Hallmark-Barham Specific Plan EIR

Technical Appendices

Appendix K

Transportation Analysis

LINSCOTT LAW & GREENSPAN engineers

TRANSPORTATION IMPACT ANALYSIS & LOCAL TRANSPORTATION ANALYSIS

HALLMARK BARHAM SPECIFIC PLAN

San Marcos, California
May 10, 2021

LLG Ref. 3-20-3293

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LOCAL TRANSPORTATION ANALYSIS

HALLMARK BARHAM SPECIFIC PLAN

San Marcos, California
May 10, 2021

1.0 INTRODUCTION

Linscott, Law & Greenspan, Engineers (LLG) has prepared the following Transportation Impact Analysis & Local Transportation Analysis to determine and evaluate the potential impacts and effects to the local roadway system due to the proposed Hallamark Barham Specifc Plan Project. The Project site is located at 943 E. Barham Drive, west of La Moree Road in the Barham/Discovery Community of the City of San Marcos.

The following items are included in this traffic study:

- Project Description
- Existing Conditions Discussion
- Analysis Approach and Methodology
- Significance Thresholds and Level of Service Standards
- Vehicle Miles Traveled (VMT) Analysis
- Local Transportation Analysis of Existing Conditions
- Trip Generation, Distribution, and Assignment
- Local Transportation Analysis of Near-Term (Year 2025) Conditions
- Local Transportation Analysis of Horizon Year (Year 2050) Conditions
- Site Access and Circulation Review
- Active Transportation Review
- Conclusions

2.0 PROJECT DESCRIPTION

The approximate 10.56-acre site is located at 943 E. Barham Drive, west of La Moree Road in the Barham/Discovery Community of the City of San Marcos. The assessor parcel number (APN) is 228-310-0100. The Project site is currently zoned MU (Mixed Use)-3, which is intended to support a job-based mixed-use area combining a variety of commercial and office uses.

The Project requires a General Plan Amendment, Specific Plan, Rezone, Multi-Family Site Development Plan, Tentative Subdivision Map, Conditional Use Permit and a Grading Variance. If approved, these entitlements would allow for 151 multi-family residential units, which will result in reduced density as compared to the current MU-3 zoning.

The Specific Plan is a comprehensive planning document that establishes development guidelines for the project site. The document will serve as the primary land use, policy, and regulatory document for the project by providing a development planning review process, as authorized by California Government Code Section 65450, in conjunction with the City of San Marcos Zoning Ordinance, Chapter 20.535.

2.1 Access and Circulation

Access to the project site will be via two driveways on E. Barham Drive which will provide an internal loop through the project site and provide access to alleys. Both driveways will be unsignalized and will offer full access. A secondary emergency-only access is provided through the western boundary of the project site to connect to an existing emergency access driveway on the adjacent property which connects to Saddleback Way and then to E. Barham Drive. This access point is for emergency vehicles only and bollards would be put in place. Driveways and alleys within the project site will be private. In addition, the project provides and accessible path of travel through the site and to each residence via pedestrian pathways.

2.2 Project Construction

Grading of the Project site will consist of approximately 36,394 cubic yards (CY) of cut material and 91,526 CY of fill material requiring an import of approximately 46,341 CY of material. Assuming Project approvals in late 2021, the project is expected to start construction in late 2022 with an occupancy of Spring 2025.

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

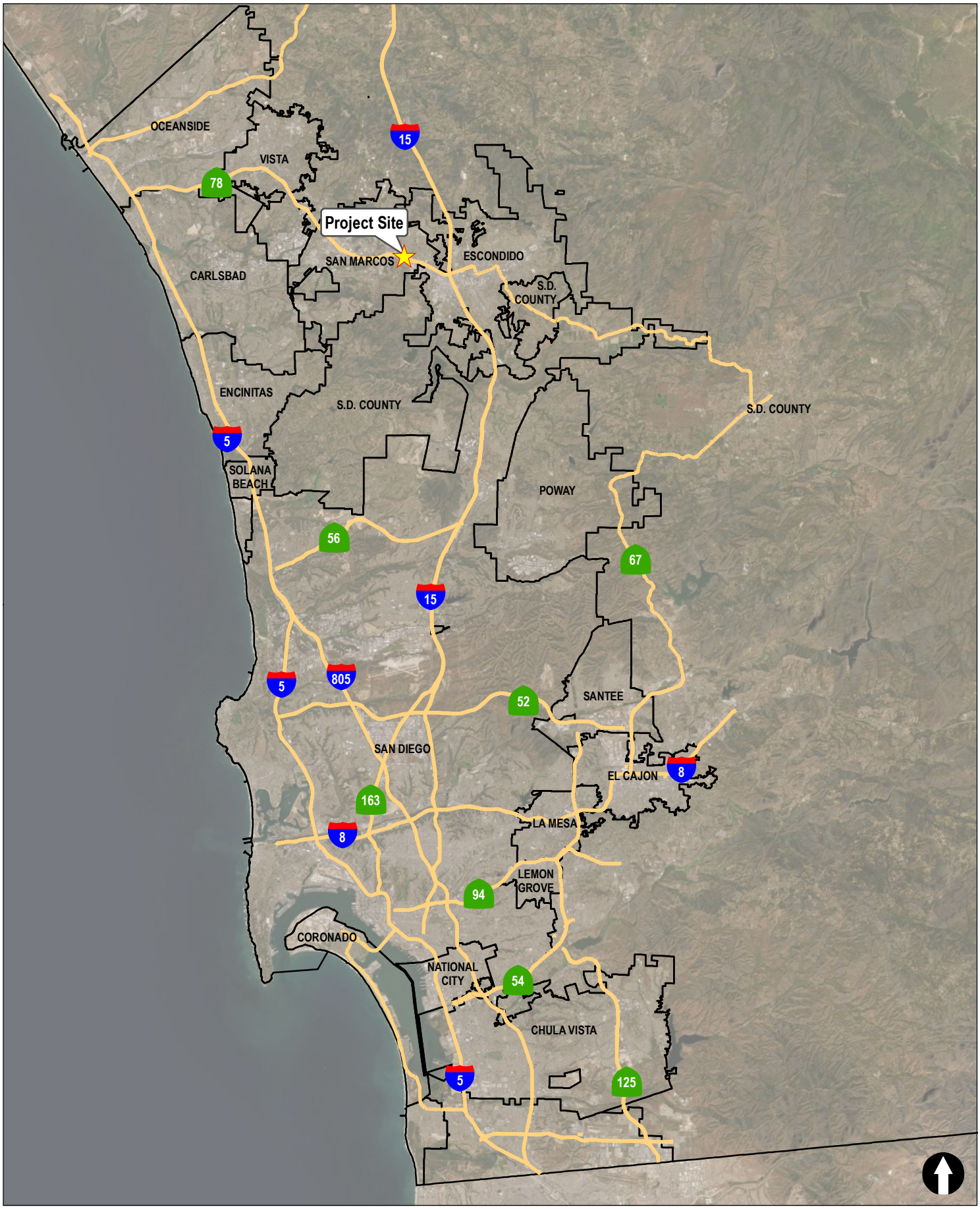

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Figure 2-1

Vicinity Map

Barham Residential

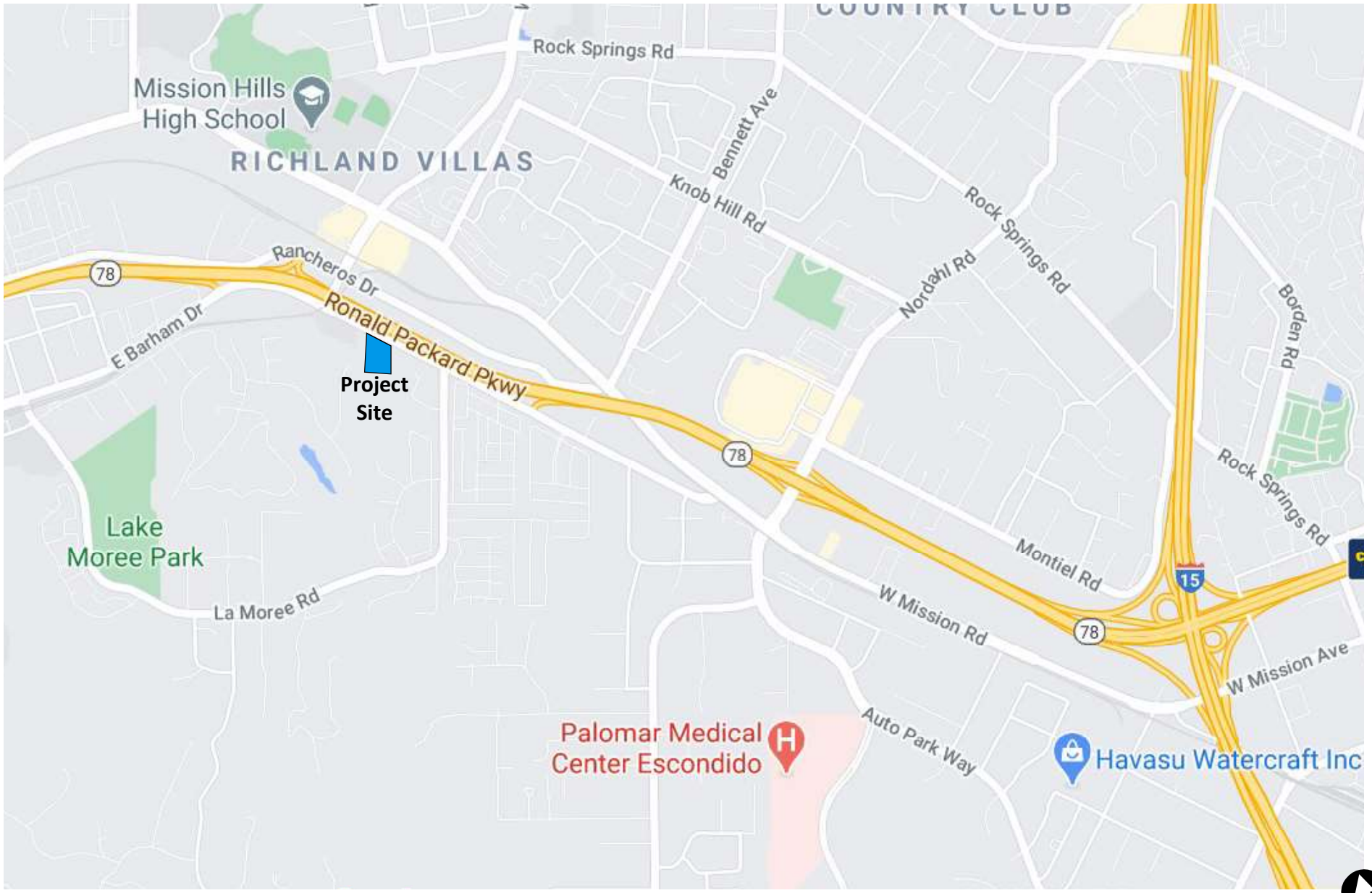

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Figure 2-2

Project Area Map

BARHAM RESIDENTIAL

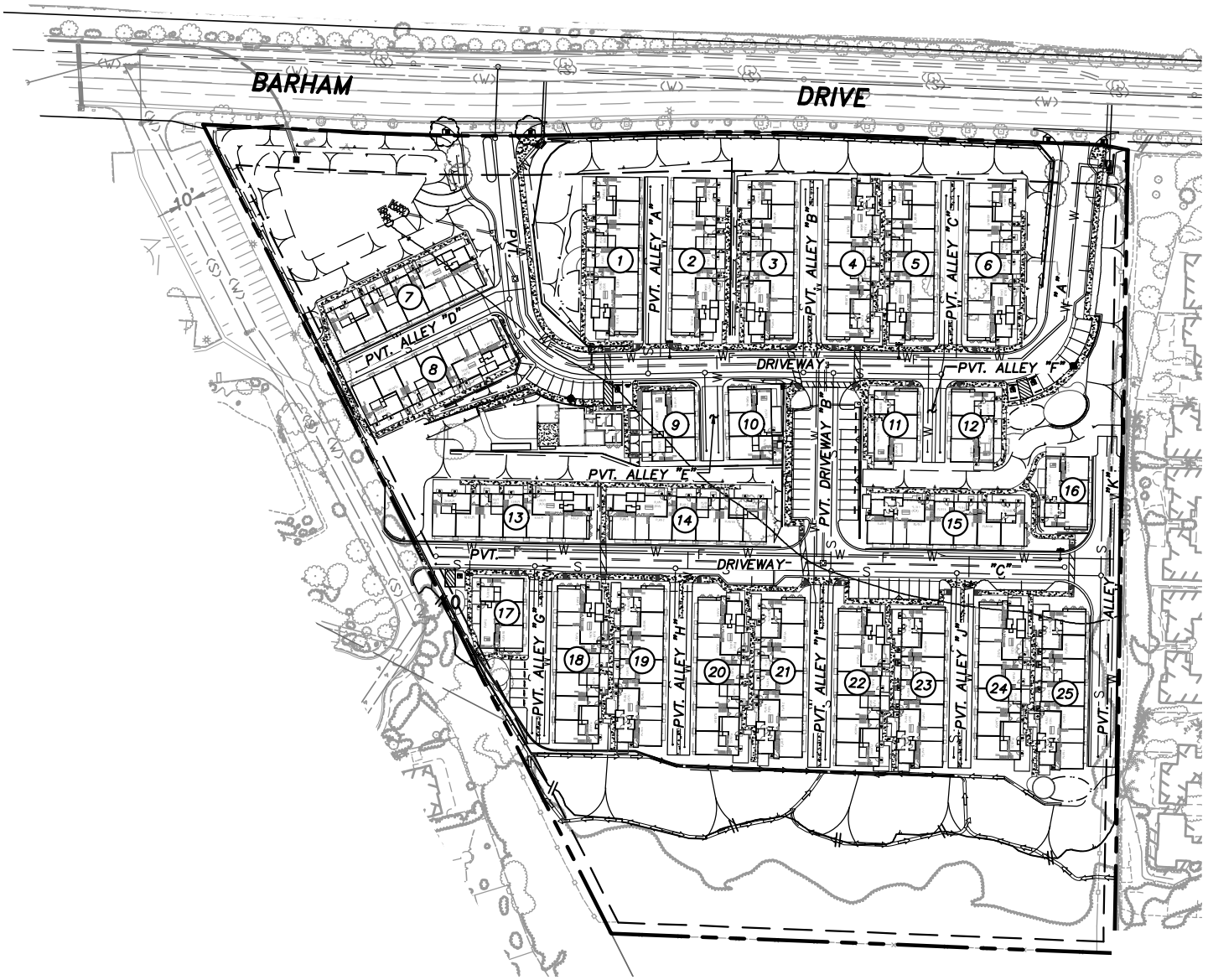

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Figure 2-3

Site Plan

Barham Residential

3.0 EXISTING CONDITIONS

Effective evaluation of the traffic impacts and effects associated with the proposed Project requires an understanding of the existing transportation system within the study area. ***Figure 3–1*** shows an existing conditions diagram, including intersection control and lane configurations. The study area includes the following intersections and street segments based on guidance provided in the City of San Marcos' *Transportation Impact Analysis Guidelines* (November 2020), the anticipated distribution of the Project traffic, and areas of potential effect:

Intersection

1. E. Barham Dr / SR-78 Off Ramp
2. Rancheros Dr / SR-78 WB Ramp
3. Rancheros Dr / Woodland Pkwy
4. E. Barham Dr / Woodland Pkwy
5. E. Barham Dr / Project Driveway 1 (West)
6. E. Barham Dr / Project Driveway 2 (East)
7. E. Barham Dr / La Moore Road

Segments

E. Barham Drive

- Woodland Parkway to Project Driveway (West)
- Project Driveway (W) to Project Driveway (East)
- Project Driveway (East) to La Moree Road
- East of La Moree Road

3.1 Existing Street Network

The principal roadways in the project study are described briefly below. Roadway classification was determined from a review of the *City of San Marcos Mobility Element* and information gathered from field observations. ***Figure 3–1*** illustrates the existing circulation conditions.

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)

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 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

La Moree Road is a two-lane local collector on the *City of San Marcos Mobility Element*. The posted speed limit is 25 mph. and curbside parking is prohibited in both directions. No sidewalks are provided. Bicycle facilities are not provided.

3.2 Existing Traffic Volumes

Manual hand counts at the study area intersections, including bicycle and pedestrian counts, were conducted in September 2018 between the hours of 7:00-9:00 AM and 4:00-6:00 PM while schools were in session. A growth factor of 1% per year for three years (3% total) was added to the traffic counts to represent Year 2021 conditions.

Table 3–1 is a summary of the average daily traffic volumes conducted by Count Data in December 2018 with a 3% growth factor applied.

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

TABLE 3–1
EXISTING TRAFFIC VOLUMES

Street Segment	ADT[a]
E. Barham Drive	
Woodland Parkway to Project Driveway (West)	18,025
Project Driveway (West) to Project Driveway (East)	18,025
Project Driveway (East) to La Moree Road	18,025
East of La Moree Road	18,025

Footnotes:

a. Average Daily Traffic Volumes. The only recent traffic count within the study area was obtained from the approved Sunrise Residential project for the street segment of Barham Drive between Woodland Parkway and Meyers Avenue

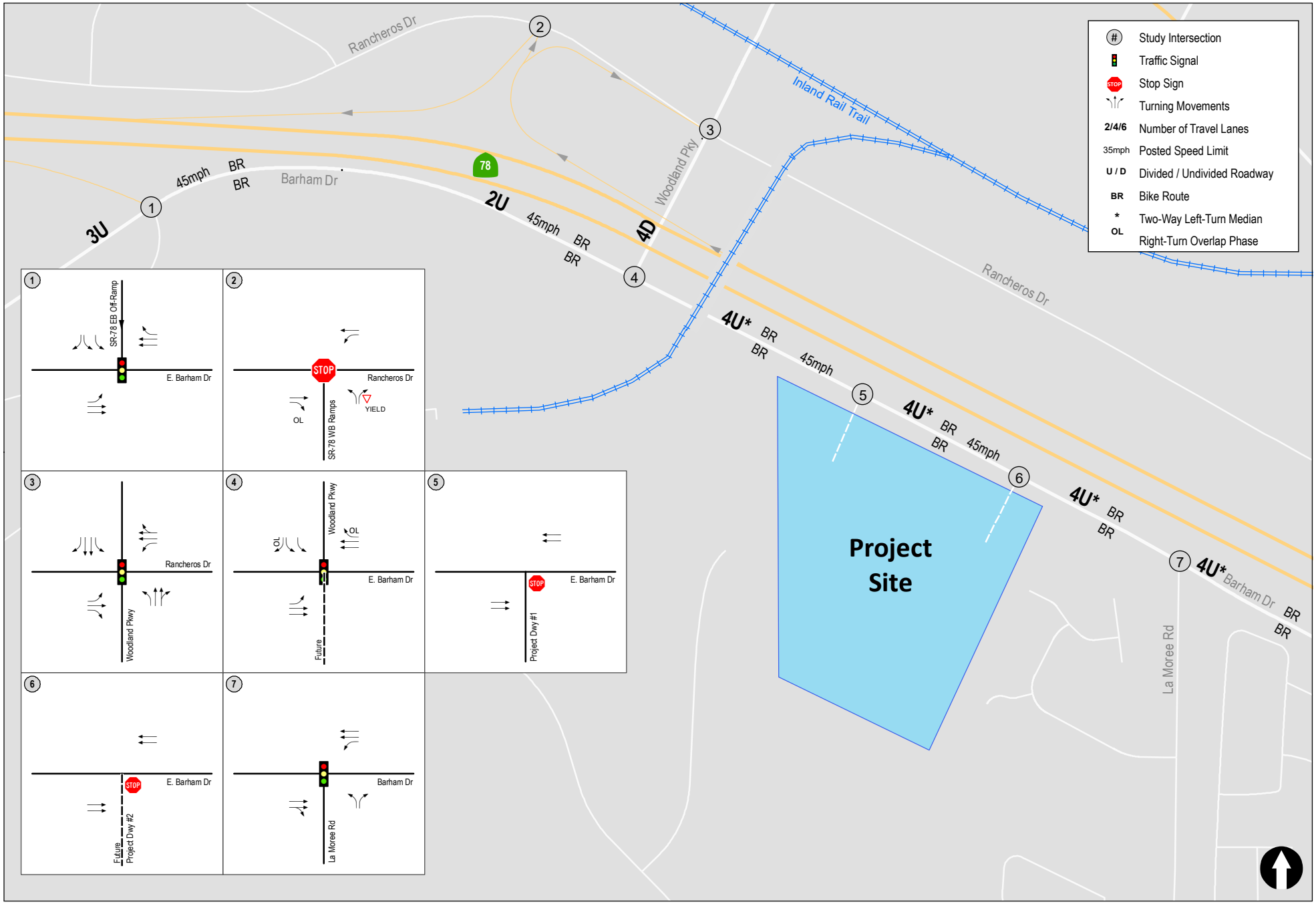

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Figure 3-1

Existing Conditions Diagram

Barham Residential

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Figure 3-2

Existing Traffic Volumes

Barham Residential

4.0 ANALYSIS APPROACH AND METHODOLOGY

The City of San Marcos' *Transportation Impact Analysis Guidelines* (November 2020) specifically address the requirements of California Senate Bill (SB) 743 which mandated specific types of CEQA analysis of transportation projects effective July 1, 2020.

Prior to implementation of SB 743, CEQA transportation analyses of individual projects typically determined impacts on the circulation system in terms of roadway delay and/or capacity usage at specific locations, such as street intersections or roadway segments. SB 743, signed into law in September 2013, required changes to the guidelines for CEQA transportation analysis. The changes include the elimination of auto delay, level of service (LOS), and other similar measures of vehicular capacity or traffic congestion as a basis for determining significant impacts. The purpose of SB 743 is to promote the reduction of greenhouse gas emissions, the development of multimodal transportation networks, and a diversity of land uses.

Under SB 743, a project's effect on automobile delay shall not constitute a significant environmental impact. Therefore, LOS and other similar vehicle delay or capacity metrics may no longer serve as transportation impact metrics for CEQA analysis. The California Office of Planning and Research (OPR) has updated the CEQA Guidelines and provided a final technical advisory in December 2018, which recommends vehicle miles traveled (VMT) as the most appropriate measure of transportation impacts under CEQA. The California Natural Resources Agency certified and adopted the CEQA Guidelines including the Guidelines section implementing SB 743. The changes have been approved by the Office of the Administrative Law and are now in effect.

While VMT is the preferred quantitative metric for assessing potentially significant transportation impacts under CEQA, it should be noted that SB 743 does not prevent a city or county from using metrics such as LOS as part of the application of local general plan policies, municipal and zoning codes, conditions of approval, or any other planning requirements through a city's planning approval process; cities can still ensure adequate operation of the transportation system in terms of transportation congestion measures related to vehicular delay and roadway capacity. As such, the City can continue to require congestion-related transportation analysis and mitigation projects through planning approval processes outside CEQA.

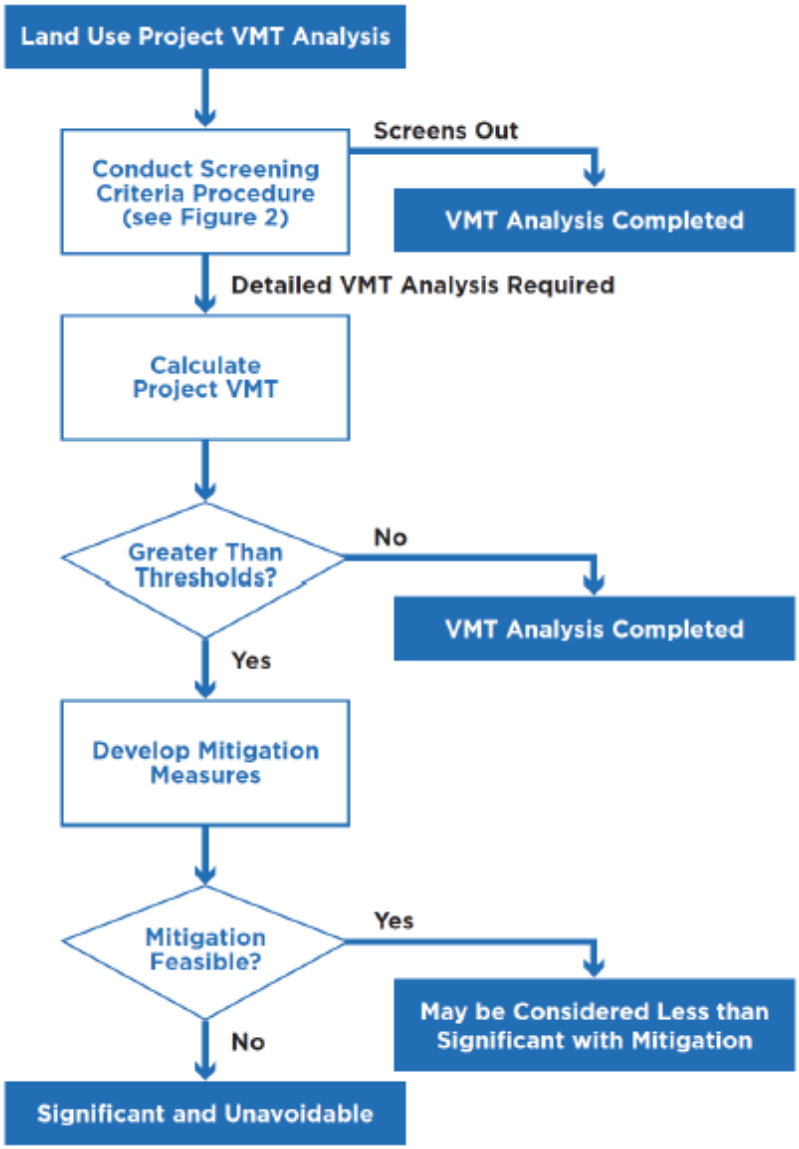
To comply with the requirements of SB 743, the City of San Marcos has prepared its *Transportation Impact Analysis Guidelines* (November 2020) to provide guidance on conducting transportation impact analyses in the City as follows:

- CEQA Analysis Requirements: Requirements for conducting CEQA analysis, which consists of SB 743-consistent VMT analysis as well as assessing impacts to pedestrians, bicyclists, transit, hazards, emergency access, and other impacts.
- Local Transportation Analysis Requirements: Requirements for conducting LOS analysis, site access assessments, and other local transportation analyses for non-CEQA purposes.

This study presents a SB 743-consistent VMT analysis to determine and evaluate the potential impacts to the local roadway system due to the proposed Hallamark Barham Specifc Plan Project. In addition to the VMT analysis, a Local Transportation Analysis was also prepared that focuses on automobile delay/LOS, consistent with the City's guidelines. The LOS analysis was conducted to identify roadway deficiencies in the Project study area and recommend Project improvements to address such deficiency; however, the CEQA significance determination for the proposed Project is based only on VMT and not on LOS.

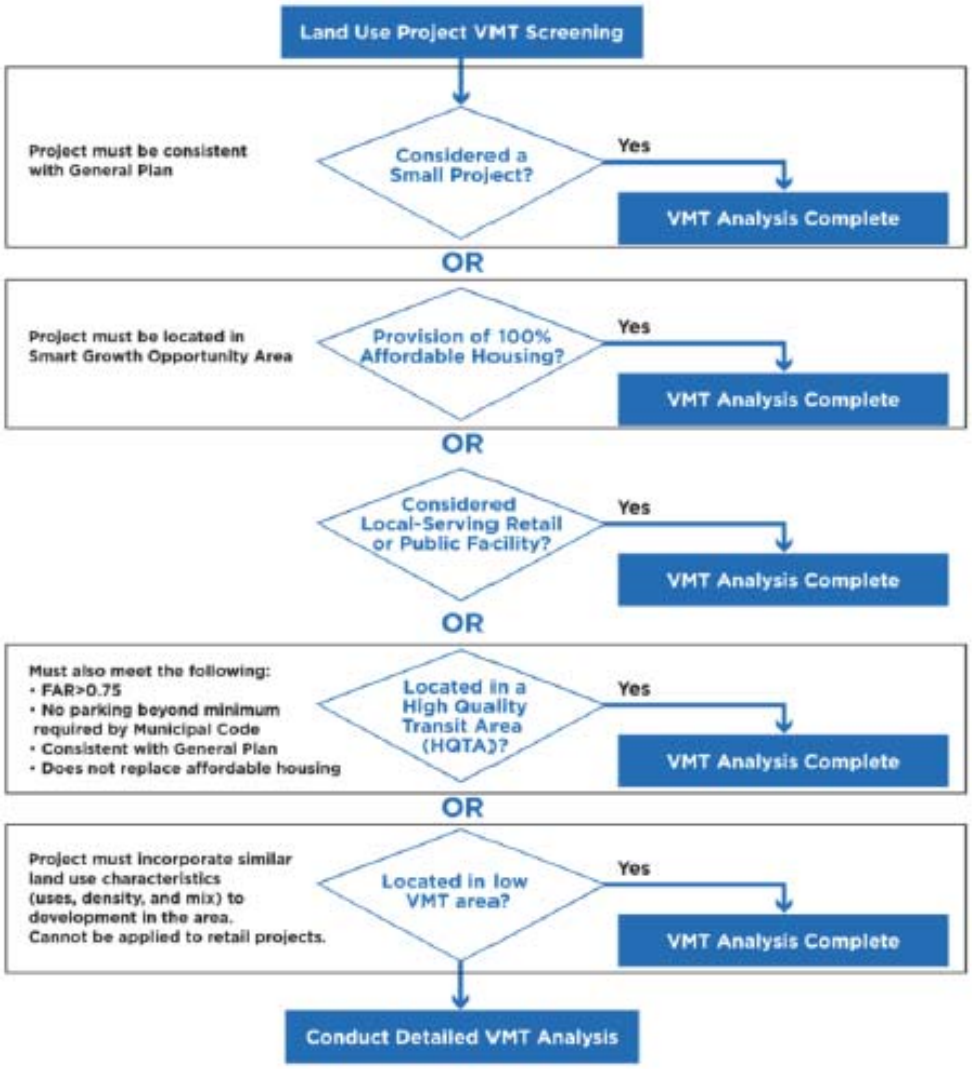
4.1 CEQA Analysis Methodology

The following flow chart from the City's *Transportation Impact Analysis Guidelines* depicts how a project would be analyzed under VMT-based metrics.



4.1.1 *Project Screening*

Several screening approaches are provided to identify when a project should be expected to cause a less-than-significant impact related to VMT. The following flowchart from the City's *Transportation Impact Analysis Guidelines* depicts how project would be analyzed under the City's screening criteria. A project that meets at least one of the screening criteria would be considered to have a less-than-significant VMT impact due to project or location characteristics.



4.1.2 *VMT Estimating Tools*

If a project is not presumed to have a less than significant VMT impact due to project characteristics and/or location, a transportation VMT analysis using the SANDAG Regional Travel Demand Model is required per the City's *Transportation Impact Analysis Guidelines.* The recommended tools to estimate VMT are outlined below.

- SANDAG Travel Demand Model: The San Diego Association of Governments (SANDAG) regional travel demand model can be used to estimate VMT and traffic

volumes in the City. This tool can be used to estimate VMT efficiency metrics specific to a project, as well as total citywide VMT.

- SANDAG Online VMT Tool: SANDAG has prepared an online VMT estimating tool to estimate VMT efficiency metrics for residential and employment projects. This tool maps VMT by census tract in San Diego County.

The use of the SANDAG online VMT mapping tool should be limited to individual land-use projects where an efficiency metric (such as VMT per capita or per employee) is being estimated. In addition, the use of the online tool should be limited to projects generating fewer than 2,400 daily vehicle trips, with trip generation estimated using SANDAG's *(Not So) Brief Guide of Vehicular Traffic Generation Rates for the San Diego Region* (April 2002).

4.2 Local Transportation Analysis Methodology

In addition to the CEQA analysis, a non-CEQA local transportation analysis may be required to evaluate the effects of a development project on the circulation network, primarily on local access and circulation in the proximity of a project site. This analysis will address traffic operations, safety issues and needed project design features related to a proposed land use project, as well as site access and internal circulation.

A local transportation analysis is required for projects generating more than 1,000 daily vehicle trips or more than 100 peak hour vehicle trips (if consistent with the latest version of the City's General Plan) or generating at least 500 daily vehicle trips or at least 50 peak hour vehicle trips if inconsistent with the City's latest General Plan. This determination should be made using SANDAG trip generation rates (or ITE or local rates if an applicable SANDAG rate is not available); mixed-use project trip generation should take internalization into account.

Existing, Interim Year, Interim Year Plus Project, Horizon Year, and Horizon Year Plus Project peak hour intersection LOS must be evaluated for all study intersections using the most recent edition of the Highway Capacity Manual (HCM) methodology.

Roadway segments should be analyzed by calculating daily LOS using the daily volume capacities detailed below based on average daily traffic (ADT).

4.2.1 *Level of Service*

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 and unsignalized intersections, as well as for roadway segments.

4.2.2 *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* (version 10) computer software. The delay values (represented in seconds) were qualified with a corresponding intersection LOS. City of Santee and Caltrans location-specific signal timing information such as minimum greens, cycle lengths, splits for the freeway interchanges and real-time peak hour field observations were included in the analysis, where available.

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

4.2.3 *Street Segments*

Street segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the City of San Marcos's *Roadway Classifications, Capacity, and LOS Table*, attached in ***Appendix B***. This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics.

5.0 SIGNIFICANCE THRESHOLDS AND LEVEL OF SERVICE STANDARDS

5.1 VMT Significant Impact Thresholds

Based on the City of San Marcos' *Transportation Impact Analysis Guidelines,* the transportation VMT thresholds of significance are shown in ***Table 5–1***.

TABLE 5–1
VMT IMPACT THRESHOLDS BY LAND USE TYPE

Land Use Type	Impact Threshold
Residential Uses	A significant impact will occur if the project generates VMT per resident exceeding a level of 15 percent below the existing countywide average.
Employment Projects (including office and industrial)	A significant impact will occur if the project generates VMT per employee exceeding a level of 15 percent below the existing countywide average.
Retail Uses	A significant impact will occur if the project would result in a net increase in existing total citywide VMT.
Mixed-Use Projects	Evaluate each component of a mixed-use project independently and apply the significance threshold for each land use type, incorporating internalization reductions.
Redevelopment Projects (replaces existing uses)	If the project results in a net increase in VMT, apply the appropriate significance threshold for the project land use type(s).

Source: City of San Marcos' Transportation Impact Analysis Guidelines (November 2020)

5.2 Level of Service Standards

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

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

6.0 VEHICLE MILES TRAVELED (VMT) ANALYSIS

6.1 Screening Criteria

The screening criteria described in *Section 4.1.1* are not applicable to the Project. Since the Project is not screened out, a detailed transportation VMT per resident analysis using the SANDAG Regional Travel Demand Model was conducted per the City of San Marcos' *Transportation Impact Analysis Guidelines*.

6.2 VMT Analysis

The SANDAG Series 13 Year 2020 Travel Demand Model was used to calculate the Project's VMT per resident. The model generates a land use-specific average trip length as well as an average daily volume, which ultimately calculates the total VMT per resident. The SANDAG Series 13 Year 2020 Travel Demand Model results are included in ***Appendix C***.

Table 6–1 summarizes the Regional average baseline VMT results provided by SANDAG. As seen in *Table 6–1*, the Regional average baseline VMT per resident is 17.6 miles per resident. For the purpose of determining the significance of VMT impacts, the Project VMT per capita would need to be 15% below the Regional average, which equates to 14.96 VMT per resident.

Similar to the Regional average baseline calculations, the Project VMT per resident was determined. The Project site is located in Traffic Analysis Zone (TAZ) 1026. As shown in *Table 6–1*, the average VMT per resident for TAZ 1026 is calculated at 18.2 VMT per resident.

Since the Project VMT per resident is higher than 85% of the Regional average, a significant VMT impact is calculated.

The results of the Project VMT comparison indicate that the Project would exceed the significance threshold by 21.66%. This would require mitigation of 21.66% or more to reduce the VMT impact to less-than-significant.

TABLE 6–1
PROJECT VMT FINDINGS

Scenario	Regional Baseline VMT per Capita	Significance Threshold[a]	Project VMT per Capita	Transportation Impact? (Over Threshold)
VMT per Resident	17.6	14.96	18.2	Yes

Footnotes:
a. 85% of the Regional Baseline VMT per Capita

Source: SANDAG, October, 2020

6.3 VMT Impacts Summary & Mitigation Measures

When a Project results in a significant impact, CEQA requires mitigation measures to be implemented to reduce or mitigate impacts. With the shift away from LOS, delay, and vehicular capacity metrics and impact thresholds to VMT thresholds, mitigating significant impacts now requires focusing on measures to shorten vehicle trip distances or reduce single-occupancy vehicle trips (in favor of carpooling, taking public transit, bicycling, walking, and other modes), since VMT in essence is a function of the number of vehicle trips and their associated trip lengths. Whereas previous LOS-related mitigation measures focused on expanding roadway facilities primarily for vehicles, VMT-reducing mitigation measures can include modifying project characteristics, implementing on- or off-site improvements to transit, pedestrian and bicycle facilities, parking management strategies, and Transportation Demand Management (TDM) strategies to either reduce or shorten vehicular trips.

Specific VMT mitigation strategies applicable to projects in the City of San Marcos have been developed based on a review of relevant literature and research. The selected strategies, as well as the applicable VMT reduction percentages and other attributes, included in ***Appendix I,*** are primarily based on a review of the guidance published by the California Air Pollution Control Officers Association (CAPCOA) in August 2010 (*Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures*).

It should be noted that there is a limit to the amount of VMT reduction that can be applied to a development project. Within the City of San Marcos, with its suburban land use and transportation context, CAPCOA indicates that the maximum feasible total reduction combining all measures is 15%.

Based on the VMT analysis presented above, a ***significant transportation impact is calculated.*** The results of the Project VMT comparison indicate that the Project would exceed the significance threshold by 21.66%. This would require mitigation of 21.66% or more to reduce the VMT impact to less-than-significant. Since the maximum feasible total VMT reduction combining all measures is 15%, the Project's impact is considered significant and unmitigated.

However, the CAPCOA measure *LUT-1: Increase Density*, was identified as a measure that would reduce the Project's VMT as calculated using the SANDAG Series 13 Year 2020 Travel Demand Model, thereby partially mitigating the Project's significant transportation impact. This measure was selected since the Project's features meet the measure's description and applicability criteria. A brief description of CAPCOA measure LUT-1 is provided below.

- LUT-1 Increase Density: Designing the project with increased densities (i.e., dwellings per unit area). Increased density affects the distance people travel and provides greater options for the mode of travel they choose. This measure is applicable for residential projects in a suburban area.

To calculate the VMT reduction for this measure, a comparative VMT calculation was conducted between the residential density in TAZ 1026 and in the Project site. The residential density for TAZ

1026 was calculated by taking the total number of dwelling units contained in the TAZ and dividing it by the total acreage on which the dwelling units lay. Based on the weighted average of the data, the residential density for TAZ 1026 is **7**.03 dwelling units per acre. The average residential density of the Project site is 14.3 dwelling units per acre. The calculations are included in *Appendix I*.

Using the residential densities determined for TAZ 1026 and the Project site, the corresponding VMT reductions were calculated using the CAPCOA methodology for LUT 1. The VMT reduction utilized for LUT-1 is the difference between the Project site VMT Reduction and the total TAZ VMT Reduction. Therefore, **the Project's net-VMT reduction associated with LUT-1 is calculated to be 6.2%.** This 6.2% reduction in the Project's unadjusted VMT per capita of 18.2 results in a Project VMT per Capita of 17.07.

Additional information is included in *Appendix I*.

7.0 LOCAL TRANSPORTATION ANALYSIS OF EXISTING CONDITIONS

In addition to the VMT analysis presented above, a Local Transportation Analysis (LTA) was also prepared that focuses on automobile delay and Level of Service (LOS). The LOS analysis was conducted to identify Project effects on the roadway operations in the Project study area and recommend Project improvements to address noted deficiencies; however, the CEQA impact significance determination for the proposed Project is based only on VMT and not on LOS.

7.1 Peak Hour Intersection Levels of Service

Table 7-1 summarizes the peak hour intersection operations for existing conditions. As seen in *Table 7-1*, all intersections are calculated to currently operate at LOS D or better during both the AM and PM peak hours, with the exception of Rancheros Drive / SR-78 WB ramps which is calculate to operate at LOS F.

Appendix D contains the Existing intersection analysis calculation worksheets.

7.2 Daily Street Segment Levels of Service

Table 7-2 summarizes the existing roadway segment operations. As seen in *Table 7-2,* the study area segments are calculated to currently operate at LOS C.

TABLE 7–1
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing	
			Delay[a]	LOS[b]
1. E Barham Dr / SR-78 EB Off Ramp	Signal	AM PM	30.0 17.0	C B
2. Rancheros Dr / SR-78 WB Ramp	AWSC[d]	AM PM	**69.3** **55.0**	**F** **F**
3. Rancheros Dr / Woodland Pkwy	Signal	AM PM	31.3 25.2	C C
4. E Barham Dr / Woodland Pkwy	Signal	AM PM	49.1 45.6	D D
5. E Barham Dr / Project Driveway (West)[c]	-	AM PM	- -	- -
6. E Barham Dr / Project Driveway (East)[c]	-	AM PM	- -	- -
7. E Barham Dr / La Moore Rd	Signal	AM PM	4.8 4.8	A A

Footnotes:
b. Average delay expressed in seconds per vehicle.
c. Level of Service.
d. Intersection does not currently exist
e. AWSC – All Way Stop Control

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

TABLE 7–2
EXISTING STREET SEGMENT OPERATIONS

Street Segment	Classification	Capacity (LOS E) [a]	ADT [b]	LOS [c]	V/C [d]
E. Barham Drive					
Woodland Parkway to Project Driveway (West)	4-Ln Collector/ Secondary Arterial	30,000	18,025	C	0.601
Project Driveway (West) to Project Driveway (East)	4-Ln Collector/ Secondary Arterial	30,000	18,025	C	0.601
Project Driveway (East) to La Moree Road	4-Ln Collector/ Secondary Arterial	30,000	18,025	C	0.601
East of La Moree Road	4-Ln Collector/ Secondary Arterial	30,000	18,025	C	0.601

Footnotes:

a. Capacities based on City of San Marcos's Roadway Classification Table.

b. Average Daily Traffic Volumes.

c. Level of Service.

d. Volume to Capacity.

8.0 TRIP GENERATION, DISTRIBUTION, & ASSIGNMENT

8.1 Project Trip Generation

Trip generation rates were obtained from the (Not So) *Brief guide of Vehicular Traffic Generation Rates for the San Diego Region*, April 2002 by SANDAG. The "Multi-family Residential" (6- 20 DU/acre)" trip rate was used to estimate the Project trip generation.

Table 8–1 tabulates the total Project traffic generation. The Project is calculated to generate 1,208 ADT with 19 inbound / 78 outbound trips during the AM peak hour and 85 inbound / 36 outbound trips during the PM peak hour.

TABLE 8–1
PROJECT TRIP GENERATION

Land Use	Quantity	Daily Trip Ends (ADT)		AM Peak Hour					PM Peak Hour				
				% of ADT	In:Out Split	Volume			% of ADT	In:Out Split	Volume		
		Rate	Volume			In	Out	Total			In	Out	Total
Multi-Family Residential (6- 20 DU /acre)	151 DU	8 /DU	1,208	8%	20 : 80	19	78	97	10%	70 : 30	85	36	121

Footnotes:
a. Trip generation rates were obtained from the (Not So) Brief guide of Vehicular Traffic Generation Rates for the San Diego Region, April 2002 by SANDAG

8.2 Construction Trip Generation

Grading of the Project site will consist of approximately 36,394 cubic yards (CY) of cut material and 91,526 CY of fill material requiring an import of approximately 46,341 cy of material. The grading phase of the Project is not expected to generate trips above the trips associated with the 151-unit multi-family residential development. Therefore, the grading phase will not result in any traffic related significant impacts or substantial effects above those associated with the Project and disclosed in this study.

8.3 Trip Distribution/Assignment

The Project traffic was distributed and assigned to the street system based on the Project's proximity to state highways and arterials, the Project's two full-access driveways and based on other traffic studies prepared for developments in the area.

Figure 8–1 depicts the Project Traffic Distribution, and ***Figure 8–2*** depicts the Project Traffic Assignment.

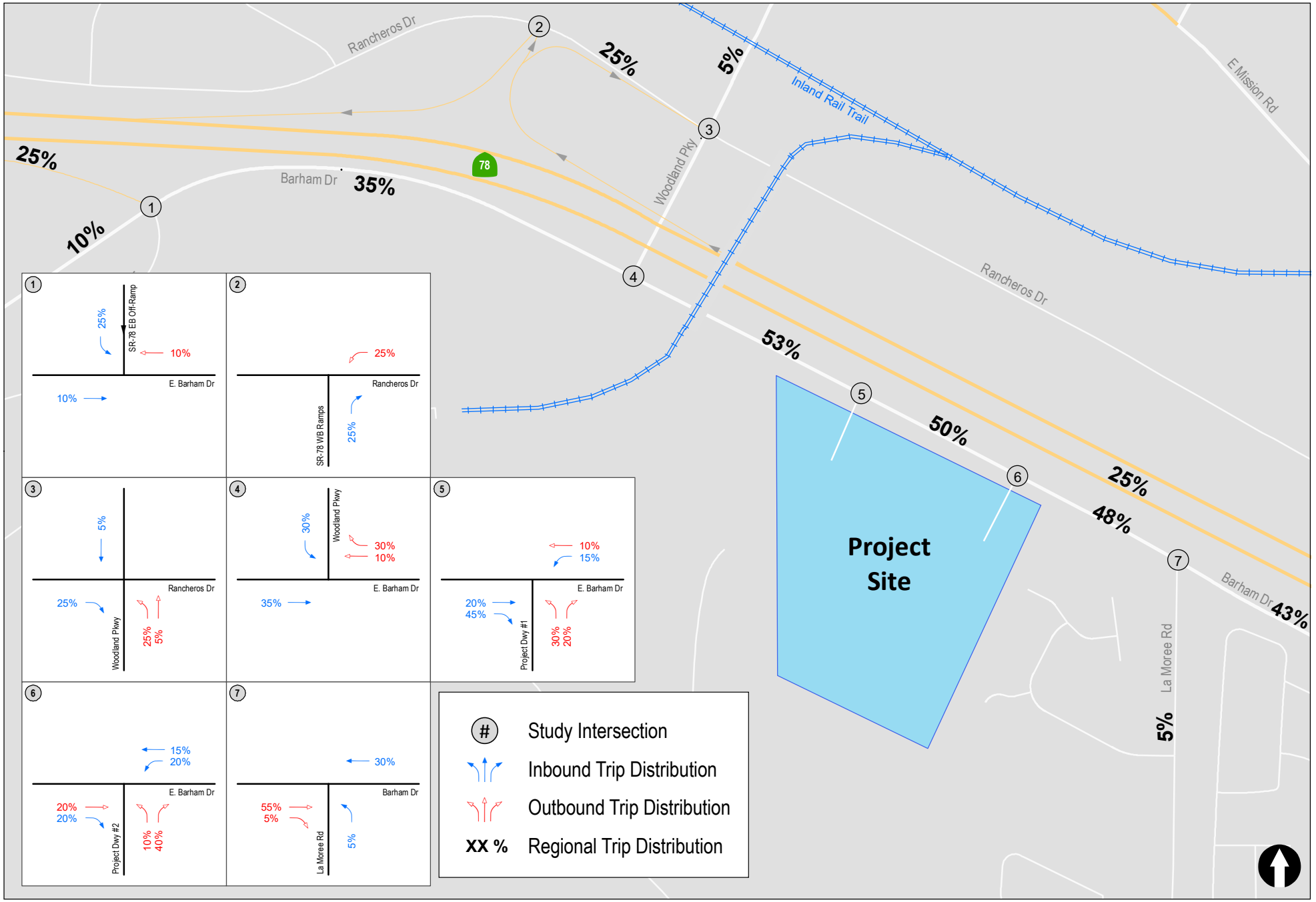


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Figure 8-1

Project Traffic Distribution

Barham Residential

LINSCOTT LAW & GREENSPAN engineers

Date: 5/7/2021
Time: 9:29 AM

Figure 8-2

Project Traffic Volumes

Barham Residential

9.0 LOCAL TRANSPORTATION ANALYSIS OF NEAR-TERM (YEAR 2025) CONDITIONS

The following section presents the analysis of study area intersections and street segments under Near-Term conditions without and with the proposed Project. Assuming Project approvals in late 2021, the project is expected to start construction in late 2022 with an occupancy of Spring 2025.

9.1 Near-Term Year 2025 Traffic Volumes

Year 2025 traffic volumes were calculated based on the manual hand counts at the study area intersections conducted in September 2018. A growth factor of 1% per year for seven years (7% total) was added to the traffic counts to represent Year 2025 conditions.

Figure 9–1 shows the Near-Term (Year 2025) without Project traffic volumes. ***Figure 9–2*** shows the Near-Term (Year 2025) + Project traffic volumes.

9.2 Near-Term (Year 2025) Without Project

9.2.1 *Intersection Analysis*

Table 9–1 summarizes the peak hour intersection operations for the Near-Term (Year 2025) without Project condition. As seen in *Table 9–1*, all intersections are calculated to operate acceptably at LOS D or better during both the AM and PM peak hours with the exception of Rancheros Drive / SR-78 WB ramps which is calculate to operate at LOS F.

Appendix E contains the Near-Term (Year 2025) without Project intersection analysis calculation worksheets.

9.2.2 *Segment Operations*

Table 9–2 summarizes the segment operations throughout the study area for the Near-Term (Year 2025) without Project condition. As seen in *Table 9–2*, all of the study area segments are calculated to operate acceptably at LOS C.

9.3 Near-Term (Year 2025) + Project

9.3.1 *Intersections Analysis*

Table 9–1 summarizes the intersection operations through the study area for the Near-Term (Year 2025) + Project condition. As seen in *Table 9–1*, with the addition of Project traffic all intersections are calculated to continue to operate acceptably at LOS D or better during both the AM and PM peak hours with the exception of Rancheros Drive / SR-78 WB Ramps which is calculate to operate at LOS F under both "without" and "with Project" conditions. A substantial LOS related effect is identified at this intersection since the Project-related increase in delay exceeds the LOS standard threshold maximum of 2.0 seconds.

Additionally, the northbound left-turn movements out of the Project's western and eastern driveways are calculated to operate at LOS E during the PM peak hour. A substantial LOS related effect is identified at these approaches due to the deficient LOS E. It should be noted that all other movements operate acceptably, including the northbound right-turns out of the site and the

westbound left-turns into the site. The substantial effect is only for the outbound left-turns during the PM peak hour.

Appendix F contains the Near-Term (Year 2025) + Project intersection analysis calculation worksheets.

9.3.2 *Segment Operations*

Table 9–2 summarizes the segment operations throughout the study area for the Near-Term (Year 2025) + Project condition. As seen in *Table 9–2*, with the addition of Project traffic all of the study area segments are calculated to continue to operate at LOS C, and therefore roadway improvements are not required.

TABLE 9–1
NEAR-TERM (YEAR 2025) INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Movement	Year 2025 Without Project		Year 2025 With Project		Δ [c]	Consistent w/ City LOS Standards?[f]
				Delay [a]	LOS [b]	Delay	LOS		
1. E Barham Dr / SR-78 EB Off Ramp	Signal	AM	Average	35.9	D	37.6	D	1.7	Yes
		PM		21.7	C	25.5	C	3.8	Yes
2. Rancheros Dr / SR-78 WB Ramp	AWSC[g]	AM	Average	**79.7**	**F**	88.2	**F**	**8.5**	**No**
		PM		**63.8**	**F**	68.9	**F**	**5.1**	**No**
3. Rancheros Dr / Woodland Pkwy	Signal	AM	Average	35.0	C	37.2	D	2.2	Yes
		PM		26.5	C	27.7	C	1.2	Yes
4. E Barham Dr / Woodland Pkwy	Signal	AM	Average	54.5	D	54.6	D	0.1	Yes
		PM		43.8	D	48.5	D	4.7	Yes
5. E Barham Dr / Project Driveway (West)	MSSC[d]	AM	NBL	-	-	30.0	D	-	Yes
			NBR	-	-	14.9	B	-	Yes
			WBL	-	-	12.5	B	-	Yes
		PM	NBL	-	-	**46.7**	**E**	-	**No**
			NBR	-	-	18.6	C	-	Yes
			WBL	-	-	16.5	C	-	Yes
6. E Barham Dr / Project Driveway (East)	MSSC	AM	NBL	-	-	27.7	D	-	Yes
			NBR	-	-	15.4	C	-	Yes
			WBL	-	-	12.5	B	-	Yes
		PM	NBL	-	-	**43.0**	**E**	-	**No**
			NBR	-	-	18.7	C	-	Yes
			WBL	-	-	16.3	C	-	Yes
7. E Barham Dr / La Moore Rd	Signal	AM	Average	4.8	A	4.8	A	0.0	Yes
		PM		4.9	A	4.9	A	0.0	Yes

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Δ denotes the increase in delay due to Project.
d. MSSC = Minor Street Stop Controlled intersection. Worst-Case movement approach delay and LOS reported.
e. Intersection does not exist under "without Project" conditions.
f. City of San Marcos strives to maintain intersection and roadway segment operations based on LOS standards (LOS D or better) outlined in the General Plan Mobility Element.
g. AWSC = All Way Stop Controlled intersection

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

TABLE 9–2
NEAR-TERM (YEAR 2025) STREET SEGMENT OPERATIONS

Street Segment	Capacity (LOS E) [a]	Year 2025 Without Project			Year 2025 With Project			Δ[e]	Consistent w/ City LOS Standards?[f]
		ADT [b]	LOS [c]	V/C [d]	ADT	LOS	V/C		
E. Barham Drive									
Woodland Parkway to Project Driveway (West)	30,000	18,930	C	0.631	19,570	C	0.652	0.021	Yes
Project Driveway (West) to Project Driveway (East)	30,000	18,930	C	0.631	19,530	C	0.651	0.020	Yes
Project Driveway (East) to La Moree Road	30,000	18,930	C	0.631	19,510	C	0.650	0.019	Yes
East of La Moree Road	30,000	18,930	C	0.631	19,450	C	0.648	0.017	Yes

Footnotes:

a. Capacities based on City of San Marcos's Roadway Classification Table
b. Average Daily Traffic Volumes.
c. Level of Service.
d. Volume to Capacity.
e. Δ denotes a project-induced increase in the Volume to Capacity (V/C) ratio.
f. City of San Marcos strives to maintain intersection and roadway segment operations based on LOS standards (LOS D or better) outlined in the General Plan Mobility Element.

Figure 9-1

Near-Term (Year 2025) without Project Traffic Volumes

Barham Residential

LINSCOTT LAW & GREENSPAN engineers

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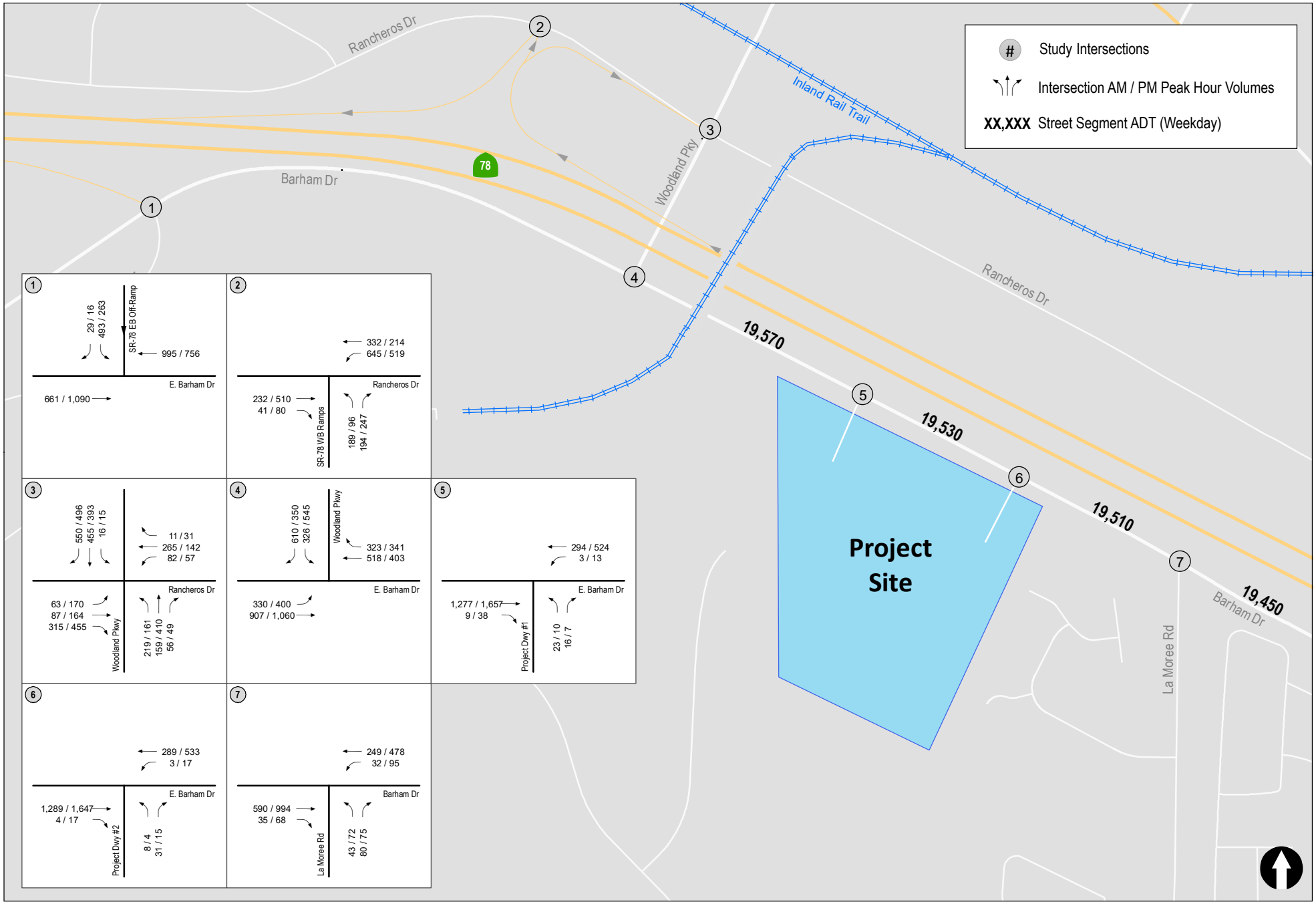

LINSCOTT LAW & GREENSPAN engineers

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Figure 9-2

Near-Term (Year 2025) + Project Traffic Volumes

Barham Residential

10.0 LOCAL TRANSPORTATION ANALYSIS OF HORIZON YEAR (YEAR 2050) CONDITIONS

10.1 Year 2050 Network Conditions

There are a series of improvements to the SR-78 freeway system in the vicinity of the Project 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.

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.

The above-listed improvements are assumed in the baseline conditions for Year 2050 analysis of study area intersections and street segments. ***Figure 10–1*** depicts Year 2050 network conditions.

10.2 Year 2050 Traffic Volumes

LLG reviewed several recent traffic studied prepared in the City of San Marcos that included buildout traffic volume assumptions, specifically the traffic study for the approved Sunrise Residential project located just east of the Project. The Sunrise Residential project used the SANDAG Series 12 Year 2035 traffic model to forecast Year 2035 traffic volumes in the study area, assuming the Woodland Parkway Highway 78 Interchange project improvements discussed above were in place.

In order to conduct an analysis of Year 2050 conditions based on the City's *Traffic Impact Analysis Guidelines*, LLG conducted a comparison of the SANDAG Series 12 Year 2035 traffic volumes from the Sunrise Residential project traffic study to the SANDAG Series 13 Year 2050 model traffic volumes. The Series 13 Year 2050 volumes were found to be lower than the Series 12 Year 2035 volumes. Therefore, in order to provide a conservative analysis and be consistent with other documents prepared for projects in the area, the Year 2035 traffic volumes taken directly from the Sunrise Residential traffic study were used for the analysis of Year 2050 conditions instead of assuming lower volumes in Year 2050 as compared to Year 2035.

Figure 10–2 depicts Year 2050 Without Project traffic volumes. ***Figure 10–3*** depicts Year 2050 With Project traffic volumes.

10.3 Year 2050 Without Project Analysis

10.3.1 *Intersection Analysis*

Table 10–1 summarizes the Year 2050 without Project peak hour intersection analysis. As shown in *Table 10–1*, all intersections are calculated to operate acceptably at LOS D or better during both the AM and PM peak hours.

Appendix G contains the Year 2050 Without Project peak hour intersection analysis worksheets.

10.3.2 *Segment Operations*

Table 10–2 summarizes the Year 2050 without Project daily street segment operations. As shown in *Table 10–2*, all street segments are calculated to operate acceptably at LOS C.

10.4 Year 2050 With Project Analysis

10.4.1 *Intersection Analysis*

Table 10–1 summarizes the Year 2050 with Project peak hour intersection analysis. As shown in *Table 10–1*, with the addition of Project traffic all intersections are calculated to continue to operate acceptably at LOS D or better during the AM and PM peak hours with the exception of the northbound left-turn movements out of the Project's western and eastern driveways which are calculated to operate at LOS E during the PM peak hour. A substantial LOS related effect is identified at these approaches due to the deficient LOS E. It should be noted that all other movements operate acceptably, including the northbound right-turns out of the site and the

westbound left-turns into the site. The substantial effect is only for the outbound left-turns during the PM peak hour.

Appendix H contains the Year 2050 With Project peak hour intersection analysis worksheets.

10.4.2 *Segment Operations*

Table 10–2 summarizes the Year 2050 with Project daily street segment operations. As shown in *Table 10–2*, with the addition of project traffic all street segments are calculated to operate at LOS C, and therefore roadway improvements are not required.

TABLE 10–1
YEAR 2050 INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Movement	Year 2050		Year 2050 + Project		Δ [c]	Consistent w/ City LOS Standards?[f]
				Delay [a]	LOS [b]	Delay	LOS		
1. E Barham Dr / SR-78 EB Off Ramp	Signal	AM	Average	6.7	A	6.7	A	0.0	Yes
		PM		4.9	A	5.0	A	0.1	Yes
2. Rancheros Dr / SR-78 WB Ramp	Signal	AM	Average	14.4	B	14.7	B	0.3	Yes
		PM		18.7	B	18.9	B	0.2	Yes
3. Rancheros Dr / Woodland Pkwy	Signal	AM	Average	24.9	C	26.0	C	1.1	Yes
		PM		21.9	C	22.7	C	0.8	Yes
4. E Barham Dr / Woodland Pkwy	Signal	AM	Average	15.6	B	15.7	B	0.1	Yes
		PM		28.3	C	32.7	C	4.4	Yes
5. E Barham Dr / Project Driveway (West)	MSSC[d]	AM	NBL	-	-	27.3	D	-	Yes
			NBR	-	-	14.3	B	-	Yes
			WBL	-	-	12.0	B	-	Yes
		PM	NBL	-	-	**40.9**	**E**	-	**No**
			NBR	-	-	17.5	C	-	Yes
			WBL	-	-	15.4	C	-	Yes
6. E Barham Dr / Project Driveway (East)	MSSC	AM	NBL	-	-	25.7	D	-	Yes
			NBR	-	-	14.7	B	-	Yes
			WBL	-	-	12.0	B	-	Yes
		PM	NBL	-	-	**38.1**	**E**	-	**No**
			NBR	-	-	17.5	C	-	Yes
			WBL	-	-	15.2	C	-	Yes
7. E Barham Dr / La Moore Rd	Signal	AM	Average	5.1	A	5.1	A	0.0	Yes
		PM		5.3	A	5.3	A	0.0	Yes

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. Δ denotes the increase in delay due to Project.
d. MSSC = Minor Street Stop Controlled intersection. Worst-Case movement approach delay and LOS reported.
e. Intersection does not exist under "without Project" conditions.
f. City of San Marcos strives to maintain intersection and roadway segment operations based on LOS standards (LOS D or better) outlined in the General Plan Mobility Element.

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

TABLE 10–2
YEAR 2050 STREET SEGMENT OPERATIONS

Street Segment	LOS E [a] Capacity	Year 2050			Year 2050 + Project				Consistent w/ City LOS Standards?[f]
		ADT [b]	LOS [c]	V/C [d]	ADT	LOS	V/C	Δ [e]	
Barham Drive									
Woodland Parkway to Project Driveway (West)	30,000	18,380	C	0.613	19,020	C	0.634	0.021	Yes
Project Driveway (West) to Project Driveway (East)	30,000	18,380	C	0.613	18,980	C	0.633	0.020	Yes
Project Driveway (East) to La Moree Road	30,000	18,380	C	0.613	18,960	C	0.632	0.019	Yes
East of La Moree Road	30,000	18,380	C	0.613	18,900	C	0.630	0.017	Yes

Footnotes:

a. Capacities based on City of San Marcos's Roadway Classification Table
b. Average Daily Traffic Volumes.
c. Level of Service.
d. Volume to Capacity.
e. Δ denotes a project-induced increase in the Volume to Capacity (V/C) ratio.
f. City of San Marcos strives to maintain intersection and roadway segment operations based on LOS standards (LOS D or better) outlined in the General Plan Mobility Element.

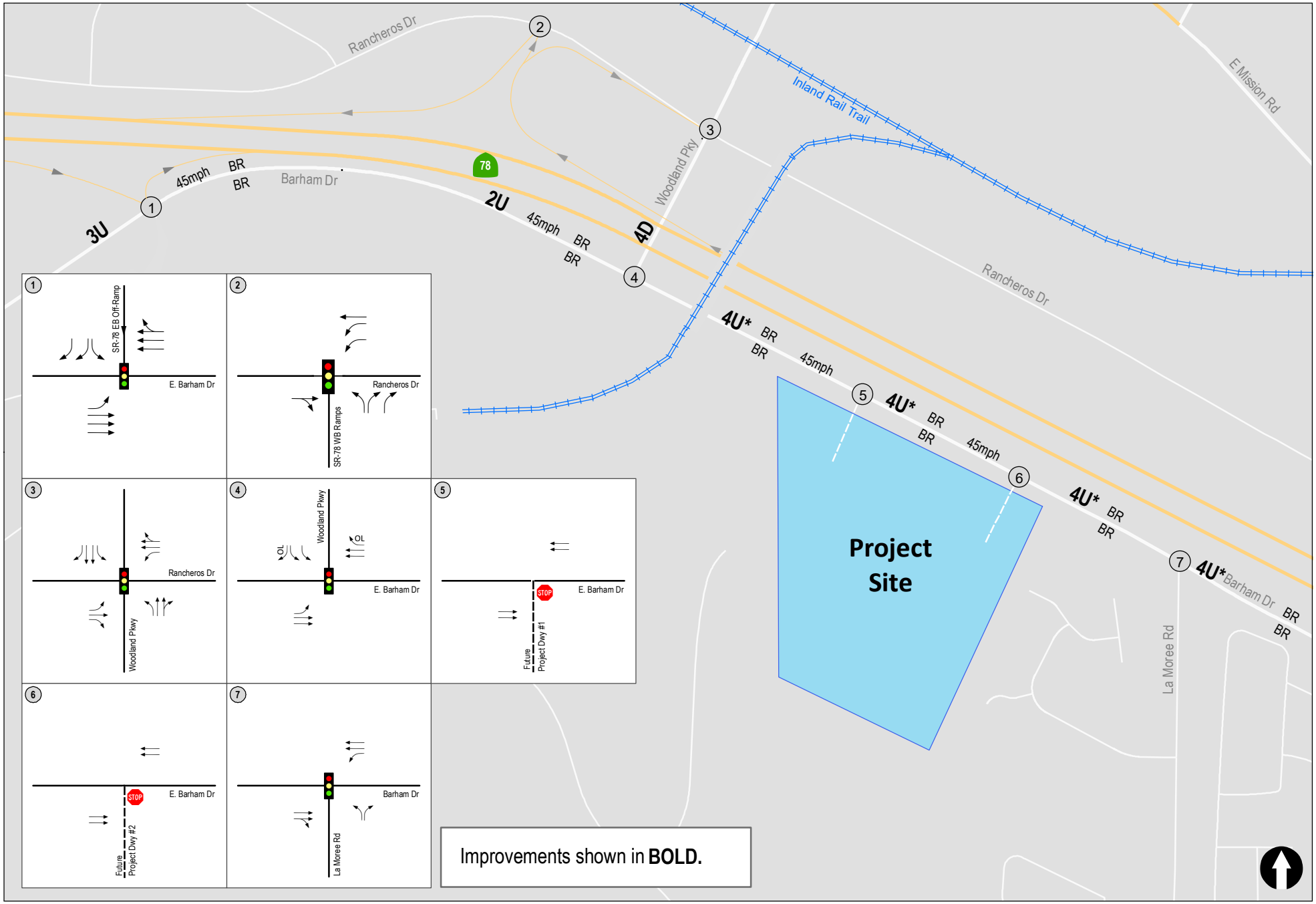

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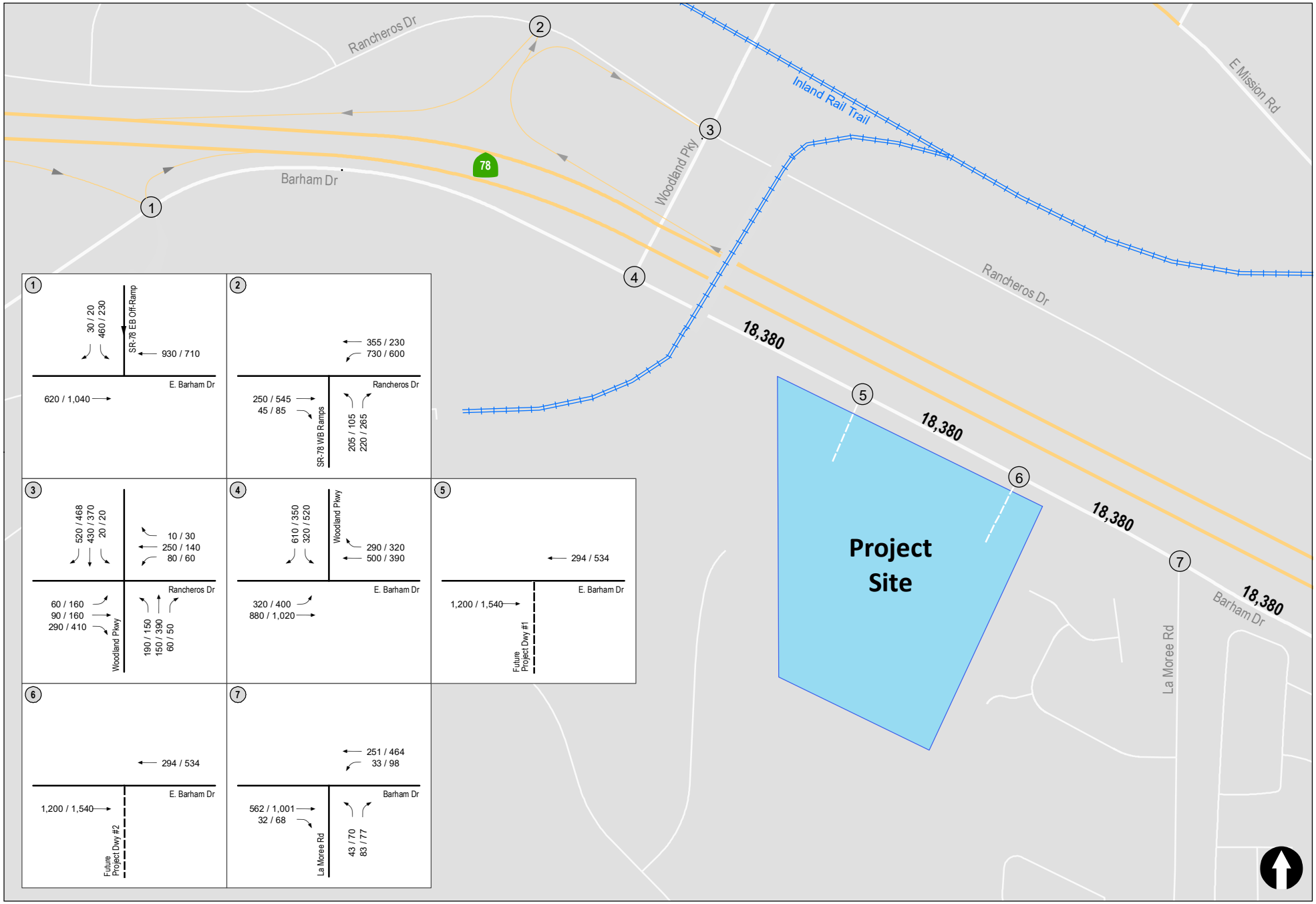
Figure 10-1

Year 2050 Network Conditions

Barham Residential



LINSCOTT LAW & GREENSPAN engineers

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Figure 10-2

Year 2050 without Project Traffic Volumes

Barham Residential

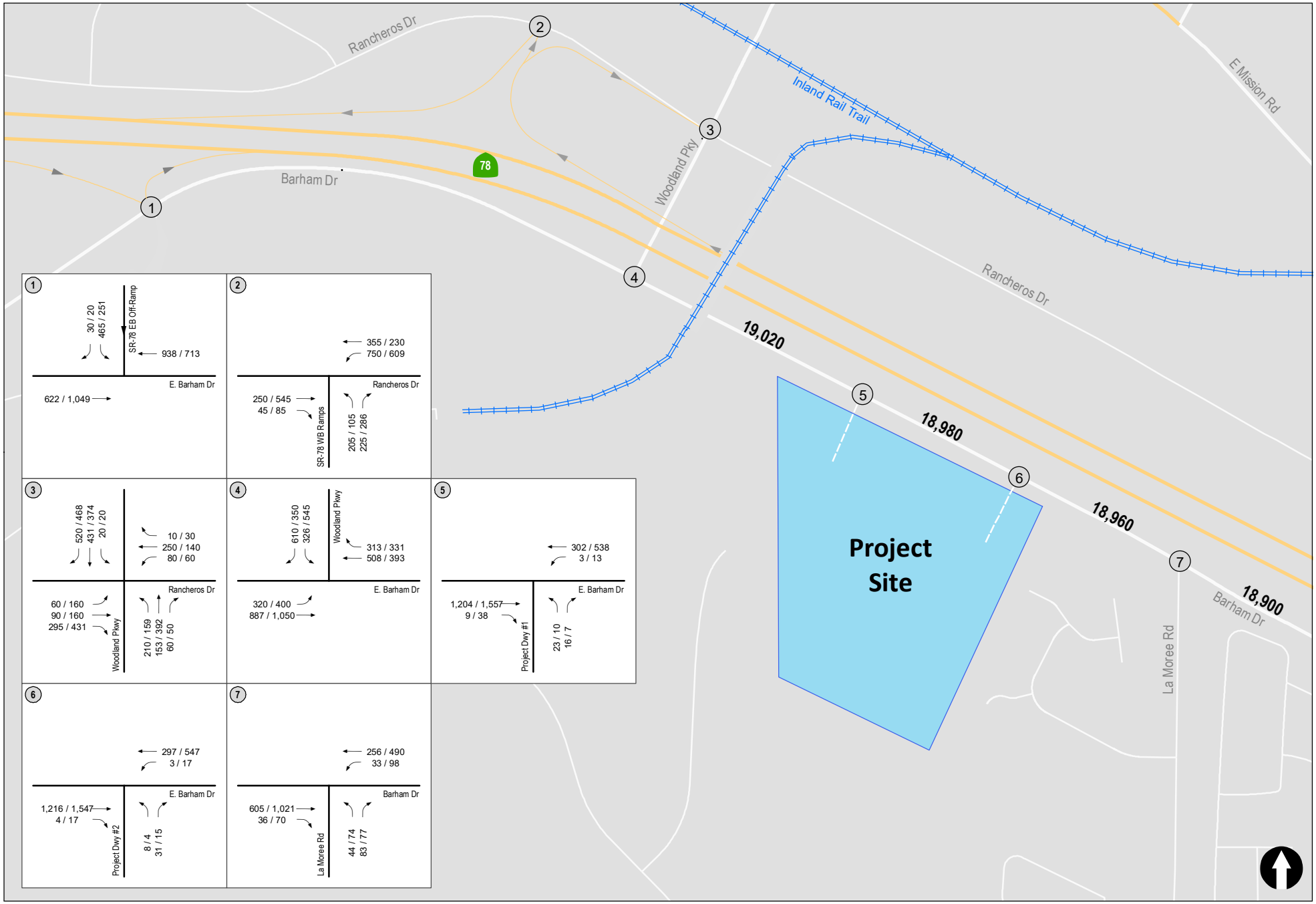

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Figure 10-3

Year 2050 + Project Traffic Volumes

Barham Residential

11.0 SITE ACCESS AND CIRCULATION REVIEW

11.1 Site Access

Access to the project site will be via two driveways on E. Barham Drive which will provide an internal loop through the project site and provide access to alleys. Both driveways will be unsignalized and will offer full access. A secondary emergency-only access is provided through the western boundary of the project site to connect to an existing emergency access driveway on the adjacent property which connects to Saddleback Way and then to E. Barham Drive. This access point is for emergency vehicles only and bollards would be put in place. Driveways and alleys within the project site will be private. In addition, the project provides and accessible path of travel through the site and to each residence via pedestrian pathways.

The Project's driveways calculated to operate acceptably at LOS D or better during both the AM and PM peak hours, as shown in *Tables 9-1* and *10-1*.

11.2 Parking

The project proposes a total of 349 parking spaces. This includes 283 garage spaces associated with the units, which will be pre-wired for electric vehicle charging stations. An additional 10 assigned outdoor spaces and 56 guest spaces (50 open spaces, 4 ADA spaces, 1 EV space and 1 postal delivery space).

11.3 Driveway Sight Distance Assessment

A line-of-sight assessment was conducted to determine if there is adequate sight distance for vehicles existing the Project site. Sight distance is the length of roadway visible to a driver. The driver of a vehicle departing a driveway should have an unobstructed view of oncoming traffic to anticipate and avoid potential collisions.

Two outbound maneuvers can be completed at the driveways: the left-turn maneuver and the right-turn maneuver. The outbound left-turn maneuver requires first clearing eastbound thru traffic, then entering the westbound stream of traffic. The required sight distance for this maneuver is affected by the amount of time it takes the stopped vehicle to turn left, clear the eastbound traffic and reach average running speed of the westbound traffic without affecting the speed of approaching vehicles.

The outbound right-turn maneuver must have sufficient distance to permit entrance onto the intersection roadway and then accelerate to the posted speed limit without being overtaken by approaching vehicles.

Table 1 of the City of San Marcos' *Intersection Sight Distance Guidelines*, December 2020, lists the minimum sight distance requirements for the left and right-turn maneuvers based on design speeds.

The design speed of E. Barham Drive Barham is 50 mph, and therefore based on the *Intersection Sight Distance Guidelines*, 550' of sight distance for the left-turn maneuver (looking eastbound) and 480' of sight distance for the right-turn maneuver (looking westbound) should be provided.

Based on the Sight Visibility Triangle exhibit prepared for the Project (included in ***Appendix J***), an adequate amount of unobstructed sight distance is provided looking both to the east and west from both of the proposed driveways.

11.4 Fire Truck Turning Template Assessment

Firetruck turning templates were run within the Project site to ensure acceptable operations. The firetruck turning templates are included in ***Appendix K***.

11.5 Vehicle Queuing

Access to the Project site will be via two unsignalized, full access driveways on E. Barham Drive as described above. A two-way left-turn lane along the Project frontage on E. Barham Drive currently exists and will help facilitate left-turns into and out of the Project site. In order to ensure the vehicle queue turning left into and out of the Project site won't exceed the available storage length, resulting in potential congestion and backups along E. Barham Drive and within the Project site, an assessment of the potential left-turn queues at the Project driveways was conducted using the Synchro analysis software. An assessment of the potential eastbound right-turn / thru lane queue at the intersection of E. Barham Drive / La Moree Road was also conducted at the City's request.

Under Near-Term + Project conditions, the 95th percentile queues at the locations listed above were calculated to be much less than the available storage during the AM and PM peak hours, as shown in ***Table 11-1***. The 95th-percentile queue is defined to be the queue length that has only a 5-percent probability of being exceeded during the analysis time period. Therefore, the available storage is expected to contain the vehicular queues.

Appendix F contains the Near-Term (Year 2025) + Project queue calculation worksheets.

TABLE 11-1
VEHICULAR QUEUE SUMMARY

Intersection	Movement	Peak Hour	Available Storage (feet)	Year 2025 with Project Queue (feet)
E. Barham Drive / Project Driveway (West)	WBL	AM	>500’	<25’
		PM		<25’
	NBL	AM	100’	<25’
		PM		<25’
E. Barham Drive / Project Driveway (East)	WBL	AM	>500’	<25’
		PM		<25’
	NBL	AM	100’	<25’
		PM		<25’
E. Barham Drive / La Moree Road	EBR/Thru	AM	>500’	51’
		PM		116’

General Notes:

1. 95th percentile queues reported.

12.0 ACTIVE TRANSPORTATION REVIEW

12.1 Pedestrian Conditions

Pedestrian facilities are intermittently provided within the Project study area. Paved sidewalks are provided along the south side of E. Barham Drive, on the east side of Woodland Parkway, and on both sides of La Moree Road. However, no sidewalks are currently provided along Rancheros Drive.

12.2 Transit Conditions

The project site is located within 1 mile of the Cal State San Marcos Sprinter light rail station and within 0.9 miles of the Nordahl Road Sprinter light rail station. Bus stops serving the North County Transit District (NCTD) Routes 305 and Route 347 are located approximately 0.7 miles from the project site Residents will be able to utilize these public transit opportunities. A summary of the available transit service routes is provided below:

The SPRINTER hybrid rail line spans 22-miles and connects Oceanside, Vista, San Marcos, and Escondido – serving 15 stations along Highway 78 corridor. The SPRINTER runs every 30 minutes in each direction Monday through Friday from approximately 4:00 AM to 9:00 PM. Saturday, Sunday, and holiday trains operate every 30 minutes between 10:00 AM and 6:00 PM and hourly before 10:00 AM and after 6:00 PM.

Route 305 runs from the Vista Transit Center to the Escondido Transit Center with destinations to Palomar College, San Marcos Civic Center, Mission Hills High School, San Marcos Middle School, Vista Transit Center Escondido Transit Center, Arc Enterprises, and DMV. There are 33 stops along this route. Route 305 currently operates Monday through Friday from 4:32 AM through 11:02 PM departing from the Vista Transit Center and from 4:19 AM through 10:16 PM departing from the Escondido Transit Center. Weekend route schedule begins at 5:32 AM through 11:02 PM departing from Vista Transit Center and begins at 5:15 AM to 10:18 PM departing from the Escondido Transit Center. Route 305 travels at 30-minute headways on weekdays, and 30-minute headways on weekends.

Route 347 runs from Cal State San Marcos to Palomar College with destinations to Cal State University San Marcos, Palomar College, Restaurant Row, Cal State San Marcos SPRINTER Station, and Edwards Cinemas. There are 24 stops along this route. Route 347 currently operates Monday through Friday from 5:20 AM through 7:12 PM departing from the CSUSM Sprinter Station and from 5:45 AM through 7:36 PM departing from Palomar College Transit Center. Saturday route schedule begins at 7:51 AM through 7:12 PM departing from CSUSM Sprinter Station and begins at 7:14 AM to 6:35 PM departing from Palomar College Transit Center. Route 347 does not operate on Sundays. Route 305 travels at 30-minute headways on weekdays, and 60-minute headways on Saturdays.

12.3 Bicycle Conditions

There are currently Class II bike lanes in each direction of travel on E. Barham Drive, Woodland Parkway, and La Moree Road in the vicinity of the Project site, consistent with the *City of San Marcos Bicycle and Pedestrian Plan*, September 2012.

Table 12–1 summarizes the existing and future bicycle facility classifications along E. Barham Drive within the study area.

TABLE 12–1
BICYCLE MOBILITY

Street Segment	Existing Condition	Future Classification [a]
Barham Drive		
Woodland Parkway to Project Driveway (West)	Class II Bicycle Lane	Class II Bicycle Lane
Project Driveway (West) to Project Driveway (East)	Class II Bicycle Lane	Class II Bicycle Lane
Project Driveway (East) to La Moree Road	Class II Bicycle Lane	Class II Bicycle Lane
East of La Moree Road	Class II Bicycle Lane	Class II Bicycle Lane

Source: City of San Marcos Bicycle and Pedestrian Master Plan.

13.0 CONCLUSIONS

The preceding Transportation Impact Analysis & Local Transportation Analysis were prepared to determine and evaluate the potential impacts and effects to the local roadway system due to the proposed Hallamark Barham Specifc Plan Project.

13.1 VMT Analysis

Based on the VMT analysis presented above in *Section 6*, a significant transportation impact is calculated. The results of the Project VMT comparison indicate that the Project would exceed the significance threshold by 21.66%. This would require mitigation of 21.66% or more to reduce the VMT impact to less-than-significant. Since the maximum feasible total VMT reduction combining all measures is 15%, the Project's impact is considered significant and unmitigated.

However, the CAPCOA measure *LUT-1: Increase Density*, was identified as a measure that would reduce the Project's VMT as calculated using the SANDAG Series 13 Year 2020 Travel Demand Model, thereby partially mitigating the Project's significant transportation impact.

Using the residential densities determined for TAZ 1026 and for the Project site, the corresponding VMT reductions were calculated using the CAPCOA methodology for LUT 1. The Project's net-VMT reduction associated with LUT-1 is calculated to be 6.2%.

13.2 Local Mobility Analysis

The Local Mobility Analysis conducted shows that all study intersections and street segments are calculated to operate acceptably at LOS D or better with the addition of Project traffic, with the exception of Rancheros Drive / SR-78 WB Ramps which is calculated to operate at LOS F under both "without" and "with Project" conditions. A substantial LOS related effect is identified at this intersection since the Project-related increase in delay exceeds the LOS standard threshold maximum of 2.0 seconds.

The existing traffic conditions at this location are already substandard and warrant a traffic signal. Provision of a traffic signal alone would be sufficient to reduce the Project's LOS related effect to less than substantial.

The following measure would improve operations at the intersection and reduce the Project's LOS related effect to less than substantial:

Prior to the issuance of the first building permit, the Project Developer shall pay the local and regional PFF development fees assessed to address the impact to the City of San Marcos' SR 78 Interchanges.

The Project site is currently zoned MU-3, which is intended to support a job-based mixed-use area combining a variety of commercial and office uses. The Project will result in reduced traffic as compared to the current MU-3 zoning considered in the CIP. Therefore, no additional payment is required based on the proposed zone change.

A comparison of the Project's trip generation calculations and trip generation calculations for a conceptual development plan based on the MU-3 zoning is shown below in ***Table 13-1***. As shown, the Project is calculated to generate approximately 4,200 fewer ADT as compared to the land uses assumed in the General Plan.

TABLE 13–1
TRIP GENERATION COMPARISON

Land Use [a]	Quantity	Daily Trip Ends (ADT)	
		Rate	Volume
Proposed Project			
Multi-family Residential (6- 20 DU/acre)	151 DU	8 /DU	**1,208**
Existing Zoning			
Office (Large Commercial Office (more than 100,000 SF)	275.067 KSF	17 /KSF	4,676
Retail (Specialty Retail / Strip Commercial)	18.344 KSF	40 /KSF	734
Total			**5,410**

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

It should be noted that interchange improvements would be located within the jurisdiction and control of the State of California (Caltrans), and neither the Developer 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.

Additionally, the northbound left-turn movements out of the Project's western and eastern driveways are calculated to operate at LOS E during the PM peak hour. A substantial LOS related effect is identified at these approaches due to the deficient LOS E. It should be noted that all other movements operate acceptably, including the northbound right-turns out of the site and the westbound left-turns into the site. The substantial effect is only for the outbound left-turns during the PM peak hour. It is recommended that the Project restrict left-turns out of both the western and eastern driveways between the hours of 4 PM and 6 PM in order to improve operations at the intersections and reduce the Project's LOS related effect to less than substantial.

LINSCOTT LAW & GREENSPAN engineers

TECHNICAL APPENDICES

HALLMARK BARHAM SPECIFIC PLAN

San Marcos, California

May 10, 2021

LLG Ref. 3-20-3293

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APPENDIX A

INTERSECTION AND ROADWAY SEGMENT MANUAL COUNT SHEETS

Intersection Turning Movement - Peak Hour Vehicle Count

LINSCOTT LAW & GREENSPAN engineers

Location:	#01	File Name:	ITM-20-046-01
Intersection:	La Moree Road & Barham Drive	Project:	LLG Ref. 3-20-3293
Date of Count:	Wednesday, November 4, 2020		Barham Residental

AM	- Southbound			Barham Drive Westbound			La Moree Road Northbound			Barham Drive Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
7:00	0	0	0	7	28	0	13	0	15	0	111	6	180
7:15	0	0	0	5	34	0	10	0	18	0	126	7	200
7:30	0	0	0	10	55	0	9	0	16	0	135	7	232
7:45	0	0	0	11	68	0	11	0	22	0	139	7	258
8:00	0	0	0	4	71	0	9	0	19	0	111	8	222
8:15	0	0	0	6	35	0	8	0	25	0	104	8	186
8:30	0	0	0	11	47	0	13	0	21	0	107	12	211
8:45	0	0	0	1	27	0	9	0	15	0	110	11	173
Total	0	0	0	55	365	0	82	0	151	0	943	66	1662
Approach%	-	-	-	13.1	86.9	-	35.2	-	64.8	-	93.5	6.5	
Total%	-	-	-	3.3	22.0	-	4.9	-	9.1	-	56.7	4.0	

AM Intersection Peak Hour: **07:15 to 08:15**

Volume	-	-	-	30	228	-	39	-	75	-	511	29	912
Approach%	-	-	-	11.6	88.4	-	34.2	-	65.8	-	94.6	5.4	
Total%	-	-	-	3.3	25.0	-	4.3	-	8.2	-	56.0	3.2	
PHF			#DIV/0!			0.82			0.86			0.92	0.00

PM	- Southbound			Barham Drive Westbound			La Moree Road Northbound			Barham Drive Eastbound			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
16:00	0	0	0	23	117	0	21	0	22	0	230	11	424
16:15	0	0	0	24	115	0	13	0	22	0	251	18	443
16:30	0	0	0	16	97	0	11	0	12	0	221	12	369
16:45	0	0	0	26	93	0	19	0	14	0	208	21	381
17:00	0	0	0	16	105	0	13	0	16	0	237	13	400
17:15	0	0	0	20	81	0	5	0	17	0	198	18	339
17:30	0	0	0	30	49	0	6	0	12	0	177	15	289
17:45	0	0	0	16	49	0	8	0	12	0	139	9	233
Total	0	0	0	171	706	0	96	0	127	0	1661	117	2878
Approach%	-	-	-	19.5	80.5	-	43.0	-	57.0	-	93.4	6.6	
Total%	-	-	-	5.9	24.5	-	3.3	-	4.4	-	57.7	4.1	

PM Intersection Peak Hour: **16:00 to 17:00**

Volume	-	-	-	89	422	-	64	-	70	-	910	62	1,617
Approach%	-	-	-	17.4	82.6	-	47.8	-	52.2	-	93.6	6.4	
Total%	-	-	-	5.5	26.1	-	4.0	-	4.3	-	56.3	3.8	
PHF			#DIV/0!			0.91			0.78			0.90	0.00

Intersection Turning Movement - Bicycle & Pedestrian Count

LINSCOTT LAW & GREENSPAN engineers

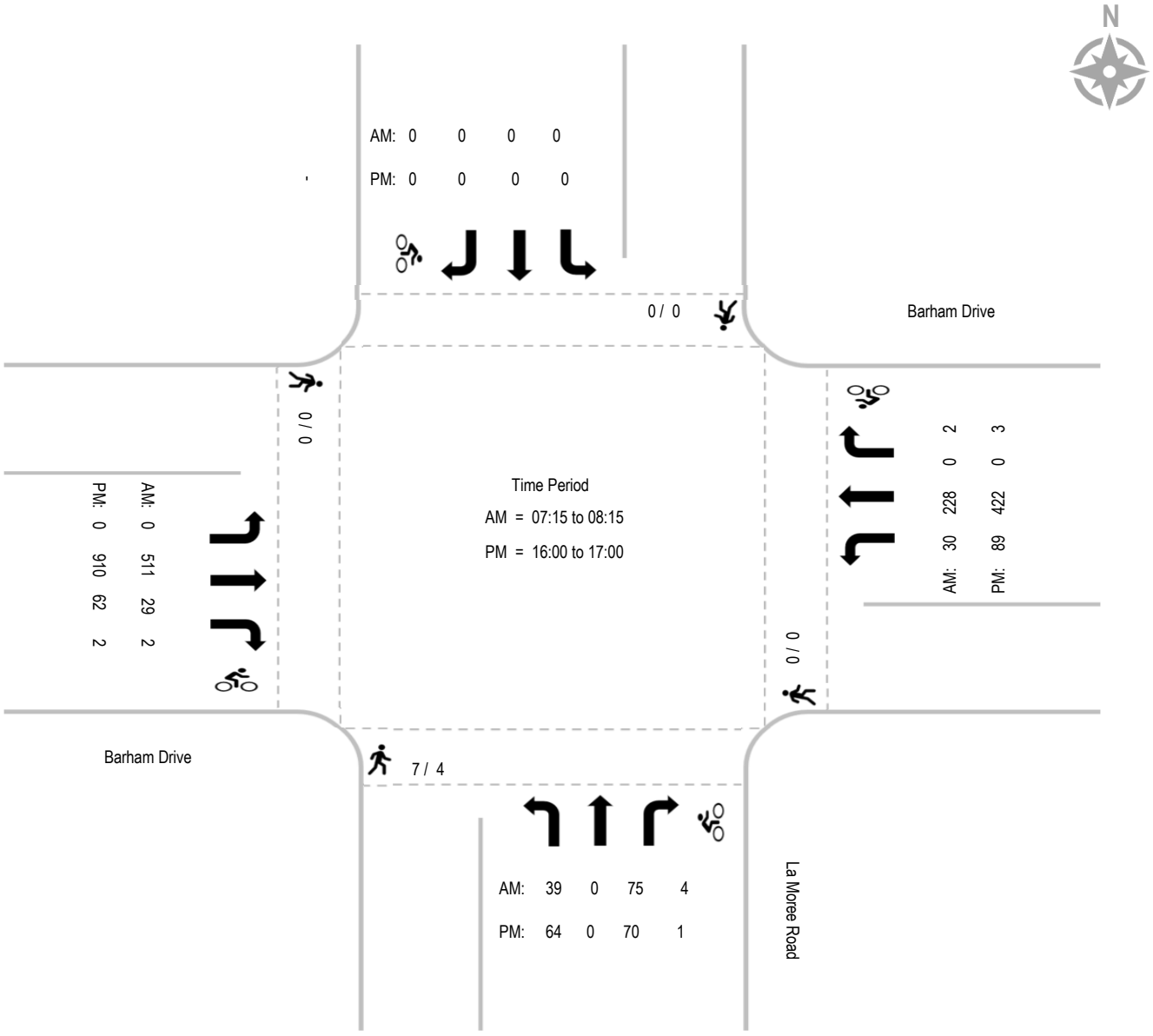
Location:	#01	File Name:	ITM-20-046-01
Intersection:	La Moree Road & Barham Drive	Project:	LLG Ref. 3-20-3293
Date of Count:	Wednesday, November 4, 2020		Barham Residental

AM	- Southbound				Barham Drive Westbound				La Moree Road 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	1	1	0	0	0	0	0	0	0	0	1	0	3
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	1	0	0	1	0	0	0	0	1	1
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	2	2	0	1	0	0	0	0	2	3
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	0	0	0	0	0	0	1	0	0	1
8:45	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0
Ped Total	0				0				7				0				7	
Bike Total		0	0	0		1	1	0		2	0	2		0	1	1		8

PM	- Southbound				Barham Drive Westbound				La Moree Road 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	1	0	0	0	0	1	0	0	0	0	0	2
16:30	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	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	1	0	1	0	0	0	0	0	1	0	1	2
17:15	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
17:45	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	1
Ped Total	0				0				4				0				4	
Bike Total		0	0	0		0	3	0		0	0	1		0	2	0		6

Intersection Turning Movement - Peak Hour Summary

Location:	#01	File Name:	ITM-20-046-01
Intersection:	La Moree Road & Barham Drive	Project:	LLG Ref. 3-20-3293
Date of Count:	Wednesday, November 4, 2020		Barham Residental



Intersection Turning Movement - Peak Hour Vehicle Count

LINSCOTT LAW & GREENSPAN engineers

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			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
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			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
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

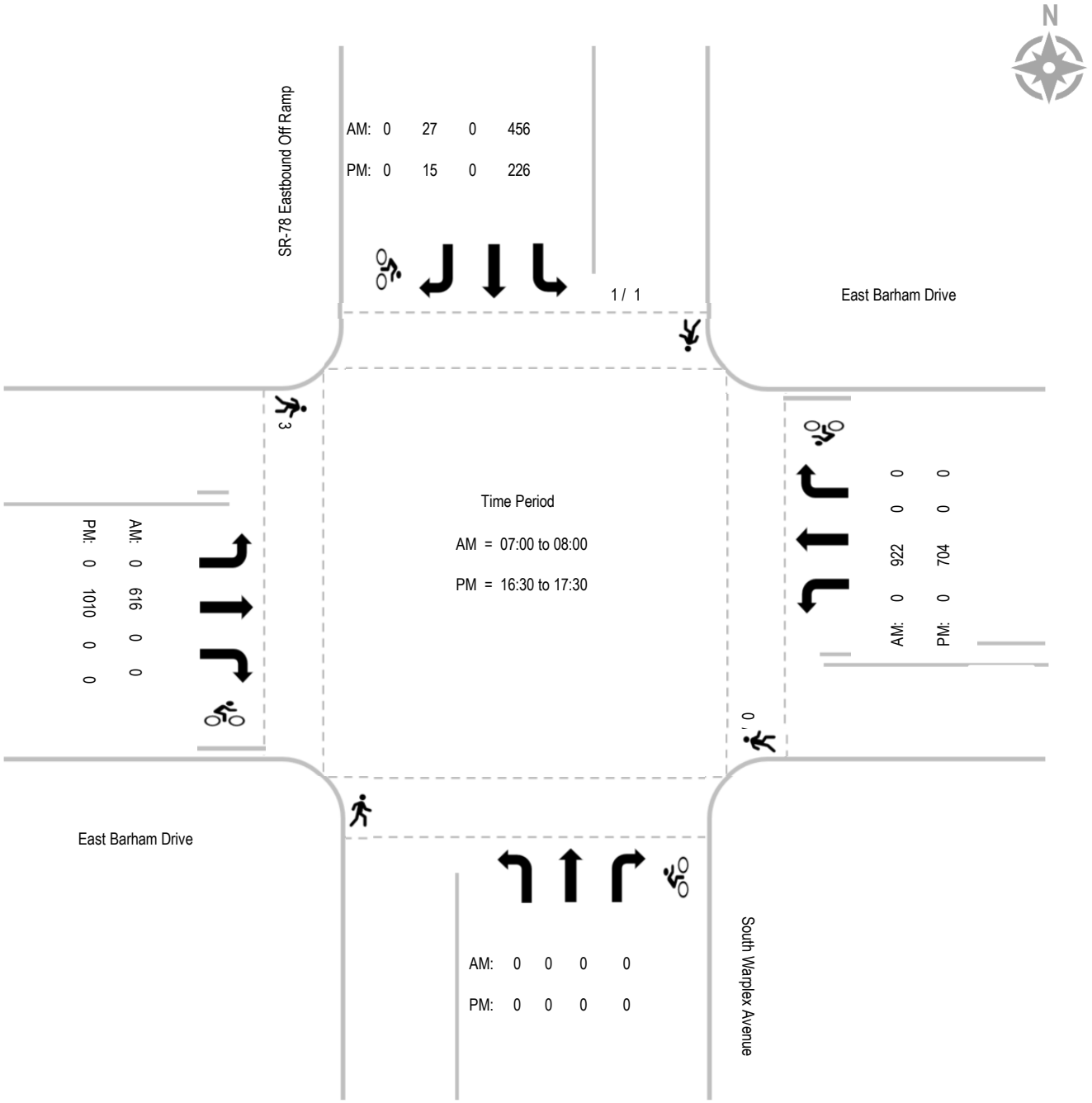
LINSCOTT LAW & GREENSPAN engineers	Location:	#01	File Name:	ITM-18-129-01
	Intersection:	SR-78 EB Off Ramp & E. Barham Drive & S. Warplex Avenue	Project:	LLG Ref. 3-18-2835
	Date of Count:	Thursday, September 20, 2018		San Marcos

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

LINSCOTT LAW & GREENSPAN engineers	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

LINSCOTT LAW & GREENSPAN engineers

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			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
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			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
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

LINSCOTT LAW & GREENSPAN engineers

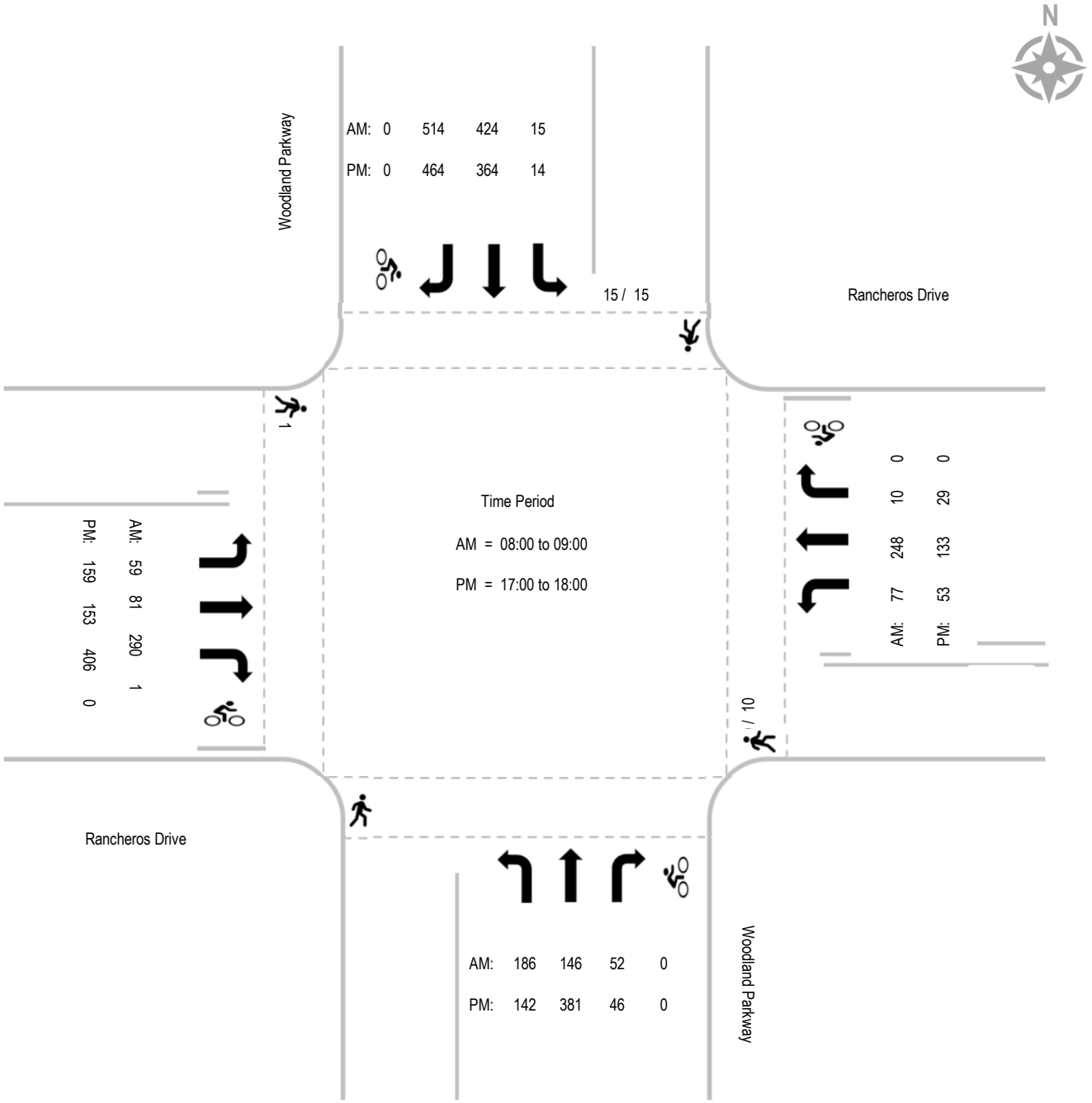
Location:	#03	File Name:	ITM-18-129-03
Intersection:	Woodland Parkway & Rancheros Drive	Project:	LLG Ref. 3-18-2835
Date of Count:	Thursday, September 20, 2018		San Marcos

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

LINSCOTT LAW & GREENSPAN engineers	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



Intersection Turning Movement - Peak Hour Vehicle Count

LINSCOTT LAW & GREENSPAN engineers

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			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
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			
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Total
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

LINSCOTT LAW & GREENSPAN engineers

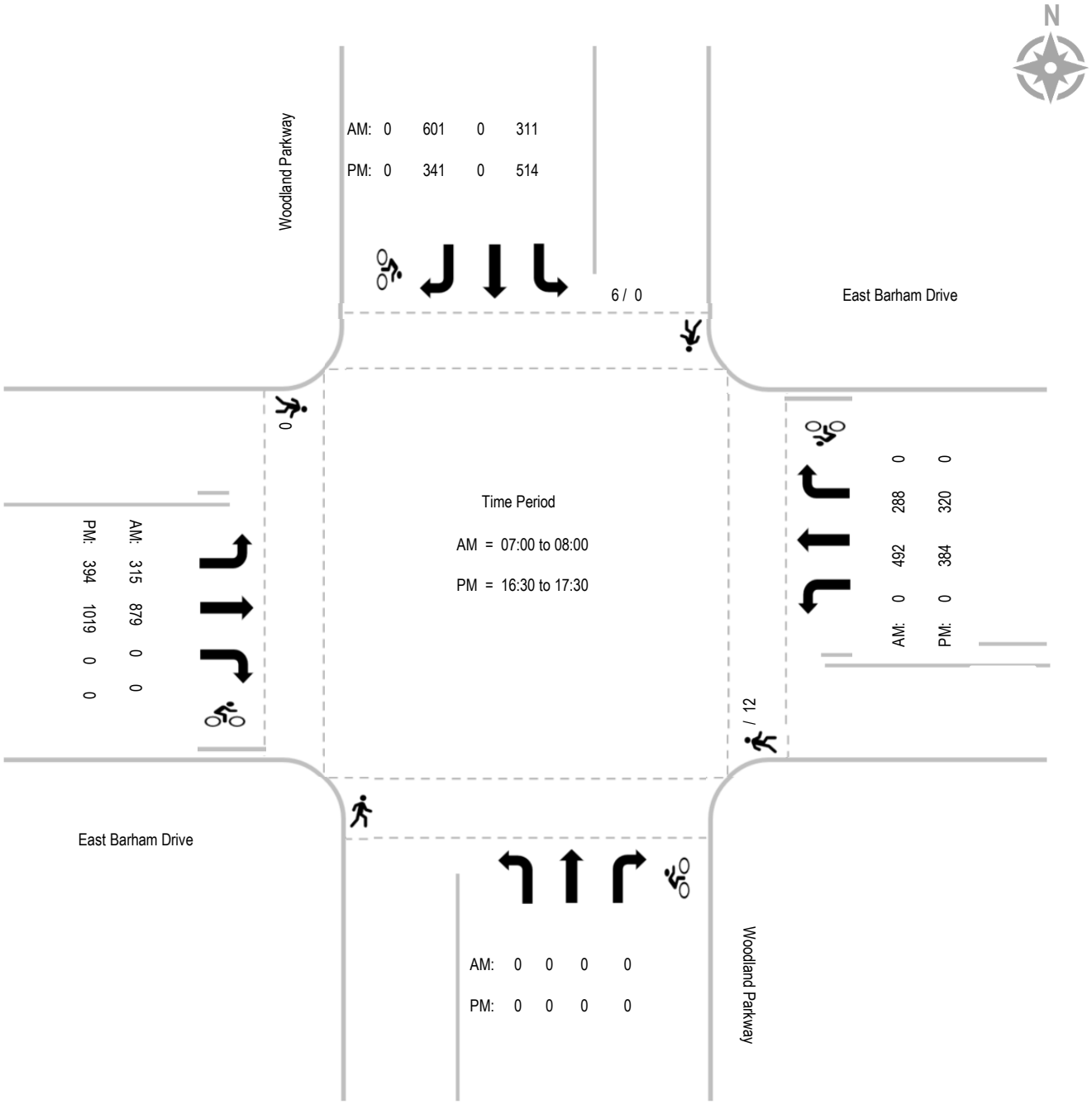
Location:	#04	File Name:	ITM-18-129-04
Intersection:	Woodland Parkway & East Barham Drive	Project:	LLG Ref. 3-18-2835
Date of Count:	Thursday, September 20, 2018		San Marcos

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

LINSCOTT LAW & GREENSPAN engineers	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



Linscott, Law & Greenspan, Engineers

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

Linscott, Law & Greenspan, Engineers

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

Linscott, Law & Greenspan, Engineers

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

Average Daily Traffic

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

Date: **Wednesday, February 13, 2019** Total Daily Volume: **8607** 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
16	11	10	15	20	82	343	748	658	438	448	472	487	597	739	802	845	792	487	246	160	106	60	25
4	6	4	1	0	12	65	165	198	116	104	112	131	117	154	183	211	241	142	85	36	20	21	5
2	2	2	3	6	16	86	177	174	106	121	116	107	124	188	230	225	197	135	67	56	26	13	4
7	1	2	7	5	31	80	190	145	116	117	126	132	168	174	199	214	196	120	51	37	30	12	4
3	2	2	4	9	23	112	216	141	100	106	118	117	188	223	190	195	158	90	43	31	30	14	12

Date: **Wednesday, February 13, 2019** Total Daily Volume: **3674** 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
3	5	5	4	8	38	163	236	219	181	192	234	212	265	344	376	382	357	225	104	55	40	19	7
0	4	2	1	0	5	27	55	54	41	45	49	55	42	62	93	113	108	68	37	11	9	7	1
0	0	0	1	0	10	45	60	56	43	61	62	49	61	74	101	114	79	52	25	20	8	4	2
3	0	1	1	4	15	38	73	60	51	58	69	60	84	98	90	90	106	62	22	16	10	4	0
0	1	2	1	4	8	53	48	49	46	28	54	48	78	110	92	65	64	43	20	8	13	4	4

Date: **Wednesday, February 13, 2019** Total Daily Volume: **4933** 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
13	6	5	11	12	44	180	512	439	257	256	238	275	332	395	426	463	435	262	142	105	66	41	18
4	2	2	0	0	7	38	110	144	75	59	63	76	75	92	90	98	133	74	48	25	11	14	4
2	2	2	2	6	6	41	117	118	63	60	54	58	63	114	129	111	118	83	42	36	18	9	2
4	1	1	6	1	16	42	117	85	65	59	57	72	84	76	109	124	90	58	29	21	20	8	4
3	1	0	3	5	15	59	168	92	54	78	64	69	110	113	98	130	94	47	23	23	17	10	8

APPENDIX B

CITY OF SAN MARCOS ROADWAY CLASSIFICATION TABLE

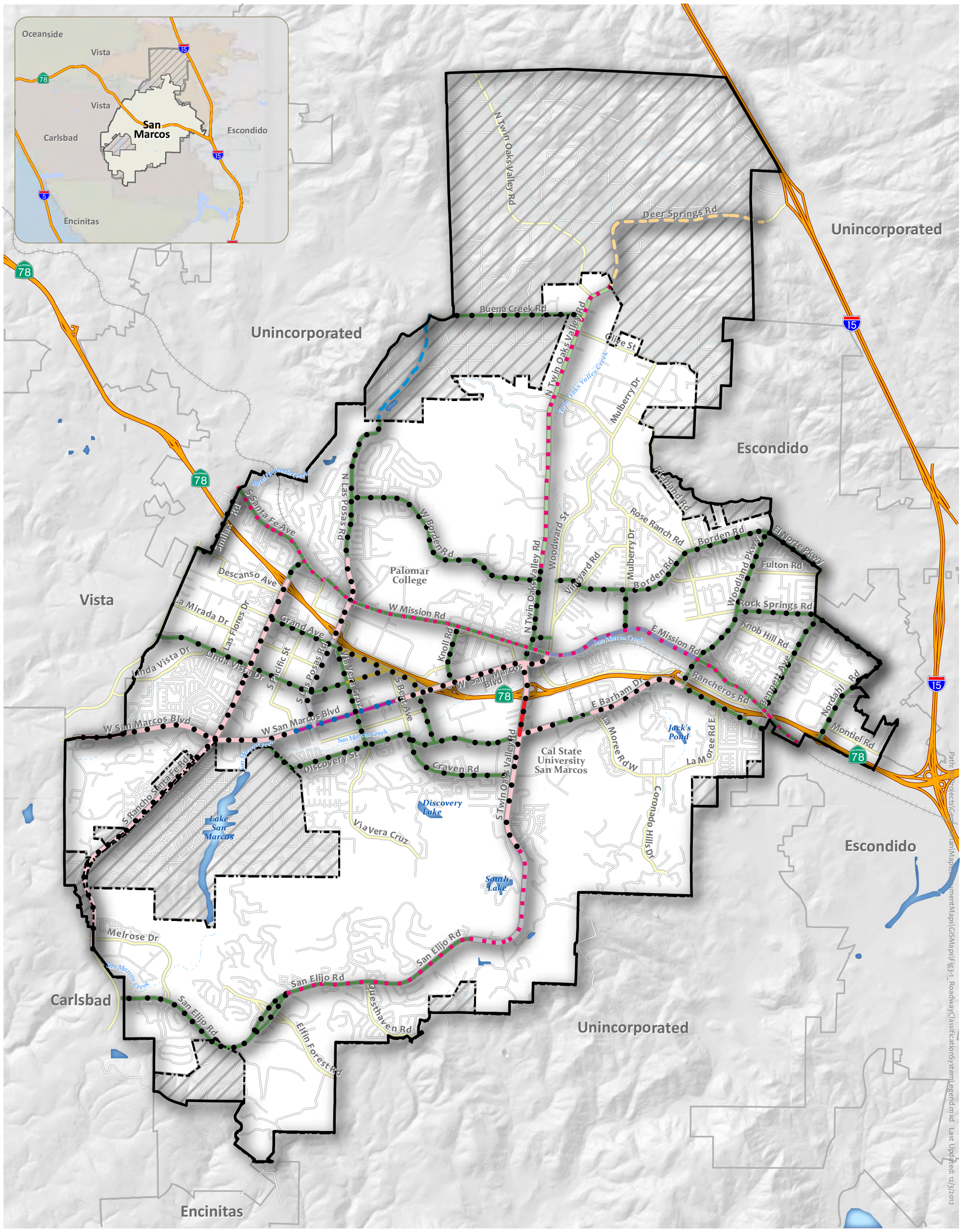
Table 3.16-2
Daily Roadway Segment Capacity

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.



3 MOBILITY ELEMENT

FIGURE 3-1

City of San Marcos

Roadway Classifications

0 0.25 0.5 1 Miles

San Marcos City Limits
Sphere of Influence
Planning Area
Major Hydrologic Features
Creeks
Railroad
Freeway
Highway
Major Road
Minor Road

Roadway Classifications
- 2 Lanes with Right-of-Way consistent with County of San Diego's General Plan
- 4 Lanes with Right-of-Way consistent with County of San Diego's General Plan
- Arterial Enhanced
- Complete Street
- 4 Lanes (Rural)
- 4 Lanes
- 4 Lanes +
- Multi-Way Boulevard
- 6 Lanes
- 6 Lanes +

Street Typology*
- Arterial with Class II or III Bicycle Facilities and Sidewalks
- Arterial with Enhanced Bicycle/Pedestrian Facilities
- Multi-Way

* See the Street Design Manual for additional street typology assignments

SOURCES OF DATA:
City of San Marcos 12/12

APPENDIX C

SANDAG SERIES 13 YEAR 2020 TRAVEL DEMAND MODEL RESULTS

Vehicle Miles of Travel Report

Scenario ID **991** **Barham Drive - 2020rc_turnprh - TAZ 1026**

Aggregate VMT

Gross VMT

Geography	VMT
Regionwide	84,682,067
Clip 1	
Clip 2	

Distribution VMT

Query	Type	Description	VMT
1	Zone		
2	0	0	-
3	0	0	-
4	0	0	-

SB-743 VMT

VMT per Resident

	Geography	Scenario ID	Residents	Total Trips	Person Miles of Travel	Vehicle Miles of Travel	VMT per Resident
Regionwide		991	3,435,715	12,302,411	77,559,665	56,353,219	16.4
Jurisdiction	City of San Marco	991	98,877	348,681	2,022,016	1,442,511	14.6
Site	TAZ 1026	991	2,279	9,084	54,398	41,439	**18.2**

VMT per Employee

	Geography	Scenario ID	Employees	Total Trips	Person Miles of Travel	Vehicle Miles of Travel	VMT per Employee
Regionwide		991	1,444,771	4,995,914	41,235,140	35,989,589	24.9
Jurisdiction	City of San Marco	991	41,109	145,168	1,097,998	938,226	22.8
Site	TAZ 1026	991	132	477	3,162	2,598	**19.7**

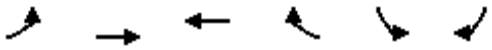
Report Generated: 10/30/20

SANDAG

Table A Barham Residential VMT/Resident Comparison				
Source	**VMT/Resident Regional Mean**	**85% Threshold**	**VMT/Resident Project TAZ**	**Impact?**
SANDAG Series 13 TAZ 1026 Year 2020 VMT Model	17.6	14.96	18.2	Yes

APPENDIX D

EXISTING PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↰	↱
Traffic Volume (veh/h)	0	634	950	0	470	28
Future Volume (veh/h)	0	634	950	0	470	28
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	689	1033	0	511	30
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	546	486
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	689	1033	0	511	30
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	19.2	40.7	0.0	21.8	1.0
Cycle Q Clear(g_c), s	0.0	19.2	40.7	0.0	21.8	1.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1082	1082	0	546	486
V/C Ratio(X)	0.00	0.64	0.96	0.00	0.94	0.06
Avail Cap(c_a), veh/h	0	1112	1112	0	558	497
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	11.0	15.5	0.0	26.4	19.2
Incr Delay (d2), s/veh	0.0	1.2	17.0	0.0	23.1	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	7.2	19.6	0.0	12.2	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	12.2	32.6	0.0	49.5	19.2
LnGrp LOS	A	B	C	A	D	B
Approach Vol, veh/h		689	1033		541	
Approach Delay, s/veh		12.2	32.6		47.8	
Approach LOS		B	C		D	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		49.7		28.5		49.7
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		21.2		23.8		42.7
Green Ext Time (p_c), s		5.2		0.2		2.5

Intersection Summary		
HCM 6th Ctrl Delay		30.0
HCM 6th LOS		C

Intersection	
Intersection Delay, s/veh	69.3
Intersection LOS	F

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	224	39	602	319	182	182
Future Vol, veh/h	224	39	602	319	182	182
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	243	42	654	347	198	198
Number of Lanes	1	1	1	1	1	1

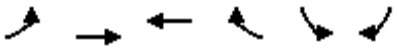
Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	16	105.8	15.3
HCM LOS	C	F	C

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	182	182	224	39	602	319
LT Vol	182	0	0	0	602	0
Through Vol	0	0	224	0	0	319
RT Vol	0	182	0	39	0	0
Lane Flow Rate	198	198	243	42	654	347
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.431	0.365	0.483	0.076	1.255	0.616
Departure Headway (Hd)	8.211	6.986	7.487	6.768	6.902	6.392
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	441	518	485	532	530	565
Service Time	5.911	4.686	5.187	4.468	4.636	4.127
HCM Lane V/C Ratio	0.449	0.382	0.501	0.079	1.234	0.614
HCM Control Delay	17	13.6	17	10	151.9	18.9
HCM Lane LOS	C	B	C	A	F	C
HCM 95th-tile Q	2.1	1.7	2.6	0.2	26	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	61	83	299	79	255	10	192	150	54	15	437	529
Future Volume (veh/h)	61	83	299	79	255	10	192	150	54	15	437	529
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	66	90	325	86	277	11	209	163	59	16	475	575
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	90	387	550	111	391	16	249	1200	419	34	643	625
Arrive On Green	0.05	0.21	0.21	0.06	0.22	0.22	0.14	0.46	0.46	0.02	0.34	0.34
Sat Flow, veh/h	1781	1870	1585	1781	1787	71	1781	2583	902	1781	1870	1585
Grp Volume(v), veh/h	66	90	325	86	0	288	209	110	112	16	475	575
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1858	1781	1777	1708	1781	1870	1585
Q Serve(g_s), s	2.7	2.9	12.3	3.5	0.0	10.4	8.3	2.6	2.7	0.6	16.3	25.0
Cycle Q Clear(g_c), s	2.7	2.9	12.3	3.5	0.0	10.4	8.3	2.6	2.7	0.6	16.3	25.0
Prop In Lane	1.00		1.00	1.00		0.04	1.00		0.53	1.00		1.00
Lane Grp Cap(c), veh/h	90	387	550	111	0	406	249	825	793	34	643	625
V/C Ratio(X)	0.73	0.23	0.59	0.78	0.00	0.71	0.84	0.13	0.14	0.47	0.74	0.92
Avail Cap(c_a), veh/h	208	504	649	169	0	459	257	825	793	122	643	625
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	34.1	24.0	19.5	33.6	0.0	26.3	30.5	11.1	11.2	35.3	21.0	21.0
Incr Delay (d2), s/veh	10.8	0.3	1.0	11.7	0.0	4.3	20.7	0.1	0.1	9.9	4.5	19.0
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	1.4	1.3	4.4	1.8	0.0	4.9	4.9	0.9	1.0	0.4	7.4	11.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.9	24.3	20.5	45.4	0.0	30.6	51.2	11.2	11.2	45.2	25.5	40.0
LnGrp LOS	D	C	C	D	A	C	D	B	B	D	C	D
Approach Vol, veh/h		481			374			431			1066	
Approach Delay, s/veh		24.6			34.0			30.6			33.6	
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	38.3	9.0	19.6	14.7	29.5	8.2	20.4
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	5.6	30.5	6.9	19.6	10.5	25.0	8.5	18.0
Max Q Clear Time (g_c+I1), s	2.6	4.7	5.5	14.3	10.3	27.0	4.7	12.4
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	31.3
HCM 6th LOS	C



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	320	884	497	293	316	606
Future Volume (veh/h)	320	884	497	293	316	606
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	348	961	540	318	343	594
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	385	1103	617	1036	576	513
Arrive On Green	0.22	0.59	0.33	0.33	0.32	0.32
Sat Flow, veh/h	1781	1870	1870	1585	1781	1585
Grp Volume(v), veh/h	348	961	540	318	343	594
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1585	1781	1585
Q Serve(g_s), s	19.7	44.9	28.2	9.0	16.7	33.5
Cycle Q Clear(g_c), s	19.7	44.9	28.2	9.0	16.7	33.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	385	1103	617	1036	576	513
V/C Ratio(X)	0.90	0.87	0.88	0.31	0.60	1.16
Avail Cap(c_a), veh/h	507	1400	786	1179	576	513
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	39.5	17.9	32.7	7.8	29.3	35.0
Incr Delay (d2), s/veh	16.2	5.2	9.0	0.2	1.7	91.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.2	19.2	14.0	6.6	7.3	13.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	55.7	23.1	41.7	7.9	31.0	126.3
LnGrp LOS	E	C	D	A	C	F
Approach Vol, veh/h		1309	858		937	
Approach Delay, s/veh		31.8	29.2		91.4	
Approach LOS		C	C		F	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		65.5		38.0	26.9	38.7
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		46.9		35.5	21.7	30.2
Green Ext Time (p_c), s		9.4		0.0	0.7	4.0

Intersection Summary		
HCM 6th Ctrl Delay		49.1
HCM 6th LOS		D

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1226	0	0	275	0	0
Future Vol, veh/h	1226	0	0	275	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	-	0	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	1333	0	0	299	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1333	0	1483	667
Stage 1	-	-	-	-	1333	-
Stage 2	-	-	-	-	150	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	513	-	116	401
Stage 1	-	-	-	-	211	-
Stage 2	-	-	-	-	862	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	513	-	116	401
Mov Cap-2 Maneuver	-	-	-	-	183	-
Stage 1	-	-	-	-	211	-
Stage 2	-	-	-	-	862	-

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)	-	-	-	-	513	-
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	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1226	0	0	275	0	0
Future Vol, veh/h	1226	0	0	275	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	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	1333	0	0	299	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1333	0	1483	667
Stage 1	-	-	-	-	1333	-
Stage 2	-	-	-	-	150	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	513	-	116	401
Stage 1	-	-	-	-	211	-
Stage 2	-	-	-	-	862	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	513	-	116	401
Mov Cap-2 Maneuver	-	-	-	-	183	-
Stage 1	-	-	-	-	211	-
Stage 2	-	-	-	-	862	-

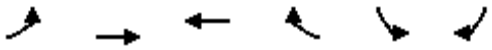
Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	513	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	526	30	31	235	40	77
Future Volume (veh/h)	526	30	31	235	40	77
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	572	33	34	255	43	84
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	1451	84	611	1510	225	200
Arrive On Green	0.42	0.42	0.42	0.42	0.13	0.13
Sat Flow, veh/h	3509	197	815	3647	1781	1585
Grp Volume(v), veh/h	297	308	34	255	43	84
Grp Sat Flow(s),veh/h/ln	1777	1835	815	1777	1781	1585
Q Serve(g_s), s	2.3	2.3	0.6	0.9	0.4	1.0
Cycle Q Clear(g_c), s	2.3	2.3	2.9	0.9	0.4	1.0
Prop In Lane		0.11	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	755	780	611	1510	225	200
V/C Ratio(X)	0.39	0.39	0.06	0.17	0.19	0.42
Avail Cap(c_a), veh/h	4473	4619	2316	8946	2708	2410
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	4.0	4.0	5.0	3.6	7.8	8.1
Incr Delay (d2), s/veh	0.3	0.3	0.0	0.1	0.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.2	0.0	0.1	0.1	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.3	4.3	5.0	3.6	8.3	9.5
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h	605			289	127	
Approach Delay, s/veh	4.3			3.8	9.1	
Approach LOS	A			A	A	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	13.0				13.0	7.0
Change Period (Y+Rc), s	4.5				4.5	4.5
Max Green Setting (Gmax), s	50.5				50.5	30.5
Max Q Clear Time (g_c+I1), s	4.3				4.9	3.0
Green Ext Time (p_c), s	4.2				2.1	0.4

Intersection Summary	
HCM 6th Ctrl Delay	4.8
HCM 6th LOS	A



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↰	↱
Traffic Volume (veh/h)	0	1040	725	0	233	15
Future Volume (veh/h)	0	1040	725	0	233	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	1130	788	0	253	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	1196	1196	0	324	288
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	1130	788	0	253	16
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	27.7	13.2	0.0	6.8	0.4
Cycle Q Clear(g_c), s	0.0	27.7	13.2	0.0	6.8	0.4
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1196	1196	0	324	288
V/C Ratio(X)	0.00	0.95	0.66	0.00	0.78	0.06
Avail Cap(c_a), veh/h	0	1229	1229	0	638	568
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	8.3	5.7	0.0	19.6	17.0
Incr Delay (d2), s/veh	0.0	14.3	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	10.9	3.4	0.0	2.9	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	22.6	6.9	0.0	23.7	17.1
LnGrp LOS	A	C	A	A	C	B
Approach Vol, veh/h		1130	788		269	
Approach Delay, s/veh		22.6	6.9		23.3	
Approach LOS		C	A		C	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		36.6		13.6		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		29.7		8.8		15.2
Green Ext Time (p_c), s		2.4		0.5		5.6

Intersection Summary		
HCM 6th Ctrl Delay		17.0
HCM 6th LOS		B

Intersection	
Intersection Delay, s/veh	55
Intersection LOS	F

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	491	77	491	206	93	217
Future Vol, veh/h	491	77	491	206	93	217
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	534	84	534	224	101	236
Number of Lanes	1	1	1	1	1	1

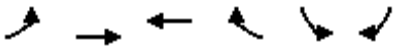
Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	61.9	67	15.4
HCM LOS	F	F	C

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	93	217	491	77	491	206
LT Vol	93	0	0	0	491	0
Through Vol	0	0	491	0	0	206
RT Vol	0	217	0	77	0	0
Lane Flow Rate	101	236	534	84	534	224
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.232	0.463	1.015	0.143	1.076	0.42
Departure Headway (Hd)	8.539	7.301	7.057	6.339	7.256	6.745
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	424	498	518	569	502	533
Service Time	6.239	5.001	4.757	4.039	5.019	4.507
HCM Lane V/C Ratio	0.238	0.474	1.031	0.148	1.064	0.42
HCM Control Delay	13.8	16.1	70	10.1	89.1	14.3
HCM Lane LOS	B	C	F	B	F	B
HCM 95th-tile Q	0.9	2.4	14.4	0.5	16.6	2.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	164	158	418	55	137	30	146	392	47	14	375	478
Future Volume (veh/h)	164	158	418	55	137	30	146	392	47	14	375	478
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	178	172	454	60	149	33	159	426	51	15	408	520
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	219	530	625	86	309	69	198	1283	153	32	576	683
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	1483	328	1781	3198	381	1781	1870	1585
Grp Volume(v), veh/h	178	172	454	60	0	182	159	236	241	15	408	520
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1811	1781	1777	1802	1781	1870	1585
Q Serve(g_s), s	7.0	5.2	17.6	2.4	0.0	6.4	6.3	6.6	6.7	0.6	13.9	20.1
Cycle Q Clear(g_c), s	7.0	5.2	17.6	2.4	0.0	6.4	6.3	6.6	6.7	0.6	13.9	20.1
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	219	530	625	86	0	378	198	713	723	32	576	683
V/C Ratio(X)	0.81	0.32	0.73	0.70	0.00	0.48	0.80	0.33	0.33	0.47	0.71	0.76
Avail Cap(c_a), veh/h	284	585	672	170	0	452	249	713	723	123	580	687
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	20.4	18.6	33.8	0.0	25.1	31.3	14.9	15.0	35.1	22.1	17.4
Incr Delay (d2), s/veh	12.8	0.4	3.7	9.6	0.0	1.0	13.9	0.3	0.3	10.2	3.9	5.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.7	2.2	6.5	1.2	0.0	2.7	3.4	2.5	2.6	0.3	6.4	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.7	20.8	22.2	43.4	0.0	26.1	45.3	15.2	15.2	45.3	26.0	22.4
LnGrp LOS	D	C	C	D	A	C	D	B	B	D	C	C
Approach Vol, veh/h		804			242			636			943	
Approach Delay, s/veh		26.7			30.4			22.7			24.3	
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	33.5	8.0	24.9	12.5	26.7	13.4	19.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.3	27.5	6.9	22.6	10.1	22.4	11.5	18.0
Max Q Clear Time (g_c+I1), s	2.6	8.7	4.4	19.6	8.3	22.1	9.0	8.4
Green Ext Time (p_c), s	0.0	2.7	0.0	0.9	0.1	0.2	0.1	0.6

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



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	406	1050	396	330	529	351
Future Volume (veh/h)	406	1050	396	330	529	351
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	441	1141	430	359	446	455
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	478	1179	583	920	478	425
Arrive On Green	0.27	0.63	0.31	0.31	0.27	0.27
Sat Flow, veh/h	1781	1870	1870	1585	1781	1585
Grp Volume(v), veh/h	441	1141	430	359	446	455
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1585	1781	1585
Q Serve(g_s), s	21.4	51.5	18.3	10.9	21.8	23.9
Cycle Q Clear(g_c), s	21.4	51.5	18.3	10.9	21.8	23.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	478	1179	583	920	478	425
V/C Ratio(X)	0.92	0.97	0.74	0.39	0.93	1.07
Avail Cap(c_a), veh/h	522	1199	583	920	478	425
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	31.7	15.6	27.4	10.1	31.8	32.6
Incr Delay (d2), s/veh	21.3	18.5	4.9	0.3	25.4	63.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.7	24.3	8.7	6.6	12.4	7.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	53.0	34.1	32.3	10.4	57.2	95.9
LnGrp LOS	D	C	C	B	E	F
Approach Vol, veh/h		1582	789		901	
Approach Delay, s/veh		39.4	22.3		76.8	
Approach LOS		D	C		E	

Timer - Assigned Phs	2		4	5	6
Phs Duration (G+Y+Rc), s	60.6		28.4	28.4	32.3
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	53.5		25.9	23.4	20.3
Green Ext Time (p_c), s	2.7		0.0	0.4	2.2

Intersection Summary	
HCM 6th Ctrl Delay	45.6
HCM 6th LOS	D

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1579	0	0	501	0	0
Future Vol, veh/h	1579	0	0	501	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	-	0	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	1716	0	0	545	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1716	0	1989	858
Stage 1	-	-	-	-	1716	-
Stage 2	-	-	-	-	273	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	365	-	53	300
Stage 1	-	-	-	-	130	-
Stage 2	-	-	-	-	748	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	365	-	53	300
Mov Cap-2 Maneuver	-	-	-	-	112	-
Stage 1	-	-	-	-	130	-
Stage 2	-	-	-	-	748	-

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)	-	-	-	-	365	-
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	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1579	0	0	501	0	0
Future Vol, veh/h	1579	0	0	501	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	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	1716	0	0	545	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1716	0	1989	858
Stage 1	-	-	-	-	1716	-
Stage 2	-	-	-	-	273	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	365	-	53	300
Stage 1	-	-	-	-	130	-
Stage 2	-	-	-	-	748	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	365	-	53	300
Mov Cap-2 Maneuver	-	-	-	-	112	-
Stage 1	-	-	-	-	130	-
Stage 2	-	-	-	-	748	-

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)	-	-	-	-	365	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

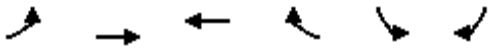
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	937	64	92	435	66	72
Future Volume (veh/h)	937	64	92	435	66	72
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1018	70	100	473	72	78
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	1940	133	447	2044	214	190
Arrive On Green	0.58	0.58	0.58	0.58	0.12	0.12
Sat Flow, veh/h	3467	232	518	3647	1781	1585
Grp Volume(v), veh/h	536	552	100	473	72	78
Grp Sat Flow(s),veh/h/ln	1777	1829	518	1777	1781	1585
Q Serve(g_s), s	5.4	5.4	4.3	1.9	1.1	1.3
Cycle Q Clear(g_c), s	5.4	5.4	9.7	1.9	1.1	1.3
Prop In Lane		0.13	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1022	1052	447	2044	214	190
V/C Ratio(X)	0.52	0.52	0.22	0.23	0.34	0.41
Avail Cap(c_a), veh/h	3703	3811	1229	7406	1177	1047
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	3.8	3.8	6.8	3.1	11.9	12.0
Incr Delay (d2), s/veh	0.4	0.4	0.3	0.1	0.9	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.6	0.3	0.2	0.4	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.2	4.2	7.0	3.1	12.8	13.4
LnGrp LOS	A	A	A	A	B	B
Approach Vol, veh/h	1088			573	150	
Approach Delay, s/veh	4.2			3.8	13.1	
Approach LOS	A			A	B	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	21.5				21.5	8.0
Change Period (Y+Rc), s	4.5				4.5	4.5
Max Green Setting (Gmax), s	61.5				61.5	19.5
Max Q Clear Time (g_c+I1), s	7.4				11.7	3.3
Green Ext Time (p_c), s	9.6				5.2	0.4

Intersection Summary	
HCM 6th Ctrl Delay	4.8
HCM 6th LOS	A

APPENDIX E

NEAR-TERM (YEAR 2025) WITHOUT PROJECT PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↰	↱
Traffic Volume (veh/h)	0	659	987	0	488	29
Future Volume (veh/h)	0	659	987	0	488	29
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	716	1073	0	530	32
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	1087	1087	0	546	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	716	1073	0	530	32
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	20.8	45.1	0.0	23.5	1.1
Cycle Q Clear(g_c), s	0.0	20.8	45.1	0.0	23.5	1.1
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1087	1087	0	546	485
V/C Ratio(X)	0.00	0.66	0.99	0.00	0.97	0.07
Avail Cap(c_a), veh/h	0	1087	1087	0	546	485
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	11.4	16.5	0.0	27.4	19.6
Incr Delay (d2), s/veh	0.0	1.5	24.1	0.0	31.3	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	7.9	23.4	0.0	14.2	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	12.8	40.5	0.0	58.7	19.7
LnGrp LOS	A	B	D	A	E	B
Approach Vol, veh/h		716	1073		562	
Approach Delay, s/veh		12.8	40.5		56.5	
Approach LOS		B	D		E	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		51.0		29.0		51.0
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		22.8		25.5		47.1
Green Ext Time (p_c), s		5.4		0.0		0.0

Intersection Summary	
HCM 6th Ctrl Delay	35.9
HCM 6th LOS	D

Intersection	
Intersection Delay, s/veh	79.7
Intersection LOS	F

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	232	41	625	332	189	189
Future Vol, veh/h	232	41	625	332	189	189
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	252	45	679	361	205	205
Number of Lanes	1	1	1	1	1	1

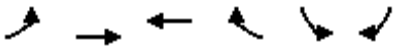
Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	16.7	122.8	15.9
HCM LOS	C	F	C

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	189	189	232	41	625	332
LT Vol	189	0	0	0	625	0
Through Vol	0	0	232	0	0	332
RT Vol	0	189	0	41	0	0
Lane Flow Rate	205	205	252	45	679	361
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.45	0.382	0.505	0.081	1.317	0.649
Departure Headway (Hd)	8.297	7.071	7.615	6.895	6.981	6.471
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	438	512	477	523	523	559
Service Time	5.997	4.771	5.315	4.595	4.719	4.209
HCM Lane V/C Ratio	0.468	0.4	0.528	0.086	1.298	0.646
HCM Control Delay	17.6	14.1	17.8	10.2	177.2	20.4
HCM Lane LOS	C	B	C	B	F	C
HCM 95th-tile Q	2.3	1.8	2.8	0.3	29	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	87	310	82	265	11	199	156	56	16	454	550
Future Volume (veh/h)	63	87	310	82	265	11	199	156	56	16	454	550
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	68	95	337	89	288	12	216	170	61	17	493	598
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	91	397	561	114	402	17	253	1192	413	36	633	617
Arrive On Green	0.05	0.21	0.21	0.06	0.23	0.23	0.14	0.46	0.46	0.02	0.34	0.34
Sat Flow, veh/h	1781	1870	1585	1781	1783	74	1781	2589	897	1781	1870	1585
Grp Volume(v), veh/h	68	95	337	89	0	300	216	115	116	17	493	598
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1857	1781	1777	1709	1781	1870	1585
Q Serve(g_s), s	2.8	3.1	12.9	3.6	0.0	11.0	8.8	2.8	2.9	0.7	17.5	25.0
Cycle Q Clear(g_c), s	2.8	3.1	12.9	3.6	0.0	11.0	8.8	2.8	2.9	0.7	17.5	25.0
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	91	397	561	114	0	419	253	818	787	36	633	617
V/C Ratio(X)	0.75	0.24	0.60	0.78	0.00	0.72	0.85	0.14	0.15	0.48	0.78	0.97
Avail Cap(c_a), veh/h	205	496	645	166	0	452	253	818	787	120	633	617
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	34.6	24.2	19.6	34.1	0.0	26.5	31.0	11.5	11.6	35.8	22.0	22.2
Incr Delay (d2), s/veh	11.7	0.3	1.2	13.2	0.0	4.9	23.6	0.1	0.1	9.7	6.2	28.7
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	1.5	1.4	4.6	1.9	0.0	5.2	5.3	1.0	1.0	0.4	8.3	14.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.3	24.5	20.8	47.3	0.0	31.4	54.5	11.6	11.6	45.5	28.2	50.8
LnGrp LOS	D	C	C	D	A	C	D	B	B	D	C	D
Approach Vol, veh/h		500			389			447			1108	
Approach Delay, s/veh		25.0			35.0			32.3			40.7	
Approach LOS		C			D			C			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.0	38.5	9.2	20.2	15.0	29.5	8.3	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	6.9	19.6	10.5	25.0	8.5	18.0
Max Q Clear Time (g_c+I1), s	2.7	4.9	5.6	14.9	10.8	27.0	4.8	13.0
Green Ext Time (p_c), s	0.0	1.3	0.0	0.8	0.0	0.0	0.0	0.7

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



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	330	900	510	300	320	610
Future Volume (veh/h)	330	900	510	300	320	610
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	359	978	554	326	348	598
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	397	1129	631	1025	551	490
Arrive On Green	0.22	0.60	0.34	0.34	0.31	0.31
Sat Flow, veh/h	1781	1870	1870	1585	1781	1585
Grp Volume(v), veh/h	359	978	554	326	348	598
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1585	1781	1585
Q Serve(g_s), s	20.3	44.9	28.8	9.5	17.4	32.0
Cycle Q Clear(g_c), s	20.3	44.9	28.8	9.5	17.4	32.0
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	397	1129	631	1025	551	490
V/C Ratio(X)	0.91	0.87	0.88	0.32	0.63	1.22
Avail Cap(c_a), veh/h	525	1428	795	1164	551	490
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	17.0	32.3	8.1	30.7	35.7
Incr Delay (d2), s/veh	15.9	4.8	9.2	0.2	2.3	116.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.5	18.9	14.3	6.7	7.7	39.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	55.1	21.9	41.4	8.3	33.0	152.0
LnGrp LOS	E	C	D	A	C	F
Approach Vol, veh/h		1337	880		946	
Approach Delay, s/veh		30.8	29.2		108.2	
Approach LOS		C	C		F	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		67.0		36.5	27.5	39.4
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		79.0		32.0	30.5	44.0
Max Q Clear Time (g_c+I1), s		46.9		34.0	22.3	30.8
Green Ext Time (p_c), s		9.8		0.0	0.7	4.1

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

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1273	0	0	286	0	0
Future Vol, veh/h	1273	0	0	286	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	-	0	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	1384	0	0	311	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1384	0	1540	692
Stage 1	-	-	-	-	1384	-
Stage 2	-	-	-	-	156	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	491	-	106	386
Stage 1	-	-	-	-	198	-
Stage 2	-	-	-	-	856	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	491	-	106	386
Mov Cap-2 Maneuver	-	-	-	-	172	-
Stage 1	-	-	-	-	198	-
Stage 2	-	-	-	-	856	-

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)	-	-	-	-	491	-
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	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1273	0	0	286	0	0
Future Vol, veh/h	1273	0	0	286	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	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	1384	0	0	311	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1384	0	1540	692
Stage 1	-	-	-	-	1384	-
Stage 2	-	-	-	-	156	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	491	-	106	386
Stage 1	-	-	-	-	198	-
Stage 2	-	-	-	-	856	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	491	-	106	386
Mov Cap-2 Maneuver	-	-	-	-	172	-
Stage 1	-	-	-	-	198	-
Stage 2	-	-	-	-	856	-

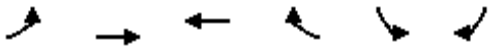
Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	-	491	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	547	31	32	244	42	80
Future Volume (veh/h)	547	31	32	244	42	80
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	595	34	35	265	46	87
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	1476	84	600	1535	231	205
Arrive On Green	0.43	0.43	0.43	0.43	0.13	0.13
Sat Flow, veh/h	3511	195	797	3647	1781	1585
Grp Volume(v), veh/h	309	320	35	265	46	87
Grp Sat Flow(s),veh/h/ln	1777	1835	797	1777	1781	1585
Q Serve(g_s), s	2.5	2.5	0.6	0.9	0.5	1.0
Cycle Q Clear(g_c), s	2.5	2.5	3.1	0.9	0.5	1.0
Prop In Lane		0.11	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	768	793	600	1535	231	205
V/C Ratio(X)	0.40	0.40	0.06	0.17	0.20	0.42
Avail Cap(c_a), veh/h	4372	4516	2217	8745	2647	2356
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	4.0	4.0	5.1	3.6	8.0	8.2
Incr Delay (d2), s/veh	0.3	0.3	0.0	0.1	0.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.2	0.0	0.1	0.1	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.3	4.3	5.1	3.6	8.4	9.6
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h	629			300	133	
Approach Delay, s/veh	4.3			3.8	9.2	
Approach LOS	A			A	A	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	13.4				13.4	7.2
Change Period (Y+Rc), s	4.5				4.5	4.5
Max Green Setting (Gmax), s	50.5				50.5	30.5
Max Q Clear Time (g_c+I1), s	4.5				5.1	3.0
Green Ext Time (p_c), s	4.4				2.2	0.4

Intersection Summary	
HCM 6th Ctrl Delay	4.8
HCM 6th LOS	A



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↰	↱
Traffic Volume (veh/h)	0	1081	753	0	242	16
Future Volume (veh/h)	0	1081	753	0	242	16
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	1175	818	0	263	17
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	1195	1195	0	333	296
Arrive On Green	0.00	0.64	0.64	0.00	0.19	0.19
Sat Flow, veh/h	0	1870	1870	0	1781	1585
Grp Volume(v), veh/h	0	1175	818	0	263	17
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	31.5	14.5	0.0	7.3	0.5
Cycle Q Clear(g_c), s	0.0	31.5	14.5	0.0	7.3	0.5
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1195	1195	0	333	296
V/C Ratio(X)	0.00	0.98	0.68	0.00	0.79	0.06
Avail Cap(c_a), veh/h	0	1195	1195	0	621	552
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	9.1	6.0	0.0	20.0	17.3
Incr Delay (d2), s/veh	0.0	22.0	1.6	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	14.6	3.9	0.0	3.1	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	31.0	7.6	0.0	24.3	17.3
LnGrp LOS	A	C	A	A	C	B
Approach Vol, veh/h		1175	818		280	
Approach Delay, s/veh		31.0	7.6		23.8	
Approach LOS		C	A		C	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		37.5		14.1		37.5
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		33.5		9.3		16.5
Green Ext Time (p_c), s		0.0		0.6		5.7

Intersection Summary		
HCM 6th Ctrl Delay		21.7
HCM 6th LOS		C

Intersection	
Intersection Delay, s/veh	63.8
Intersection LOS	F

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	510	80	510	214	96	226
Future Vol, veh/h	510	80	510	214	96	226
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	554	87	554	233	104	246
Number of Lanes	1	1	1	1	1	1

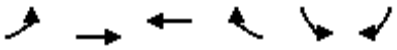
Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	75	75.9	16
HCM LOS	F	F	C

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	96	226	510	80	510	214
LT Vol	96	0	0	0	510	0
Through Vol	0	0	510	0	0	214
RT Vol	0	226	0	80	0	0
Lane Flow Rate	104	246	554	87	554	233
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.238	0.484	1.066	0.15	1.113	0.435
Departure Headway (Hd)	8.628	7.388	7.147	6.429	7.423	6.91
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	418	491	510	561	493	523
Service Time	6.328	5.088	4.847	4.129	5.123	4.61
HCM Lane V/C Ratio	0.249	0.501	1.086	0.155	1.124	0.446
HCM Control Delay	14	16.8	85.1	10.3	101.6	14.8
HCM Lane LOS	B	C	F	B	F	B
HCM 95th-tile Q	0.9	2.6	16.4	0.5	18.1	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	164	434	57	142	31	152	408	49	15	389	496
Future Volume (veh/h)	170	164	434	57	142	31	152	408	49	15	389	496
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	185	178	472	62	154	34	165	443	53	16	423	539
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	226	540	639	87	313	69	204	1277	152	34	568	683
Arrive On Green	0.13	0.29	0.29	0.05	0.21	0.21	0.11	0.40	0.40	0.02	0.30	0.30
Sat Flow, veh/h	1781	1870	1585	1781	1484	328	1781	3198	381	1781	1870	1585
Grp Volume(v), veh/h	185	178	472	62	0	188	165	245	251	16	423	539
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1811	1781	1777	1802	1781	1870	1585
Q Serve(g_s), s	7.5	5.5	18.7	2.5	0.0	6.7	6.7	7.1	7.2	0.7	15.0	21.6
Cycle Q Clear(g_c), s	7.5	5.5	18.7	2.5	0.0	6.7	6.7	7.1	7.2	0.7	15.0	21.6
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	226	540	639	87	0	382	204	709	719	34	568	683
V/C Ratio(X)	0.82	0.33	0.74	0.71	0.00	0.49	0.81	0.35	0.35	0.47	0.74	0.79
Avail Cap(c_a), veh/h	278	573	667	167	0	442	244	709	719	121	568	683
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	31.4	20.6	18.7	34.5	0.0	25.6	31.9	15.4	15.5	35.8	23.1	18.1
Incr Delay (d2), s/veh	14.6	0.4	4.2	10.3	0.0	1.0	15.7	0.3	0.3	10.0	5.3	6.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.0	2.4	7.0	1.3	0.0	2.9	3.7	2.7	2.8	0.4	7.0	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.0	21.0	22.9	44.9	0.0	26.6	47.5	15.7	15.7	45.8	28.4	24.3
LnGrp LOS	D	C	C	D	A	C	D	B	B	D	C	C
Approach Vol, veh/h		835			250			661			978	
Approach Delay, s/veh		27.6			31.1			23.7			26.4	
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	33.9	8.1	25.8	12.9	26.9	13.8	20.0
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	5.6	27.5	6.9	22.6	10.1	22.4	11.5	18.0
Max Q Clear Time (g_c+I1), s	2.7	9.2	4.5	20.7	8.7	23.6	9.5	8.7
Green Ext Time (p_c), s	0.0	2.8	0.0	0.6	0.1	0.0	0.1	0.6

Intersection Summary	
HCM 6th Ctrl Delay	26.5
HCM 6th LOS	C



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	400	1030	400	330	520	350
Future Volume (veh/h)	400	1030	400	330	520	350
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	435	1120	435	359	440	449
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	471	1185	594	920	469	417
Arrive On Green	0.26	0.63	0.32	0.32	0.26	0.26
Sat Flow, veh/h	1781	1870	1870	1585	1781	1585
Grp Volume(v), veh/h	435	1120	435	359	440	449
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1585	1781	1585
Q Serve(g_s), s	20.7	47.6	18.0	10.7	21.0	22.9
Cycle Q Clear(g_c), s	20.7	47.6	18.0	10.7	21.0	22.9
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	471	1185	594	920	469	417
V/C Ratio(X)	0.92	0.95	0.73	0.39	0.94	1.08
Avail Cap(c_a), veh/h	502	1249	626	947	469	417
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	31.2	14.6	26.4	9.9	31.4	32.0
Incr Delay (d2), s/veh	22.3	14.0	4.2	0.3	26.8	66.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.5	21.4	8.4	6.4	12.2	25.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	53.5	28.6	30.6	10.2	58.2	98.0
LnGrp LOS	D	C	C	B	E	F
Approach Vol, veh/h		1555	794		889	
Approach Delay, s/veh		35.6	21.4		78.3	
Approach LOS		D	C		E	

Timer - Assigned Phs	2		4	5	6
Phs Duration (G+Y+Rc), s	59.6		27.4	27.5	32.1
Change Period (Y+Rc), s	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s	58.1		22.9	24.5	29.1
Max Q Clear Time (g_c+I1), s	49.6		24.9	22.7	20.0
Green Ext Time (p_c), s	5.5		0.0	0.3	2.8

Intersection Summary		
HCM 6th Ctrl Delay	43.8	
HCM 6th LOS	D	

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1640	0	0	520	0	0
Future Vol, veh/h	1640	0	0	520	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	-	0	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	1783	0	0	565	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1783	0	2066	892
Stage 1	-	-	-	-	1783	-
Stage 2	-	-	-	-	283	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	344	-	47	285
Stage 1	-	-	-	-	120	-
Stage 2	-	-	-	-	740	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	344	-	47	285
Mov Cap-2 Maneuver	-	-	-	-	103	-
Stage 1	-	-	-	-	120	-
Stage 2	-	-	-	-	740	-

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)	-	-	-	-	344	-
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	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1640	0	0	520	0	0
Future Vol, veh/h	1640	0	0	520	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	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	1783	0	0	565	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1783	0	2066	892
Stage 1	-	-	-	-	1783	-
Stage 2	-	-	-	-	283	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	344	-	47	285
Stage 1	-	-	-	-	120	-
Stage 2	-	-	-	-	740	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	344	-	47	285
Mov Cap-2 Maneuver	-	-	-	-	103	-
Stage 1	-	-	-	-	120	-
Stage 2	-	-	-	-	740	-

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)	-	-	-	-	344	-
HCM Lane V/C Ratio	-	-	-	-	-	-
HCM Control Delay (s)	0	0	-	-	0	-
HCM Lane LOS	A	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	-	0	-

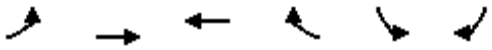
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	974	66	95	452	68	75
Future Volume (veh/h)	974	66	95	452	68	75
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1059	72	103	491	74	82
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	1989	135	433	2094	213	189
Arrive On Green	0.59	0.59	0.59	0.59	0.12	0.12
Sat Flow, veh/h	3470	229	498	3647	1781	1585
Grp Volume(v), veh/h	557	574	103	491	74	82
Grp Sat Flow(s),veh/h/ln	1777	1829	498	1777	1781	1585
Q Serve(g_s), s	5.8	5.8	4.8	2.0	1.2	1.5
Cycle Q Clear(g_c), s	5.8	5.8	10.6	2.0	1.2	1.5
Prop In Lane		0.13	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1047	1078	433	2094	213	189
V/C Ratio(X)	0.53	0.53	0.24	0.23	0.35	0.43
Avail Cap(c_a), veh/h	3539	3643	1131	7077	1125	1001
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	3.8	3.8	7.0	3.0	12.5	12.6
Incr Delay (d2), s/veh	0.4	0.4	0.3	0.1	1.0	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.6	0.6	0.3	0.2	0.4	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.2	4.2	7.3	3.1	13.5	14.2
LnGrp LOS	A	A	A	A	B	B
Approach Vol, veh/h	1131			594	156	
Approach Delay, s/veh	4.2			3.8	13.8	
Approach LOS	A			A	B	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	22.7				22.7	8.2
Change Period (Y+Rc), s	4.5				4.5	4.5
Max Green Setting (Gmax), s	61.5				61.5	19.5
Max Q Clear Time (g_c+I1), s	7.8				12.6	3.5
Green Ext Time (p_c), s	10.2				5.6	0.4

Intersection Summary	
HCM 6th Ctrl Delay	4.9
HCM 6th LOS	A

APPENDIX F

NEAR-TERM (YEAR 2025) + PROJECT PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↰	↱
Traffic Volume (veh/h)	0	661	995	0	493	29
Future Volume (veh/h)	0	661	995	0	493	29
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	718	1082	0	536	32
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	1087	1087	0	546	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	718	1082	0	536	32
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	20.9	46.0	0.0	23.9	1.1
Cycle Q Clear(g_c), s	0.0	20.9	46.0	0.0	23.9	1.1
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1087	1087	0	546	485
V/C Ratio(X)	0.00	0.66	1.00	0.00	0.98	0.07
Avail Cap(c_a), veh/h	0	1087	1087	0	546	485
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	11.4	16.6	0.0	27.5	19.6
Incr Delay (d2), s/veh	0.0	1.5	26.1	0.0	33.9	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	7.9	24.3	0.0	14.7	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	12.9	42.7	0.0	61.5	19.7
LnGrp LOS	A	B	D	A	E	B
Approach Vol, veh/h		718	1082		568	
Approach Delay, s/veh		12.9	42.7		59.1	
Approach LOS		B	D		E	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		51.0		29.0		51.0
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		22.9		25.9		48.0
Green Ext Time (p_c), s		5.4		0.0		0.0

Intersection Summary		
HCM 6th Ctrl Delay		37.6
HCM 6th LOS		D

Intersection	
Intersection Delay, s/veh	88.2
Intersection LOS	F

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	232	41	645	332	189	194
Future Vol, veh/h	232	41	645	332	189	194
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	252	45	701	361	205	211
Number of Lanes	1	1	1	1	1	1

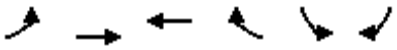
Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	16.8	136.5	16
HCM LOS	C	F	C

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	189	194	232	41	645	332
LT Vol	189	0	0	0	645	0
Through Vol	0	0	232	0	0	332
RT Vol	0	194	0	41	0	0
Lane Flow Rate	205	211	252	45	701	361
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.45	0.392	0.506	0.081	1.363	0.65
Departure Headway (Hd)	8.339	7.112	7.667	6.947	6.997	6.488
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	436	510	474	519	519	556
Service Time	6.039	4.812	5.367	4.647	4.735	4.225
HCM Lane V/C Ratio	0.47	0.414	0.532	0.087	1.351	0.649
HCM Control Delay	17.7	14.3	18	10.3	196.2	20.5
HCM Lane LOS	C	B	C	B	F	C
HCM 95th-tile Q	2.3	1.8	2.8	0.3	31.5	4.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	63	87	315	82	265	11	219	159	56	16	455	550
Future Volume (veh/h)	63	87	315	82	265	11	219	159	56	16	455	550
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	68	95	342	89	288	12	238	173	61	17	495	598
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	91	401	564	114	406	17	252	1193	407	35	630	615
Arrive On Green	0.05	0.21	0.21	0.06	0.23	0.23	0.14	0.46	0.46	0.02	0.34	0.34
Sat Flow, veh/h	1781	1870	1585	1781	1783	74	1781	2601	886	1781	1870	1585
Grp Volume(v), veh/h	68	95	342	89	0	300	238	116	118	17	495	598
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1857	1781	1777	1711	1781	1870	1585
Q Serve(g_s), s	2.8	3.1	13.1	3.7	0.0	11.0	9.8	2.8	3.0	0.7	17.7	25.0
Cycle Q Clear(g_c), s	2.8	3.1	13.1	3.7	0.0	11.0	9.8	2.8	3.0	0.7	17.7	25.0
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	91	401	564	114	0	423	252	815	785	35	630	615
V/C Ratio(X)	0.75	0.24	0.61	0.78	0.00	0.71	0.94	0.14	0.15	0.48	0.79	0.97
Avail Cap(c_a), veh/h	204	494	643	166	0	451	252	815	785	120	630	615
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	34.7	24.1	19.6	34.2	0.0	26.4	31.5	11.6	11.7	36.0	22.2	22.3
Incr Delay (d2), s/veh	11.8	0.3	1.3	13.3	0.0	4.8	41.4	0.1	0.1	9.7	6.5	29.4
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	1.5	1.4	4.7	2.0	0.0	5.2	7.0	1.0	1.1	0.4	8.4	14.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.5	24.4	20.9	47.5	0.0	31.1	73.0	11.7	11.8	45.6	28.6	51.7
LnGrp LOS	D	C	C	D	A	C	E	B	B	D	C	D
Approach Vol, veh/h		505			389			472			1110	
Approach Delay, s/veh		25.0			34.9			42.6			41.3	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.0	38.5	9.3	20.4	15.0	29.5	8.3	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	5.0	30.5	6.9	19.6	10.5	25.0	8.5	18.0
Max Q Clear Time (g_c+I1), s	2.7	5.0	5.7	15.1	11.8	27.0	4.8	13.0
Green Ext Time (p_c), s	0.0	1.3	0.0	0.8	0.0	0.0	0.0	0.7

Intersection Summary	
HCM 6th Ctrl Delay	37.2
HCM 6th LOS	D



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	330	907	518	323	326	610
Future Volume (veh/h)	330	907	518	323	326	610
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	359	986	563	351	354	598
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	1134	639	1031	549	489
Arrive On Green	0.22	0.61	0.34	0.34	0.31	0.31
Sat Flow, veh/h	1781	1870	1870	1585	1781	1585
Grp Volume(v), veh/h	359	986	563	351	354	598
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1585	1781	1585
Q Serve(g_s), s	20.7	46.3	29.9	10.5	18.1	32.5
Cycle Q Clear(g_c), s	20.7	46.3	29.9	10.5	18.1	32.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	395	1134	639	1031	549	489
V/C Ratio(X)	0.91	0.87	0.88	0.34	0.64	1.22
Avail Cap(c_a), veh/h	499	1393	790	1158	549	489
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	40.0	17.3	32.7	8.3	31.4	36.4
Incr Delay (d2), s/veh	17.8	5.3	9.7	0.2	2.6	117.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.9	19.7	14.9	7.4	8.1	40.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	57.8	22.5	42.3	8.5	34.0	154.1
LnGrp LOS	E	C	D	A	C	F
Approach Vol, veh/h		1345	914		952	
Approach Delay, s/veh		32.0	29.3		109.5	
Approach LOS		C	C		F	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		68.4		37.0	27.9	40.5
Change Period (Y+Rc), s		4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s		78.5		32.5	29.5	44.5
Max Q Clear Time (g_c+I1), s		48.3		34.5	22.7	31.9
Green Ext Time (p_c), s		9.8		0.0	0.7	4.1

Intersection Summary		
HCM 6th Ctrl Delay		54.2
HCM 6th LOS		D

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1277	9	3	294	23	16
Future Vol, veh/h	1277	9	3	294	23	16
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	-	0	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	1388	10	3	320	25	17

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1398	0	1559	699
Stage 1	-	-	-	-	1393	-
Stage 2	-	-	-	-	166	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	485	-	103	382
Stage 1	-	-	-	-	195	-
Stage 2	-	-	-	-	846	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	485	-	102	382
Mov Cap-2 Maneuver	-	-	-	-	169	-
Stage 1	-	-	-	-	195	-
Stage 2	-	-	-	-	841	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	23.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	169	382	-	-	485	-
HCM Lane V/C Ratio	0.148	0.046	-	-	0.007	-
HCM Control Delay (s)	30	14.9	-	-	12.5	-
HCM Lane LOS	D	B	-	-	B	-
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1289	4	3	289	8	31
Future Vol, veh/h	1289	4	3	289	8	31
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	-	0	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	1401	4	3	314	9	34

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1405	0	1566	703
Stage 1	-	-	-	-	1403	-
Stage 2	-	-	-	-	163	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	482	-	102	380
Stage 1	-	-	-	-	193	-
Stage 2	-	-	-	-	849	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	482	-	101	380
Mov Cap-2 Maneuver	-	-	-	-	167	-
Stage 1	-	-	-	-	193	-
Stage 2	-	-	-	-	844	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	17.9
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	167	380	-	-	482	-
HCM Lane V/C Ratio	0.052	0.089	-	-	0.007	-
HCM Control Delay (s)	27.7	15.4	-	-	12.5	-
HCM Lane LOS	D	C	-	-	B	-
HCM 95th %tile Q(veh)	0.2	0.3	-	-	0	-

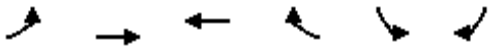
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	590	35	32	249	43	80
Future Volume (veh/h)	590	35	32	249	43	80
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	641	38	35	271	47	87
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	1531	91	582	1596	229	204
Arrive On Green	0.45	0.45	0.45	0.45	0.13	0.13
Sat Flow, veh/h	3502	202	761	3647	1781	1585
Grp Volume(v), veh/h	334	345	35	271	47	87
Grp Sat Flow(s),veh/h/ln	1777	1834	761	1777	1781	1585
Q Serve(g_s), s	2.7	2.7	0.7	1.0	0.5	1.1
Cycle Q Clear(g_c), s	2.7	2.7	3.4	1.0	0.5	1.1
Prop In Lane		0.11	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	798	824	582	1596	229	204
V/C Ratio(X)	0.42	0.42	0.06	0.17	0.21	0.43
Avail Cap(c_a), veh/h	4212	4348	2044	8424	2550	2269
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	4.0	4.0	5.1	3.5	8.3	8.6
Incr Delay (d2), s/veh	0.4	0.3	0.0	0.0	0.4	1.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	0.2	0.0	0.1	0.1	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.3	4.3	5.2	3.6	8.7	10.0
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h	679			306	134	
Approach Delay, s/veh	4.3			3.7	9.5	
Approach LOS	A			A	A	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	14.1				14.1	7.2
Change Period (Y+Rc), s	4.5				4.5	4.5
Max Green Setting (Gmax), s	50.5				50.5	30.5
Max Q Clear Time (g_c+I1), s	4.7				5.4	3.1
Green Ext Time (p_c), s	4.8				2.2	0.4

Intersection Summary	
HCM 6th Ctrl Delay	4.8
HCM 6th LOS	A

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	679	35	271	47	87
v/c Ratio	0.30	0.08	0.12	0.13	0.23
Control Delay	4.6	4.8	4.1	11.5	4.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	4.6	4.8	4.1	11.5	4.8
Queue Length 50th (ft)	28	2	10	8	0
Queue Length 95th (ft)	51	10	21	19	17
Internal Link Dist (ft)	477		3533	844	
Turn Bay Length (ft)					
Base Capacity (vph)	3511	732	3539	1602	1441
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.19	0.05	0.08	0.03	0.06

Intersection Summary



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↰	↱
Traffic Volume (veh/h)	0	1090	756	0	263	16
Future Volume (veh/h)	0	1090	756	0	263	16
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	1185	822	0	286	17
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	1176	1176	0	356	317
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	1185	822	0	286	17
Grp Sat Flow(s),veh/h/ln	0	1870	1870	0	1781	1585
Q Serve(g_s), s	0.0	33.0	15.3	0.0	8.0	0.5
Cycle Q Clear(g_c), s	0.0	33.0	15.3	0.0	8.0	0.5
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1176	1176	0	356	317
V/C Ratio(X)	0.00	1.01	0.70	0.00	0.80	0.05
Avail Cap(c_a), veh/h	0	1176	1176	0	611	544
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	9.7	6.5	0.0	20.0	17.0
Incr Delay (d2), s/veh	0.0	28.1	1.9	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	17.2	4.3	0.0	3.4	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	37.9	8.3	0.0	24.3	17.1
LnGrp LOS	A	F	A	A	C	B
Approach Vol, veh/h		1185	822		303	
Approach Delay, s/veh		37.9	8.3		23.9	
Approach LOS		D	A		C	

Timer - Assigned Phs		2		4		6
Phs Duration (G+Y+Rc), s		37.5		15.0		37.5
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		35.0		10.0		17.3
Green Ext Time (p_c), s		0.0		0.6		5.6

Intersection Summary	
HCM 6th Ctrl Delay	25.5
HCM 6th LOS	C

Intersection	
Intersection Delay, s/veh	68.9
Intersection LOS	F

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	510	80	519	214	96	247
Future Vol, veh/h	510	80	519	214	96	247
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	554	87	564	233	104	268
Number of Lanes	1	1	1	1	1	1

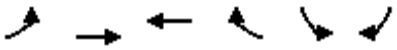
Approach	EB	WB	NB
Opposing Approach	WB	EB	
Opposing Lanes	2	2	0
Conflicting Approach Left		NB	EB
Conflicting Lanes Left	0	2	2
Conflicting Approach Right	NB		WB
Conflicting Lanes Right	2	0	2
HCM Control Delay	79.2	85	16.9
HCM LOS	F	F	C

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	96	247	510	80	519	214
LT Vol	96	0	0	0	519	0
Through Vol	0	0	510	0	0	214
RT Vol	0	247	0	80	0	0
Lane Flow Rate	104	268	554	87	564	233
Geometry Grp	7	7	7	7	7	7
Degree of Util (X)	0.239	0.524	1.08	0.152	1.147	0.441
Departure Headway (Hd)	8.672	7.431	7.257	6.539	7.522	7.009
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	416	489	504	552	485	516
Service Time	6.372	5.131	4.957	4.239	5.222	4.709
HCM Lane V/C Ratio	0.25	0.548	1.099	0.158	1.163	0.452
HCM Control Delay	14.1	18	90	10.4	113.8	15.1
HCM Lane LOS	B	C	F	B	F	C
HCM 95th-tile Q	0.9	3	16.9	0.5	19.4	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	170	164	455	57	142	31	161	410	49	15	393	496
Future Volume (veh/h)	170	164	455	57	142	31	161	410	49	15	393	496
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	185	178	495	62	154	34	175	446	53	16	427	539
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	225	552	658	86	322	71	213	1276	151	34	557	672
Arrive On Green	0.13	0.30	0.30	0.05	0.22	0.22	0.12	0.40	0.40	0.02	0.30	0.30
Sat Flow, veh/h	1781	1870	1585	1781	1484	328	1781	3201	379	1781	1870	1585
Grp Volume(v), veh/h	185	178	495	62	0	188	175	247	252	16	427	539
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	0	1811	1781	1777	1802	1781	1870	1585
Q Serve(g_s), s	7.6	5.6	20.0	2.6	0.0	6.8	7.2	7.3	7.4	0.7	15.6	22.3
Cycle Q Clear(g_c), s	7.6	5.6	20.0	2.6	0.0	6.8	7.2	7.3	7.4	0.7	15.6	22.3
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	225	552	658	86	0	393	213	708	718	34	557	672
V/C Ratio(X)	0.82	0.32	0.75	0.72	0.00	0.48	0.82	0.35	0.35	0.48	0.77	0.80
Avail Cap(c_a), veh/h	272	562	666	163	0	433	239	708	718	118	557	672
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	32.1	20.7	18.7	35.3	0.0	25.7	32.3	15.8	15.8	36.6	24.1	18.9
Incr Delay (d2), s/veh	15.4	0.3	4.8	10.8	0.0	0.9	18.2	0.3	0.3	10.1	6.4	6.9
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	4.1	2.4	7.6	1.4	0.0	2.9	4.1	2.8	2.9	0.4	7.5	8.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	47.5	21.0	23.5	46.1	0.0	26.6	50.5	16.1	16.1	46.6	30.4	25.9
LnGrp LOS	D	C	C	D	A	C	D	B	B	D	C	C
Approach Vol, veh/h		858			250			674			982	
Approach Delay, s/veh		28.1			31.5			25.0			28.2	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	5.9	34.5	8.1	26.7	13.5	26.9	14.0	20.8
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	5.6	27.5	6.9	22.6	10.1	22.4	11.5	18.0
Max Q Clear Time (g_c+I1), s	2.7	9.4	4.6	22.0	9.2	24.3	9.6	8.8
Green Ext Time (p_c), s	0.0	2.8	0.0	0.2	0.0	0.0	0.1	0.6

Intersection Summary	
HCM 6th Ctrl Delay	27.7
HCM 6th LOS	C



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	400	1060	403	341	545	350
Future Volume (veh/h)	400	1060	403	341	545	350
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	435	1152	438	371	453	463
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	468	1187	601	928	471	419
Arrive On Green	0.26	0.63	0.32	0.32	0.26	0.26
Sat Flow, veh/h	1781	1870	1870	1585	1781	1585
Grp Volume(v), veh/h	435	1152	438	371	453	463
Grp Sat Flow(s),veh/h/ln	1781	1870	1870	1585	1781	1585
Q Serve(g_s), s	21.2	52.3	18.5	11.3	22.4	23.6
Cycle Q Clear(g_c), s	21.2	52.3	18.5	11.3	22.4	23.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	468	1187	601	928	471	419
V/C Ratio(X)	0.93	0.97	0.73	0.40	0.96	1.10
Avail Cap(c_a), veh/h	489	1203	601	928	471	419
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	15.5	26.8	10.0	32.4	32.8
Incr Delay (d2), s/veh	23.7	19.1	4.5	0.3	31.7	75.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.9	24.8	8.7	6.8	13.5	8.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	55.8	34.6	31.3	10.3	64.0	108.1
LnGrp LOS	E	C	C	B	E	F
Approach Vol, veh/h		1587	809		916	
Approach Delay, s/veh		40.4	21.7		86.3	
Approach LOS		D	C		F	

Timer - Assigned Phs	2		4	5	6
Phs Duration (G+Y+Rc), s	61.1		28.1	28.0	33.2
Change Period (Y+Rc), s	4.5		4.5	4.5	4.5
Max Green Setting (Gmax), s	57.4		23.6	24.5	28.4
Max Q Clear Time (g_c+I1), s	54.3		25.6	23.2	20.5
Green Ext Time (p_c), s	2.3		0.0	0.2	2.6

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

Notes

User approved volume balancing among the lanes for turning movement.

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1657	38	13	524	10	7
Future Vol, veh/h	1657	38	13	524	10	7
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	-	0	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	1801	41	14	570	11	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1842	0	2135	921
Stage 1	-	-	-	-	1822	-
Stage 2	-	-	-	-	313	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	326	-	42	273
Stage 1	-	-	-	-	114	-
Stage 2	-	-	-	-	715	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	326	-	40	273
Mov Cap-2 Maneuver	-	-	-	-	97	-
Stage 1	-	-	-	-	114	-
Stage 2	-	-	-	-	684	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	35.1
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	97	273	-	-	326	-
HCM Lane V/C Ratio	0.112	0.028	-	-	0.043	-
HCM Control Delay (s)	46.7	18.6	-	-	16.5	-
HCM Lane LOS	E	C	-	-	C	-
HCM 95th %tile Q(veh)	0.4	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1647	17	17	533	4	15
Future Vol, veh/h	1647	17	17	533	4	15
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	-	0	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	1790	18	18	579	4	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1808	0	2125	904
Stage 1	-	-	-	-	1799	-
Stage 2	-	-	-	-	326	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	336	-	43	280
Stage 1	-	-	-	-	117	-
Stage 2	-	-	-	-	704	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	336	-	41	280
Mov Cap-2 Maneuver	-	-	-	-	99	-
Stage 1	-	-	-	-	117	-
Stage 2	-	-	-	-	666	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	23.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	99	280	-	-	336	-
HCM Lane V/C Ratio	0.044	0.058	-	-	0.055	-
HCM Control Delay (s)	43	18.7	-	-	16.3	-
HCM Lane LOS	E	C	-	-	C	-
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0.2	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	994	68	95	478	72	75
Future Volume (veh/h)	994	68	95	478	72	75
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	1080	74	103	520	78	82
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	2016	138	425	2123	212	189
Arrive On Green	0.60	0.60	0.60	0.60	0.12	0.12
Sat Flow, veh/h	3468	231	487	3647	1781	1585
Grp Volume(v), veh/h	568	586	103	520	78	82
Grp Sat Flow(s),veh/h/ln	1777	1829	487	1777	1781	1585
Q Serve(g_s), s	6.0	6.0	5.0	2.2	1.3	1.5
Cycle Q Clear(g_c), s	6.0	6.0	11.1	2.2	1.3	1.5
Prop In Lane		0.13	1.00		1.00	1.00
Lane Grp Cap(c), veh/h	1061	1092	425	2123	212	189
V/C Ratio(X)	0.54	0.54	0.24	0.24	0.37	0.43
Avail Cap(c_a), veh/h	3443	3543	1078	6885	1094	974
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	3.8	3.8	7.1	3.0	12.9	13.0
Incr Delay (d2), s/veh	0.4	0.4	0.3	0.1	1.1	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	0.7	0.3	0.2	0.5	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.2	4.2	7.4	3.1	13.9	14.6
LnGrp LOS	A	A	A	A	B	B
Approach Vol, veh/h	1154			623	160	
Approach Delay, s/veh	4.2			3.8	14.3	
Approach LOS	A			A	B	

Timer - Assigned Phs	2				6	8
Phs Duration (G+Y+Rc), s	23.5				23.5	8.3
Change Period (Y+Rc), s	4.5				4.5	4.5
Max Green Setting (Gmax), s	61.5				61.5	19.5
Max Q Clear Time (g_c+I1), s	8.0				13.1	3.5
Green Ext Time (p_c), s	10.5				5.9	0.4

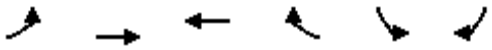
Intersection Summary	
HCM 6th Ctrl Delay	4.9
HCM 6th LOS	A

Lane Group	EBT	WBL	WBT	NBL	NBR
Lane Group Flow (vph)	1154	103	520	78	82
v/c Ratio	0.47	0.36	0.21	0.25	0.24
Control Delay	5.0	9.1	3.7	19.0	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.0	9.1	3.7	19.0	7.2
Queue Length 50th (ft)	64	10	23	17	0
Queue Length 95th (ft)	116	42	45	49	27
Internal Link Dist (ft)	477		3533	844	
Turn Bay Length (ft)					
Base Capacity (vph)	3504	408	3539	816	774
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.33	0.25	0.15	0.10	0.11

Intersection Summary

APPENDIX G

YEAR 2050 WITHOUT PROJECT PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	620	930	0	460	30
Future Volume (veh/h)	0	620	930	0	460	30
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	0	674	1011	0	500	33
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	6	2225	2225	0	864	396
Arrive On Green	0.00	0.44	0.44	0.00	0.25	0.25
Sat Flow, veh/h	1781	5274	5443	0	3456	1585
Grp Volume(v), veh/h	0	674	1011	0	500	33
Grp Sat Flow(s),veh/h/ln	1781	1702	1702	0	1728	1585
Q Serve(g_s), s	0.0	2.5	4.0	0.0	3.6	0.5
Cycle Q Clear(g_c), s	0.0	2.5	4.0	0.0	3.6	0.5
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	6	2225	2225	0	864	396
V/C Ratio(X)	0.00	0.30	0.45	0.00	0.58	0.08
Avail Cap(c_a), veh/h	1026	7647	3904	0	2184	1002
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	5.3	5.7	0.0	9.4	8.2
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.0	0.6	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	0.4	0.7	0.0	1.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	5.3	5.8	0.0	10.0	8.3
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h		674	1011		533	
Approach Delay, s/veh		5.3	5.8		9.9	
Approach LOS		A	A		A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		17.0		11.7	0.0	17.0
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		4.5		5.6	0.0	6.0
Green Ext Time (p_c), s		5.4		1.6	0.0	6.5

Intersection Summary	
HCM 6th Ctrl Delay	6.7
HCM 6th LOS	A

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

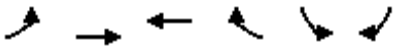
Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	90	290	80	250	10	190	150	60	20	430	520
Future Volume (veh/h)	60	90	290	80	250	10	190	150	60	20	430	520
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	65	98	315	87	272	11	207	163	65	22	467	500
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	94	400	569	113	782	31	258	1064	408	45	1081	566
Arrive On Green	0.05	0.21	0.21	0.06	0.22	0.22	0.14	0.42	0.42	0.03	0.30	0.30
Sat Flow, veh/h	1781	1870	1585	1781	3482	140	1781	2511	963	1781	3554	1585
Grp Volume(v), veh/h	65	98	315	87	138	145	207	113	115	22	467	500
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1777	1845	1781	1777	1697	1781	1777	1585
Q Serve(g_s), s	2.4	2.9	10.5	3.2	4.3	4.3	7.4	2.6	2.7	0.8	6.9	19.5
Cycle Q Clear(g_c), s	2.4	2.9	10.5	3.2	4.3	4.3	7.4	2.6	2.7	0.8	6.9	19.5
Prop In Lane	1.00		1.00	1.00		0.08	1.00		0.57	1.00		1.00
Lane Grp Cap(c), veh/h	94	400	569	113	399	414	258	753	719	45	1081	566
V/C Ratio(X)	0.69	0.24	0.55	0.77	0.35	0.35	0.80	0.15	0.16	0.49	0.43	0.88
Avail Cap(c_a), veh/h	718	967	1049	284	486	505	474	878	839	135	1081	566
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	30.6	21.4	16.9	30.3	21.4	21.5	27.2	11.7	11.7	31.6	18.3	19.9
Incr Delay (d2), s/veh	8.7	0.3	0.8	10.5	0.5	0.5	5.8	0.1	0.1	8.1	0.3	15.3
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	1.2	1.2	3.6	1.6	1.7	1.8	3.4	0.9	1.0	0.4	2.7	8.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	39.3	21.8	17.7	40.8	22.0	22.0	33.0	11.8	11.8	39.7	18.6	35.2
LnGrp LOS	D	C	B	D	C	C	C	B	B	D	B	D
Approach Vol, veh/h		478			370			435			989	
Approach Delay, s/veh		21.5			26.4			21.9			27.4	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.2	32.4	8.7	18.6	14.0	24.5	8.0	19.3
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	32.5	10.5	34.0	17.5	20.0	26.5	18.0
Max Q Clear Time (g_c+I1), s	2.8	4.7	5.2	12.5	9.4	21.5	4.4	6.3
Green Ext Time (p_c), s	0.0	1.3	0.1	1.6	0.4	0.0	0.1	1.2

Intersection Summary	
HCM 6th Ctrl Delay	24.9
HCM 6th LOS	C



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	320	880	500	290	320	610
Future Volume (veh/h)	320	880	500	290	320	610
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	348	957	543	315	348	587
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	417	1994	861	811	480	752
Arrive On Green	0.23	0.56	0.24	0.24	0.27	0.27
Sat Flow, veh/h	1781	3647	3647	1585	1781	2790
Grp Volume(v), veh/h	348	957	543	315	348	587
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1585	1781	1395
Q Serve(g_s), s	9.9	8.6	7.3	6.4	9.4	10.3
Cycle Q Clear(g_c), s	9.9	8.6	7.3	6.4	9.4	10.3
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	417	1994	861	811	480	752
V/C Ratio(X)	0.84	0.48	0.63	0.39	0.72	0.78
Avail Cap(c_a), veh/h	620	2877	1338	1024	604	945
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	19.4	7.0	18.0	7.9	17.6	17.9
Incr Delay (d2), s/veh	6.3	0.2	0.8	0.3	3.2	3.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	2.4	2.7	3.3	3.9	0.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	25.7	7.2	18.8	8.2	20.8	21.3
LnGrp LOS	C	A	B	A	C	C
Approach Vol, veh/h		1305	858		935	
Approach Delay, s/veh		12.1	14.9		21.1	
Approach LOS		B	B		C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		34.3		18.8	16.9	17.4
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		10.6		12.3	11.9	9.3
Green Ext Time (p_c), s		8.2		2.0	0.6	3.6

Intersection Summary		
HCM 6th Ctrl Delay		15.6
HCM 6th LOS		B

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1200	0	0	294	0	0
Future Vol, veh/h	1200	0	0	294	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	-	0	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	1304	0	0	320	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1304	0	1464	652
Stage 1	-	-	-	-	1304	-
Stage 2	-	-	-	-	160	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	527	-	119	411
Stage 1	-	-	-	-	218	-
Stage 2	-	-	-	-	852	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	527	-	119	411
Mov Cap-2 Maneuver	-	-	-	-	188	-
Stage 1	-	-	-	-	218	-
Stage 2	-	-	-	-	852	-

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)	-	-	-	-	527	-
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	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1200	0	0	294	0	0
Future Vol, veh/h	1200	0	0	294	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	1304	0	0	320	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1304	0	1464	652
Stage 1	-	-	-	-	1304	-
Stage 2	-	-	-	-	160	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	527	-	119	411
Stage 1	-	-	-	-	218	-
Stage 2	-	-	-	-	852	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	527	-	119	411
Mov Cap-2 Maneuver	-	-	-	-	188	-
Stage 1	-	-	-	-	218	-
Stage 2	-	-	-	-	852	-

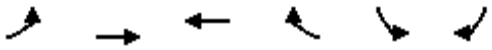
Approach	EB	WB	NB
HCM Control Delay, s	0	0	0
HCM LOS			A

Minor Lane/Major Mvmt	NBLn1	EBT	EBR	WBL	WBT
Capacity (veh/h)	-	-	-	527	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	562	32	33	251	43	83
Future Volume (veh/h)	562	32	33	251	43	83
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	611	35	36	273	47	90
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	1487	85	0	2222	74	142
Arrive On Green	0.44	0.44	0.00	0.44	0.13	0.13
Sat Flow, veh/h	3510	195	0	5274	562	1075
Grp Volume(v), veh/h	317	329	0	273	138	0
Grp Sat Flow(s),veh/h/ln	1777	1835	0	1702	1649	0
Q Serve(g_s), s	2.6	2.6	0.0	0.7	1.6	0.0
Cycle Q Clear(g_c), s	2.6	2.6	0.0	0.7	1.6	0.0
Prop In Lane		0.11	0.00		0.34	0.65
Lane Grp Cap(c), veh/h	773	799	0	2222	218	0
V/C Ratio(X)	0.41	0.41	0.00	0.12	0.63	0.00
Avail Cap(c_a), veh/h	3673	3794	0	12887	2259	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.0	4.0	0.0	3.5	8.6	0.0
Incr Delay (d2), s/veh	0.3	0.3	0.0	0.0	3.0	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	0.2	0.2	0.0	0.0	0.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.4	4.4	0.0	3.5	11.6	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	646			273	138	
Approach Delay, s/veh	4.4			3.5	11.6	
Approach LOS	A			A	B	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	0.0	13.6				13.6	7.2
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	5.0	43.0				52.5	28.5
Max Q Clear Time (g_c+I1), s	0.0	4.6				2.7	3.6
Green Ext Time (p_c), s	0.0	4.5				2.0	0.4

Intersection Summary		
HCM 6th Ctrl Delay	5.1	
HCM 6th LOS	A	



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1040	710	0	230	20
Future Volume (veh/h)	0	1040	710	0	230	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	0	1130	772	0	250	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	6	2839	2839	0	511	234
Arrive On Green	0.00	0.56	0.56	0.00	0.15	0.15
Sat Flow, veh/h	1781	5274	5443	0	3456	1585
Grp Volume(v), veh/h	0	1130	772	0	250	22
Grp Sat Flow(s),veh/h/ln	1781	1702	1702	0	1728	1585
Q Serve(g_s), s	0.0	3.8	2.4	0.0	2.0	0.4
Cycle Q Clear(g_c), s	0.0	3.8	2.4	0.0	2.0	0.4
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	6	2839	2839	0	511	234
V/C Ratio(X)	0.00	0.40	0.27	0.00	0.49	0.09
Avail Cap(c_a), veh/h	1834	10581	4568	0	2046	938
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	3.8	3.5	0.0	11.9	11.2
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.0	0.7	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	0.0	0.4	0.3	0.0	0.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	3.9	3.6	0.0	12.6	11.4
LnGrp LOS	A	A	A	A	B	B
Approach Vol, veh/h		1130	772		272	
Approach Delay, s/veh		3.9	3.6		12.5	
Approach LOS		A	A		B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		21.4		9.0	0.0	21.4
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		5.8		4.0	0.0	4.4
Green Ext Time (p_c), s		11.1		0.8	0.0	5.6

Intersection Summary	
HCM 6th Ctrl Delay	4.9
HCM 6th LOS	A

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	18.4	30.5				48.9	9.4
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	13.5	38.9				62.9	18.1
Max Q Clear Time (g_c+I1), s	12.3	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

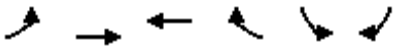
Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	160	410	60	140	30	150	390	50	20	370	468
Future Volume (veh/h)	160	160	410	60	140	30	150	390	50	20	370	468
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	174	174	446	65	152	33	163	424	54	22	402	444
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	221	544	646	93	639	135	207	1168	148	45	983	635
Arrive On Green	0.12	0.29	0.29	0.05	0.22	0.22	0.12	0.37	0.37	0.02	0.28	0.28
Sat Flow, veh/h	1781	1870	1585	1781	2918	618	1781	3173	402	1781	3554	1585
Grp Volume(v), veh/h	174	174	446	65	91	94	163	236	242	22	402	444
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1777	1759	1781	1777	1798	1781	1777	1585
Q Serve(g_s), s	6.5	5.0	15.8	2.4	2.9	3.0	6.1	6.6	6.7	0.8	6.3	15.9
Cycle Q Clear(g_c), s	6.5	5.0	15.8	2.4	2.9	3.0	6.1	6.6	6.7	0.8	6.3	15.9
Prop In Lane	1.00		1.00	1.00		0.35	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	221	544	646	93	389	385	207	654	662	45	983	635
V/C Ratio(X)	0.79	0.32	0.69	0.70	0.23	0.24	0.79	0.36	0.37	0.49	0.41	0.70
Avail Cap(c_a), veh/h	483	766	833	225	469	465	405	795	805	131	1043	662
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	29.0	18.9	16.7	31.8	21.9	22.0	29.3	15.7	15.7	32.8	20.1	17.0
Incr Delay (d2), s/veh	6.1	0.3	1.7	9.3	0.3	0.3	6.5	0.3	0.3	8.2	0.3	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.0	2.1	5.5	1.3	1.2	1.2	2.9	2.5	2.6	0.4	2.5	5.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.1	19.2	18.3	41.1	22.2	22.3	35.8	16.0	16.1	41.0	20.4	20.1
LnGrp LOS	D	B	B	D	C	C	D	B	B	D	C	C
Approach Vol, veh/h		794			250			641			868	
Approach Delay, s/veh		22.2			27.2			21.1			20.8	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.2	29.6	8.0	24.3	12.4	23.4	13.0	19.4
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	5.0	30.5	8.6	27.9	15.5	20.0	18.5	18.0
Max Q Clear Time (g_c+I1), s	2.8	8.7	4.4	17.8	8.1	17.9	8.5	5.0
Green Ext Time (p_c), s	0.0	2.9	0.0	2.0	0.2	1.0	0.3	0.7

Intersection Summary	
HCM 6th Ctrl Delay	21.9
HCM 6th LOS	C



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	400	1020	390	320	520	350
Future Volume (veh/h)	400	1020	390	320	520	350
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	435	1109	424	348	565	304
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	501	2012	760	801	520	814
Arrive On Green	0.28	0.57	0.21	0.21	0.29	0.29
Sat Flow, veh/h	1781	3647	3647	1585	1781	2790
Grp Volume(v), veh/h	435	1109	424	348	565	304
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1585	1781	1395
Q Serve(g_s), s	14.7	12.5	6.8	8.8	18.5	5.5
Cycle Q Clear(g_c), s	14.7	12.5	6.8	8.8	18.5	5.5
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	501	2012	760	801	520	814
V/C Ratio(X)	0.87	0.55	0.56	0.43	1.09	0.37
Avail Cap(c_a), veh/h	801	2943	1093	950	520	814
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	21.7	8.7	22.2	9.9	22.4	17.8
Incr Delay (d2), s/veh	6.1	0.2	0.6	0.4	65.1	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.5	3.9	2.7	5.0	16.4	4.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	27.7	8.9	22.9	10.3	87.6	18.1
LnGrp LOS	C	A	C	B	F	B
Approach Vol, veh/h		1544	772		869	
Approach Delay, s/veh		14.2	17.2		63.3	
Approach LOS		B	B		E	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		40.4		23.0	22.3	18.1
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		14.5		20.5	16.7	10.8
Green Ext Time (p_c), s		10.4		0.0	1.1	2.7

Intersection Summary		
HCM 6th Ctrl Delay		28.3
HCM 6th LOS		C

Intersection	
Int Delay, s/veh	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1540	0	0	534	0	0
Future Vol, veh/h	1540	0	0	534	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	-	0	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	1674	0	0	580	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1674	0	1964	837
Stage 1	-	-	-	-	1674	-
Stage 2	-	-	-	-	290	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	379	-	55	310
Stage 1	-	-	-	-	138	-
Stage 2	-	-	-	-	734	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	379	-	55	310
Mov Cap-2 Maneuver	-	-	-	-	118	-
Stage 1	-	-	-	-	138	-
Stage 2	-	-	-	-	734	-

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)	-	-	-	-	379	-
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	0

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1540	0	0	534	0	0
Future Vol, veh/h	1540	0	0	534	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	1674	0	0	580	0	0

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1674	0	1964	837
Stage 1	-	-	-	-	1674	-
Stage 2	-	-	-	-	290	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	379	-	55	310
Stage 1	-	-	-	-	138	-
Stage 2	-	-	-	-	734	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	379	-	55	310
Mov Cap-2 Maneuver	-	-	-	-	118	-
Stage 1	-	-	-	-	138	-
Stage 2	-	-	-	-	734	-

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)	-	-	-	379	-
HCM Lane V/C Ratio	-	-	-	-	-
HCM Control Delay (s)	0	-	-	0	-
HCM Lane LOS	A	-	-	A	-
HCM 95th %tile Q(veh)	-	-	-	0	-

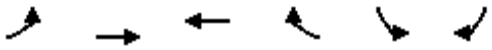
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1001	68	98	464	70	77
Future Volume (veh/h)	1001	68	98	464	70	77
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	1088	74	107	504	76	84
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	1980	135	0	2995	101	111
Arrive On Green	0.59	0.59	0.00	0.59	0.13	0.13
Sat Flow, veh/h	3470	230	0	5274	790	873
Grp Volume(v), veh/h	572	590	0	504	161	0
Grp Sat Flow(s),veh/h/ln	1777	1829	0	1702	1674	0
Q Serve(g_s), s	6.2	6.2	0.0	1.4	2.9	0.0
Cycle Q Clear(g_c), s	6.2	6.2	0.0	1.4	2.9	0.0
Prop In Lane		0.13	0.00		0.47	0.52
Lane Grp Cap(c), veh/h	1042	1073	0	2995	214	0
V/C Ratio(X)	0.55	0.55	0.00	0.17	0.75	0.00
Avail Cap(c_a), veh/h	2821	2904	0	9648	1143	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.0	4.0	0.0	3.0	13.3	0.0
Incr Delay (d2), s/veh	0.5	0.4	0.0	0.0	5.3	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	0.8	0.8	0.0	0.1	1.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.4	4.4	0.0	3.0	18.6	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	1162			504	161	
Approach Delay, s/veh	4.4			3.0	18.6	
Approach LOS	A			A	B	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	0.0	23.0				23.0	8.5
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	5.0	50.0				59.5	21.5
Max Q Clear Time (g_c+I1), s	0.0	8.2				3.4	4.9
Green Ext Time (p_c), s	0.0	10.3				4.0	0.4

Intersection Summary	
HCM 6th Ctrl Delay	5.3
HCM 6th LOS	A

APPENDIX H

YEAR 2050 + PROJECT PEAK HOUR INTERSECTION ANALYSIS WORKSHEETS



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	622	938	0	465	30
Future Volume (veh/h)	0	622	938	0	465	30
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	0	676	1020	0	505	33
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	6	2230	2230	0	868	398
Arrive On Green	0.00	0.44	0.44	0.00	0.25	0.25
Sat Flow, veh/h	1781	5274	5443	0	3456	1585
Grp Volume(v), veh/h	0	676	1020	0	505	33
Grp Sat Flow(s),veh/h/ln	1781	1702	1702	0	1728	1585
Q Serve(g_s), s	0.0	2.5	4.1	0.0	3.7	0.5
Cycle Q Clear(g_c), s	0.0	2.5	4.1	0.0	3.7	0.5
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	6	2230	2230	0	868	398
V/C Ratio(X)	0.00	0.30	0.46	0.00	0.58	0.08
Avail Cap(c_a), veh/h	1019	7596	3878	0	2169	995
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	5.3	5.7	0.0	9.5	8.3
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.0	0.6	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	0.4	0.7	0.0	1.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	5.3	5.9	0.0	10.1	8.3
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h		676	1020		538	
Approach Delay, s/veh		5.3	5.9		10.0	
Approach LOS		A	A		A	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		17.1		11.7	0.0	17.1
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		4.5		5.7	0.0	6.1
Green Ext Time (p_c), s		5.4		1.6	0.0	6.5

Intersection Summary	
HCM 6th Ctrl Delay	6.7
HCM 6th LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	250	45	750	355	205	225
Future Volume (veh/h)	250	45	750	355	205	225
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	815	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	1056	1195	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	815	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	9.8	4.3	5.5	0.0
Cycle Q Clear(g_c), s	0.0	7.5	9.8	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	1056	1195	291	
V/C Ratio(X)	0.00	0.75	0.77	0.32	0.77	
Avail Cap(c_a), veh/h	0	719	1495	1733	735	
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	16.2	14.4	3.7	18.2	0.0
Incr Delay (d2), s/veh	0.0	2.7	1.6	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	18.9	16.0	3.9	22.4	0.0
LnGrp LOS	A	B	B	A	C	
Approach Vol, veh/h	321			1201	223	A
Approach Delay, s/veh	18.9			12.1	22.4	
Approach LOS	B			B	C	

Timer - Assigned Phs	2	3	4		8
Phs Duration (G+Y+Rc), s	12.0	18.4	15.2		33.6
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	11.8	9.5		6.3
Green Ext Time (p_c), s	0.5	2.2	1.2		2.6

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

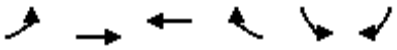
Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	90	295	80	250	10	210	153	60	20	431	520
Future Volume (veh/h)	60	90	295	80	250	10	210	153	60	20	431	520
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	65	98	321	87	272	11	228	166	65	22	468	500
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	93	400	588	113	783	32	279	1085	409	45	1058	555
Arrive On Green	0.05	0.21	0.21	0.06	0.22	0.22	0.16	0.43	0.43	0.03	0.30	0.30
Sat Flow, veh/h	1781	1870	1585	1781	3482	140	1781	2524	951	1781	3554	1585
Grp Volume(v), veh/h	65	98	321	87	138	145	228	115	116	22	468	500
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1777	1845	1781	1777	1699	1781	1777	1585
Q Serve(g_s), s	2.4	2.9	10.7	3.2	4.4	4.4	8.3	2.6	2.8	0.8	7.2	20.0
Cycle Q Clear(g_c), s	2.4	2.9	10.7	3.2	4.4	4.4	8.3	2.6	2.8	0.8	7.2	20.0
Prop In Lane	1.00		1.00	1.00		0.08	1.00		0.56	1.00		1.00
Lane Grp Cap(c), veh/h	93	400	588	113	400	415	279	763	730	45	1058	555
V/C Ratio(X)	0.70	0.24	0.55	0.77	0.35	0.35	0.82	0.15	0.16	0.49	0.44	0.90
Avail Cap(c_a), veh/h	703	947	1051	279	476	495	464	860	822	133	1058	555
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	31.3	21.9	16.7	31.0	21.9	21.9	27.4	11.7	11.7	32.3	19.1	20.7
Incr Delay (d2), s/veh	9.0	0.3	0.8	10.5	0.5	0.5	5.8	0.1	0.1	8.2	0.3	17.8
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	1.2	1.3	3.7	1.7	1.8	1.9	3.8	1.0	1.0	0.4	2.8	9.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.3	22.2	17.5	41.5	22.4	22.4	33.2	11.8	11.8	40.5	19.4	38.5
LnGrp LOS	D	C	B	D	C	C	C	B	B	D	B	D
Approach Vol, veh/h		484			370			459			990	
Approach Delay, s/veh		21.5			26.9			22.4			29.5	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.2	33.3	8.8	18.9	15.0	24.5	8.0	19.6
Change Period (Y+Rc), s	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Max Green Setting (Gmax), s	5.0	32.5	10.5	34.0	17.5	20.0	26.5	18.0
Max Q Clear Time (g_c+I1), s	2.8	4.8	5.2	12.7	10.3	22.0	4.4	6.4
Green Ext Time (p_c), s	0.0	1.4	0.1	1.6	0.4	0.0	0.1	1.2

Intersection Summary	
HCM 6th Ctrl Delay	26.0
HCM 6th LOS	C



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	320	887	508	313	326	610
Future Volume (veh/h)	320	887	508	313	326	610
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	348	964	552	340	354	587
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	416	2001	872	815	479	750
Arrive On Green	0.23	0.56	0.25	0.25	0.27	0.27
Sat Flow, veh/h	1781	3647	3647	1585	1781	2790
Grp Volume(v), veh/h	348	964	552	340	354	587
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1585	1781	1395
Q Serve(g_s), s	10.0	8.7	7.4	7.1	9.7	10.4
Cycle Q Clear(g_c), s	10.0	8.7	7.4	7.1	9.7	10.4
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	416	2001	872	815	479	750
V/C Ratio(X)	0.84	0.48	0.63	0.42	0.74	0.78
Avail Cap(c_a), veh/h	615	2854	1327	1018	599	938
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	19.5	7.0	18.1	8.0	17.9	18.1
Incr Delay (d2), s/veh	6.5	0.2	0.8	0.3	3.7	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.4	2.4	2.8	3.7	4.0	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	26.0	7.2	18.8	8.4	21.6	21.6
LnGrp LOS	C	A	B	A	C	C
Approach Vol, veh/h		1312	892		941	
Approach Delay, s/veh		12.2	14.8		21.6	
Approach LOS		B	B		C	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		34.6		18.9	17.0	17.6
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		10.7		12.4	12.0	9.4
Green Ext Time (p_c), s		8.3		2.0	0.6	3.7

Intersection Summary		
HCM 6th Ctrl Delay		15.7
HCM 6th LOS		B

Intersection	
Int Delay, s/veh	0.6

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1204	9	3	302	23	16
Future Vol, veh/h	1204	9	3	302	23	16
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	-	0	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	1309	10	3	328	25	17

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1319	0	1484	660
Stage 1	-	-	-	-	1314	-
Stage 2	-	-	-	-	170	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	520	-	116	406
Stage 1	-	-	-	-	216	-
Stage 2	-	-	-	-	843	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	520	-	115	406
Mov Cap-2 Maneuver	-	-	-	-	186	-
Stage 1	-	-	-	-	216	-
Stage 2	-	-	-	-	838	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	22
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	186	406	-	-	520	-
HCM Lane V/C Ratio	0.134	0.043	-	-	0.006	-
HCM Control Delay (s)	27.3	14.3	-	-	12	-
HCM Lane LOS	D	B	-	-	B	-
HCM 95th %tile Q(veh)	0.5	0.1	-	-	0	-

Intersection	
Int Delay, s/veh	0.4

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1216	4	3	297	8	31
Future Vol, veh/h	1216	4	3	297	8	31
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	-	0	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	1322	4	3	323	9	34

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1326	0	1492	663
Stage 1	-	-	-	-	1324	-
Stage 2	-	-	-	-	168	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	517	-	114	404
Stage 1	-	-	-	-	213	-
Stage 2	-	-	-	-	844	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	517	-	113	404
Mov Cap-2 Maneuver	-	-	-	-	183	-
Stage 1	-	-	-	-	213	-
Stage 2	-	-	-	-	839	-

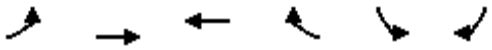
Approach	EB	WB	NB
HCM Control Delay, s	0	0.1	17
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	183	404	-	-	517	-
HCM Lane V/C Ratio	0.048	0.083	-	-	0.006	-
HCM Control Delay (s)	25.7	14.7	-	-	12	-
HCM Lane LOS	D	B	-	-	B	-
HCM 95th %tile Q(veh)	0.1	0.3	-	-	0	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	605	36	33	256	44	83
Future Volume (veh/h)	605	36	33	256	44	83
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	658	39	36	278	48	90
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	1542	91	0	2310	75	140
Arrive On Green	0.45	0.45	0.00	0.45	0.13	0.13
Sat Flow, veh/h	3502	202	0	5274	570	1068
Grp Volume(v), veh/h	343	354	0	278	139	0
Grp Sat Flow(s),veh/h/ln	1777	1834	0	1702	1650	0
Q Serve(g_s), s	2.8	2.8	0.0	0.7	1.7	0.0
Cycle Q Clear(g_c), s	2.8	2.8	0.0	0.7	1.7	0.0
Prop In Lane		0.11	0.00		0.35	0.65
Lane Grp Cap(c), veh/h	804	830	0	2310	216	0
V/C Ratio(X)	0.43	0.43	0.00	0.12	0.64	0.00
Avail Cap(c_a), veh/h	3538	3652	0	12412	2177	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.0	4.0	0.0	3.4	8.9	0.0
Incr Delay (d2), s/veh	0.4	0.3	0.0	0.0	3.2	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	0.3	0.3	0.0	0.0	0.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.4	4.4	0.0	3.4	12.1	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	697			278	139	
Approach Delay, s/veh	4.4			3.4	12.1	
Approach LOS	A			A	B	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	0.0	14.3				14.3	7.3
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	5.0	43.0				52.5	28.5
Max Q Clear Time (g_c+I1), s	0.0	4.8				2.7	3.7
Green Ext Time (p_c), s	0.0	4.9				2.1	0.4

Intersection Summary		
HCM 6th Ctrl Delay	5.1	
HCM 6th LOS	A	



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1049	713	0	251	20
Future Volume (veh/h)	0	1049	713	0	251	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	0	1140	775	0	273	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	6	2840	2840	0	525	241
Arrive On Green	0.00	0.56	0.56	0.00	0.15	0.15
Sat Flow, veh/h	1781	5274	5443	0	3456	1585
Grp Volume(v), veh/h	0	1140	775	0	273	22
Grp Sat Flow(s),veh/h/ln	1781	1702	1702	0	1728	1585
Q Serve(g_s), s	0.0	3.9	2.4	0.0	2.2	0.4
Cycle Q Clear(g_c), s	0.0	3.9	2.4	0.0	2.2	0.4
Prop In Lane	1.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	6	2840	2840	0	525	241
V/C Ratio(X)	0.00	0.40	0.27	0.00	0.52	0.09
Avail Cap(c_a), veh/h	1809	10435	4505	0	2018	925
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	3.9	3.6	0.0	12.0	11.2
Incr Delay (d2), s/veh	0.0	0.1	0.1	0.0	0.8	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	0.0	0.5	0.3	0.0	0.7	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	4.0	3.6	0.0	12.8	11.4
LnGrp LOS	A	A	A	A	B	B
Approach Vol, veh/h		1140	775		295	
Approach Delay, s/veh		4.0	3.6		12.7	
Approach LOS		A	A		B	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		21.6		9.2	0.0	21.6
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		5.9		4.2	0.0	4.4
Green Ext Time (p_c), s		11.2		0.8	0.0	5.7

Intersection Summary	
HCM 6th Ctrl Delay	5.0
HCM 6th LOS	A

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	545	85	609	230	105	286
Future Volume (veh/h)	545	85	609	230	105	286
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	662	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	832	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	662	250	114	0
Grp Sat Flow(s),veh/h/ln	0	1826	1728	1870	1781	1395
Q Serve(g_s), s	0.0	19.5	10.6	2.2	3.7	0.0
Cycle Q Clear(g_c), s	0.0	19.5	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	832	1426	151	
V/C Ratio(X)	0.00	0.84	0.80	0.18	0.76	
Avail Cap(c_a), veh/h	0	1210	1148	2004	549	
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	20.9	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	7.5	4.2	0.3	1.8	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	18.0	23.7	2.0	33.8	0.0
LnGrp LOS	A	B	C	A	C	
Approach Vol, veh/h	684			912	114	A
Approach Delay, s/veh	18.0			17.7	33.8	
Approach LOS	B			B	C	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	18.6	30.6				49.3	9.5
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	19.5	38.9				62.9	18.1
Max Q Clear Time (g_c+I1), s	12.6	21.5				4.2	5.7
Green Ext Time (p_c), s	1.6	4.6				1.6	0.2

Intersection Summary	
HCM 6th Ctrl Delay	18.9
HCM 6th LOS	B

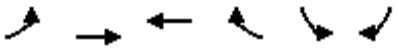
Notes

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

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	160	160	431	60	140	30	159	392	50	20	374	468
Future Volume (veh/h)	160	160	431	60	140	30	159	392	50	20	374	468
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	174	174	468	65	152	33	173	426	54	22	407	444
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	220	559	667	91	660	140	217	1175	148	44	970	628
Arrive On Green	0.12	0.30	0.30	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	2918	618	1781	3175	400	1781	3554	1585
Grp Volume(v), veh/h	174	174	468	65	91	94	173	237	243	22	407	444
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1777	1759	1781	1777	1798	1781	1777	1585
Q Serve(g_s), s	6.7	5.1	17.1	2.5	2.9	3.1	6.7	6.8	6.9	0.9	6.6	16.6
Cycle Q Clear(g_c), s	6.7	5.1	17.1	2.5	2.9	3.1	6.7	6.8	6.9	0.9	6.6	16.6
Prop In Lane	1.00		1.00	1.00		0.35	1.00		0.22	1.00		1.00
Lane Grp Cap(c), veh/h	220	559	667	91	402	398	217	658	666	44	970	628
V/C Ratio(X)	0.79	0.31	0.70	0.71	0.23	0.24	0.80	0.36	0.36	0.50	0.42	0.71
Avail Cap(c_a), veh/h	467	740	821	217	454	449	392	769	778	126	1008	645
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	30.0	19.1	16.8	32.9	22.2	22.3	30.1	16.1	16.2	33.9	21.0	17.8
Incr Delay (d2), s/veh	6.3	0.3	2.0	9.9	0.3	0.3	6.5	0.3	0.3	8.4	0.3	3.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.1	2.1	6.0	1.3	1.2	1.2	3.1	2.7	2.7	0.5	2.6	6.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.3	19.4	18.8	42.9	22.5	22.6	36.6	16.5	16.5	42.3	21.3	21.3
LnGrp LOS	D	B	B	D	C	C	D	B	B	D	C	C
Approach Vol, veh/h		816			250			653			873	
Approach Delay, s/veh		22.7			27.8			21.8			21.8	
Approach LOS		C			C			C			C	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	6.3	30.6	8.1	25.6	13.1	23.7	13.2	20.5
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	5.8	30.5	8.6	27.9	15.5	20.0	18.5	18.0
Max Q Clear Time (g_c+I1), s	2.9	8.9	4.5	19.1	8.7	18.6	8.7	5.1
Green Ext Time (p_c), s	0.0	2.9	0.0	1.9	0.2	0.7	0.3	0.7

Intersection Summary	
HCM 6th Ctrl Delay	22.7
HCM 6th LOS	C



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	400	1050	393	331	545	350
Future Volume (veh/h)	400	1050	393	331	545	350
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	435	1141	427	360	592	304
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	501	2025	775	805	516	808
Arrive On Green	0.28	0.57	0.22	0.22	0.29	0.29
Sat Flow, veh/h	1781	3647	3647	1585	1781	2790
Grp Volume(v), veh/h	435	1141	427	360	592	304
Grp Sat Flow(s),veh/h/ln	1781	1777	1777	1585	1781	1395
Q Serve(g_s), s	14.8	13.0	6.8	9.2	18.5	5.6
Cycle Q Clear(g_c), s	14.8	13.0	6.8	9.2	18.5	5.6
Prop In Lane	1.00			1.00	1.00	1.00
Lane Grp Cap(c), veh/h	501	2025	775	805	516	808
V/C Ratio(X)	0.87	0.56	0.55	0.45	1.15	0.38
Avail Cap(c_a), veh/h	794	2919	1084	942	516	808
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	21.9	8.7	22.2	10.0	22.7	18.1
Incr Delay (d2), s/veh	6.3	0.2	0.6	0.4	87.3	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	4.0	2.7	5.2	19.6	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	28.1	9.0	22.8	10.4	110.0	18.4
LnGrp LOS	C	A	C	B	F	B
Approach Vol, veh/h		1576	787		896	
Approach Delay, s/veh		14.2	17.1		78.9	
Approach LOS		B	B		E	

Timer - Assigned Phs		2		4	5	6
Phs Duration (G+Y+Rc), s		40.9		23.0	22.5	18.4
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		15.0		20.5	16.8	11.2
Green Ext Time (p_c), s		10.8		0.0	1.1	2.7

Intersection Summary		
HCM 6th Ctrl Delay		32.7
HCM 6th LOS		C

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1557	38	13	538	10	7
Future Vol, veh/h	1557	38	13	538	10	7
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	-	0	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	1692	41	14	585	11	8

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1733	0	2034	867
Stage 1	-	-	-	-	1713	-
Stage 2	-	-	-	-	321	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	360	-	49	296
Stage 1	-	-	-	-	131	-
Stage 2	-	-	-	-	708	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	360	-	47	296
Mov Cap-2 Maneuver	-	-	-	-	111	-
Stage 1	-	-	-	-	131	-
Stage 2	-	-	-	-	680	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.4	31.3
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	111	296	-	-	360	-
HCM Lane V/C Ratio	0.098	0.026	-	-	0.039	-
HCM Control Delay (s)	40.9	17.5	-	-	15.4	-
HCM Lane LOS	E	C	-	-	C	-
HCM 95th %tile Q(veh)	0.3	0.1	-	-	0.1	-

Intersection	
Int Delay, s/veh	0.3

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Vol, veh/h	1547	17	17	547	4	15
Future Vol, veh/h	1547	17	17	547	4	15
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	-	0	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	1682	18	18	595	4	16

Major/Minor	Major1		Major2		Minor1	
Conflicting Flow All	0	0	1700	0	2025	850
Stage 1	-	-	-	-	1691	-
Stage 2	-	-	-	-	334	-
Critical Hdwy	-	-	4.14	-	6.84	6.94
Critical Hdwy Stg 1	-	-	-	-	5.84	-
Critical Hdwy Stg 2	-	-	-	-	5.84	-
Follow-up Hdwy	-	-	2.22	-	3.52	3.32
Pot Cap-1 Maneuver	-	-	371	-	50	304
Stage 1	-	-	-	-	135	-
Stage 2	-	-	-	-	697	-
Platoon blocked, %	-	-		-		
Mov Cap-1 Maneuver	-	-	371	-	48	304
Mov Cap-2 Maneuver	-	-	-	-	113	-
Stage 1	-	-	-	-	135	-
Stage 2	-	-	-	-	663	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.5	21.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT
Capacity (veh/h)	113	304	-	-	371	-
HCM Lane V/C Ratio	0.038	0.054	-	-	0.05	-
HCM Control Delay (s)	38.1	17.5	-	-	15.2	-
HCM Lane LOS	E	C	-	-	C	-
HCM 95th %tile Q(veh)	0.1	0.2	-	-	0.2	-

Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	1021	70	98	490	74	77
Future Volume (veh/h)	1021	70	98	490	74	77
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	1110	76	107	533	80	84
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	1993	136	0	3016	106	112
Arrive On Green	0.59	0.59	0.00	0.59	0.13	0.13
Sat Flow, veh/h	3468	231	0	5274	813	853
Grp Volume(v), veh/h	584	602	0	533	165	0
Grp Sat Flow(s),veh/h/ln	1777	1829	0	1702	1676	0
Q Serve(g_s), s	6.5	6.5	0.0	1.5	3.1	0.0
Cycle Q Clear(g_c), s	6.5	6.5	0.0	1.5	3.1	0.0
Prop In Lane		0.13	0.00		0.48	0.51
Lane Grp Cap(c), veh/h	1050	1080	0	3016	219	0
V/C Ratio(X)	0.56	0.56	0.00	0.18	0.75	0.00
Avail Cap(c_a), veh/h	2748	2829	0	9399	1115	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.0	4.0	0.0	3.0	13.5	0.0
Incr Delay (d2), s/veh	0.5	0.5	0.0	0.0	5.1	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	0.8	0.9	0.0	0.2	1.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.5	4.5	0.0	3.1	18.7	0.0
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h	1186			533	165	
Approach Delay, s/veh	4.5			3.1	18.7	
Approach LOS	A			A	B	

Timer - Assigned Phs	1	2				6	8
Phs Duration (G+Y+Rc), s	0.0	23.6				23.6	8.7
Change Period (Y+Rc), s	4.5	4.5				4.5	4.5
Max Green Setting (Gmax), s	5.0	50.0				59.5	21.5
Max Q Clear Time (g_c+I1), s	0.0	8.5				3.5	5.1
Green Ext Time (p_c), s	0.0	10.6				4.2	0.4

Intersection Summary	
HCM 6th Ctrl Delay	5.3
HCM 6th LOS	A

APPENDIX I

VMT MITIGATION MEASURE SUMMARY AND CALCULATIONS

Transportation Measures (five subcategories) Global Maximum Reduction (all VMT)

Max 15.0% | Project 6.2%

Global cap for road pricing needs further study

Transportation Measures (four categories) Cross-Category Max Reduction (all VMT)

Max 10.0% | Project 6.2%

Max Reduction = 15% Overall; Work VMT = 25% School VMT = 65%

Max (Work) 25% | Project 0.0%

Max Reduction = 25%

Max 25% | Project 0.0%

Land Use / Location	Neighborhood / Site Enhancement	Parking Policy / Pricing	Transit System Improvements	Commute Trip Reduction (Assumes mixed use)	Road Pricing Management	Vehicles
Max 10% / Project 6.2%	Max 5% / Project 0.0%	Max 20% / Project 0.0%	Max 10% / Project 0.0%	Max (Work) 25% / Project 0.0%	Max 25% / Project 0.0%	
Increase Density (LUT-1) Max **30.0%** Project **6.2%**	**Pedestrian Network (SDT-1)** Max **2.0%** Project **0.0%**	**Parking Supply Limits (PDT-1)** Max **12.5%** Project **0.0%**	**Rapid Bus Transit System (TST-1)** Max **3.2%** Project **0.00%**	**CTR Program Voluntary (TRT-1)** Max **6.2%** Project **0.0%**	**Area/Cordon Pricing (RPT-1)** Max **22.0%** Project **0.0%**	Electrify Loading Docks/Idling-Reduction Systems VT-1
Location Efficiency[1] (LUT-2) Max 10.0%	**Traffic Calming (SDT-2)** Max **1.0%** Project **0.00%**	**Unbundled Parking Costs (PDT-2)** Max **13.0%** Project **0.0%**	Transit Access Improvements (TST-2)	**CTR Program Required (TRT-2)** Max **21.0%** Project **0.0%**	Traffic Flow Improvement (RPT-2)	Utilize Alternative Fueled Vehicles VT-2
Mixed-Use (LUT-3) Max **30.0%** Project **0.0%**	**NEV Network (SDT-3)** Max **12.7%** Project **0.0%**	**Price On-Street Parking (PDT-3)** Max **5.5%** Project **0.0%**	**Expand Transit Network (TST-3)** Max **8.2%** Project **0.0%**	**Ride Share Programs (TRT-3)** Max **15.0%** Project **0.0%**	Contributions to Transportation Infrastructure (RPT-3)	Utilize Electric or Hybrid Vehicles VT-3
Destination Accessibility (LUT-4) Max **20.0%** Project **0.0%**	Non-Motorized Zones (SDT-4)	Residential Area Parking Permits (PDT-4)	**Transit Frequency/Speed (TST-4)** Max **2.5%** Project **0.00%**	**Transit Fare Subsidy (TRT-4)** Max **20.0%** Project **0.0%**	Park and Ride Lots (RPT-4)	
Transit Accessibility (LUT-5) Max **24.6%** Project **0.0%**	Bike Lane Street Design (On-Site) (SDT-5)		Bike Parking Near Transit (TST-5)	End of Trip facilities (TRT-5)		
Affordable Housing (LUT-6) Max **1.2%** Project **0.00%**	Non-Residential Bike Parking (SDT-6)		Local Shuttles (TST-6)	**Alt. Work Schedule & Telecommute (TRT-6)** Max **5.5%** Project **0.0%**		
Non-Auto Corridor (LUT-7)	Multi-Unit Residential Bike Parking (SDT-7)			**CTR Marketing (TRT-7)** Max **4.0%** Project **0.0%**		
Proximity to Bike Path/Bike Lane (LUT-8)	Electric Vehicle Parking (SDT-8)			Preferential Parking Permit (TRT-8)		
Design (LUT-9) Max 21.3% Project 0.0%	Dedicate Land for Bike Trails (SDT-9)			**Car Share Program (TRT-9)** Max **0.7%** Project **0.0%**		
				School Pool Program (TRT-10) Max **15.8%** Project **0.0%**		
				Employer Sponsored Vanpool/Shuttle (TRT-11) Max 13.4% Project 0.0%		
				Bike Share Program (TRT-12)		
				School Bus Program (TRT-13) Max **63.0%** Project **0.0%**		
				Workplace Parking Pricing (TRT-14) Max **19.7%** Project **0.0%**		
				Employee Parking Cash-Out (TRT-15) Max **7.7%** Project **0.0%**		

General Notes:

A. Strategies in bold text are primary strategies with reported VMT reductions. Non-bolded strategies are support or grouped strategies.

Footnotes:

1. This measure is not intended as a separate strategy but rather a cap for all land use/locations strategies.

LINSCOTT LAW & GREENSPAN engineers

Transportation Strategies Organization Chart

Date: 3/17/2021

LLG Ref: 3-20-3293

Project Name: Hallmark Barham SP

Project Settings: Suburban without Neighborhood Electric Vehicle Network

Notes:

-Measures shown in green are utilized

Section:	3.1.1		**Increase Density**
Measure:	LUT-1		
Utilize:	☑		
			VMT Reduction Utilized (Project minus TAZ 1026) ***6.2%***

Section:	3.1.1		**Increase Density (TAZ 1026)**	
Measure:	LUT-1		Min	0.8%
Utilize:	☑		Max	30.0%
			Number of Housing Units or Jobs per Acre	7.03
			Unit	Housing Units per Acre
		A	Percent Increase in Housing Units or Jobs per Acre [not to exceed 500%]	-7%
		B	Elasticity of VMT with respect to density	0.07
			VMT Reduction = A x B [not to exceed 30%]	-0.5%
			VMT Reduction	***0.0%***

Section:	3.1.1		**Increase Density (Project)**	
Measure:	LUT-1		Min	0.8%
Utilize:	☑		Max	30.0%
			Number of Housing Units or Jobs per Acre	14.30
			Unit	Housing Units per Acre
		A	Percent Increase in Housing Units or Jobs per Acre [not to exceed 500%]	88%
		B	Elasticity of VMT with respect to density	0.07
			VMT Reduction = A x B [not to exceed 30%]	6.2%
			VMT Reduction	***6.2%***

Land Uses included in the TAZ 1026 of the SANDAG Series 13 Year 2020 Travel Demand Model

yr	mgra	lu	lu_description	plu	plu_description	acres	hs_sf	hs_mf	hs_mh	emp_adj	hotel_roor	mgra	lu	lu_descript	plu	plu_descri	acres	hs_sf	hs_mf	hs_mh	emp_adj	hotel_roon
2020	19196	9101	Vacant and Undeveloped Land	4114	Parking Lot - Surfac	3.684	0	0	0	0	0	19196	9101	Vacant anc	4114	Parking Lo	3.684	0	0	0	0	0
2020	19196	7606	Landscape Open Space	7606	Landscape Open Sp	0.096	0	0	0	0	0	19196	7606	Landscape	7606	Landscape	0.096	0	0	0	0	0
2020	19196	103	Mobile Home Park	1300	Mobile Home Park	103.587	0	0	691	0	0	19196	103	Mobile Ho	1300	Mobile Ho	103.587	0	0	691	0	0
2020	19196	4118	Road Right of Way	4118	Road Right of Way	0.889	0	0	0	0	0	19196	4118	Road Right	4118	Road Right	0.889	0	0	0	0	0
2020	19196	4119	Other Transportation	4114	Parking Lot - Surfac	0.355	0	0	0	0	0	19196	4119	Other Tran	4114	Parking Lo	0.355	0	0	0	0	0
2020	19196	4112	Freeway	4112	Freeway	16.071	0	0	0	0	0	19196	4112	Freeway	4112	Freeway	16.071	0	0	0	0	0
2020	19201	101	Single Family Detached	1110	Single Family Detac	6.542	11	0	0	0	0	19201	101	Single Fam	1110	Single Fam	6.542	11	0	0	0	0
2020	19201	9101	Single Family Residential Without Units	1190	Single Family Reside	0.634	0	0	0	0	0	19201	9101	Single Fam	1190	Single Fam	0.634	0	0	0	0	0
2020	19201	1000	Spaced Rural Residential	1000	Spaced Rural Reside	5.247	2	0	0	0	0	19201	1000	Spaced Rui	1000	Spaced Rui	5.247	2	0	0	0	0
2020	19201	6102	Religious Facility	6102	Religious Facility	1.744	0	0	0	0	0	19201	6102	Religious F	6102	Religious F	1.744	0	0	0	0	0
2020	19242	4118	Road Right of Way	4118	Road Right of Way	1.294	0	0	0	0	0	19242	4118	Road Right	4118	Road Right	1.294	0	0	0	0	0
2020	19242	9101	Vacant and Undeveloped Land	9700	Mixed Use	11.466	0	0	0	0	0	19242	9101	Vacant anc	9700	Mixed Use	11.466	0	0	0	0	0
2020	19242	101	Single Family Multiple-Units	1120	Single Family Multip	9.557	50	0	0	0	0	19242	101	Single Fam	1120	Single Fam	9.557	50	0	0	0	0
2020	19247	101	Single Family Detached	1110	Single Family Detac	10.938	103	0	0	0	0	19247	101	Single Fam	1110	Single Fam	10.938	103	0	0	0	0
2020	19247	7603	Open Space Park or Preserve	7603	Open Space Park or	15.652	0	0	0	0	0	19247	7603	Open Spac	7603	Open Spac	15.652	0	0	0	0	0
2020	19247	4118	Road Right of Way	4118	Road Right of Way	7.491	0	0	0	0	0	19247	4118	Road Right	4118	Road Right	7.491	0	0	0	0	0
2020	19247	7606	Landscape Open Space	7606	Landscape Open Sp	3.16	0	0	0	0	0	19247	7606	Landscape	7606	Landscape	3.16	0	0	0	0	0
2020	19249	7607	Residential Recreation	7607	Residential Recreati	3.668	0	0	0	0	0	19249	7607	Residentia	7607	Residentia	3.668	0	0	0	0	0
2020	19249	101	Single Family Detached	1110	Single Family Detac	5.921	57	0	0	0	0	19249	101	Single Fam	1110	Single Fam	5.921	57	0	0	0	0
2020	19249	4118	Road Right of Way	4118	Road Right of Way	2.577	0	0	0	0	0	19249	4118	Road Right	4118	Road Right	2.577	0	0	0	0	0
2020	19249	7606	Landscape Open Space	7606	Landscape Open Sp	1.355	0	0	0	0	0	19249	7606	Landscape	7606	Landscape	1.355	0	0	0	0	0

RESIDENTIAL DENSITY: TAZ 1026

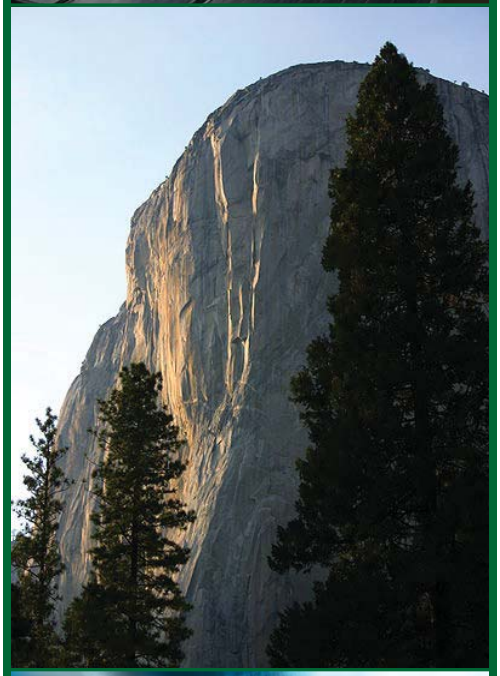
		ACRES	DU	DU/ACRE	FACTOR
1110	Single Family Detac	6.542	11	1.68	18.49587
1120	Single Family Multip	9.557	50	5.23	261.5884
1110	Single Family Detac	10.938	103	9.42	969.9214
1110	Single Family Detac	5.921	57	9.63	548.7249
	Mobile Home Park	103.587	691	6.67	4609.468
	TOTAL	136.545	912		6408.199
	WEIGHTED AVERAGE DU/ACRE				7.03

RESIDENTIAL DENSITY: PROJECT

ACRES	DU	DU/ACRE
10.56	151	14.30
2.8	151	53.93

CAPCOA

CALIFORNIA AIR POLLUTION CONTROL OFFICERS ASSOCIATION



Quantifying Greenhouse Gas Mitigation Measures

A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures

August, 2010

3.0 Transportation

3.1 Land Use/Location

3.1.1 Increase Density

Range of Effectiveness: 0.8 – 30.0% vehicle miles traveled (VMT) reduction and therefore a 0.8 – 30.0% reduction in GHG emissions.

Measure Description:

Designing the Project with increased densities, where allowed by the General Plan and/or Zoning Ordinance reduces GHG emissions associated with traffic in several ways. Density is usually measured in terms of persons, jobs, or dwellings per unit area. Increased densities affect the distance people travel and provide greater options for the mode of travel they choose. This strategy also provides a foundation for implementation of many other strategies which would benefit from increased densities. For example, transit ridership increases with density, which justifies enhanced transit service.

The reductions in GHG emissions are quantified based on reductions to VMT. The relationship between density and VMT is described by its elasticity. According to a recent study published by Brownstone, et al. in 2009, the elasticity between density and VMT is 0.12. Default densities are based on the typical suburban densities in North America which reflects the characteristics of the ITE Trip Generation Manual data used in the baseline estimates.

Measure Applicability:

- Urban and suburban context
    - Negligible impact in a rural context
- Appropriate for residential, retail, office, industrial, and mixed-use projects

Baseline Method:

See introduction to transportation section for a discussion of how to estimate trip rates and VMT. The CO_2 emissions are calculated from VMT as follows:

$$CO_2 = VMT \times EF_{running}$$

Where:

VMT = vehicle miles traveled

$EF_{running}$ = emission factor for running emissions

Inputs:

The following information needs to be provided by the Project Applicant:

- Number of housing units per acre or jobs per job acre

Mitigation Method:

% VMT Reduction = A * B [not to exceed 30%]

Where:

A = Percentage increase in housing units per acre or jobs per job acre[33] = (number of housing units per acre or jobs per job acre – number of housing units per acre or jobs per job acre for typical ITE development) / (number of housing units per acre or jobs per job acre for typical ITE development) For small and medium sites (less than ½ mile in radius) the calculation of housing and jobs per acre should be performed for the development site as a whole, so that the analysis does not erroneously attribute trip reduction benefits to measures that simply shift jobs and housing within the site with no overall increase in site density. For larger sites, the analysis should address the development as several ½-mile-radius sites, so that shifts from one area to another would increase the density of the receiving area but reduce the density of the donating area, resulting in trip generation rate decreases and increases, respectively, which cancel one another.
B = Elasticity of VMT with respect to density (from literature)

Detail:

- A: [not to exceed 500% increase]
  - If housing: (Number of housing units per acre – 7.6) / 7.6 (See Appendix C for detail)
  - If jobs: (Number of jobs per acre – 20) / 20 (See Appendix C for detail)
- B: 0.07 (Boarnet and Handy 2010)

Assumptions:

Data based upon the following references:

- Boarnet, Marlon and Handy, Susan. 2010. "DRAFT Policy Brief on the Impacts of Residential Density Based on a Review of the Empirical Literature." http://arb.ca.gov/cc/sb375/policies/policies.htm; Table 1.

[33] This value should be checked first to see if it exceeds 500% in which case A = 500%.

Emission Reduction Ranges and Variables:

Pollutant	Category Emissions Reductions[34]
CO_2e	1.5-30% of running
PM	1.5-30% of running
CO	1.5-30% of running
NOx	1.5-30% of running
SO_2	1.5-30% of running
ROG	0.9-18% of total

Discussion:

The VMT reductions for this strategy are based on changes in density versus the typical suburban residential and employment densities in North America (referred to as "ITE densities"). These densities are used as a baseline to mirror those densities reflected in the ITE Trip Generation Manual, which is the baseline method for determining VMT.

There are two separate maxima noted in the fact sheet: a cap of 500% on the allowable percentage increase of housing units or jobs per acre (variable A) and a cap of 30% on % VMT reduction. The rationale for the 500% cap is that there are diminishing returns to any change in environment. For example, it is reasonably doubtful that increasing residential density by a factor of six instead of five would produce any additional change in travel behavior. The purpose for the 30% cap is to limit the influence of any single environmental factor (such as density). This emphasizes that community designs that implement multiple land use strategies (such as density, design, diversity, etc.) will show more of a reduction than relying on improvements from a single land use factor.

Example:

Sample calculations are provided below for housing:

Low Range % VMT Reduction (8.5 housing units per acre)

$= (8.5 - 7.6) / 7.6 * 0.07 = 0.8\%$

High Range % VMT Reduction (60 housing units per acre)

$= \frac{60 - 7.6}{7.6} = 6.9$ or 690% Since greater than 500%, set to 500%

= 500% x 0.07 = 0.35 or 35% Since greater than 30%, set to 30%

[34] The percentage reduction reflects emission reductions from running emissions. The actual value will be less than this when starting and evaporative emissions are factored into the analysis. ROG emissions have been adjusted to reflect a ratio of 40% evaporative and 60% exhaust emissions based on a statewide EMFAC run of all vehicles.

Sample calculations are provided below for jobs:

Low Range % VMT Reduction (25 jobs per acre)
= (25 – 20) / 20 *0.12 = 3%

High Range % VMT Reduction (100 jobs per acre)

$$= \frac{100 - 20}{20} = 4 \text{ or } 400\%$$

=400% x 0.12 = 0.48 or 48% Since greater than 30%, set to 30%

Preferred Literature:

- -0.07 = elasticity of VMT with respect to density

Boarnet and Handy's detailed review of existing literature highlighted three individual studies that used the best available methods for analyzing data for individual households. These studies provided the following elasticities: -0.12 - Brownstone (2009), -0.07 – Bento (2005), and -0.08 – Fang (2008). To maintain a conservative estimate of the impacts of this strategy, the lower elasticity of -0.07 is used in the calculations.

Alternative Literature:

- -0.05 to -0.25 = elasticity of VMT with respect to density

The *TRB Special Report 298* literature suggests that doubling neighborhood density across a metropolitan area might lower household VMT by about 5 to 12 percent, and perhaps by as much as 25 percent, if coupled with higher employment concentrations, significant public transit improvements, mixed uses, and other supportive demand management measures.

Alternative Literature References:

TRB, 2009. *Driving and the Built Environment*, Transportation Research Board Special Report 298. http://onlinepubs.trb.org/Onlinepubs/sr/sr298.pdf . Accessed March 2010. (p. 4)

Other Literature Reviewed:

None

TRANSPORTATION IMPACT ANALYSIS GUIDELINES

City of San Marcos, CA

November 16, 2020

Attachment C: VMT Mitigation

KITTELSON & ASSOCIATES
750 THE CITY DRIVE, SUITE 410
ORANGE, CA 92868
P 714.468.1997

MEMORANDUM

Date: October 9, 2020 Project #24296

To: City of San Marcos

From: Michael Sahimi

Project: City of San Marcos SB 743 Implementation

Subject: VMT Mitigation Measures

With the passage of Senate Bill (SB) 743 in 2013, and the adoption of the City's updated transportation impact analysis guidelines in 2020, the basis for measuring significant transportation impacts for development projects under the California Environmental Quality Act (CEQA) has shifted from level of service (LOS) and automobile delay to vehicle miles traveled (VMT). This shift in focus from reducing impact to drivers to reducing the impact of driving better aligns with the State's goals to reduce greenhouse gas (GHG) emissions and encourage infill development and active transportation.

When projects under CEQA review are found to result in significant impacts to the environment, the lead agency must consider mitigation measures that would reduce the impact to below significant levels. With the shift away from LOS, delay, and vehicular capacity metrics and impact thresholds to VMT thresholds, mitigating significant impacts now requires focusing on measures to shorten vehicle trip distances or reduce single-occupancy vehicle trips (in favor of carpooling, taking public transit, bicycling, walking, and other modes), since VMT in essence is a function of the number of vehicle trips and their associated trip lengths. Whereas previous LOS-related mitigation measures focused on expanding roadway facilities primarily for vehicles, VMT-reducing mitigation measures can include modifying project characteristics, implementing on- or off-site improvements to transit, pedestrian and bicycle facilities, parking management strategies, and Transportation Demand Management (TDM) strategies to either reduce or shorten vehicular trips. In particular, TDM can reduce travel by single-occupancy vehicles by expanding traveler choices and encouraging ridesharing, carpooling, bicycling, walking, and riding transit. TDM strategies are among the most effective at reducing VMT impacts for land development projects at the project level.

This memorandum documents VMT mitigation strategies that Kittelson has determined can be applicable to projects in the City of San Marcos, based on a review of relevant literature and research. The selected strategies, as well as the applicable VMT reduction percentages and other attributes, are primarily based on a review of the guidance published by the California Air Pollution Control Officers Association (CAPCOA) in August 2010 (*Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures*). This resource forms the basis for much of the TDM and VMT mitigation research and policymaking in the state. The

recommendations in this memo are also based on more recent information, such as recent research published by the San Diego Association of Governments (SANDAG) in June 2019 (*Mobility Management Guidebook* and *Mobility Management VMT Reduction Calculator Tool – Design Document*), California Air Resources Board (CARB) in 2014, Western Riverside Council of Governments (WRCOG) in March 2019, and City of San Jose in February 2018.

VMT mitigation measures that can be applicable to projects in the City are provided in Table 1. Information provided in the table includes the following:

- **Tier**: Mitigation measures can fall within one of two categories – Project Tier (strategies that would be implemented at a project site) and City/Community Tier (strategies that would be implemented at a community or citywide scale).
- **Measure Category**: Measures consist of multiple categories including commute strategies (aimed at employee trips), parking policies and programs (can apply to multiple land use and trip types), transit improvements (can include networkwide service and/or fare changes), neighborhood enhancements (to improve multimodal connectivity), and land use and location strategies (involve project location and land use mix).
- **Description**: A detailed description is included for each measure, including requirements to successfully implement the measure. In addition, some measures may overlap and should not be analyzed together as part of a mitigation program; this information is also included.
- **Range of Reductions**: The maximum allowable reduction per each measure is provided.
- **Land Use Applicability**: The applicable land use for each measure (primarily consisting of residential, office/employment, and retail) is provided. It is important to note that some measures may not be applicable to all project types; for example, commute trip reduction measures cannot be applied to residential projects.
- **Implementation Body**: The appropriate implementation body or bodies are included for each measure. For example, some measures are under the purview of the City or local transit agencies such as NCTD. Physical on-site improvements are generally implemented by the site developer. Programs or other continuous measures would generally be implemented by tenants or other bodies (such as homeowners associations).
- **Source**: For each measure, the source for the appropriate methodology and VMT reduction formula is included.

It is important to note that reductions between multiple measures are not additive, and the sum of VMT reductions across measures must be dampened using the following formula per CAPCOA:

Total VMT Reduction % = 1-(1-A)*(1-B)*(1-C)*…

Where A, B, and C represent the reduction percentages from individual strategies

This calculation should be applied within each category, and then across all five categories to obtain the total VMT reduction percentage for a project undergoing VMT mitigation. For example, if an applicant estimates reductions from four mitigation measures (5% from Land Use and Location: Increase Site

Density, 8% from Land Use and Location: Major Transit Center Accessibility, 10% from Parking Management Strategies: Parking Supply Limits, and 3% from Parking Management Strategies: Parking Pricing), then the calculations would be as follows:

Total Land Use and Location Strategies Reduction % = 1-(1-5%)*(1-8%) = 12.6%

Total Parking Management Strategies Reduction % = 1-(1-10%)*(1-3%) = 12.7%

Total Global VMT Reduction % = 1-(1-12.6%)*(1-12.7%) = **23.7%**

In addition, it is important to note that this is a limit to the amount of VMT reduction that can be applied to a development project. Within the City of San Marcos, with its suburban land use and transportation context, CAPCOA indicates that the maximum feasible total reduction combining all measures is 15%. There are also maximum feasible reductions within and across the five mitigation categories; these are indicated in Table 2. Care should be taken that any calculated VMT reductions do not exceed these maximums. In the example above, in a suburban setting the Land Use and Location strategies reduction of 12.6% would be capped at 5%, and the total reduction would be capped at 15%.

At this time, several VMT-reducing measures are already required for new developments by the City's Municipal Code, which should be considered project features to be applied during a project's VMT impact assessment and should not be used as part of mitigation calculations:

- Chapter 20.340.050 requires trip reduction measures for all major non-residential development projects and the non-residential portions of mixed-use development projects that exceed 25,000 square feet of gross floor area. Requirements include preferential carpool/vanpool parking, passenger loading areas, and shower or locker facilities. Developments that provide more shower and storage locker facilities or secure bicycle parking than required may reduce their parking requirement.
- Chapter 20.340.090 requires bicycle parking spaces in compliance with the minimum requirements listed in the Municipal Code.

iCommute (www.icommutesd.com) is the transportation demand management program for San Diego County. It provides valuable resources and assistance that can be utilized by developers and tenants looking to implement TDM programs. iCommute has an employer services program which provides assistance and tools to help organizations design and implement commuter programs. In addition, iCommute provides the following items:

- information about carpool services and a carpool incentive pilot program
- subsidized vanpool program and transit passes
- regional support for biking
- the Guaranteed Ride Home program
- information about teleworking
- bike and pedestrian safety support for schools

Table 1: Applicable VMT Reduction Strategies

Tier and Category	Mitigation Measure	Description	Maximum VMT Reduction	Land Use Applicability	Implementation Body/Method	Source
Project Tier: Land Use and Location	Increase Site Density	This measure increases the density of households and employment per acre for the project site over what was used in the initial project VMT estimation. Density can be measured in terms of jobs, residents, employees, or dwelling units per unit area. Floor area ratio may be used as a proxy for employment, when employment is not known, or when considering non-office commercial developments.	Up to 30%	Residential, Office, Retail	Developer, City	CAPCOA (1.1)
	Increase Site Diversity	This measure involves improving the mix of uses and jobs/housing balance within a project or a planning area, incorporating a range of complementary land uses that provide a balanced development approach relative to the surrounding neighborhood and encourage shorter trips and transportation alternatives.	Up to 30%	Residential, Office, Retail	Developer, City	SANDAG (2B)
	Major Transit Center Accessibility	This measure locates a project within half a mile or a ten minute walk of a major transit center, defined as a rail transit station or a bus rapid transit station, but can be any transit stop with frequent service (5 to 15 minute headways) and significant transfer opportunities to other transit routes. Residential and commercial centers designed around rail and bus stations are known as Transit-Oriented Development and contain bike and pedestrian access.	Up to 14.4%	Residential, Office, Retail	Developer, City	SANDAG (2A)
	Integrate Affordable Housing	This measure incorporates a higher proportion of affordable housing within the residential portion of a project, subdivision, or a planning area. Income has a statistically significant effect on whether someone will drive a single-occupant vehicle to work or for other trip purposes.	Up to 32.5% of home VMT	Residential, Office, Retail	Developer, City	San Jose (PC-003)
Project Tier: Commute Demand Management Strategies	Voluntary Employer Commute Program	This measure consists of a variety of measures to reduce single-occupant vehicle commuting through an employer, such as carpool/vanpool programs, subsidized transit passes, preferential carpool parking, bicycle facilities, and flexible work schedules. Unlike a mandatory program, this strategy does not require monitoring, reporting, or performance standards. Note, this measure cannot be analyzed in combination with a mandatory employer commute program. In addition, separate commute demand management measures should not be analyzed if already included under this measure.	Up to 6.2% of work VMT	Office, Retail	Tenant	SANDAG (1A)

Tier and Category	Mitigation Measure	Description	Maximum VMT Reduction	Land Use Applicability	Implementation Body/Method	Source
	Mandatory Employer Commute Program	This measure consists of a variety of measures to reduce single-occupant vehicle commuting through an employer, such as carpool/vanpool programs, subsidized transit passes, preferential carpool parking, bicycle facilities, and flexible work schedules. Unlike a voluntary program, this strategy requires regular monitoring, reporting, and performance standards. Note, this measure cannot be analyzed in combination with a voluntary employer commute program. In addition, separate commute demand management measures should not be analyzed if already included under this measure.	Up to 26% of work VMT	Office, Retail	Tenant	SANDAG (1B)
	Employer Carpool/Vanpool Program	This measure consists of supporting ride sharing through more convenient pick up/drop off locations, parking locations during workdays, and subsidies. Employers can encourage vanpooling and carpooling by providing ride-matching assistance, priority parking for carpool/vanpool vehicles, incentives, and subsidies.	Up to 7.1% of work VMT	Office, Retail	Tenant (in partnership with City or other agencies)	SANDAG (1E)
	Employer Transit Subsidy	This measure consists of employer-provided subsidized or discounted daily or monthly transit passes to employees; the employer would pay for a portion or the entirety of an employee's transit costs.	Up to 10.9% of work VMT	Office, Retail	Tenant (in partnership with transit agencies)	SANDAG (1D)
	Employer Telecommute and Alternative Work Schedules	This measure involves encouraging and supporting employers and employees interested in telecommuting or working alternative work schedules. It involves marketing, equipment, and infrastructure to support telecommuting. A telework program enables employees to work from home or a remote location one or more days per week. Alternative work schedules are usually compressed work weeks that allow workers to reduce the number of commute trips they make.	Up to 5.5% of work VMT	Office	Tenant	CAPCOA (4.6)/San Jose (TP-008)
	School Bus Program/ School Pool Program	This measure consists of two types of programs: supporting expanded school bus programs, or organizing groups of volunteer parents to provide shared rides to school. Developers and the City can work with school districts to expand school bus services in the project area and local community; alternatively, school carpool programs can fill service gaps for school buses.	Up to 6.3% of school VMT (school bus); Up to 15.8% of school VMT (school pool)	Residential	Developer, City	CAPCOA (4.10/ 4.13)
Project Tier: Parking Management Strategies	Parking Cash Out	This measure consists of providing cash to employees for not parking a vehicle on site, if free parking is provided for employees and is paid for by the employer. The cash payment would consist of the cash value of the space in lieu of the space itself. This measure can be used where free parking is prevalent and it is not feasible to directly charge for parking.	Up to 7.7% of work VMT	Office, Retail	Property Manager, Tenant	CAPCOA (4.15)

Tier and Category	Mitigation Measure	Description	Maximum VMT Reduction	Land Use Applicability	Implementation Body/Method	Source
	Parking Pricing	This measure consists of charging drivers directly for parking. Parking pricing can be implemented on- or off-street. This measure can be implemented in several ways, including implementing residential parking permit programs, unbundling parking costs from rent or property costs, charging for on-street parking, and charging for workplace parking.	Up to 7.5%	Residential, Office, Retail	Property Manager, Tenant, City	SANDAG (3A)
	Parking Supply Limits	This measure sets the amount of available on-site and on-street parking available at some level below current peak demand. This measure can be implemented in several ways, including eliminating or reducing minimum parking requirements, establishing maximum parking requirements, requiring shared parking between different uses, limiting parking to residents with permits, and establishing parking time limits.	Up to 12.5%	Residential, Office, Retail	Developer, City	CAPCOA (3.1)
City/Community Tier: Transit Strategies	New Transit Service and Coverage	This measure involves expanding transit service in terms of areas and/or times of day being served, in order to better accommodate existing and future demand and encourage a shift away from driving. This can include creating new transit routes.	Up to 5.9%	Residential, Office, Retail	City, Transit Agencies	SANDAG (5A)
	Reduce fares	This measure consists of lowering transit fares in specific zones or across the transit system service area to make transit accessible to an increased number of users. Unlike the Employer Transit Subsidy, this measure is not limited to a single project site and reduces fares rather than providing discounts or subsidies.	Up to 1.2%	Residential, Office, Retail	City, Transit Agencies	SANDAG (5D)
	Increased Transit Service Frequency	This measure consists of measures to increase the frequency of service on transit routes to improve the viability of taking public transit as an alternative to driving. Measures can be implemented systemwide or on specific routes to reduce headways and increase ridership by reducing travel times.	Up to 8.2%	Residential, Office, Retail	City, Transit Agencies	SANDAG (5B)
	Increased Transit Speed and Reliability	This measure consists of roadway, traffic control, and other infrastructure improvements that expedite transit service and improve schedule adherence (reliability). Transit supportive treatments to increase transit vehicle speed and service reliability can include transit signal priority, bus-only signal phases, queue jumps, curb improvements to increase the speed of passenger loading, and dedicated bus lanes.	Up to 0.4%	Residential, Office, Retail	City, Transit Agencies	SANDAG (5C)

Tier and Category	Mitigation Measure	Description	Maximum VMT Reduction	Land Use Applicability	Implementation Body/Method	Source
	Microtransit NEV Shuttle	Microtransit services use real-time ride-hailing, mobile tracking, and app-based payment to provide demand-based services to user; this can include services utilizing Neighborhood Electric Vehicles (NEVs). Microtransit services are flexible and can consist of point-to-point shuttles or first/last-mile shuttles connecting with major transit hubs to provide an alternative to short vehicle trips.	Up to 0.1%	Residential, Office, Retail	Property Manager, Tenant, City, Transit Agencies	SANDAG (5E)
City/Community Tier: Neighborhood Circulation Enhancements	Improved Street Connectivity	This measure consists of strategies to improve street connectivity by increasing the density of publicly accessible streets, resulting in shorter block lengths between intersections to shorten trip lengths to increase the comfort and connectivity of pedestrians and bicyclists.	Up to 6%	Residential, Office, Retail	Developer, City	SANDAG (4A)/San Jose (MI-003)
	Pedestrian and Bicycle Facility and Network Improvements	This strategy improves the accessibility, convenience, and perceived safety of sidewalks, bicycle lanes, and pedestrian/bicycle paths. Improvements to the pedestrian/ bicycle network include removing physical barriers, adding crossing infrastructure, widening sidewalks and bike lanes, and creating network links. This consists of three types of improvements: • Pedestrian facility improvements (enhancing the existing streetscape and adding crossing improvements) • Bikeway network expansion (increasing the existing network of on- or off-street bikeways) • Bike facility improvements (implementing new bikeways)	Up to 1.4% (pedestrian facility improvements); Up to 5.0% (bikeway network expansion); Up to 0.3% (individual bike facility improvement)	Residential, Office, Retail	Developer, City	SANDAG (4B/4C/ 4D)
	Support Bike Share	This measure consists of supporting bike sharing through parking facilities and subsidies. This can include partnering with docked and dockless bicycle, e-bike, and scooter share companies to provide on-demand active transportation options to residents and employees. Employers and cities can support these programs by providing bicycle parking, marketing bike share services, and subsidizing user cost.	Up to 0.1%	Residential, Office, Retail	Property Manager/HOA, Tenant, Developer, City	SANDAG (4E)
	Car Share	This measure consists of supporting car sharing through priority parking facilities and membership discounts and subsidies. This measure can help reduce automobile ownership. Types of carshare programs can include one-way (free-floating) programs that allow users to leave their vehicle at their final destination (without returning it to the origin) while roundtrip programs require users to return the vehicle to a designated location.	Up to 0.7%	Residential, Office, Retail	Property Manager/HOA, Tenant, Developer, City	SANDAG (4F)

Tier and Category	Mitigation Measure	Description	Maximum VMT Reduction	Land Use Applicability	Implementation Body/Method	Source
	Traffic Calming	This measure consists of strategies to reduce the speeds of vehicle traffic on the street and improve the lateral separation between bicyclists, pedestrians, and motor vehicles; such strategies increase bicyclist and pedestrian comfort and can encourage a shift away from driving for shorter trips. Traffic calming strategies can include: • Narrowing roadways • Vertical deflection such as speed bumps, humps, or tables • Horizontal deflection • Enforcement and education • Lowering speed limits	Up to 1%	Residential, Office, Retail	Developer, City	CAPCOA (2.2)
	Community-Based Travel Planning	This measure consists of an agency- or HOA-sponsored TDM program; unlike the Voluntary Employer Commute Program and Mandatory Employer Commute Program, this measure is focused on residents. The organization responsible for operating the TDM program utilizes advisors to engage residents and provide information, incentives, and support to encourage residents and visitors to use alternative modes of travel. It may or may not be monitored with reduction targets.	Up to 2%	Residential	Property Manager/HOA, Tenant, Developer, City	SANDAG (4G)
	NEV Network	This measure consists of establishing a neighborhood electric vehicle (NEV) network. NEVs are low speed vehicles which are electric powered, offering an alternative to traditional vehicle trips and can legally be used on roadways with speed limits of 35 MPH or less (unless specifically restricted). Creating an NEV network requires implementing the necessary infrastructure, including NEV parking, charging facilities, striping, signage, and educational tools.	Up to 13%	Residential	Property Manager/HOA, Tenant, Developer, City	CAPCOA (2.3)
	Cordon Pricing	This strategy consists of levying a toll on motor vehicles seeking to enter a specific area, such as a downtown area. The cordon pricing system would be set up to cover all entry points to the area, with funds potentially being utilized to improve multimodal facilities in the area.	Up to 22%	Residential, Office, Retail	City	CAPCOA (6.1)

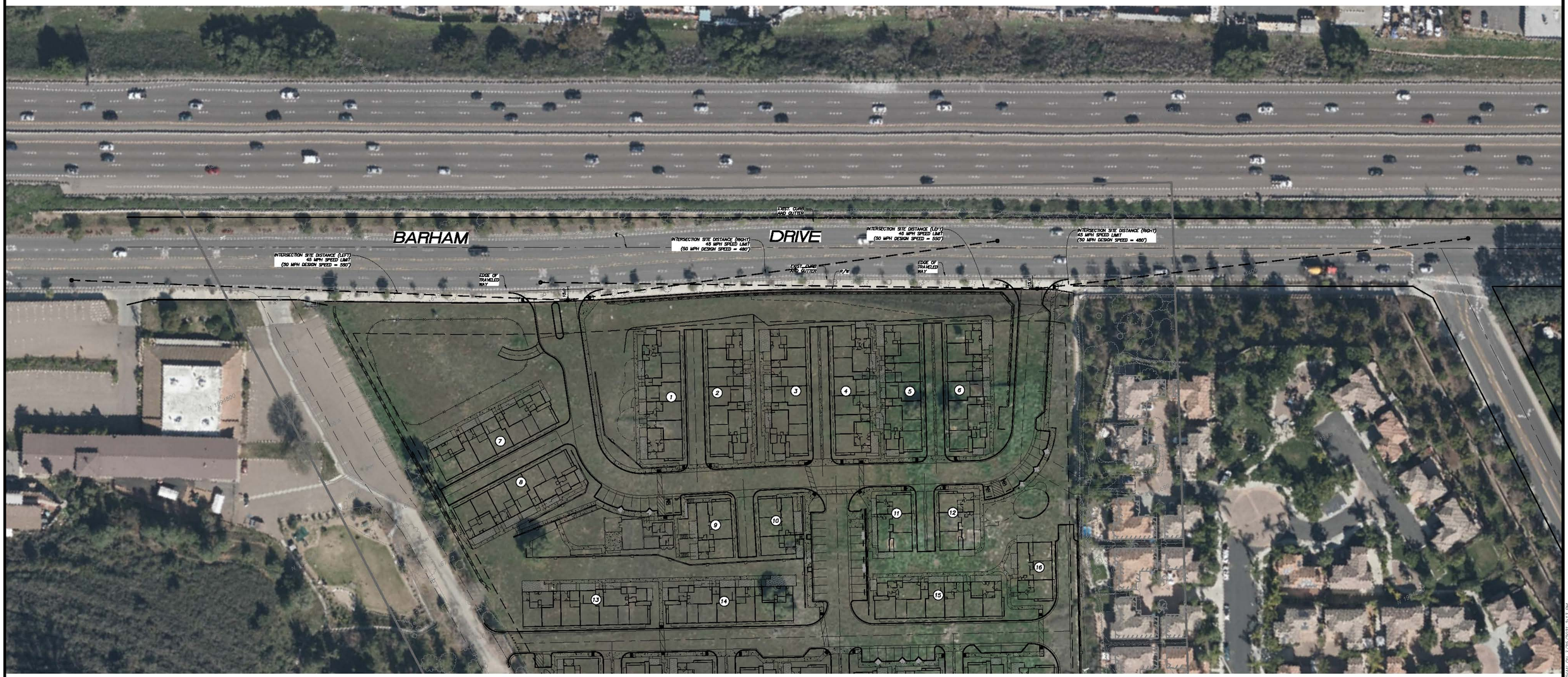
Table 2: Maximum VMT Reductions (Suburban Areas)

Max Category Reductions			Max Cross-Category Reductions	Global Max Reduction
Project Tier	Commute Demand Management Strategies (including Parking Cash Out)	25% (work VMT)	15% overall; 25% work VMT; 65% school VMT	15% without NEV; 20% with NEV (all VMT)
	Parking Management Strategies (excluding Parking Cash Out)	20%	10% without NEV; 15% with NEV (all VMT)	
	Land Use and Location	5%		
City/ Community Tier	Transit Strategies	10%		
	Neighborhood Circulation Enhancements (excluding Cordon Pricing)	5% without NEV; 15% with NEV		
	Cordon Pricing	22%		

Source: California Air Pollution Control Officers Association (CAPCOA) *Quantifying Greenhouse Gas Mitigation Measures: A Resource for Local Government to Assess Emission Reductions from Greenhouse Gas Mitigation Measures* (August 2010)
Note: NEV signifies the Neighborhood Electric Vehicle network mitigation measure, which is within the Neighborhood Circulation Enhancements category.

APPENDIX J

DRIVEWAY SIGHT VISIBILITY TRIANGLE



SCALE: 1" = 50'

GRAPHIC SCALE

50 0 50 100 150

INTERSECTION SIGHT DISTANCE

BARHAM DRIVE

SB&O INC.
PLANNING ENGINEERING SURVEYING
3990 Ruffin Road, Suite 120
San Diego, Ca. 92123
858-560-1141
858-560-8157 Fax

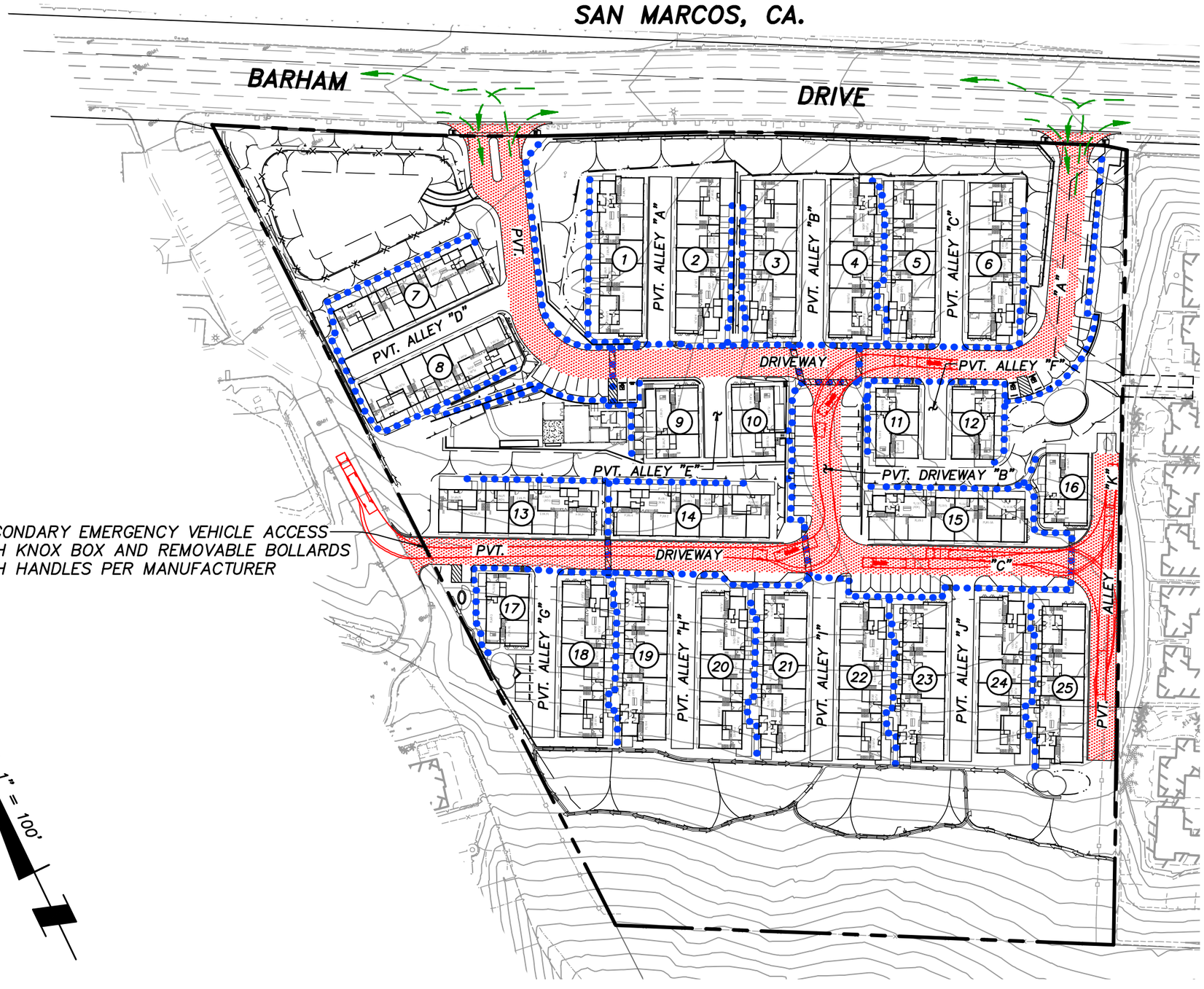
FILE NAME: P:\7500\BARHAM DRIVE\03 DWG\ISBARHAM — SIGHT VISIBILITY RHANGES.DWG, PLOTTED BY: JONATHAN ON 3/25/2021 2:13 PM

03/24/2021

APPENDIX K

FIRETRUCK TURNING TEMPLATES

BARHAM DRIVE
SAN MARCOS, CA.



SECONDARY EMERGENCY VEHICLE ACCESS
WITH KNOX BOX AND REMOVABLE BOLLARDS
WITH HANDLES PER MANUFACTURER

LEGEND

- VEHICLE ACCESS
- FIRE TRUCK ACCESS
- ACCESSIBLE PATH OF TRAVEL

SCALE: 1" = 100'

GRAPHIC SCALE

100 0 100 200 300

SB&O INC.
PLANNING ENGINEERING SURVEYING

75052.35

Plotted: 3/10/2021 2:48 PM D:\75051 BARHAM DRIVE\03 DWG\EX\75052EX03 FIRE TRUCK TURN.DWG - rpowell