	20.7	8.5
Unsig. Movement Delay, s/veh						0.00						
LnGrp Delay(d),s/veh	92.0	31.6	34.9	61.5	50.8	0.0	104.1	33.6	27.8	57.5	51.8	36.5
LnGrp LOS	F	C	C	E	D	A	F	C	C	E	D	D
Approach Vol, veh/h		1233			1185	A		1495			2017	
Approach Delay, s/veh		53.3			37.6			54.7			50.4	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.5	44.7	19.8	46.0	19.1	35.1	21.0	44.8				
Change Period (Y+Rc), s	4.6	5.3	4.6	4.9	4.6	5.3	4.6	4.9				
Max Green Setting (Gmax), s	7.1	41.4	15.2	36.9	14.5	34.0	21.1	31.0				
Max Q Clear Time (g_c+I1), s	5.1	22.0	17.2	40.5	16.5	26.8	15.6	19.3				
Green Ext Time (p_c), s	0.0	4.4	0.0	0.0	0.0	3.0	0.7	5.5				
Intersection Summary												
HCM 6th Ctrl Delay			49.6									
HCM 6th LOS			D									
Notes												
Unsignalized Delay for [WBR] is included in calculations of the approach delay and intersection delay.												

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑↑		↖	↑↑	↖	↗
Traffic Volume (veh/h)	855	359	89	820	154	136
Future Volume (veh/h)	855	359	89	820	154	136
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	929	390	97	891	167	120
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	1213	505	136	2372	253	225
Arrive On Green	0.50	0.50	0.08	0.67	0.14	0.14
Sat Flow, veh/h	2540	1018	1781	3647	1781	1585
Grp Volume(v), veh/h	672	647	97	891	167	120
Grp Sat Flow(s),veh/h/ln	1777	1687	1781	1777	1781	1585
Q Serve(g_s), s	14.5	14.8	2.5	5.3	4.2	3.3
Cycle Q Clear(g_c), s	14.5	14.8	2.5	5.3	4.2	3.3
Prop In Lane		0.60	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	881	837	136	2372	253	225
V/C Ratio(X)	0.76	0.77	0.71	0.38	0.66	0.53
Avail Cap(c_a), veh/h	1049	996	207	2850	682	607
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	9.7	9.7	21.3	3.5	19.2	18.8
Incr Delay (d2), s/veh	2.8	3.2	6.8	0.1	2.9	1.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	4.7	1.2	0.9	1.8	1.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	12.5	12.9	28.1	3.6	22.1	20.8
LnGrp LOS	B	B	C	A	C	C
Approach Vol, veh/h	1319			988	287	
Approach Delay, s/veh	12.7			6.0	21.5	
Approach LOS	B			A	C	
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	8.1	27.9			36.0	11.2
Change Period (Y+Rc), s	4.5	4.5			4.5	4.5
Max Green Setting (Gmax), s	5.5	27.9			37.9	18.1
Max Q Clear Time (g_c+I1), s	4.5	16.8			7.3	6.2
Green Ext Time (p_c), s	0.0	6.6			7.4	0.7
Intersection Summary						
HCM 6th Ctrl Delay			11.1			
HCM 6th LOS			B			

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	915	91	663	1120	0	155	5	841	15	5	0
Future Volume (veh/h)	0	915	91	663	1120	0	155	5	841	15	5	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	0	995	99	721	1217	0	168	5	914	16	5	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	1	997	445	717	2535	0	305	9	1613	27	8	0
Arrive On Green	0.00	0.28	0.28	0.40	0.71	0.00	0.18	0.18	0.18	0.02	0.02	0.00
Sat Flow, veh/h	1781	3554	1585	1781	3647	0	1732	52	2790	1373	429	0
Grp Volume(v), veh/h	0	995	99	721	1217	0	173	0	914	21	0	0
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	0	1784	0	1395	1802	0	0
Q Serve(g_s), s	0.0	41.4	7.1	59.5	22.1	0.0	13.1	0.0	26.0	1.7	0.0	0.0
Cycle Q Clear(g_c), s	0.0	41.4	7.1	59.5	22.1	0.0	13.1	0.0	26.0	1.7	0.0	0.0
Prop In Lane	1.00		1.00	1.00		0.00	0.97		1.00	0.76		0.00
Lane Grp Cap(c), veh/h	1	997	445	717	2535	0	314	0	1613	35	0	0
V/C Ratio(X)	0.00	1.00	0.22	1.01	0.48	0.00	0.55	0.00	0.57	0.60	0.00	0.00
Avail Cap(c_a), veh/h	60	997	445	717	2535	0	314	0	1613	61	0	0
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)	0.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	53.1	40.8	44.2	9.2	0.0	55.6	0.0	19.6	71.9	0.0	0.0
Incr Delay (d2), s/veh	0.0	27.9	0.3	35.1	0.1	0.0	2.1	0.0	0.5	15.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	22.3	2.8	33.0	8.3	0.0	6.1	0.0	9.9	0.9	0.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	81.1	41.1	79.3	9.4	0.0	57.7	0.0	20.0	87.0	0.0	0.0
LnGrp LOS	A	F	D	F	A	A	E	A	C	F	A	A
Approach Vol, veh/h		1094			1938			1087			21	
Approach Delay, s/veh		77.5			35.4			26.0			87.0	
Approach LOS		E			D			C			F	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	64.0	46.0		7.4	0.0	110.0		30.5				
Change Period (Y+Rc), s	4.5	4.5		4.5	4.5	4.5		4.5				
Max Green Setting (Gmax), s	59.5	41.5		5.0	5.0	96.0		26.0				
Max Q Clear Time (g_c+I1), s	61.5	43.4		3.7	0.0	24.1		28.0				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	13.3		0.0				
Intersection Summary												
HCM 6th Ctrl Delay			44.3									
HCM 6th LOS			D									

Year 2035 + Proj PM (Mit.)
9: Auto Park Way/Nordahl Rd & Mission Rd

Sunrise Residential
09/17/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	644	907	300	55	844	595	509	1200	60	220	720	650
Future Volume (veh/h)	644	907	300	55	844	595	509	1200	60	220	720	650
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	2057	1870	1870	2057	1870
Adj Flow Rate, veh/h	700	986	326	60	917	0	553	1304	65	239	783	635
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	553	1428	637	111	956		992	1858	524	889	1176	477
Arrive On Green	0.16	0.40	0.40	0.03	0.27	0.00	0.29	0.33	0.33	0.43	0.50	0.50
Sat Flow, veh/h	3456	3554	1585	3456	3554	1585	3456	5617	1585	3456	3909	1585
Grp Volume(v), veh/h	700	986	326	60	917	0	553	1304	65	239	783	635
Grp Sat Flow(s),veh/h/ln	1728	1777	1585	1728	1777	1585	1728	1872	1585	1728	1955	1585
Q Serve(g_s), s	22.4	32.2	14.5	2.4	35.6	0.0	19.0	28.3	4.4	6.2	21.0	42.1
Cycle Q Clear(g_c), s	22.4	32.2	14.5	2.4	35.6	0.0	19.0	28.3	4.4	6.2	21.0	42.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	553	1428	637	111	956		992	1858	524	889	1176	477
V/C Ratio(X)	1.27	0.69	0.51	0.54	0.96		0.56	0.70	0.12	0.27	0.67	1.33
Avail Cap(c_a), veh/h	553	1428	637	143	957		992	1858	524	889	1176	477
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.67	1.67	1.67
Upstream Filter(I)	0.57	0.57	0.57	1.00	1.00	0.00	1.00	1.00	1.00	0.75	0.75	0.75
Uniform Delay (d), s/veh	58.8	34.7	14.2	66.7	50.4	0.0	42.4	40.8	38.9	31.5	29.6	34.8
Incr Delay (d2), s/veh	128.0	0.8	0.4	4.0	19.9	0.0	0.7	2.2	0.5	0.1	2.3	160.1
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	19.6	14.1	5.3	1.1	18.4	0.0	8.3	13.5	1.6	2.5	8.9	35.1
Unsig. Movement Delay, s/veh	0.00											
LnGrp Delay(d),s/veh	186.8	35.5	14.6	70.7	70.3	0.0	43.0	43.1	39.3	31.6	31.8	195.0
LnGrp LOS	F	D	B	E	E	A	D	D	D	C	C	F
Approach Vol, veh/h	2012				1624			1922			1657	
Approach Delay, s/veh	84.7				42.3			42.9			94.3	
Approach LOS	F				D			D			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.1	61.5	45.5	47.0	27.7	43.0	41.3	51.2				
Change Period (Y+Rc), s	4.6	5.3	4.6	4.9	5.3	* 5.3	4.6	4.9				
Max Green Setting (Gmax), s	5.8	54.3	18.4	42.1	22.4	* 38	14.2	46.3				
Max Q Clear Time (g_c+I1), s	4.4	34.2	21.0	44.1	24.4	37.6	8.2	30.3				
Green Ext Time (p_c), s	0.0	8.5	0.0	0.0	0.0	0.1	0.4	8.6				

Intersection Summary

HCM 6th Ctrl Delay	66.3
HCM 6th LOS	E

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.
Unsignalized Delay for [WBR] is included in calculations of the approach delay and intersection delay.