

APPENDIX U

TRAFFIC IMPACT ANALYSIS AND SIGHT DISTANCE LETTER

TRAFFIC IMPACT ANALYSIS
EL MONTE SAND MINING PROJECT
June 22, 2018

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TABLE OF CONTENTS

SECTION	PAGE
1.0 Introduction.....	1
2.0 Project Description	4
2.1 Project Location	4
2.2 Project Description.....	4
3.0 Existing Conditions.....	6
3.1 Existing Roadway Conditions.....	6
3.2 Existing Traffic Volumes.....	7
3.2.1 Peak Hour Intersection Volumes	7
3.2.2 Daily Segment Volumes	7
4.0 Analysis Approach and Methodology	11
4.1 Intersections	11
4.2 Street Segments.....	11
5.0 Significance Criteria	12
5.1 County of San Diego.....	12
5.1.1 Road Segments.....	12
5.1.2 Intersections	13
5.2 SANTEC / ITE and Caltrans.....	14
6.0 Analysis of Existing Conditions	16
6.1 Peak Hour Intersection Levels of Service.....	16
6.2 Daily Street Segment Levels of Service	18
7.0 Trip Generation, Distribution and Assignment	20
7.1 Construction Project Trip Generation.....	20
7.1.1 Heavy Vehicle Traffic.....	20
7.1.2 Light Vehicle Traffic	21
7.2 Project Traffic Distribution.....	21
8.0 Cumulative Projects.....	29
8.1 Summary of Cumulative Projects Trips.....	29
9.0 Near-Term Analysis.....	34
9.1 Existing + Project.....	34
9.1.1 Intersection Analysis.....	34
9.1.2 Segment Operations	35
9.2 Near-Term without Project	39

9.2.1	Intersection Analysis.....	39
9.2.2	Segment Operations.....	39
9.3	Near-Term with Project	40
9.3.1	Intersection Analysis.....	40
9.3.2	Segment Operations.....	41
10.0	Significance of Impacts and Mitigation Measures.....	47
10.1	Significance of Impacts.....	47
10.1.1	Direct Impacts.....	47
10.1.2	Cumulative Impacts	47
10.2	Mitigation Measures	47
10.2.1	Direct Impacts.....	47
10.2.2	Cumulative Impacts	48
10.3	Truck Turning Templates	53
11.0	References and List of Preparers and Organizations Contacted	54
11.1	References.....	54
11.2	List of Preparers.....	54
11.3	Organizations Contacted.....	54

APPENDICES

APPENDIX

- A. Intersection and Segment Manual Count Sheets
- B. Intersection Methodology and Analysis Sheets
- C. County of San Diego Roadway Classification Table, SANTEC Roadway Classification Table and HCM PCE factors
- D. Existing intersection calculation sheets
- E. Existing + Project intersection calculation sheets
- F. Near-Term without Project intersection calculation sheets
- G. Near-Term with Project intersection calculation sheets
- H. Post mitigation intersection analysis calculation sheets and signal warrant analysis sheet
- I. Conceptual intersection design and truck turning templates
- J. County of San Diego TIF Transportation Needs Assessment Report (September 2012 Excerpts)
- K. Caltrans proposed improvements
- L. Truck turning templates

LIST OF FIGURES

SECTION—FIGURE #	PAGE
Figure 1–1 Vicinity Map	2
Figure 1–2 Project Limits.....	3
Figure 2–1 Site Plan	5
Figure 3–1 Existing Conditions Diagram.....	9
Figure 3–2 Existing Traffic Volumes.....	10
Figure 7–1 Project Traffic Distribution (Light Vehicles)	23
Figure 7–2 Project Traffic Distribution (Heavy Vehicles).....	24
Figure 7–3 Project Traffic Volumes (Light Vehicles)	25
Figure 7–4 Project Traffic Volumes (Heavy Vehicles).....	26
Figure 7–5 Total Project Traffic Volumes	27
Figure 7–6 Existing + Project Traffic Volumes	28
Figure 8–1 Cumulative Projects Location Map	32
Figure 8–2 Cumulative Projects Traffic Volumes	33
Figure 9–1 Near-Term without Project Traffic Volumes.....	45
Figure 9–2 Near-Term with Project Traffic Volumes.....	46

LIST OF TABLES

SECTION—TABLE #	PAGE
Table 3–1 Existing Traffic Volumes.....	8
Table 5–1 Measures of Significant Project Impacts to Congestion on Mobility Element Road Segments Allowable Increases on Congested Road Segments	12
Table 5–2 Measures of Significant Project Impacts to Congestion on Intersections Allowable Increases on Congested Intersections	13
Table 5–3 Traffic Impact Significant Thresholds	15
Table 6–1 Existing Intersection Operations.....	17
Table 6–2 Existing Street Segment Operations	19
Table 7–1 Construction Trip Generation	22
Table 8–1 Cumulative Projects	30
Table 9–1 Existing + Project Intersection Operations	36
Table 9–2 Existing + Project Street Segment Operations.....	37

Table 9–3 Near-Term Intersection Operations	42
Table 9–4 Near-Term Street Segment Operations.....	43
Table 10–1 Direct Impacts.....	47
Table 10–2 Cumulative Impacts	47
Table 10–3 Direct Impact Intersection Mitigation Analysis.....	50
Table 10–4 Direct Impact Street Segment Mitigation Analysis	51
Table 10–5 Cumulative Impact Intersection Mitigation Analysis.....	52

TRAFFIC IMPACT ANALYSIS
EL MONTE SAND MINING PROJECT
County of San Diego, California
June 22, 2018

1.0 INTRODUCTION

Linscott, Law & Greenspan Engineers has been retained to assess the traffic impacts associated with the El Monte Sand Mining Project (proposed project) in the County of San Diego. The proposed project would extract 12.5-million tons of quality construction aggregate over a 12-year period in El Monte Valley on land that is zoned for extractive use. The project site is located on El Monte Road, east of Lake Jennings Park Road, in the community of Lakeside. **Figure 1–1** shows the general vicinity of the project and **Figure 1–2** shows a more detailed project boundary.

The following sections are included in this report:

- Project Description
- Existing Conditions Assessment
- Traffic Analysis Approach & Methodology
- Significance Criteria
- Analysis of Existing Conditions
- Project Trip Generation, Distribution and Assignment
- Cumulative Projects Discussion
- Near-Term Analysis
- Significance of Impacts and Mitigation Measures

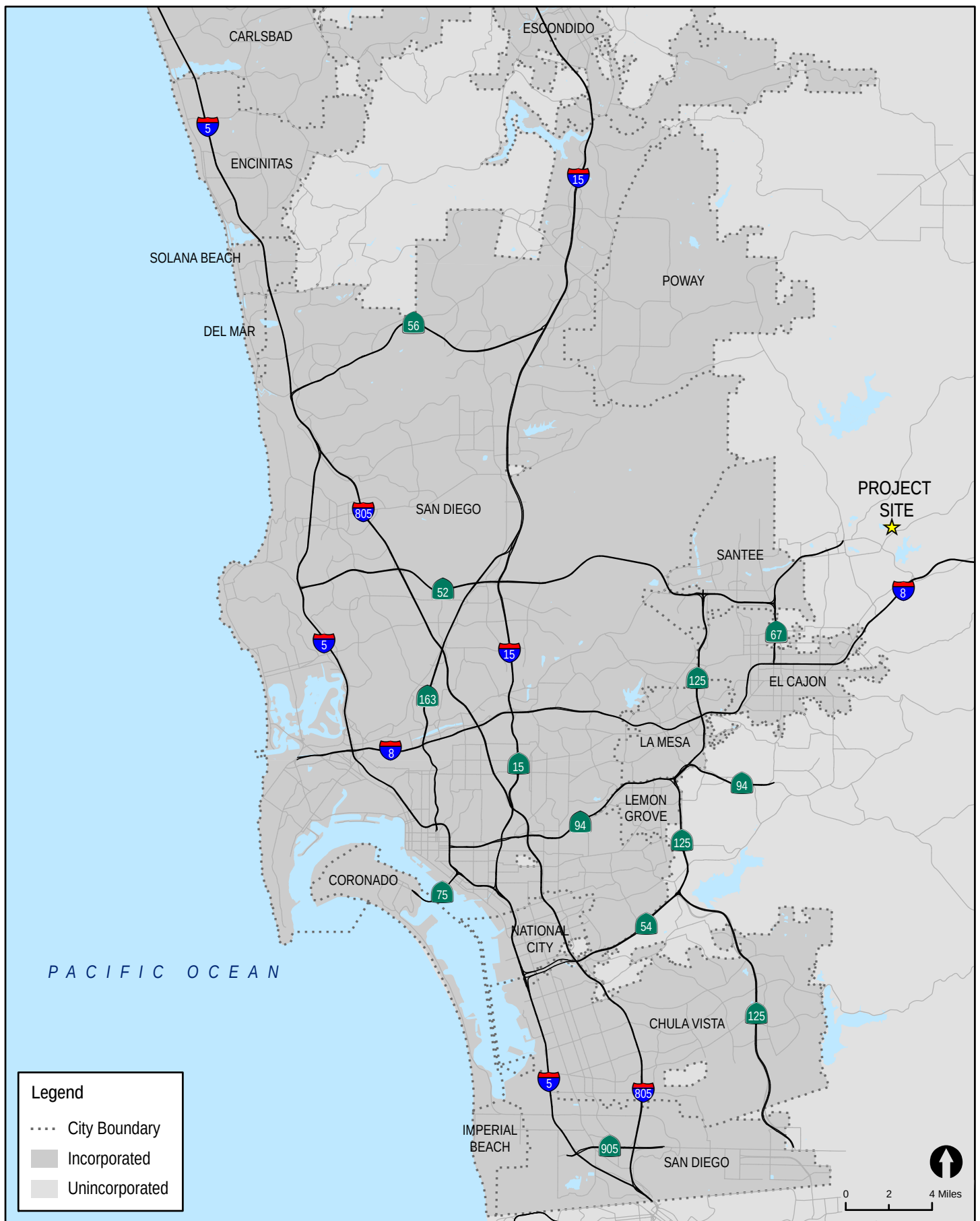


Figure 1-1

Vicinity Map

EL MONTE SAND MINING PROJECT

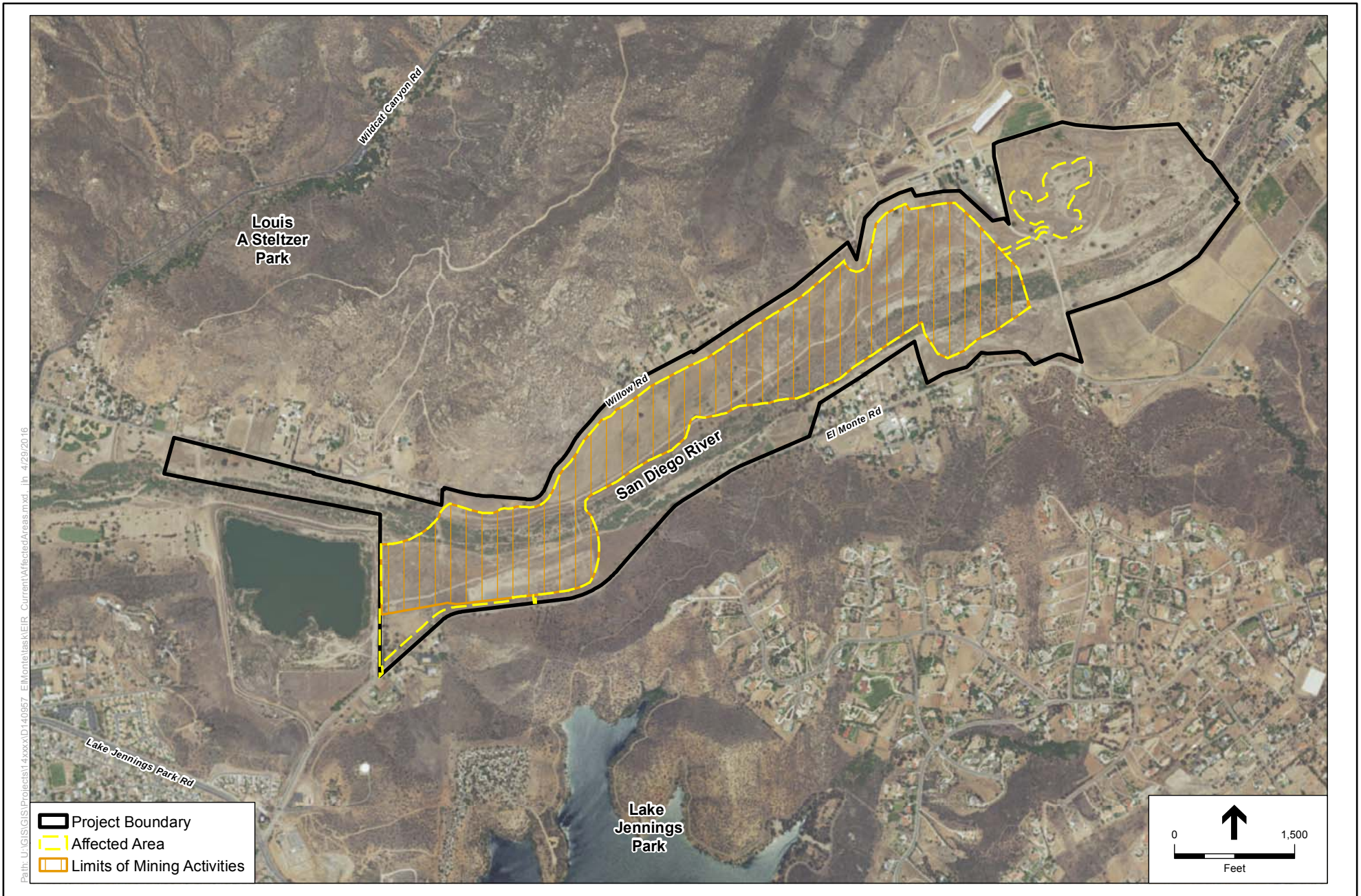


Figure 1-2
Project Limits

2.0 PROJECT DESCRIPTION

2.1 Project Location

The project site is located on El Monte Road, east of Lake Jennings Park Road, in the community of Lakeside. The entrance to the project site is 0.5 miles northeast of the El Monte Road/ Lake Jennings Park Road intersection.

Access for the site will consist of separate ingress and egress for heavy vehicles and employees. Ingress to the site from El Monte Road will use an existing eastbound left-turn lane (project driveway #1) located on the western edge of the project site. Egress (project driveway #2) from the property will be located approximately 0.4 miles east of the entrance. Access to the site will be controlled 24 hours per day through a gated entrance. Gates will be installed and open during normal hours of operation from 7:00 a.m. and 5:00 p.m., Monday through Friday, and from 7:00 am to 1:00 pm on Saturdays, and will be closed and locked during non-operational hours.



Figure 2–1 shows a detailed site plan and phasing including project driveways #1 and #2.

2.2 Project Description

The proposed project would extract 12.5-million tons of quality construction aggregate over a 12-year period in El Monte Valley on land that is zoned for extractive use. Mining would begin with site preparation, and progress in a series of westerly advancing phases (Phases 1 through 4), with reclamation completed as final reclaimed surfaces are established. In the final phase (Phase 4), the western portion of the project would be extracted, all equipment removed from the property, and the final area (50 acres) of mining related disturbance reclaimed. The mining phases also include the proposed onsite trails, trail/pathway staging areas and fuel modification areas. A total of 243 acres of the project site will be impacted by mining operations, staging areas, and trails within the mining footprint area; along with 19 acres impacted by trails/pathways and fuel modifications areas not located within the mining footprint area, for a total project impact area of 262 acres.

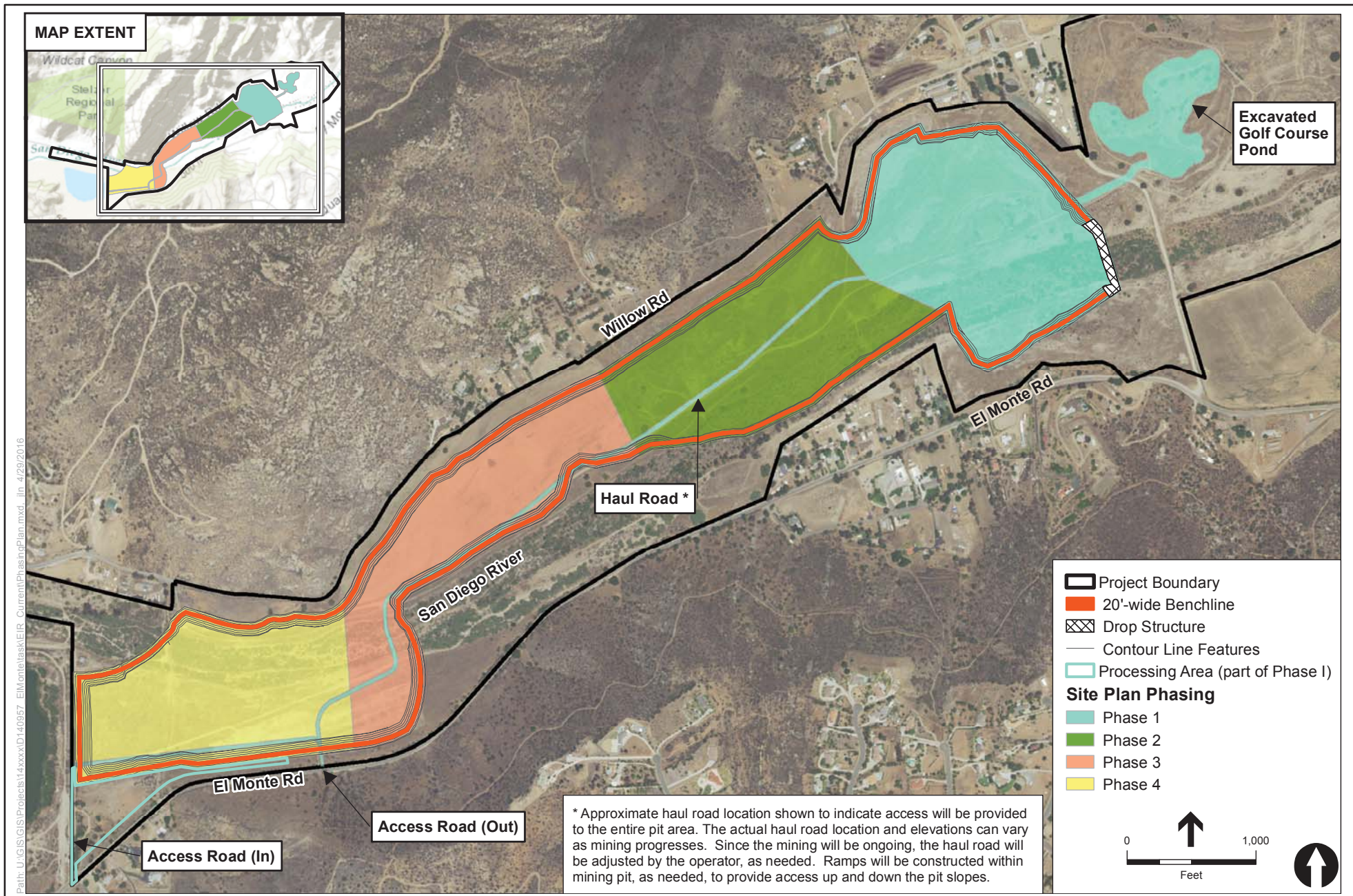


Figure 2-1
Site Plan

3.0 EXISTING CONDITIONS

This study analyzes the following intersections and segments based on the anticipated assignment of project traffic and locations most likely to be impacted by project traffic.

Intersections

1. Maplevue Street/ SR 67
2. Maplevue Street/ Maine Avenue
3. Maplevue Street/ Vine Street
4. Maplevue Street/ Ashwood Street
5. Lake Jennings Park Road/ El Monte Road
6. Lake Jennings Park Road/ Blossom Valley Road
7. Lake Jennings Park Road/ I-8 Westbound Ramps
8. Lake Jennings Park Road/ I-8 Eastbound Off-Ramp/ Olde Hwy 80

Segments

1. SR 67 – north of Maplevue Street
2. SR 67 – south of Maplevue Street
3. Maplevue Street – west of SR 67
4. Maplevue Street between SR 67 and Maine Avenue
5. Maplevue Street between Maine Avenue and Vine Street
6. Maplevue Street between Vine Street and Ashwood Street
7. Maplevue Street/ Lake Jennings Park Road between Ashwood Street and El Monte Road
8. Lake Jennings Park Road between El Monte Road and Blossom Valley Road
9. Lake Jennings Park Road between Blossom Valley Road and I-8
10. El Monte Road – north of Maplevue Street

3.1 Existing Roadway Conditions

The following is a description of the nearby roadway network:

Interstate 8 (I-8) is an east/west freeway connecting San Diego to Arizona and beyond. It is currently constructed as a four-lane freeway in the project vicinity. The posted speed limit of Interstate 8 is 70 mph. A local interchange is provided at Lake Jennings Park Road.

State Route 67 (SR 67) is classified as a 4.1A – *Major Road with a raised median* north of Maplevue Street and a 6.1 – *Expressway* south of Maplevue Street on the *County of San Diego General Plan Mobility Element* within the study area. It is currently constructed as a two-lane divided roadway north of Maplevue Street and a four-lane expressway south of Maplevue Street. The posted speed limit is 65 mph.

Mapleview Street is classified as a *4.1A – Major Road with a raised median* on the *County of San Diego General Plan Mobility Element* within the study area. It is currently constructed as a two-lane undivided roadway west of SR 67 and a four-lane undivided roadway with a two-way left-turn lane provided intermittently between SR 67 and Lake Jennings Park Road. Mapleview Street transitions to Lake Jennings Park Road between Ashwood Street and El Monte Road. Bike lanes and curbside parking are provided intermittently. A bus stop is provided at the Mapleview Street/ SR 67 interchange. The posted speed limit is 40 mph.

Lake Jennings Park Road is classified as a *4.1B – Major Road with intermittent turn lanes* on the *County of San Diego General Plan Mobility Element* within the study area. It is currently constructed as a four-lane undivided roadway with a two-way left-turn lane west of El Monte Road, a three-lane undivided roadway between El Monte Road and Blossom Valley Road and a two-lane undivided roadway between Blossom Valley Road and I-8. Bike lanes and curbside parking are provided intermittently. The posted speed limit is generally between 40 to 55 mph.

El Monte Road is classified as a *2.3C – Minor Collector* on the *County of San Diego General Plan Mobility Element* within the study area. It is currently constructed as a two-lane undivided roadway within the project vicinity. The posted speed limit is 40 mph.

Figure 3–1 depicts the existing traffic conditions and the study area intersections and segments.

3.2 Existing Traffic Volumes

3.2.1 Peak Hour Intersection Volumes

Weekday AM/PM peak hour intersection turning movement volume counts were commissioned on Tuesday, March 17, 2015. The intersection counts were conducted between the hours of 7:00-9:00 AM and 4:00-6:00 PM to capture peak commuter activity.

3.2.2 Daily Segment Volumes

Bi-directional daily traffic counts were conducted on Tuesday, March 17, 2015. **Table 3–1** is a summary of average daily traffic volumes (ADTs) for the key roadway segments in the project vicinity.

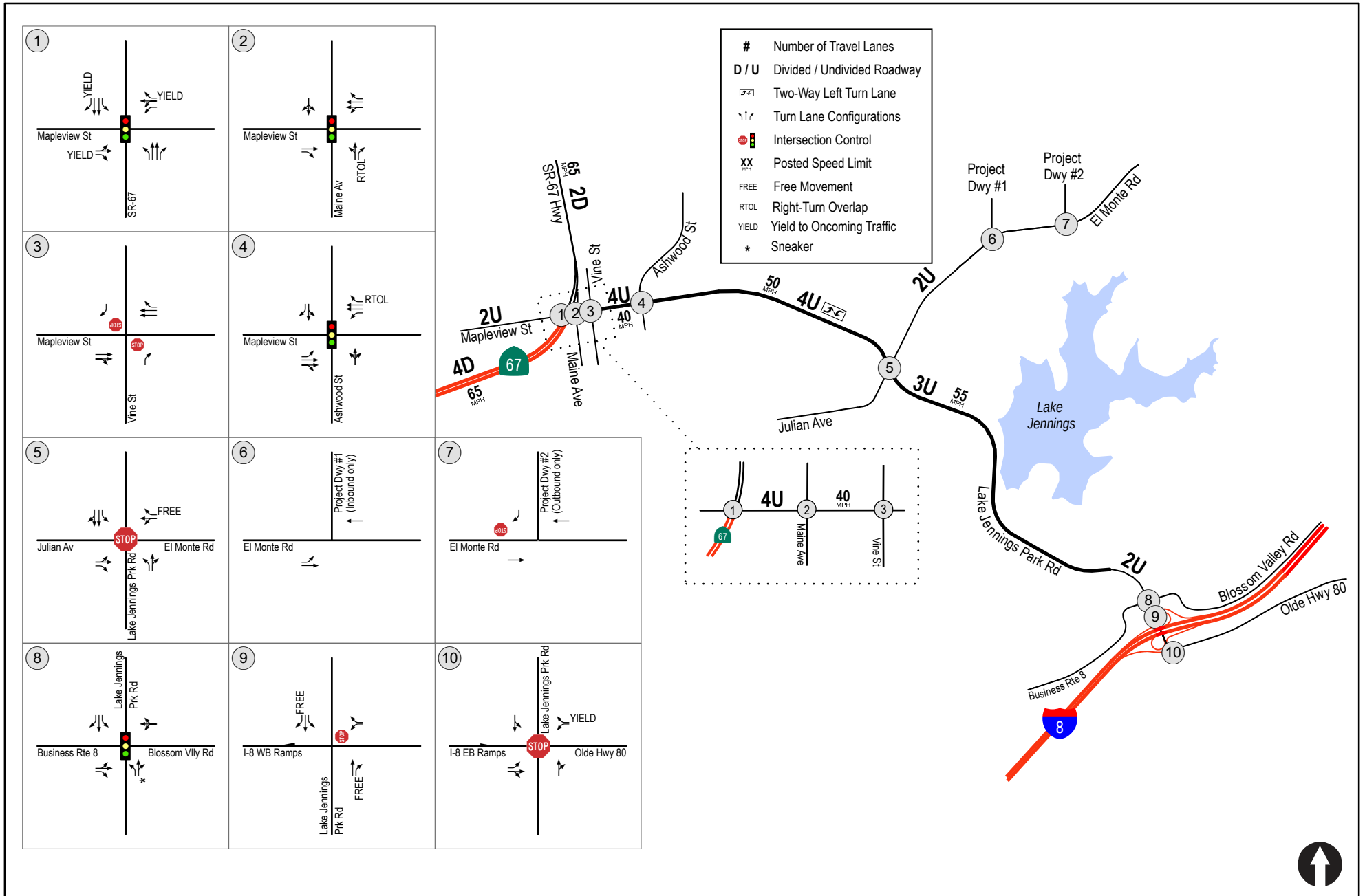
Appendix A contains the peak hour intersection and segment count sheets. **Figure 3–2** shows the existing traffic volumes.

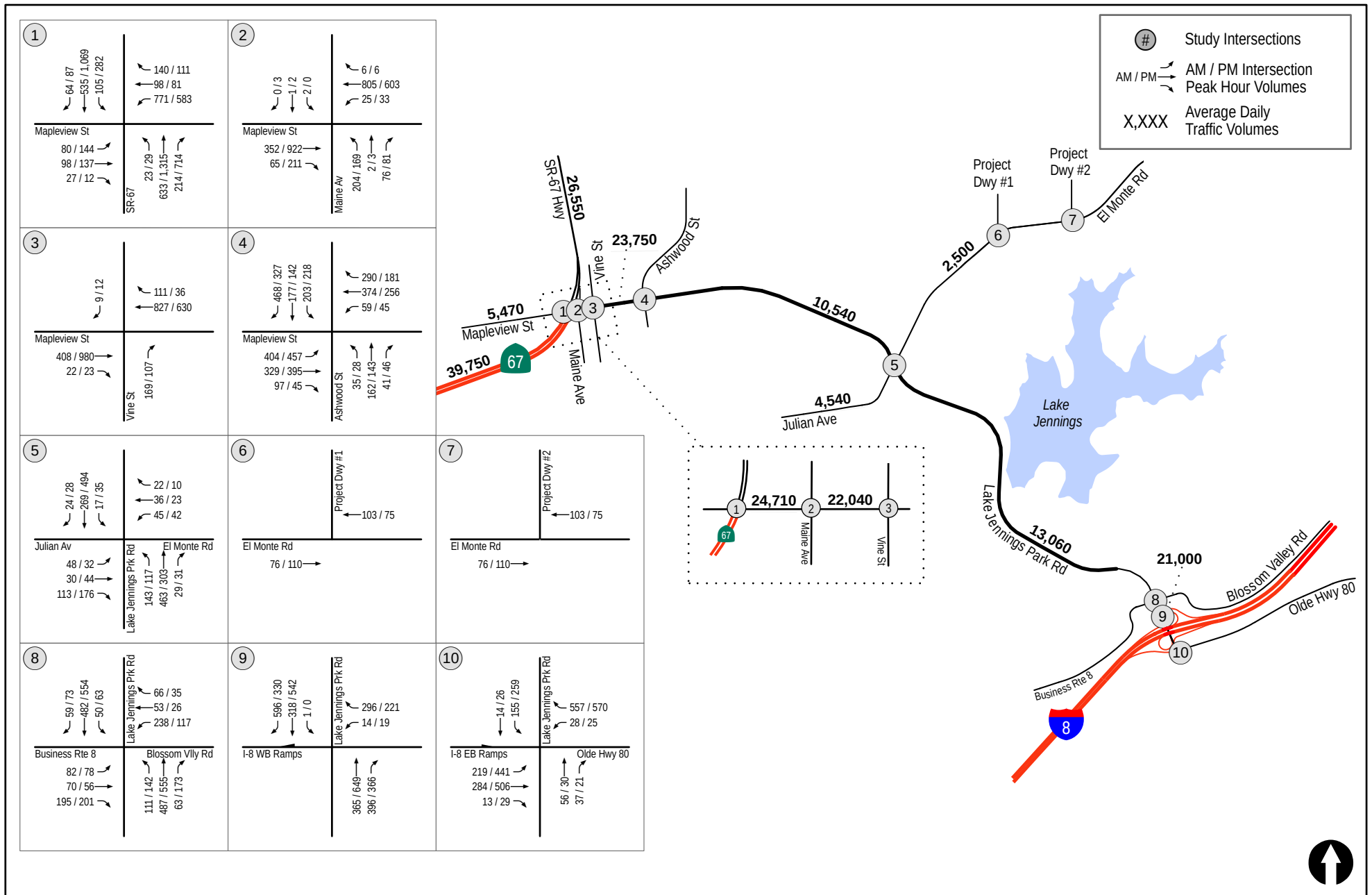
TABLE 3-1
EXISTING TRAFFIC VOLUMES

Street Segment	ADT ^a
SR 67	
North of Maplevue Street	26,550
South of Maplevue Street	39,750
Maplevue Street/ Lake Jennings Park Road	
West of SR 67	5,470
SR 67 to Maine Avenue	24,710
Maine Avenue to Vine Street	22,040
Vine Street to Ashwood Street	23,750
Ashwood Street to El Monte Road	10,540
El Monte Road to Blossom Valley Road	13,060
Blossom Valley Road to I-8	21,000
El Monte Road	
East of Lake Jennings Park Road	2,500

Footnotes:

- a. Average Daily Traffic (ADT) Volumes counts were conducted by LLG on March 17, 2015.





4.0 ANALYSIS APPROACH AND METHODOLOGY

Level of service (LOS) is the term used to denote the different operating conditions which occur on a given roadway segment under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level of service designations are reported differently for signalized intersections, unsignalized intersections and roadway segments.

4.1 Intersections

Signalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay was determined utilizing the methodology found in Volume 3: Interrupted Flow, Chapter 18 of the *2010 Highway Capacity Manual (HCM)*, with the assistance of the *Synchro* (version 9.0) computer software. The delay values (represented in seconds) were qualified with a corresponding intersection LOS. Signalized intersection calculation worksheets and a more detailed explanation of the methodology are attached in **Appendix B**.

Unsignalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay and LOS was determined based upon the procedures found in Volume 3: Interrupted Flow, Chapter 19 for two-way stop-controlled intersections of the *2010 Highway Capacity Manual (HCM)*, with the assistance of the *Synchro* (version 9.0) computer software. Unsignalized intersection calculation worksheets and a more detailed explanation of the methodology are attached in **Appendix B**.

4.2 Street Segments

Street segment analysis is based upon the comparison of ADTs to the County of San Diego's *Roadway Classification, Level of Service, and ADT Table*. This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics. The County of San Diego's *Roadway Classification, Level of Service, and ADT Table* is attached in **Appendix C**.

5.0 SIGNIFICANCE CRITERIA

The project adds traffic to locations within the County of San Diego and Caltrans jurisdictions. Therefore, the following significance criteria was used to evaluate the proposed project's traffic impacts.

5.1 County of San Diego

The following criteria was utilized to evaluate potential significant impacts, based on the *County of San Diego Guidelines for Determining Significance—Transportation and Traffic*, dated August 24, 2011. The *County of San Diego's General Plan Mobility Element* discusses the County's Level of Service criteria. It requires that development projects provide associated road improvements necessary to achieve a level of service of "D" or higher on all Mobility Element roads except for those where a failing level of service has been accepted by the County.

5.1.1 Road Segments

This section provides guidance for evaluating adverse environmental effects a project may have on street segments. The allowable ADT increases on LOS E/F operation roadways was obtained from County guidelines and are summarized in **Table 5-1**. The thresholds in *Table 5-1* are based upon average operating conditions on County roadways. Exceeding the thresholds in Table 5-1 would result in a significant impact. It should be noted that these thresholds only establish general guidelines, and that the specific project location must be taken into account in conducting an analysis of traffic impact from new development.

TABLE 5-1
MEASURES OF SIGNIFICANT PROJECT IMPACTS TO CONGESTION ON
MOBILITY ELEMENT ROAD SEGMENTS
ALLOWABLE INCREASES ON CONGESTED ROAD SEGMENTS

Level of Service	Two-Lane Road	Four-Lane Road	Six-Lane Road
LOS E	200 ADT	400 ADT	600 ADT
LOS F	100 ADT	200 ADT	300 ADT

General Notes:

1. By adding proposed project trips to all other trips from a list of projects, this same table must be used to determine if total cumulative impacts are significant. If cumulative impacts are found to be significant, each project that contributes additional trips must mitigate a share of the cumulative impacts.
2. The County may also determine impacts have occurred on roads even when a project's traffic or cumulative impacts do not trigger an unacceptable level of service, when such traffic uses a significant amount of remaining road capacity.

5.1.2 Intersections

This section provides guidance for evaluating adverse environmental effects a project may have on signalized and unsignalized intersections. **Table 5–2** was obtained from County guidelines and summarizes the allowable increases in delay or traffic volumes at signalized and unsignalized intersections. Exceeding the thresholds in *Table 5–2* would result in a significant impact.

TABLE 5–2
MEASURES OF SIGNIFICANT PROJECT IMPACTS TO CONGESTION ON INTERSECTIONS
ALLOWABLE INCREASES ON CONGESTED INTERSECTIONS

Level of service	Signalized	Unsignalized
LOS E	Delay of 2 seconds or less	20 or less peak hour trips on a critical movement
LOS F	Either a Delay of 1 second, or 5 peak hour trips or less on a critical movement	5 or less peak hour trips on a critical movement

General Notes:

1. A critical movement is an intersection movement (right-turn, left-turn, through-movement) that experiences excessive queues, which typically operate at LOS F.
2. By adding proposed project trips to all other trips from a list of projects, these same tables are used to determine if total cumulative impacts are significant. If cumulative impacts are found to be significant, each project is responsible for mitigating its share of the cumulative impact.
3. The County may also determine impacts have occurred on roads even when a project's traffic or cumulative impacts do not trigger an unacceptable LOS, when such traffic uses a significant amount of remaining road capacity.
4. For determining significance at signalized intersections with LOS F conditions, the analysis must evaluate both the delay **and** the number of trips on a critical movement; exceedance of either criteria results in a significant impact.

Signalized Intersections—Traffic volume increases from public or private projects that result in one or more of the following criteria will have a significant traffic volume or LOS traffic impact on a signalized intersection:

- The additional or redistributed ADT generated by the proposed project will significantly increase congestion on a signalized intersection currently operating at LOS E or LOS F, or will cause a signalized intersection to operate at LOS E or LOS F as identified in *Table 5–2*.
- Based upon an evaluation of existing accident rates, the signal priority list, intersection geometrics, proximity of adjacent driveways, sight distance or other factors, the project would significantly impact the operations of the intersection.

Unsignalized Intersections—The operating parameters and conditions for unsignalized intersections differ dramatically from those of signalized intersections. Very small volume increases on one leg or turn and/or through movement of an unsignalized intersection can substantially affect the calculated delay for the entire intersection. Significance criteria for unsignalized intersections are based upon a minimum number of trips added to a critical movement at an unsignalized intersection.

Traffic volume increases from public or private projects that result in one or more of the following criteria will have a significant traffic impact on an unsignalized intersection as listed in *Table 5–2* and described as text below:

- The additional or redistributed ADT generated by the proposed project will add 21 or more peak hour trips to a critical movement of an unsignalized intersection, and cause an unsignalized intersection to operate below LOS D, or
- The additional or redistributed ADT generated by the proposed project will add 21 or more peak hour trips to a critical movement of an unsignalized intersection currently operating at LOS E, or
- The additional or redistributed ADT generated by the proposed project will add 6 or more peak hour trips to a critical movement of an unsignalized intersection, and cause the unsignalized intersection to operate at LOS F, or
- The additional or redistributed ADT generated by the proposed project will add 6 or more peak hour trips to a critical movement of an unsignalized intersection currently operating at LOS F, or
- Based upon an evaluation of existing accident rates, the signal priority list, intersection geometrics, proximity of adjacent driveways, sight distance or other factors, the project would significantly impact the operations of the intersection.

5.2 SANTEC / ITE and Caltrans

Caltrans intersections and street segments in this study have been analyzed under the regionally accepted San Diego Traffic Engineers' Council/Institute of Transportation Engineers (SANTEC/ITE) guidelines. The SANTEC/ITE guidelines include the following criteria:

A project is considered to have a significant impact if traffic would decrease the operations of surrounding roadways by a defined threshold. The defined thresholds shown in *Table 5–3* below for roadway segments and intersections are based on published SANTEC guidelines. If the proposed project exceeds the thresholds in *Table 5–3*, then it would result in a significant impact.

TABLE 5-3
TRAFFIC IMPACT SIGNIFICANT THRESHOLDS

LOS with Project ^a	Allowable Increase Due to Project Impacts ^b	
	Roadway Segments	Intersections
	V/C ^c	Delay (sec.) ^d
D/E/F	0.02	2

Footnotes:

- a. All LOS measurements are based upon HCM procedures for peak-hour conditions. However, V/C ratios for Roadway Segments may be estimated on an ADT/24-hour traffic volume basis. The acceptable LOS for roadways and intersections is generally "D" ("C" for undeveloped or not densely developed locations per jurisdiction definitions).
- b. If a proposed project's traffic causes the values shown in the table to be exceeded, the impacts are deemed to be significant. These impact changes may be measured from appropriate computer programs or expanded manual spreadsheets. The project applicant shall then identify feasible mitigations (within the Traffic Impact Study [TIS] report) that will maintain the traffic facility at an acceptable LOS. If the LOS with the proposed project becomes unacceptable (see note a above), the project applicant shall be responsible for mitigating significant impact changes.
- c. V/C = volume to capacity ratio
- d. Delay = Average stopped delay per vehicle measured in seconds for intersections.

The SANTEC/ITE Guidelines's *Roadway Classification, Level of Service, and ADT Table* is attached in *Appendix C*.

6.0 ANALYSIS OF EXISTING CONDITIONS

6.1 Peak Hour Intersection Levels of Service

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

- Maplevue Street / SR 67 – LOS F during the PM peak hour
- Maplevue Street / Maine Avenue – LOS F during the PM peak hour
- Maplevue Street / Ashwood Street – LOS F during the AM peak hour
- Lake Jennings Park Road / I-8 EB Off-Ramp / Olde Hwy 80 – LOS F during the PM peak hour

Appendix D contains the existing intersection analysis worksheets.

TABLE 6-1
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing	
			Delay ^a	LOS ^b
1. Mapleview St / SR 67	Signal	AM PM	49.1 158.8	D F
2. Mapleview St / Maine Ave	Signal	AM PM	41.6 117.2	D F
3. Mapleview St / Vine St	TWSC ^c	AM PM	11.9 15.5	B C
4. Mapleview St / Ashwood St	Signal	AM PM	80.5 54.4	F D
5. Lake Jennings Park Rd / El Monte Rd / Julian Ave	AWSC ^d	AM PM	34.2 22.9	D C
6. El Monte Rd / Project Driveway #1	TWSC ^c	AM PM	DNE DNE	– –
7. El Monte Rd / Project Driveway #2	TWSC ^c	AM PM	DNE DNE	– –
8. Lake Jennings Park Rd / Blossom Valley Rd	Signal	AM PM	35.7 22.7	D C
9. Lake Jennings Park Rd / I-8 WB Ramps	TWSC ^c	AM PM	16.6 25.0	C D
10. Lake Jennings Park Rd / I-8 EB Off-Ramp / Olde Hwy 80	AWSC ^d	AM PM	32.5 57.6	D F

Footnotes:

- a. Average delay expressed in seconds per vehicle.
- b. Level of Service.
- c. TWSC – Two-Way Stop-Controlled intersection. Minor street delay reported.
- d. AWSC – All-Way Stop-Controlled intersection. Overall intersection delay reported.

General Notes:

1. DNE – does not exist.

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

6.2 Daily Street Segment Levels of Service

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

- SR 67 – North of Maplevue Street – LOS F
- Maplevue Street/Lake Jennings Park Road – between Blossom Valley Road and I-8 – LOS F

TABLE 6-2
EXISTING STREET SEGMENT OPERATIONS

Street Segment	Functional Classification	Capacity (LOS E) ^a	ADT ^b	LOS ^c
SR 67				
North of Maplevue Street	2-lane Prime Arterial ^d	20,000	26,550	F
South of Maplevue Street	4-lane Expressway ^e	53,000	39,750	C
Maplevue Street/ Lake Jennings Park Road				
West of SR 67	2.1E Community Collector <i>no Median</i>	16,200	5,470	C
SR 67 to Maine Avenue	4.1B Major Road <i>with Intermittent Turn Lanes</i>	34,200	24,710	C
Maine Avenue to Vine Street	4.1B Major Road <i>with Intermittent Turn Lanes</i>	34,200	22,040	B
Vine Street to Ashwood Street	4.1B Major Road <i>with Intermittent Turn Lanes</i>	34,200	23,750	C
Ashwood Street to El Monte Road	4.1B Major Road <i>with Intermittent Turn Lanes</i>	34,200	10,540	A
El Monte Road to Blossom Valley Road	3-lane Community Collector <i>with Intermittent Turn Lanes</i> ^f	23,500	13,060	C
Blossom Valley Road to I-8	2.2C Light Collector <i>with Intermittent Turn Lanes</i>	19,000	21,000	F
El Monte Road				
East of Lake Jennings Park Road	2.3C Minor Collector <i>no Median</i>	8,000	2,500	B

Footnotes:

- a. Capacities based on County of San Diego Roadway Classification Table.
- b. Average Daily Traffic Volumes.
- c. Level of Service.
- d. 2-lane Prime Arterial capacity of 20,000 interpolated from 6-lane Prime Arterial based on SANTEC roadway classifications.
- e. 4-lane Expressway capacity of 53,000 interpolated from 6-lane Expressway at 80,000 based on SANTEC roadway classifications.
- f. 3-lane Community Collector capacity of 23,500 interpolated between 4-lane Boulevard with intermittent turn lanes and 2-lane Community Collector with intermittent turn lanes based on County of San Diego roadway classifications.

7.0 TRIP GENERATION, DISTRIBUTION AND ASSIGNMENT

7.1 Construction Project Trip Generation

There is a potential for traffic impacts to the adjacent circulation system due to the addition of construction related trips during the construction period. These trips include construction worker (employee) trips in passenger vehicles/light trucks, as well as material export trips made in heavy vehicles (haul trucks) to/from and around the excavation site. The traffic analyses in this report analyze the potential impacts of these trips during the construction period.

The proposed project would be completed within 16 years. This would include mining, reclamation and restoration over the first 12 years, with reclamation and restoration starting in year four and continuing for an additional four years after the cessation of mining.

A typical construction day would include a maximum of 157 heavy vehicles accessing the project site, spread throughout the day. In addition to the heavy vehicle trips, up to 12 employees and 2 vendors are expected to access the project site on a typical day.

7.1.1 Heavy Vehicle Traffic

Heavy vehicle traffic would include trucks carrying loads of construction aggregate, supplies, fuel, parts, etc.

The project site would operate approximately 306 work days per year. The weight capacity of a standard heavy vehicle for outgoing loads is approximately 27 tons per truck. A maximum construction day would include 157 one-way heavy vehicles accessing the project site, spread throughout the day. In addition to the heavy vehicle trips, up to 12 employees and 2 vendors are expected to access the project site on a typical day. .

The construction work hours are proposed to be 7 AM to 5 PM (9-hour work day), which would be approximately 11% in each peak hour as the truck trips are expected to be relatively equally distributed throughout the day. The assumed percent of ADT to occur during the peak hour for truck traffic was conservatively assumed as 15%. In addition, a passenger car equivalent (PCE) factor of 2.5 for trucks is used to account for the effects of heavy vehicles in the traffic flow.

According to Highway Capacity Manual 2010, PCE is defined as the number of passenger cars that are displaced by a single heavy vehicle of a particular type under the prevailing traffic conditions. Heavy vehicles have a greater traffic impact than passenger cars since:

They are larger than passenger cars, and therefore, occupy more roadway space; and their performance characteristics are generally inferior to passenger cars, leading to the formation of downstream gaps in the traffic stream, which cannot always be effectively filled by normal passing maneuvers.

Exhibit 14-12, PCE's for Heavy Vehicles in General Terrain Segments, (obtained from "Highway Capacity Manual prepared by Transportation Research Board," dated Year 2010) summarizes PCE

factors for various types of vehicles. The type of terrain in the project area was conservatively assumed as “rolling” and the corresponding passenger car equivalents of 2.5 for trucks was used. *Appendix C* includes the PCE factors.

7.1.2 *Light Vehicle Traffic*

Light vehicle traffic would include vehicles used by employees, vendors, and miscellaneous visitors such as cars, trucks and small service vehicles. A total of 12 employees and 2 vendors are expected to access the project site on a typical day. To estimate the employee trips, LLG assumed that 80% of the employees would access the work area during AM and PM commuter peak hours. This is considered conservative, as the project trip generation does not account for workers using other modes of transportation or carpooling, which could occur. For the purpose of the traffic analysis, employees and vendor trips were combined together.

Table 7–1 tabulates the total project traffic generation. The construction project is calculated to generate approximately 813 ADT.

7.2 Project Traffic Distribution

LLG prepared separate project traffic distributions for heavy vehicle and employee trips. LLG coordinated with the applicant regarding the potential truck routes and distribution. For the purposes of this report, the heavy vehicle trips were split 50%/50% to SR 67 and I-8 based on the location of the various concrete batch plants (which are spread across San Diego County) to which the material will be delivered. The employee trip distribution was based on existing roadway network and location of residential areas in San Diego County.

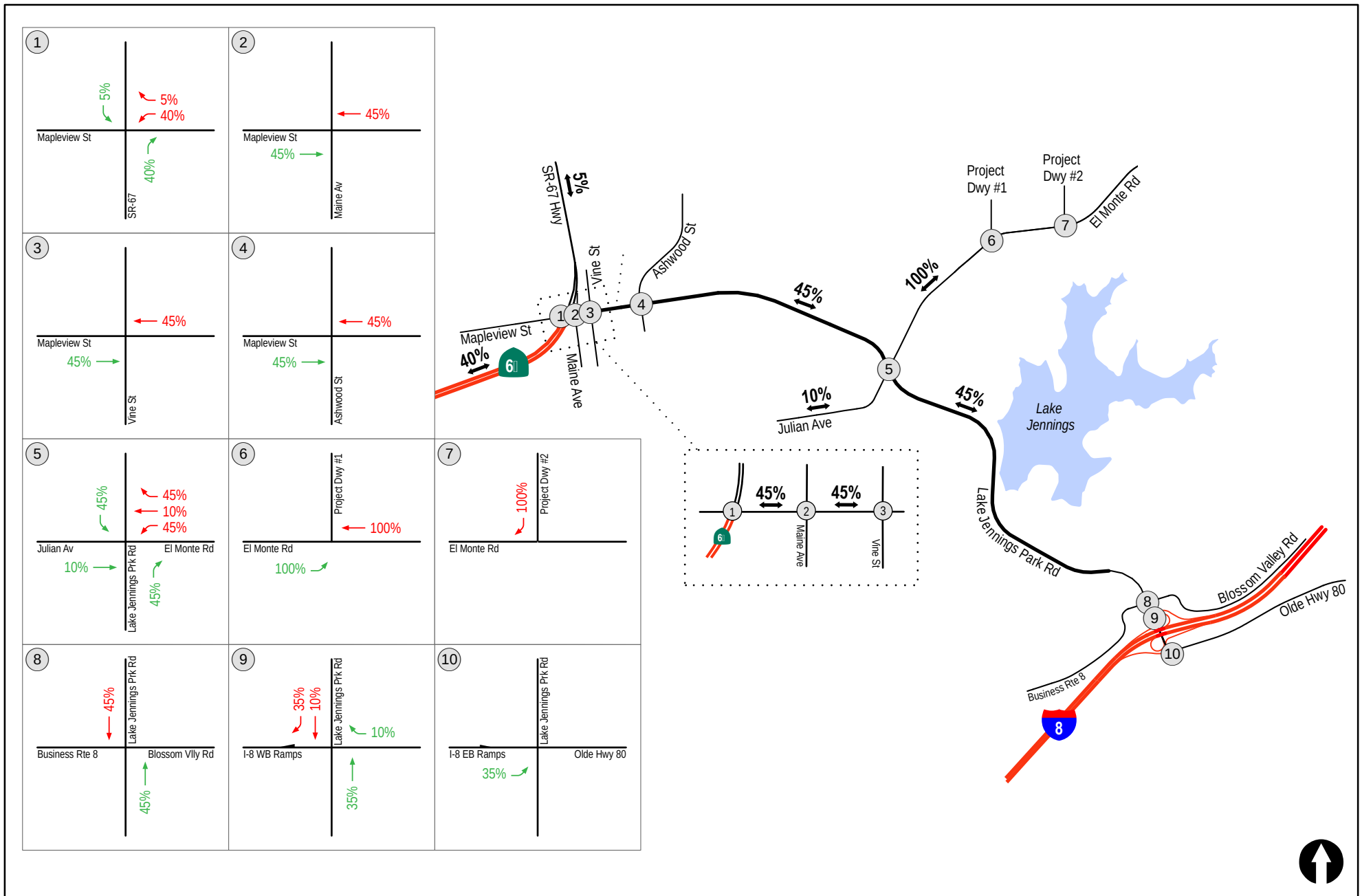
- **Figure 7–1** shows the project traffic distribution for Light Vehicles
- **Figure 7–2** shows the project traffic distribution for Heavy Vehicles
- **Figure 7–3** shows the project traffic volumes for Light Vehicles
- **Figure 7–4** shows the project traffic volumes for Heavy Vehicles
- **Figure 7–5** shows the Total Project traffic volumes
- **Figure 7–6** shows the Existing + Project traffic volumes

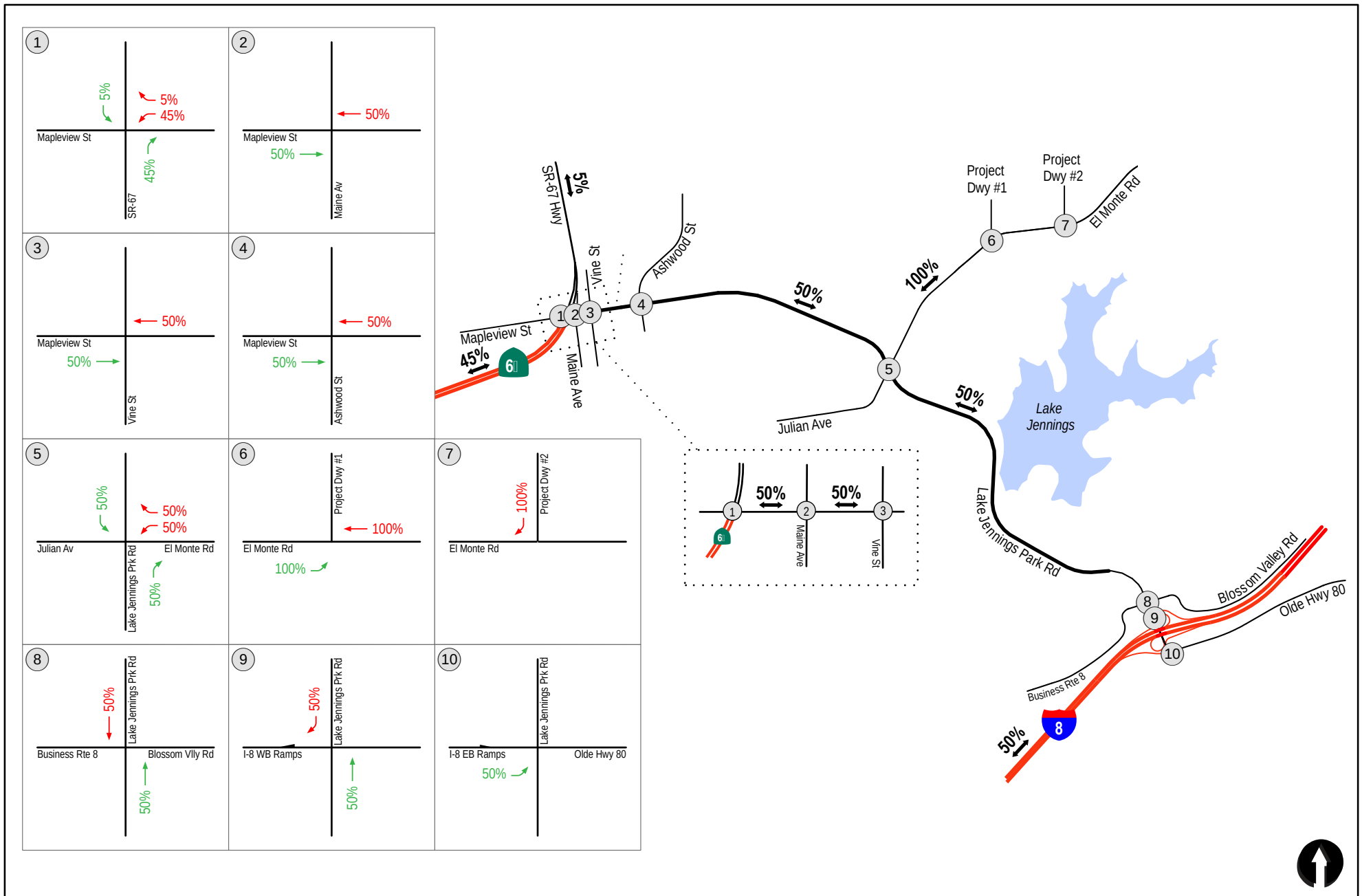
TABLE 7-1
CONSTRUCTION TRIP GENERATION

Use	Quantity	PCE	Daily Trips		AM Peak Hour					PM Peak Hour				
			Rate	ADT ^a	% of ADT	Split		Volume		% of ADT	Split		Volume	
						In	: Out	In	Out		In	: Out	In	Out
Heavy Veh (trucks) ^b	157	2.5	2.0 / vehicle	785	15% ^c	50%	: 50%	59	59	15% ^c	50%	: 50%	59	59
Light Veh (Employees)	12	1	2.0 / vehicle	24	40% ^d	90%	: 10%	9	1	40% ^d	10%	: 90%	1	9
Light Veh (Vendors/Misc.) ^e	2	1	2.0 / vehicle	4	50%	50%	: 50%	1	1	50%	50%	: 50%	1	1
Subtotal				813				69	61				61	69

Footnotes:

- a. ADT – Average daily traffic.
- b. Heavy vehicle traffic includes trucks carrying loads of construction aggregate, fuel, parts, etc.
- c. The assumed percent of ADT to occur during the peak hour for truck traffic is 15%.
- d. 40% of employee trips are anticipated to enter and 40% to exit the site during the peak periods.
- e. Light vehicle traffic includes vehicles used by employees and vendors, and miscellaneous visitors such as small service vehicles for fuel, supplies, and miscellaneous services.





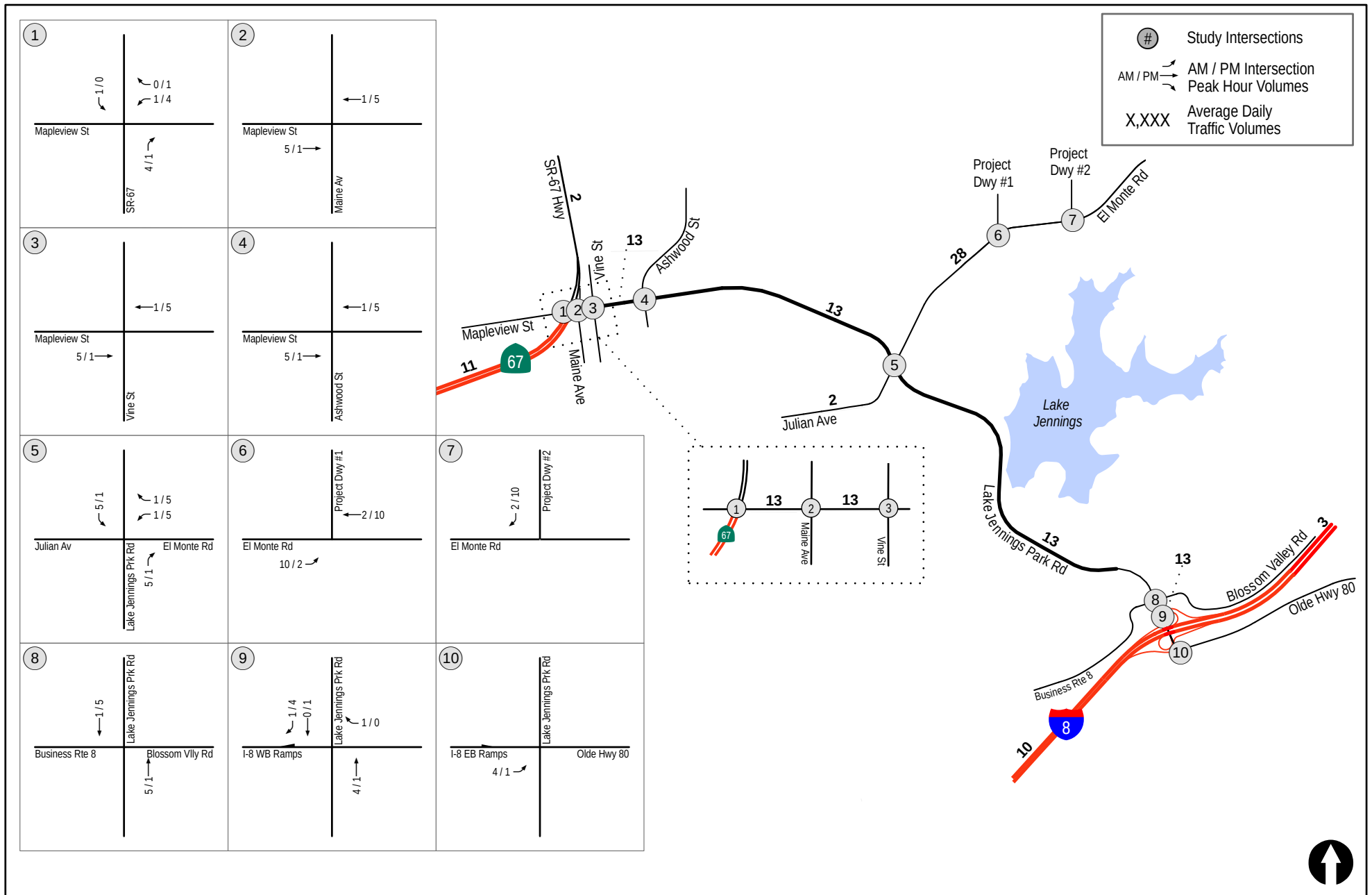
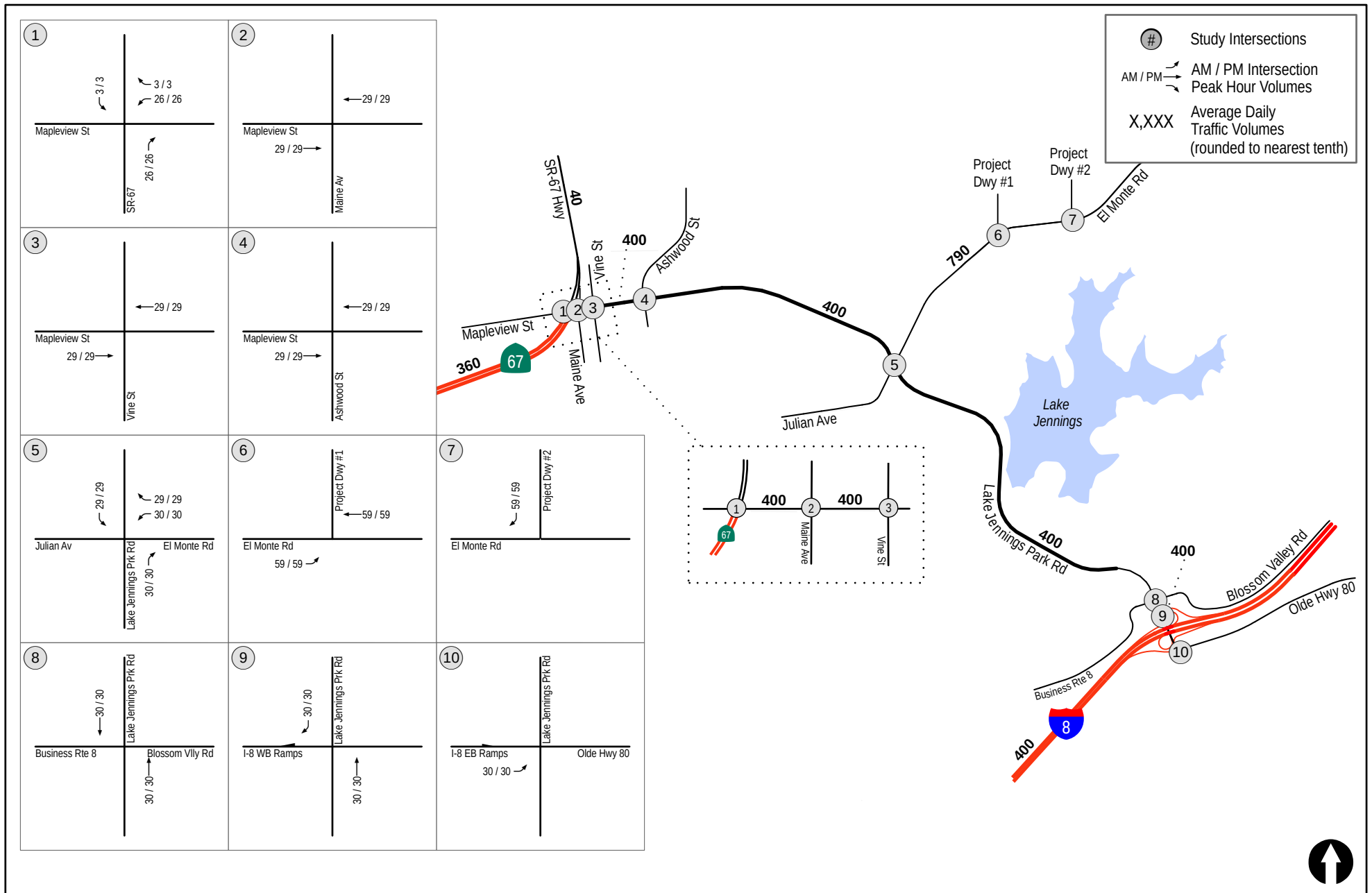
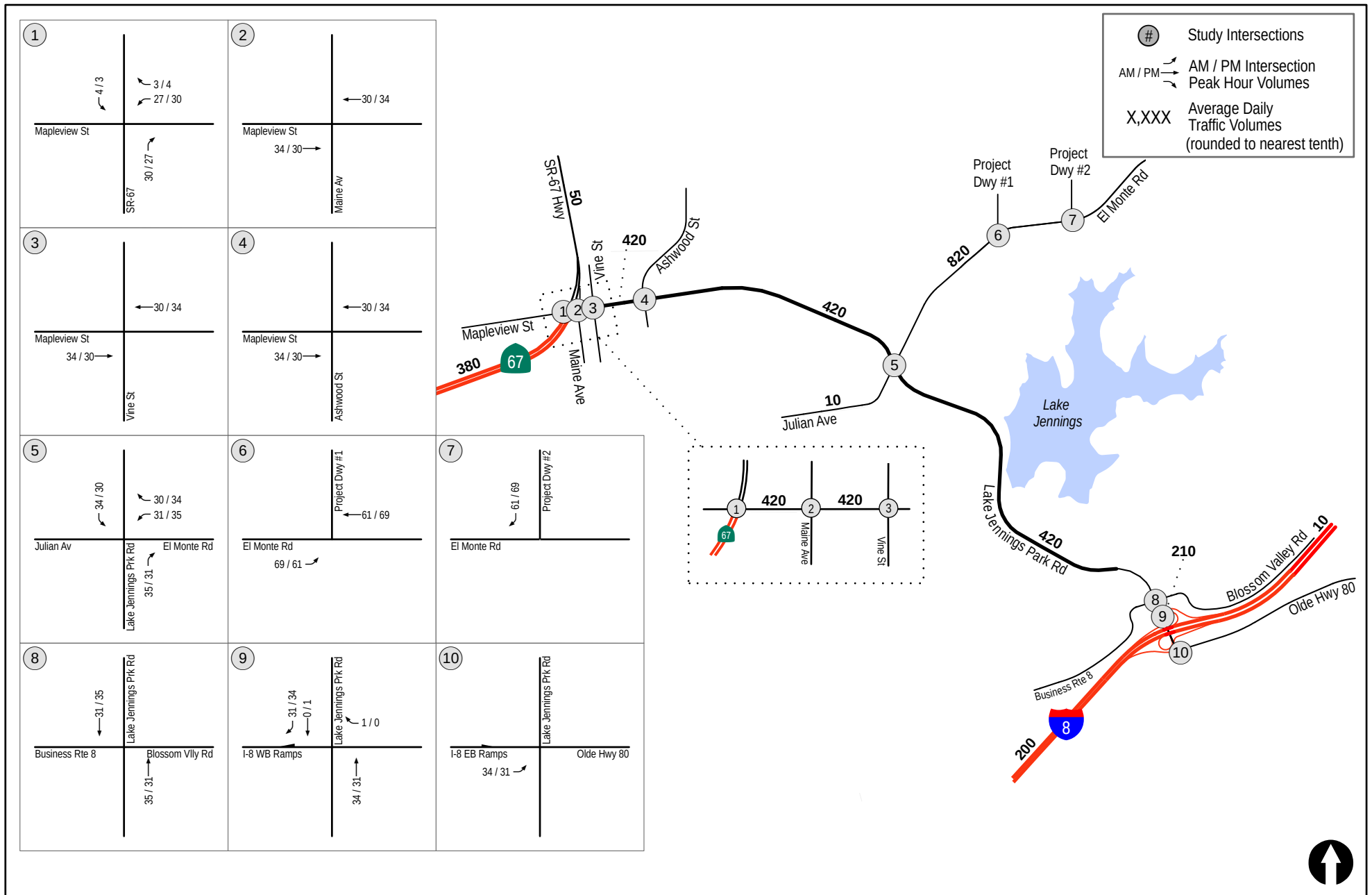
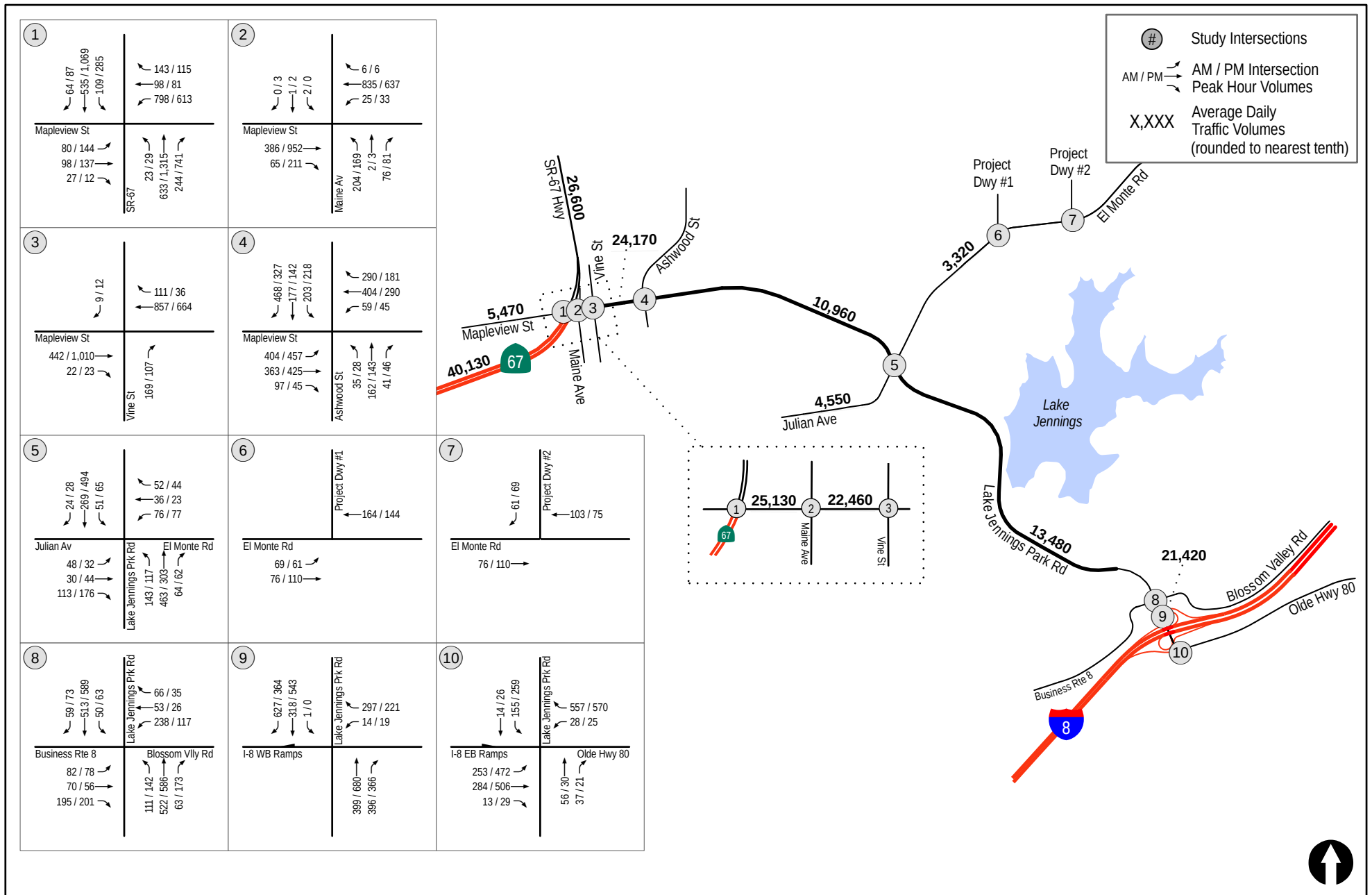


Figure 7-3
Project Traffic Volumes
(Light Vehicles)







8.0 CUMULATIVE PROJECTS

8.1 Summary of Cumulative Projects Trips

Cumulative projects are other projects in the study area that will add traffic to the local circulation system in the near future. LLG coordinated with the County of San Diego staff regarding the cumulative projects in the study area.

Table 8–1 contains the list of cumulative projects. **Figure 8–1** shows the location of each cumulative project. **Figure 8–2** shows the cumulative project traffic assignment.

**TABLE 8-1
CUMULATIVE PROJECTS**

Project Name	Type of Development	Project Size	ADT
1. Lake Jennings Marketplace (TM 5590)	Shopping Center Gasoline w/ Food Mart and Car Wash	76,100 SF 12 pumps	4,683
2. Foothills Christian School (MUP72-650)	Elementary	3,000 SF	40
3. Ashwood II Condo conversion (TM 5356)	Condominium	9 DU	72
4. Greenhills Ranch (TM 5140,TM 5563)	Estate Residential	60 DU	720
5. Adlai Ranch Estates (TM 5186)	Single Family Detached	21 DU	210
6. Rios Canyon Ranch (TM 5218)	Estate Residential	107 DU	1,284
7. Crest/Dehesa - Lakeside Ranch (TM 5317)	Estate Residential	123 DU	1,476
8. Ashwood I Condo conversion (TM 5376)	Condominium	67 DU	536
9. Settler's Point (TM 5423)	Multi-Family Residential	266 DU	2,128
10. Carroll (TMP 20530)	Multi-Family Residential	35 DU	207
11. 7-11 Inc. (SP00-003)	Convenience Market (w/ gasoline pumps)	1 space	400
12. Currier (SP03-031)	Office Warehouse	3,000 SF 3,000 SF	66
13. Payton Hardware (SP98-011)	Hardware Store	10 TSF	600
14. Lakeside Tractor Supply Co. (MUP 14-015)	Specialty Store Storage/Display	19,169 SF 17,958 SF	857
15. P&P Saksa (TPM 20128)	Single Family Detached	4 DU	36
16. Crestlake (TM 5082)	Single Family Detached	84 DU	840
17. Lakeside Burger King (SP 97-041)	Fastfood (w/ drive-thru)	3,000 SF	2,080
18. Ortega Construction (SP 98-031)	Office	1,000 SF	28
19. Glenview Glass and Screen (SP 98-019)	Office	3,000 SF	50
20. Rieken (SP 99-035)	Office	7,000 SF	136

**TABLE 8-1
CUMULATIVE PROJECTS**

Project Name	Type of Development	Project Size	ADT
21. Magnolia Courts (TM 5541)	Single Family Detached	21 DU	210
22. High Meadow Ranch (TM 3702)	Single Family Detached	145 DU	1,450
23. TM 5286	Single Family Detached	13 DU	130
24. TM 5191	Single Family Detached	32 DU	320
25. Blossom Valley Ranch (TM 5197)	Single Family Detached	25 DU	250
26. TM 5539	Single Family Detached	8 DU	80
27. Oakmont II (TM 5421)	Single Family Detached	20 DU	200
28. Flinn Springs Estates (TM 5470)	Single Family Detached	15 DU	150
29. Oak Creek RV (MUP 85-079)	Campground/RV Park	84 spaces	336
30. Sunny Ridge Estates (TM 5436)	Single Family Detached	13 DU	130
31. Eniss Sand Mine	Trucks Staff Vehicles	52 trucks 11 person	251
32. Turner Sand Mine	Trucks Staff Vehicles	61 trucks 8 person	276
33. Fanita Ranch	Residential	3,000 DU	30,000
34. Braverman Drive Residential	Single Family Detached	83 DU	830

General Notes:

1. LLG coordinated with the County of San Diego in June 2015 regarding the above cumulative project information.
2. DU – dwelling unit.
3. SF – square feet.
4. ADT – average daily traffic

LEGEND:

- 1 Lake Jennings Marketplace
- 2 Foothills Christian School
- 3 Ashwood II Condo Conversion
- 4 Greenhills Ranch
- 5 Adlai Canyon Ranch
- 6 Rios Canyon Ranch
- 7 Crest / Dehesa
- 8 Ashwood I Condo Conversion
- 9 Settler's Point
- 10 Carroll
- 11 7-11 Inc.
- 12 Currier
- 13 Payton Hardware
- 14 Lakeside Tractor Suply Co.
- 15 P&P Saksa
- 16 Crestlake
- 17 Lakeside Burger King
- 18 Ortega Construction
- 19 Glenview Glass & Screen
- 20 Rieken
- 21 Magnolia Courts
- 22 High Meadow Ranch (TM 3702)
- 23 TM 5286
- 24 TM 5191
- 25 Blossom Valley Ranch
- 26 TM 5539
- 27 Oakmont II (TM 5421)
- 28 Flinn Springs Estates (TM 5470)
- 29 Oak Creek RV
- 30 Sunny Ridge Estates (TM 5436)
- 31 Eniss Sand Mine
- 32 Turner Sand Mine
- 33 Fanita Ranch
- 34 Braverman Drive Residential

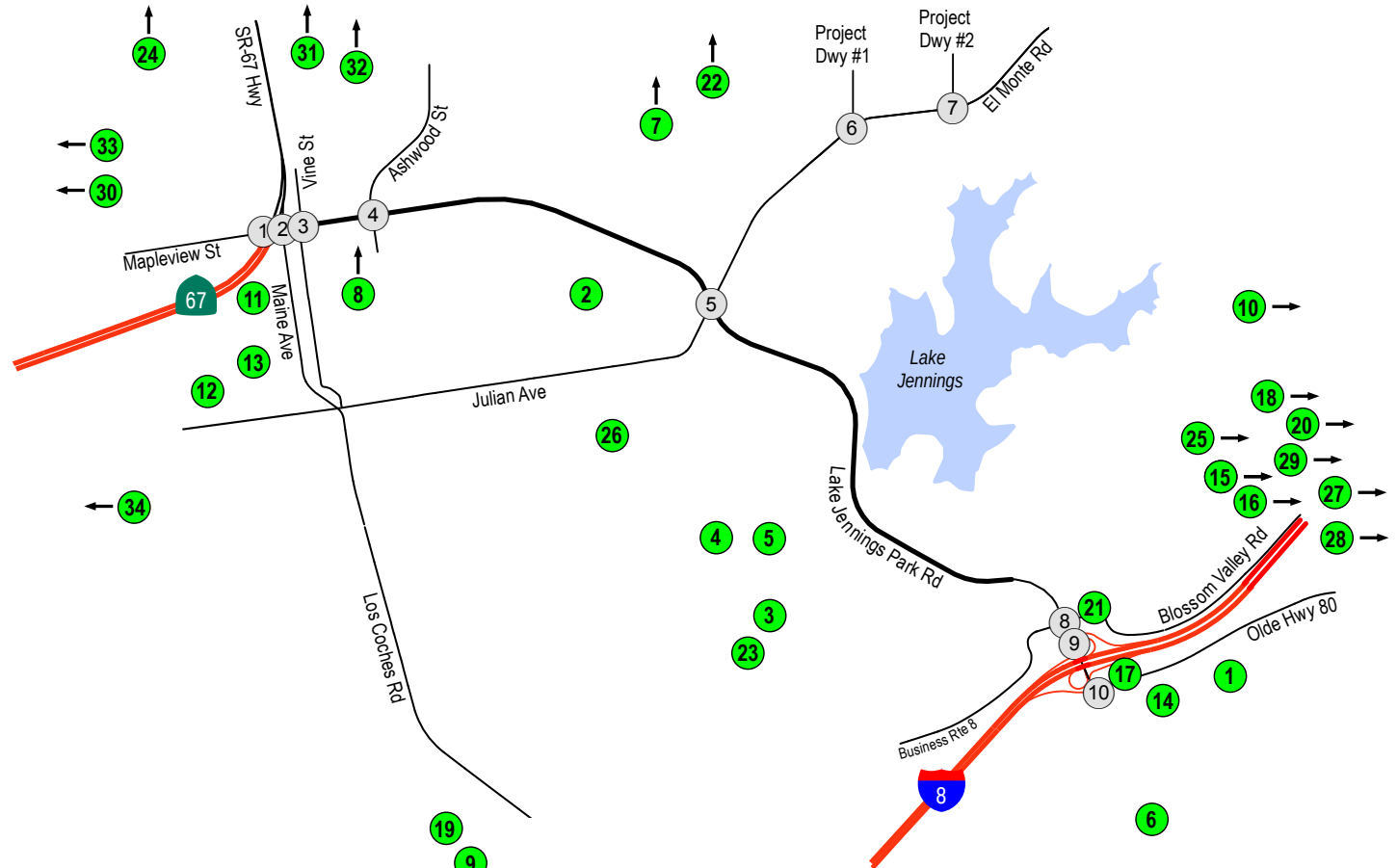
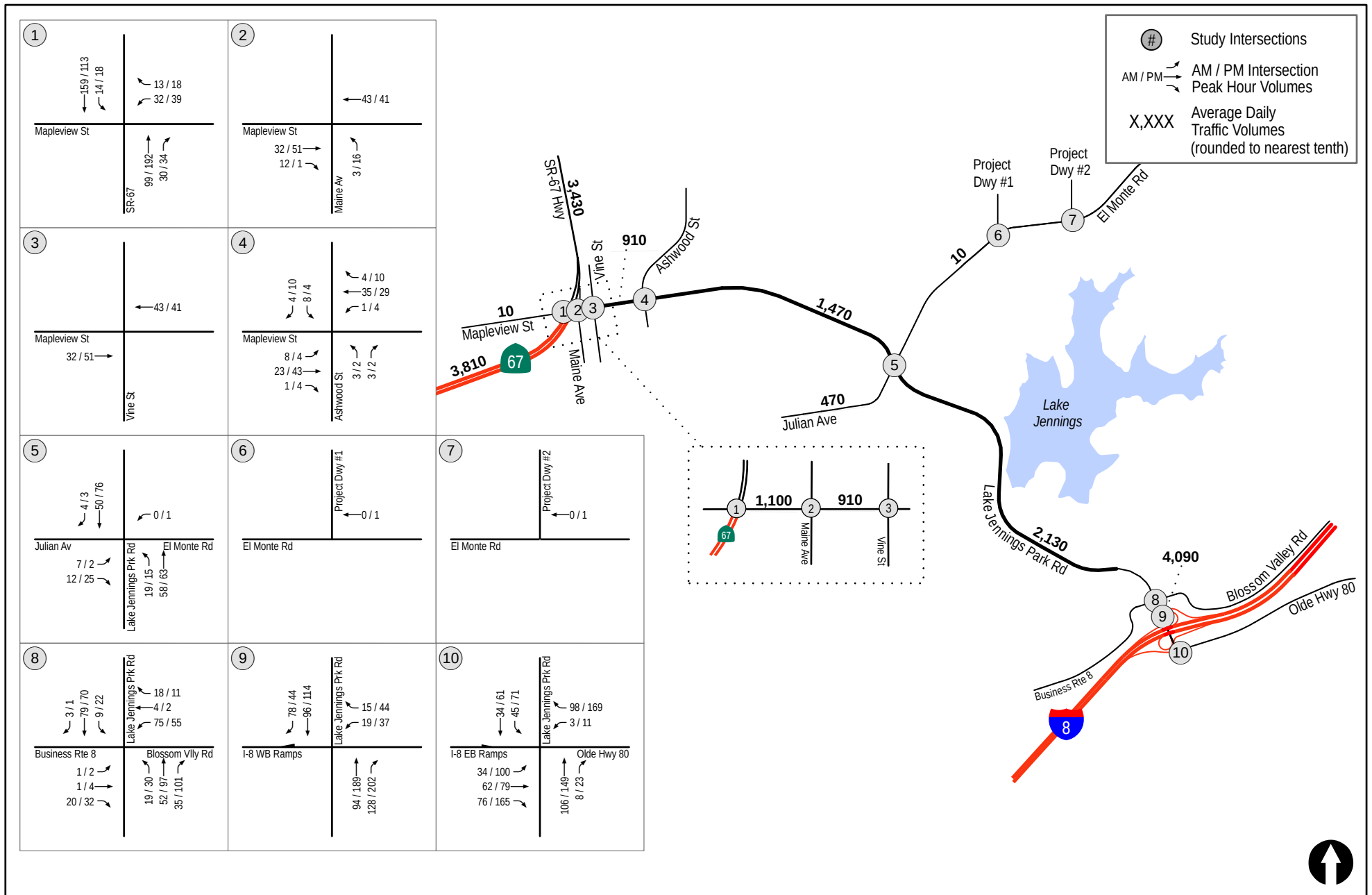


Figure 8-1

Cumulative Projects Location Map

EL MONTE SAND MINING PROJECT



9.0 NEAR-TERM ANALYSIS

9.1 Existing + Project

9.1.1 Intersection Analysis

Table 9–1 summarizes the Existing + Project intersections LOS. As seen in *Table 9–1*, the following intersections are calculated to operate at LOS E or worse:

- Maplevue Street / SR 67 – LOS F during the PM peak hour
- Maplevue Street / Maine Avenue – LOS F during the PM peak hour
- Maplevue Street / Ashwood Street – LOS F during the AM peak hour
- Lake Jennings Park Road / El Monte Road / Julian Avenue – LOS E during the AM peak hour
- Lake Jennings Park Road / I-8 EB Off-Ramp / Olde Hwy 80 – LOS F during the PM peak hour

Based on the significance criteria, no intersection impacts are calculated at the following intersections since the project contribution does not exceed the allowable thresholds:

- Maplevue Street / SR 67 – LOS F during the PM peak hour
- Maplevue Street / Maine Avenue – LOS F during the PM peak hour
- Maplevue Street / Ashwood Street – LOS F during the AM peak hour
- Lake Jennings Park Road / I-8 EB Off-Ramp / Olde Hwy 80 – LOS F during the PM peak hour

However, a **significant direct impact** is identified at the following intersection as the project traffic contribution exceeds the allowable threshold:

- Lake Jennings Park Road / El Monte Road / Julian Avenue – LOS E during the AM peak hour

Mitigation measures for this impact are discussed in detail in **Section 10.0**.

Appendix E contains the Existing + Project intersection analysis worksheets.

9.1.2 Segment Operations

Table 9–2 summarizes the Existing + Project roadway segment level of service. As seen in *Table 9–2*, all the segments are calculated to continue to operate at LOS D or better except for the following segments:

- SR 67 – North of Maplevue Street – LOS F
- Lake Jennings Park Road – between Blossom Valley Road and I-8 – LOS F

Based on the significance criteria, no street segment impact is calculated on the following segment since the project contribution does not exceed the allowable threshold:

- SR 67 – North of Maplevue Street

However, a **significant direct impact** is identified on the following street segment as the project traffic contribution exceeds the allowable threshold:

- Lake Jennings Park Road – between Blossom Valley Road and I-8

Mitigation measures for this impact are discussed in detail in *Section 10.0*.

TABLE 9-1
EXISTING + PROJECT INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing		Existing + Project			Impact Type
			Delay ^a	LOS ^b	Delay	LOS	Δ ^c	
1. Mapleview St / SR 67	Signal	AM	49.1	D	50.8	D	1.7	None
		PM	158.8	F	159.0	F	0.2	None
2. Mapleview St / Maine Ave	Signal	AM	41.6	D	46.5	D	4.9	None
		PM	117.2	F	117.5	F	0.3	None
3. Mapleview St / Vine Street	TWSC ^d	AM	11.9	B	12.1	B	— ^f	None
		PM	15.5	C	15.8	C	— ^f	None
4. Mapleview St / Ashwood St	Signal	AM	80.5	F	80.6	F	0.1	None
		PM	54.4	D	54.7	D	0.3	None
5. Lake Jennings Park Rd / El Monte Rd / Julian Ave	AWSC ^e	AM	34.2	D	35.1	E	30	Direct
		PM	22.9	C	32.5	D	— ^f	None
6. El Monte Rd / Project Driveway #1	TWSC ^d	AM	DNE	—	11.5	B	— ^f	None
		PM	DNE	—	11.5	B	— ^f	None
7. El Monte Rd / Project Driveway #2	TWSC ^d	AM	DNE	—	10.6	B	— ^f	None
		PM	DNE	—	10.1	B	— ^f	None
8. Lake Jennings Park Rd / Blossom Valley Road	Signal	AM	35.7	D	36.0	D	0.3	None
		PM	22.7	C	23.5	C	0.8	None
9. Lake Jennings Park Rd / I-8 WB Ramps	TWSC ^d	AM	16.6	C	17.9	C	1.3	None
		PM	25.0	D	27.1	D	2.1	None
10. Lake Jennings Park Rd / I-8 EB Off-Ramp / Olde Hwy 80	AWSC ^e	AM	32.5	D	34.0	D	1.5	None
		PM	57.6	F	57.8	F	0.2	None

Footnotes:

- a. Average delay expressed in seconds per vehicle.
- b. Level of Service.
- c. “Δ” denotes the project-induced increase in delay for signalized intersections and project traffic added to the critical movement for unsignalized intersections operating at LOS E or F only based on County and Caltrans criteria with the exception of unsignalized Caltrans intersection, intersection delay was used.
- d. TWSC – Two-Way Stop-Controlled intersection. Minor street delay reported.
- e. AWSC – All-Way Stop-Controlled intersection. Overall intersection delay reported.
- f. Project trips added to the critical movement not shown as intersection operates at LOS D or better.

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

General Notes:

1. **BOLD** typeface indicates a potentially significant impact.
2. DNE – does not exist.

TABLE 9-2
EXISTING + PROJECT STREET SEGMENT OPERATIONS

Street Segment	Functional Classification	Capacity (LOS E) ^a	Existing		Existing + Project			Impact Type
			ADT ^b	LOS ^c	ADT	LOS	Δ ^d	
SR 67								
North of Maplevue Street	2-lane Prime Arterial ^e	20,000	26,550	F	26,600	F	0.002	None
South of Maplevue Street	4-lane Expressway ^f	53,000	39,750	C	40,130	D	0.007	None
Maplevue Street/ Lake Jennings Park Road								
West of SR 67	2.1E Community Collector <i>no Median</i>	16,200	5,470	C	5,470	C	— ^g	None
SR 67 to Maine Avenue	4.1B Major Road <i>with Intermittent Turn Lanes</i>	34,200	24,710	C	25,130	C	— ^g	None
Maine Avenue to Vine Street	4.1B Major Road <i>with Intermittent Turn Lanes</i>	34,200	22,040	B	22,460	B	— ^g	None
Vine Street to Ashwood Street	4.1B Major Road <i>with Intermittent Turn Lanes</i>	34,200	23,750	C	24,170	C	— ^g	None
Ashwood Street to El Monte Road	4.1B Major Road <i>with Intermittent Turn Lanes</i>	34,200	10,540	A	10,960	A	— ^g	None
El Monte Road to Blossom Valley Road	3-lane Community Collector <i>with Intermittent Turn Lanes</i> ^h	23,500	13,060	C	13,480	C	— ^g	None
Blossom Valley Road to I-8	2.2C Light Collector <i>with Intermittent Turn Lanes</i>	19,000	21,000	F	21,420	F	420	Direct

TABLE 9-2
EXISTING + PROJECT STREET SEGMENT OPERATIONS

Street Segment	Functional Classification	Capacity (LOS E) ^a	Existing		Existing + Project			Impact Type
			ADT ^b	LOS ^c	ADT	LOS	Δ ^d	
El Monte Road								
East of Lake Jennings Park Road	2.3C Minor Collector <i>no Median</i>	8,000	2,500	B	3,320	B	— ^g	None

Footnotes:

- a. Capacities based on County of San Diego Roadway Classification Table.
- b. ADT - Average Daily Traffic Volumes.
- c. LOS - Level of Service.
- d. “Δ” denotes the project-induced increase in ADT or V/C based on County/Caltrans criteria.
- e. 2-lane Prime Arterial capacity of 20,000 interpolated from 6-lane Prime Arterial based on SANTEC roadway classifications.
- f. 4-lane Expressway capacity of 53,000 interpolated from 6-lane Expressway at 80,000 based on SANTEC roadway classifications.
- g. Project trips added to the street segment not shown as segment operates at LOS C or better.
- h. 3-lane Community Collector capacity of 23,500 interpolated between 4-lane Boulevard with intermittent turn lanes and 2-lane Community Collector with intermittent turn lanes based on County of San Diego roadway classifications.

General Notes:

1. **Bold** typeface indicates LOS E or worse.

9.2 Near-Term without Project

The Near-term without project represents Existing + Cumulative Projects condition. **Figure 9–1** shows the Near-Term without Project traffic volumes. The following section discussed the Near-Term without Project traffic operations.

9.2.1 Intersection Analysis

Table 9–3 summarizes the Existing + Project intersections level of service. As seen in *Table 9–3*, the following intersections are calculated to operate at LOS E or worse:

- Maplevue Street / SR 67 – LOS E during the AM and LOS F during the PM peak hour
- Maplevue Street / Maine Avenue – LOS F during the PM peak hour
- Maplevue Street / Ashwood Street – LOS F during the AM and LOS E during the PM peak hour
- Lake Jennings Park Road / El Monte Road / Julian Avenue – LOS E during the AM and PM peak hours
- Lake Jennings Park Road / Blossom Valley Road – LOS E during the AM peak hour
- Lake Jennings Park Road / I-8 WB Ramps – LOS F during the PM peak hour
- Lake Jennings Park Road / I-8 EB Off-Ramp / Olde Hwy 80 – LOS F during the AM and PM peak hours

Appendix F contains the Near-Term without Project intersection analysis worksheets.

9.2.2 Segment Operations

Table 9–4 summarizes the Existing + Project roadway segment level of service. As seen in *Table 9–4*, all street segments are calculated to operate at LOS D or better except for the following segments:

- SR 67 – North of Maplevue Street – LOS F
- Lake Jennings Park Road – between Blossom Valley Road and I-8 – LOS F

9.3 Near-Term with Project

The Near-term with project represents Existing + Cumulative Projects + Project condition. **Figure 9–2** shows the Near-Term with Project traffic volumes. The following section discussed the Near-Term with Project traffic operations.

9.3.1 Intersection Analysis

Table 9–3 summarizes the Near-Term + Project intersections level of service. As seen in *Table 9–3*, the following intersections are calculated to continue to operate at LOS E or worse:

- Maplevue Street / SR 67 – LOS E during the AM and LOS F during the PM peak hour
- Maplevue Street / Maine Avenue – LOS F during the PM peak hour
- Maplevue Street / Ashwood Street – LOS F during the AM and LOS E during the PM peak hour
- Lake Jennings Park Road / El Monte Road / Julian Avenue – LOS E during the AM and PM peak hours
- Lake Jennings Park Road / Blossom Valley Road – LOS E during the AM peak hour
- Lake Jennings Park Road / I-8 WB Ramps – LOS F during the PM peak hour
- Lake Jennings Park Road / I-8 EB Off-Ramp / Olde Hwy 80 – LOS F during the AM and PM peak hours

Based on the significance criteria, no intersection impacts are calculated at the following intersections since the project contribution does not exceed the allowable thresholds:

- Maplevue Street / SR 67 – LOS E during the AM and LOS F during the PM peak hour
- Maplevue Street / Maine Avenue – LOS F during the PM peak hour
- Maplevue Street / Ashwood Street – LOS F during the AM and LOS E during the PM peak hour
- Lake Jennings Park Road / Blossom Valley Road – LOS E during the AM peak hour
- Lake Jennings Park Road / I-8 EB Off-Ramp / Olde Hwy 80 – LOS F during the AM and PM peak hours

However, **significant cumulative impacts** are identified at the following intersections as the project traffic contribution exceeds the allowable thresholds:

- Lake Jennings Park Road / El Monte Road / Julian Avenue – LOS E during the AM and PM peak hours
- Lake Jennings Park Road / I-8 WB Ramps – LOS F during the PM peak hour

Mitigation measures for this impact are discussed in detail in *Section 10.0*

Appendix G contains the Near-Term with Project intersection analysis worksheets.

9.3.2 Segment Operations

Table 9-4 summarizes the Existing + Project + Cumulative Projects roadway segment level of service. As seen in Table 9-4, all the segments are calculated to continue to operate at LOS D or better except for the following segments:

- SR 67 – North of Maplevue Street – LOS F
- Lake Jennings Park Road – between Blossom Valley Road and I-8 – LOS F

Based on the significance criteria, no street segment impact is calculated on the following segment since the project contribution does not exceed the allowable threshold:

- SR 67 – North of Maplevue Street

However, a **significant cumulative impact** is identified on the following street segment as the project traffic contribution exceeds the allowable threshold:

- Lake Jennings Park Road – between Blossom Valley Road and I-8

Mitigation measures for this impact are discussed in detail in Section 10.0.

TABLE 9-3
NEAR-TERM INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Near-Term without Project		Near-Term with Project			Impact Type
			Delay ^a	LOS ^b	Delay	LOS	Δ ^c	
1. Mapleview St / SR 67	Signal	AM	55.4	E	55.6	E	0.2	None
		PM	197.7	F	197.8	F	0.1	None
2. Mapleview St / Maine Ave	Signal	AM	48.4	D	51.8	D	3.4	None
		PM	136.4	F	136.5	F	0.1	None
3. Mapleview St / Vine Street	TWSC ^d	AM	12.2	B	12.4	B	— ^f	None
		PM	16.1	C	16.4	C	— ^f	None
4. Mapleview St / Ashwood St	Signal	AM	83.9	F	84.5	F	0.6	None
		PM	55.9	E	56.0	E	0.1	None
5. Lake Jennings Park Rd / El Monte Rd / Julian Ave	AWSC ^e	AM	35.5	E	36.8	E	30	Cumulative
		PM	42.3	E	45.6	E	30	Cumulative
6. El Monte Rd / Project Driveway #1	TWSC ^d	AM	DNE	—	11.5	B	— ^f	None
		PM	DNE	—	11.5	B	— ^f	None
7. El Monte Rd / Project Driveway #2	TWSC ^d	AM	DNE	—	10.6	B	— ^f	None
		PM	DNE	—	0.1	B	— ^f	None
8. Lake Jennings Park Rd / Blossom Valley Road	Signal	AM	62.4	E	62.7	E	0.3	None
		PM	34.0	C	37.2	D	3.2	None
9. Lake Jennings Park Rd / I-8 WB Ramps	TWSC ^d	AM	21.5	C	23.6	C	2.1	None
		PM	67.6	F	78.2	F	10.6	Cumulative
10. Lake Jennings Park Rd / I-8 EB Off-Ramp / Olde Hwy 80	AWSC ^e	AM	50.5	F	51.0	F	0.5	None
		PM	70.0	F	70.1	F	0.1	None

Footnotes:

- a. Average delay expressed in seconds per vehicle.
- b. Level of Service.
- c. “Δ” denotes the project-induced increase in delay for signalized intersections and project traffic added to the critical movement for unsignalized intersections operating at LOS E or F only based on County and Caltrans criteria with the exception of unsignalized Caltrans intersection, intersection delay was used.
- d. TWSC – Two-Way Stop-Controlled intersection. Minor street delay reported.
- e. AWSC – All-Way Stop-Controlled intersection. Overall intersection delay reported.
- f. Project trips added to the critical movement not shown as intersection operates at LOS C or better.

General Notes:

1. **BOLD** typeface indicates a potentially significant impact.
2. DNE – does not exist.

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

TABLE 9-4
NEAR-TERM STREET SEGMENT OPERATIONS

Street Segment	Functional Classification	Capacity (LOS E) ^a	Near-Term without Project		Near-Term with Project			Impact Type
			ADT ^b	LOS ^c	ADT	LOS	Δ ^d	
SR 67								
North of Maplevue Street	2-lane Prime Arterial ^e	20,000	29,980	F	30,030	F	0.003	None
South of Maplevue Street	4-lane Expressway ^f	53,000	43,560	D	43,940	D	0.007	None
Maplevue Street/ Lake Jennings Park Road								
West of SR 67	2.1E Community Collector <i>no Median</i>	16,200	5,480	C	5,480	C	— ^g	None
SR 67 to Maine Avenue	4.1B Major Road <i>with Intermittent Turn Lanes</i>	34,200	25,810	C	26,230	C	— ^g	None
Maine Avenue to Vine Street	4.1B Major Road <i>with Intermittent Turn Lanes</i>	34,200	22,950	C	23,370	C	— ^g	None
Vine Street to Ashwood Street	4.1B Major Road <i>with Intermittent Turn Lanes</i>	34,200	24,660	C	25,080	C	— ^g	None
Ashwood Street to El Monte Road	4.1B Major Road <i>with Intermittent Turn Lanes</i>	34,200	12,010	A	12,430	A	— ^g	None
El Monte Road to Blossom Valley Road	3-lane Community Collector <i>with Intermittent Turn Lanes</i> ^h	23,500	15,190	C	15,610	C	— ^g	None
Blossom Valley Road to I-8	2.2C Light Collector <i>with Intermittent Turn Lanes</i>	19,000	25,090	F	25,510	F	420	Cumulative

TABLE 9-4
NEAR-TERM STREET SEGMENT OPERATIONS

Street Segment	Functional Classification	Capacity (LOS E) ^a	Near-Term without Project		Near-Term with Project			Impact Type
			ADT ^b	LOS ^c	ADT	LOS	Δ ^d	
El Monte Road								
East of Lake Jennings Park Road	2.3C Minor Collector <i>no Median</i>	8,000	2,510	B	3,700	B	— ^g	None

Footnotes:

- a. Capacities based on County of San Diego Roadway Classification Table.
- b. ADT - Average Daily Traffic Volumes.
- c. LOS - Level of Service.
- d. “ Δ ” denotes the project-induced increase in ADT or V/C based on County/Caltrans criteria.
- e. 2-lane Prime Arterial capacity of 20,000 interpolated from 6-lane Prime Arterial based on SANTEC roadway classifications.
- f. 4-lane Expressway capacity of 53,000 interpolated from 6-lane Expressway at 80,000 based on SANTEC roadway classifications.
- g. Project trips added to the street segment not shown as segment operates at LOS C or better.
- h. 3-lane Community Collector capacity of 23,500 interpolated between 4-lane Boulevard with intermittent turn lanes and 2-lane Community Collector with intermittent turn lanes based on County of San Diego roadway classifications.

General Notes:

1. **Bold** typeface indicates LOS E or worse.

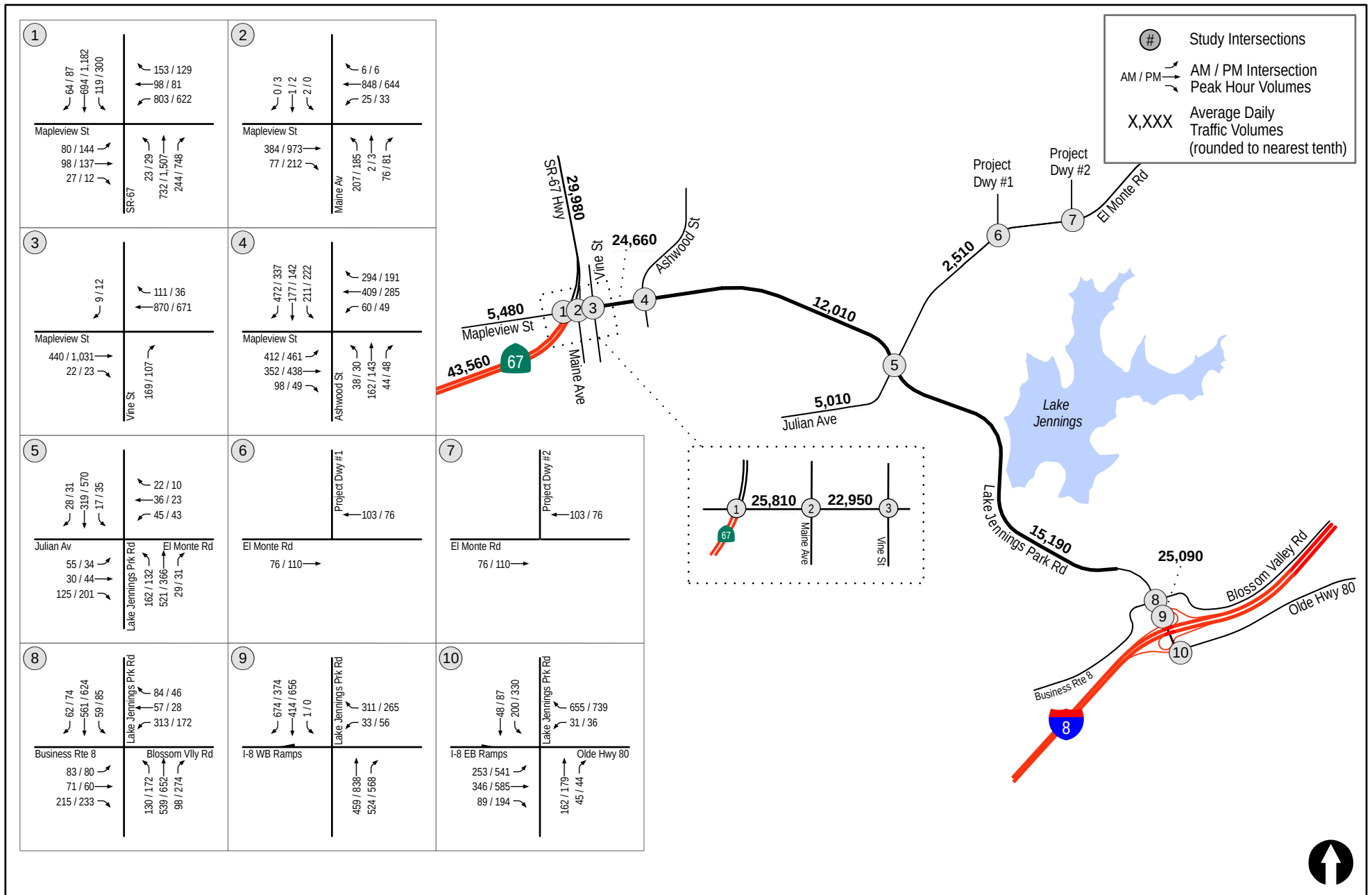


Figure 9-1
Near-Term without Project Traffic Volumes

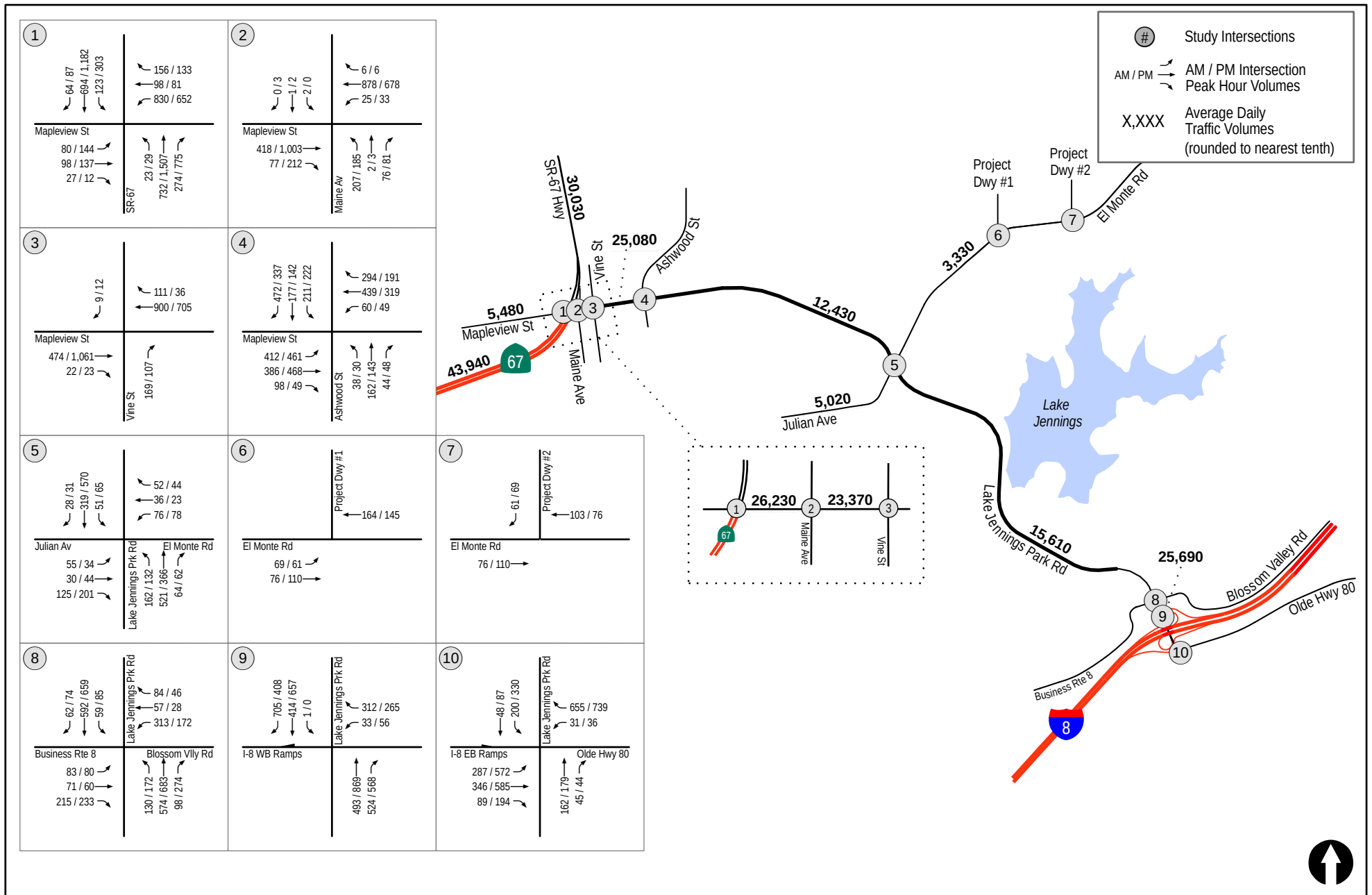


Figure 9-2
Near-Term with Project Traffic Volumes

10.0 SIGNIFICANCE OF IMPACTS AND MITIGATION MEASURES

Per the significance thresholds and the analysis methodology presented in this report, project-related traffic is calculated to cause significant impacts within the study area. The following section identifies the significance of impacts and recommended mitigation measures to address operating deficiencies. A feasible mitigation measure will need to be identified to return the impact within the thresholds (pre-project + allowable increase) or the impact will be considered significant and unmitigated. These improvements, if implemented, would improve efficiency of traffic flow and return intersection operations to below a level of significance.

10.1 Significance of Impacts

10.1.1 *Direct Impacts*

Under the Existing + Project conditions, project related traffic would result in significant direct impacts within the study area as summarized below in **Table 10-1**.

TABLE 10-1
DIRECT IMPACTS

Facility Type	Location
Intersections	• Lake Jennings Park Rd / El Monte Rd/ Julian Ave
Street Segments	• Lake Jennings Park Road – between Blossom Valley Road and I-8

10.1.2 *Cumulative Impacts*

Under Near-Term + Project conditions, project related traffic would result in significant cumulative impacts within the study area as summarized below in **Table 10-2**.

TABLE 10-2
CUMULATIVE IMPACTS

Facility Type	Location
Intersections	• Lake Jennings Park Rd / El Monte Rd/ Julian Ave • Lake Jennings Park Rd / I-8 WB Ramps
Street Segments	• Lake Jennings Park Road – between Blossom Valley Road and I-8

10.2 Mitigation Measures

10.2.1 *Direct Impacts*

Intersections

Under Existing + Project conditions, the project is calculated to have significant direct impact at one (1) intersection. The following summarizes the recommended mitigation measure:

- **Lake Jennings Park Rd / El Monte Rd / Julian Ave** – Installation of a traffic signal and restriping the intersection on the eastbound and westbound approaches to include permissive signal phasing with shared left-thru and dedicated right-turn lanes will mitigate the direct impact at this intersection. In addition, it is also recommended to reduce curb return radii for right-turn movements to improve pedestrian and bicycle mobility. To promote bicycle mobility, Class II bike lanes were proposed on El Monte Road/ Julian Avenue at this intersection. **Table 10–3** presents this analysis at this intersection. The intersection calculation sheets and signal warrant analysis sheet are contained in **Appendix H**.

A conceptual design of Lake Jennings Park Road/ El Monte Road/ Julian Avenue intersection is included in **Appendix I**. Truck turning templates were also conducted for the existing and proposed intersection geometries. As shown in the conceptual figures in **Appendix I**, the existing intersection geometry does not allow acceptable truck turning maneuvers. However, adequate truck turning maneuvers are afforded with the proposed improvements.

Street Segments

Under Existing + Project conditions, the proposed project would result in a significant direct impact on one (1) street segment, as follows:

- **Lake Jennings Park Road – between Blossom Valley Road and I-8** – To mitigate the direct impact, the project proposes to restripe Lake Jennings Park Road between Blossom Valley Road and I-8 WB off-ramp to include two (2) SB travel lanes. With a 3-lane Collector, the project’s direct impact will be reduced to below a level of significance as shown in **Table 10–4**.

10.2.2 Cumulative Impacts

Intersections

Under Near-Term with project condition, the proposed project would result in a significant cumulative impact at two (2) intersections. The following summarizes the recommended mitigation measures:

- **Lake Jennings Park Rd / El Monte Rd / Julian Ave** – The direct impact mitigation that includes the installation of a traffic signal and restriping the intersection will reduce the cumulative impact to below a level of significance. In addition, the project should pay the appropriate TIF amount towards the County TIF program. **Table 10–4** presents this analysis at this intersection.
- **Lake Jennings Park Rd / I-8 WB Ramps** – Payment of a County of San Diego traffic impact fee (TIF) will mitigate the cumulative impact at this intersection. Based on the *County of San Diego TIF Transportation Needs Assessment Report (September 2012)*,

this intersection has been included in the list of TIF eligible interchange improvements. **Appendix J** includes the excerpts from this report.

LLG also coordinated with Caltrans regarding planned improvements to the I-8 / Lake Jennings Park Road interchange. At this time, Caltrans is currently reviewing proposed improvements at this interchange which would include restriping the undercrossing to 4 lanes with Class II bike lanes, traffic signals or roundabouts at the ramp intersections. These improvements are currently being reviewed. However, a final design has not been selected or approved at this time. **Appendix K** contains the Caltrans conceptual drawing of the proposed improvements on the Lake Jennings Park Road/ I-8 WB ramps interchange.

Street Segments

Based on the significance criteria, the proposed project would result in a significant cumulative impact to one (1) study area street segment, as follows:

- **Lake Jennings Park Road – between Blossom Valley Road and I-8** – The direct impact mitigation that includes restriping of Lake Jennings Park Road to 3-lanes between Blossom Valley Road and I-8 WB off-ramp will increase roadway capacity and mitigate the cumulative impact to below a level of significance. In addition, the project should pay the appropriate TIF amount towards the County TIF program.

TABLE 10–3
DIRECT IMPACT INTERSECTION MITIGATION ANALYSIS

Intersection	Control	Peak Hour	Existing		Existing + Project		Existing + Project with Mitigation			Mitigation
			Delay ^a	LOS ^b	Delay	LOS	Delay	LOS	Δ ^c	
5. Lake Jennings Park Rd/ El Monte Rd/ Julian Ave	AWSC	AM	34.2	D	35.1	E	13.2	B	(21.9)	Install a traffic signal and restripe the eastbound and westbound approaches to include permissive signal phasing with shared left-thru and dedicated right-turn lanes. Reduce curb return radii for right-turn movements to improve pedestrian and bicycle mobility.
		PM	22.9	C	32.5	D	12.1	B	20.4	

Footnotes:

- a. Average delay expressed in seconds per vehicle.
- b. Level of Service.
- c. Δ denotes an increase or (decrease) in delay due to project mitigation.

General Notes

1. AWSC – All-Way Stop controlled intersection.

TABLE 10-4
DIRECT IMPACT STREET SEGMENT MITIGATION ANALYSIS

Roadway Segment	Classification	Capacity ^a	Existing		Existing + Project		Mitigation Classification	Mitigation Capacity	Existing + Project with Mitigation		Mitigation	Mitigated to below a level of significance?
			ADT ^b	LOS ^c	ADT	LOS			ADT	LOS		
Lake Jennings Park Road Blossom Valley Road and I-8	2.2 Local Collector <i>with Intermittent Turn Lanes</i>	19,000	21,000	F	21,420	F	3-Lane Light Collector <i>with Intermittent Turn Lanes</i>	23,500 ^d	21,420	E	Restripe Lake Jennings Park Road between Blossom Valley Road and I-8 WB off-ramp to include two (2) SB travel lanes.	Yes

Footnotes:

- a. Capacity based on County of San Diego Roadway Capacity Table.
- b. Average Daily Traffic.
- c. Level of Service.
- d. 3-lane Collector capacity of 23,500 interpolated between 4-lane Boulevard with intermittent turn lanes and 2-lane Community Collector with intermittent turn lanes based on County of San Diego roadway classifications.

TABLE 10-5
CUMULATIVE IMPACT INTERSECTION MITIGATION ANALYSIS

Intersection	Control Type	Peak Hour	Near-Term		Near-Term + Project		Near-Term + Project with Mitigation			Mitigation
			Delay ^a	LOS ^b	Delay	LOS	Delay	LOS	Δ^c	
5. Lake Jennings Park Rd/ El Monte Rd/ Julian Ave	AWSC	AM	35.5	E	36.8	E	13.7	B	(23.1)	Direct impact mitigation of installing a traffic signal and restriping the eastbound and westbound approaches to include permissive signal phasing with shared left-thru and dedicated right-turn lanes. Reduce curb return radii for right-turn movements to improve pedestrian and bicycle mobility. Project should pay the appropriate TIF amount towards the County TIF program.
		PM	42.3	E	45.6	E	12.6	B	3.0)	

Footnotes:

- a. Average delay expressed in seconds per vehicle.
- b. Level of Service.
- c. Δ denotes an increase or (decrease) in delay due to project mitigation.

General Notes

1. AWSC – All-Way Stop controlled intersection.

10.3 Truck Turning Templates

Per the request of Caltrans, truck turning templates were also conducted at the existing Maplevue Street / SR 67 and Lake Jennings Park Road / I-8 ramp intersections. **Appendix L** includes the truck turning template drawings.

As shown in the figures, adequate truck turning maneuvers are afforded at the Maplevue Street / SR 67 and Lake Jennings Park Road / I-8 WB ramp intersections. However, at the Lake Jennings Park Road / I-8 EB Off-Ramp / Olde Hwy 80 intersection, a conflict was identified for EB left-turning trucks with the raised island on the westbound approach. Therefore, to eliminate the conflict and to provide adequate truck maneuverability, the limit line and stop legend on southbound Lake Jennings Park Road is recommended to be shifted to the north by approximately 6'. Given that this conflict is identified under existing conditions and not triggered by the project, it is recommended that Caltrans implement this design improvement.

11.0 REFERENCES AND LIST OF PREPARERS AND ORGANIZATIONS CONTACTED

11.1 References

The following references were utilized in preparing this Traffic Impact Study.

1. County of San Diego Guidelines for Determining Significance—Transportation and Traffic, dated August 24, 2011
2. SANTEC/ITE Guidelines for Traffic Impact Studies (TIS) in the San Diego Region, dated March 2, 2000
3. County of San Diego Public Road Standards, March 2012
4. County of San Diego General Plan – Lakeside Mobility Element Network
5. Highway Capacity Manual (HCM) 2010

11.2 List of Preparers

1. John Boarman, P.E., Principal—Linscott, Law & Greenspan, Engineers
2. Shankar Ramakrishnan, P.E., Senior Transportation Engineer—Linscott, Law & Greenspan, Engineers
3. Renald Espiritu, Transportation Engineer I—Linscott, Law & Greenspan, Engineers

11.3 Organizations Contacted

1. County of San Diego, Department of Public Works Transportation Division
2. Caltrans District 11

TECHNICAL APPENDICES
EL MONTE SAND MINING PROJECT
County of San Diego, California
May 4, 2016

LLG Ref. 3-15-2448

APPENDICES

APPENDIX

- A. Intersection and Segment Manual Count Sheets
- B. Intersection Methodology and Analysis Sheets
- C. County of San Diego Roadway Classification Table, SANTEC Roadway Classification Table and HCM PCE factors
- D. Existing intersection calculation sheets
- E. Existing + Project intersection calculation sheets
- F. Near-Term without Project intersection calculation sheets
- G. Near-Term with Project intersection calculation sheets
- H. Post mitigation intersection analysis calculation sheets and signal warrant analysis sheet
- I. Conceptual intersection design and truck turning templates
- J. County of San Diego TIF Transportation Needs Assessment Report (September 2012 Excerpts)
- K. Caltrans proposed improvements
- L. Truck turning templates

APPENDIX A

INTERSECTION AND SEGMENT MANUAL COUNT SHEETS

Turn Count Summary

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



Location: Mapleview Street @ SR 67

Date of Count: Tuesday, March 17, 2015

Analysts: LV/CD

Weather: Sunny

AVC Proj No: 15-0329



Vehicular Count

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



Location: Mapleview Street @ SR 67

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
7:00 AM	13	113	28	10	18	227	49	25	38	2	26	20	569
7:15 AM	19	151	31	6	30	196	10	1	24	2	31	22	523
7:30 AM	20	107	30	7	16	111	42	14	22	10	29	27	435
7:45 AM	16	139	29	12	15	217	44	26	7	7	28	16	556
8:00 AM	15	161	48	41	29	226	3	148	9	9	52	39	780
8:15 AM	13	93	25	49	18	177	54	167	7	13	23	14	653
8:30 AM	20	142	14	17	20	188	85	190	2	2	6	10	696
8:45 AM	16	139	18	25	25	134	72	128	5	3	17	17	599
Total	132	1,045	223	167	171	1,476	359	699	114	48	212	165	4,811

AM Intersection Peak Hour : **8:00 AM - 9:00 AM**

Intersection PHF : **0.87**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	64	535	105	132	92	725	214	633	23	27	98	80	2,728
PHF	0.80	0.83	0.55	0.67	0.79	0.80	0.63	0.83	0.64	0.52	0.47	0.51	0.87
Movement PHF		0.79			0.80			0.79			0.51		0.87

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
4:00 PM	23	295	67	22	15	170	161	359	12	4	34	41	1,203
4:15 PM	19	258	47	31	24	125	207	344	4	7	35	45	1,146
4:30 PM	22	310	81	26	16	172	148	357	7	0	31	31	1,201
4:45 PM	23	206	85	29	24	103	194	255	6	1	36	27	989
5:00 PM	32	271	44	22	28	150	199	356	3	6	30	23	1,164
5:15 PM	25	270	46	11	15	179	208	272	3	2	32	28	1,091
5:30 PM	35	253	61	16	33	161	168	164	4	4	29	13	941
5:45 PM	25	205	49	17	11	124	196	228	5	0	34	11	905
Total	204	2068	480	174	166	1,184	1,481	2,335	44	24	261	219	8,640

PM Intersection Peak Hour : **4:00 PM - 5:00 PM**

Intersection PHF : **0.94**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	87	1069	280	108	79	570	710	1315	29	12	136	144	4539
PHF	0.95	0.862	0.824	0.871	0.823	0.828	0.857	0.916	0.604	0.429	0.944	0.8	0.94
Movement PHF		0.87			0.88			0.93			0.84		0.94



Location: Mapleview Street @ Maine Avenue

Date of Count: Tuesday, March 17, 2015

Analysts: LV/CD

Weather: Sunny

AVC Proj No: 15-0329



Vehicular Count

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



Location: Maplevue Street @ Maine Avenue

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
7:00 AM	0	0	1	0	220	11	22	1	35	17	86	0	393
7:15 AM	1	1	0	5	192	10	24	0	39	15	57	0	344
7:30 AM	1	0	1	4	99	5	31	0	34	21	79	1	276
7:45 AM	0	0	0	0	204	7	26	0	40	16	84	1	378
8:00 AM	0	0	1	3	236	7	14	0	60	22	81	0	424
8:15 AM	0	1	1	1	179	5	20	2	65	16	86	0	376
8:30 AM	0	0	0	2	186	6	16	0	39	11	94	0	354
8:45 AM	0	1	1	2	138	7	7	3	46	9	98	0	312
Total	2	3	5	17	1,454	58	160	6	358	127	665	2	2,857

AM Intersection Peak Hour : **7:45 AM - 8:45 AM**

Intersection PHF : **0.90**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	1	2	6	805	25	76	2	204	65	345	1	1,532
PHF	#####	0.25	0.50	0.50	0.85	0.89	0.73	0.25	0.78	0.74	0.92	0.25	0.90
Movement PHF		0.38			0.85			0.81			0.98		0.90

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
4:00 PM	0	0	0	2	172	9	17	3	35	54	208	0	500
4:15 PM	2	1	0	2	139	10	20	1	39	54	235	0	503
4:30 PM	0	0	0	1	166	9	27	0	48	46	214	0	511
4:45 PM	0	0	0	2	109	9	18	0	47	45	269	1	500
5:00 PM	1	2	0	2	167	9	19	1	32	66	207	0	506
5:15 PM	2	0	0	1	161	6	17	2	42	54	232	0	517
5:30 PM	1	2	0	3	152	16	12	0	57	49	208	1	501
5:45 PM	1	2	2	2	131	4	12	0	20	42	237	0	453
Total	7	7	2	15	1,197	72	142	7	320	410	1,810	2	3,991

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

Intersection PHF : **0.98**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	3	2	0	6	603	33	81	3	169	211	922	1	2034
PHF	0.38	0.25	#####	0.75	0.903	0.917	0.75	0.375	0.88	0.799	0.857	0.25	0.98
Movement PHF		0.42			0.90			0.84			0.90		0.98

Turn Count Summary

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



Location: Mapleview Street @ Vine Street

Date of Count: Tuesday, March 17, 2015

Analysts: LV/CD

Weather: Sunny

AVC Proj No: 15-0329



Location: Mapleview Street @ Vine Street

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
7:00 AM	8	0	0	58	223	0	29	0	0	9	100	0	427
7:15 AM	16	0	0	50	191	0	22	0	0	7	74	0	360
7:30 AM	5	0	0	15	103	0	56	0	0	10	101	0	290
7:45 AM	4	0	0	30	207	0	65	0	0	5	105	0	416
8:00 AM	3	0	0	31	243	0	64	0	0	5	91	0	437
8:15 AM	2	0	0	28	183	0	23	0	0	7	100	0	343
8:30 AM	0	0	0	22	194	0	17	0	0	5	105	0	343
8:45 AM	3	0	0	23	144	0	12	0	0	7	99	0	288
Total	41	0	0	257	1,488	0	288	0	0	55	775	0	2,904

AM Intersection Peak Hour : **7:45 AM - 8:45 AM**

Intersection PHF : **0.88**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	9	0	0	111	827	0	169	0	0	22	401	0	1,539
PHF	0.56	#####	#####	0.90	0.85	#####	0.65	#####	#####	0.79	0.95	#####	0.88
Movement PHF		0.56			0.86			0.65			0.96		0.88

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
4:00 PM	6	0	0	17	177	0	22	0	0	11	214	0	447
4:15 PM	11	0	0	12	140	0	30	0	0	6	249	0	448
4:30 PM	4	0	0	7	172	0	25	0	0	4	237	0	449
4:45 PM	1	0	0	6	119	0	21	0	0	6	281	0	434
5:00 PM	4	0	0	8	174	0	34	0	0	6	220	0	446
5:15 PM	3	0	0	15	165	0	27	0	0	7	242	0	459
5:30 PM	6	0	0	12	165	0	25	0	0	11	209	0	428
5:45 PM	5	0	0	7	132	0	19	0	0	4	247	0	414
Total	40	0	0	84	1,244	0	203	0	0	55	1,899	0	3,525

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

Intersection PHF : **0.97**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	12	0	0	36	630	0	107	0	0	23	980	0	1788
PHF	0.75	#####	#####	0.6	0.905	#####	0.787	#####	#####	0.821	0.872	#####	0.97
Movement PHF		0.75			0.91			0.79			0.87		0.97

Turn Count Summary

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



Location: Mapleview Street @ Ashwood Street

Date of Count: Tuesday, March 17, 2015

Analysts: LV/CD

Weather: Sunny

AVC Proj No: 15-0329



Location: Mapleview Street @ Ashwood Street

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
7:00 AM	146	48	41	100	112	14	4	41	9	33	64	90	702
7:15 AM	119	47	61	79	107	14	8	45	14	27	49	93	663
7:30 AM	121	39	48	72	90	13	14	45	7	21	107	123	700
7:45 AM	82	43	53	39	65	18	15	31	5	16	109	98	574
8:00 AM	78	30	53	51	73	17	13	35	11	7	111	122	601
8:15 AM	81	37	54	42	80	12	10	26	4	19	110	84	559
8:30 AM	66	30	46	41	48	7	7	33	8	14	69	77	446
8:45 AM	82	18	22	25	82	5	4	15	10	8	50	59	380
Total	775	292	378	449	657	100	75	271	68	145	669	746	4,625

AM Intersection Peak Hour : **7:00 AM - 8:00 AM**

Intersection PHF : **0.94**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	468	177	203	290	374	59	41	162	35	97	329	404	2,639
PHF	0.80	0.92	0.83	0.73	0.83	0.82	0.68	0.90	0.63	0.73	0.75	0.82	0.94
Movement PHF		0.90			0.80			0.89			0.83		0.94

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
4:00 PM	87	30	34	35	73	11	11	26	4	12	96	98	517
4:15 PM	81	46	55	45	74	12	15	31	6	15	100	95	575
4:30 PM	89	33	52	48	61	13	8	39	6	13	102	133	597
4:45 PM	72	30	60	46	76	7	15	37	10	5	92	111	561
5:00 PM	78	46	55	40	60	12	15	32	6	14	99	80	537
5:15 PM	88	33	51	47	59	13	8	35	6	13	102	133	588
5:30 PM	88	39	60	47	69	9	10	42	6	10	79	95	554
5:45 PM	70	28	54	26	60	16	12	19	4	10	126	109	534
Total	653	285	421	334	532	93	94	261	48	92	796	854	4,463

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

Intersection PHF : **0.96**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	327	142	218	181	256	45	46	143	28	45	395	457	2283
PHF	0.92	0.772	0.908	0.943	0.842	0.865	0.767	0.917	0.7	0.804	0.968	0.859	0.96
Movement PHF		0.96			0.93			0.88			0.90		0.96

Turn Count Summary

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



Location: Lake Jennings Park Road @ El Monte Road

Date of Count: Tuesday, March 17, 2015

Analysts: LV/CD

Weather: Sunny

AVC Proj No: 15-0329



Location: Lake Jennings Park Road @ El Monte Road

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
7:00 AM	8	6	11	6	103	29	28	5	9	4	46	4	259
7:15 AM	8	8	11	4	112	49	32	5	11	7	62	2	311
7:30 AM	9	16	14	6	129	14	32	10	14	4	76	4	328
7:45 AM	5	7	8	11	132	42	24	11	15	7	71	5	338
8:00 AM	0	5	12	8	90	38	25	4	8	6	60	6	262
8:15 AM	0	7	7	12	73	19	38	5	10	12	72	3	258
8:30 AM	0	8	12	2	79	25	30	3	5	3	63	2	232
8:45 AM	0	4	9	9	67	22	30	6	6	4	44	4	205
Total	30	61	84	58	785	238	239	49	78	47	494	30	2,193

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

Intersection PHF : **0.92**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	22	36	45	29	463	143	113	30	48	24	269	17	1,239
PHF	0.61	0.56	0.80	0.66	0.88	0.73	0.88	0.68	0.80	0.86	0.88	0.71	0.92
Movement PHF		0.66			0.86			0.85			0.92		0.92

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
4:00 PM	5	7	7	6	76	15	38	6	9	7	100	4	280
4:15 PM	0	1	10	10	91	29	38	8	11	8	96	6	308
4:30 PM	0	2	10	6	85	28	27	7	6	7	124	11	313
4:45 PM	3	7	8	7	77	24	49	9	8	6	128	10	336
5:00 PM	5	4	16	9	61	33	55	19	10	7	123	7	349
5:15 PM	2	10	8	9	80	32	45	9	8	8	119	7	337
5:30 PM	7	3	15	7	82	27	36	9	5	9	106	5	311
5:45 PM	3	4	15	10	67	34	43	8	7	15	97	6	309
Total	25	38	89	64	619	222	331	75	64	67	893	56	2,543

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

Intersection PHF : **0.96**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	10	23	42	31	303	117	176	44	32	28	494	35	1335
PHF	0.50	0.575	0.656	0.861	0.891	0.886	0.8	0.579	0.8	0.875	0.965	0.795	0.96
Movement PHF		0.75			0.93			0.75			0.97		0.96

Turn Count Summary

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



Location: Blossom Valley Road @ Lake Jennings Park Road

Date of Count: Tuesday, March 17, 2015

Analysts: LV/CD

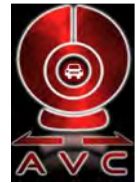
Weather: Sunny

AVC Proj No: 15-0329



Vehicular Count

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



Location: Blossom Valley Road @ Lake Jennings Park Road

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
7:00 AM	10	102	4	7	5	49	15	98	27	52	1	12	382
7:15 AM	15	137	7	14	7	57	10	120	19	45	13	19	463
7:30 AM	13	127	15	12	11	58	16	127	35	62	26	31	533
7:45 AM	18	125	15	19	10	56	15	116	23	51	23	16	487
8:00 AM	13	93	13	21	25	67	22	124	34	37	8	16	473
8:15 AM	33	115	7	11	16	50	13	86	33	47	12	15	438
8:30 AM	15	129	6	8	5	46	12	100	37	56	8	17	439
8:45 AM	13	109	9	9	7	44	18	95	47	56	11	11	429
Total	130	937	76	101	86	427	121	866	255	406	102	137	3,644

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

Intersection PHF : **0.92**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	59	482	50	66	53	238	63	487	111	195	70	82	1,956
PHF	0.82	0.88	0.83	0.79	0.53	0.89	0.72	0.96	0.79	0.79	0.67	0.66	0.92
Movement PHF		0.93			0.79			0.92			0.73		0.92

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
4:00 PM	15	162	8	13	6	36	51	98	26	42	14	15	486
4:15 PM	19	135	12	12	9	24	45	185	43	55	12	25	576
4:30 PM	16	151	19	10	10	25	39	162	29	36	5	17	519
4:45 PM	21	115	15	3	1	31	43	69	36	63	20	21	438
5:00 PM	17	153	17	10	6	37	46	139	34	47	19	15	540
5:15 PM	18	144	11	10	13	34	35	148	39	52	9	12	525
5:30 PM	15	123	7	7	9	36	42	110	33	55	8	11	456
5:45 PM	15	146	21	9	6	19	44	82	45	40	9	7	443
Total	136	1129	110	74	60	242	345	993	285	390	96	123	3,983

PM Intersection Peak Hour : **4:15 PM - 5:15 PM**

Intersection PHF : **0.90**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	73	554	63	35	26	117	173	555	142	201	56	78	2073
PHF	0.87	0.905	0.829	0.729	0.65	0.791	0.94	0.75	0.826	0.798	0.7	0.78	0.90
Movement PHF		0.92			0.84			0.80			0.81		0.90

Turn Count Summary

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



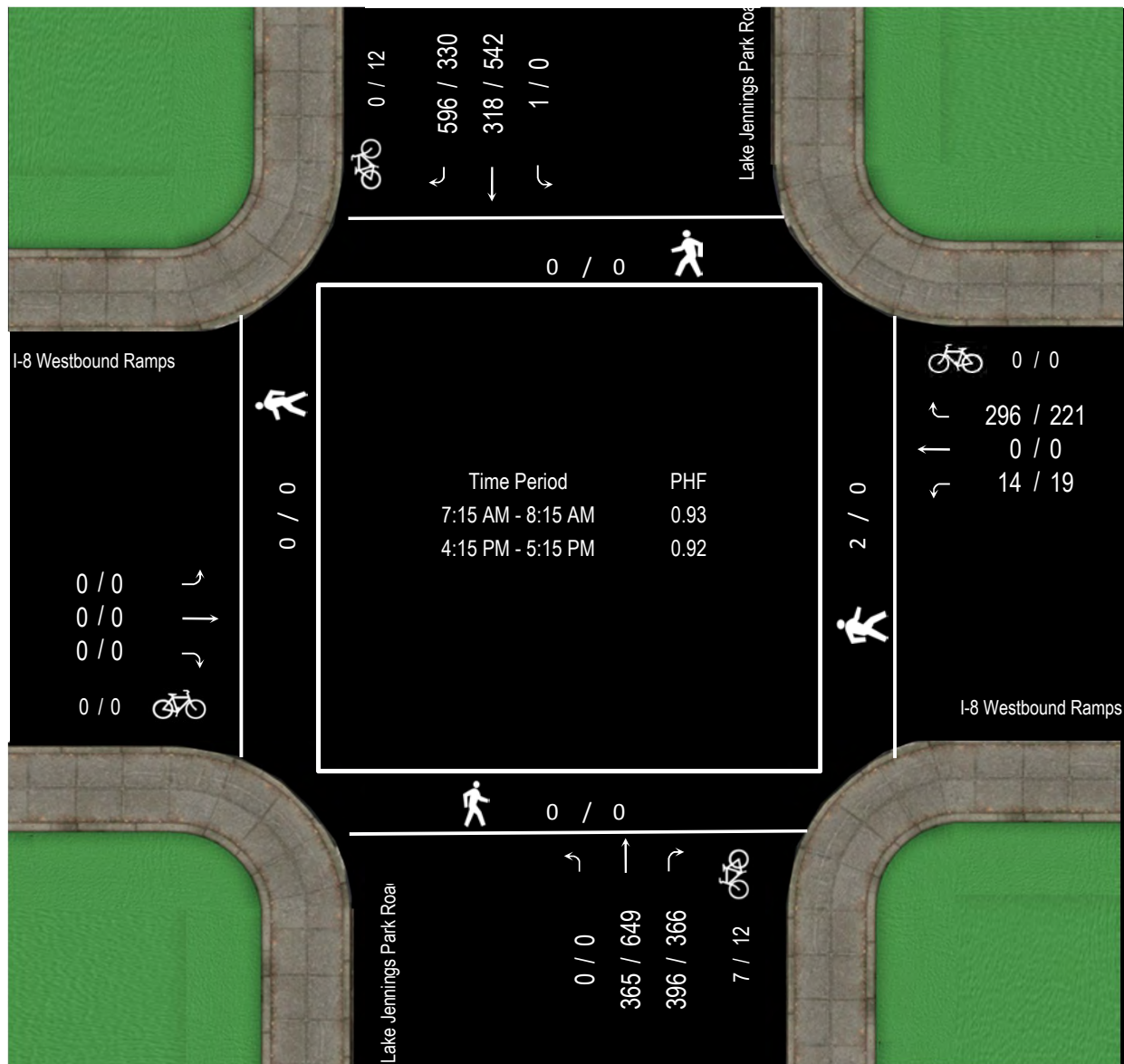
Location: I-8 Westbound Ramps @ Lake Jennings Park Road

Date of Count: Tuesday, March 17, 2015

Analysts: LV/CD

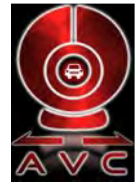
Weather: Sunny

AVC Proj No: 15-0329



Vehicular Count

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



Location: I-8 Westbound Ramps @ Lake Jennings Park Road

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
7:00 AM	142	61	0	59	0	1	119	81	0	0	0	0	463
7:15 AM	162	77	0	67	0	4	87	82	0	0	0	0	479
7:30 AM	174	72	1	81	0	3	105	97	0	0	0	0	533
7:45 AM	138	94	0	69	0	2	109	85	0	0	0	0	497
8:00 AM	122	75	0	79	0	5	95	101	0	0	0	0	477
8:15 AM	129	83	0	52	0	9	92	80	0	0	0	0	445
8:30 AM	119	112	0	54	0	8	83	95	0	0	0	0	471
8:45 AM	119	90	0	59	0	11	90	101	0	0	0	0	470
Total	1,105	664	1	520	0	43	780	722	0	0	0	0	3,835

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

Intersection PHF : **0.93**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	596	318	1	296	0	14	396	365	0	0	0	0	1,986
PHF	0.86	0.85	0.25	0.91	#####	0.70	0.91	0.90	#####	#####	#####	#####	0.93
Movement PHF		0.93			0.92			0.94		#DIV/0!			0.93

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
4:00 PM	93	147	0	40	0	12	95	135	0	0	0	0	522
4:15 PM	78	136	0	76	0	4	86	197	0	0	0	0	577
4:30 PM	89	123	0	65	0	5	101	165	0	0	0	0	548
4:45 PM	86	123	0	18	0	2	83	130	0	0	0	0	442
5:00 PM	77	160	0	62	0	8	96	157	0	0	0	0	560
5:15 PM	63	167	0	56	0	4	78	166	0	0	0	0	534
5:30 PM	87	127	0	44	0	10	67	141	0	0	0	0	476
5:45 PM	65	140	0	46	0	3	59	125	0	0	0	0	438
Total	638	1123	0	407	0	48	665	1,216	0	0	0	0	4,097

PM Intersection Peak Hour : **4:15 PM - 5:15 PM**

Intersection PHF : **0.92**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	330	542	0	221	0	19	366	649	0	0	0	0	2127
PHF	0.93	0.847	#####	0.727	#####	0.594	0.906	0.824	#####	#####	#####	#####	0.92
Movement PHF		0.92			0.75			0.90		#DIV/0!			0.92

Turn Count Summary

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



Location: I-8 Eastbound Off-Ramps @ Lake Jennings Park Road

Date of Count: Tuesday, March 17, 2015

Analysts: LV/CD

Weather: Sunny

AVC Proj No: 15-0329



Location: I-8 Eastbound Off-Ramps @ Lake Jennings Park Road

AM Period (7:00 AM - 9:00 AM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
7:00 AM	0	2	32	141	0	1	2	15	0	3	47	52	295
7:15 AM	0	2	34	120	0	3	4	19	0	1	61	38	282
7:30 AM	0	2	26	146	0	6	13	19	0	2	75	45	334
7:45 AM	0	4	38	151	0	4	8	7	0	4	88	42	346
8:00 AM	0	3	33	138	0	10	5	14	0	3	60	61	327
8:15 AM	0	1	45	133	0	3	12	15	0	4	62	59	334
8:30 AM	0	6	39	135	0	11	12	20	0	2	74	57	356
8:45 AM	0	3	39	148	0	10	7	14	0	3	73	47	344
Total	0	23	286	1,112	0	48	63	123	0	22	540	401	2,618

AM Intersection Peak Hour : **7:45 AM - 8:45 AM**

Intersection PHF : **0.96**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	14	155	557	0	28	37	56	0	13	284	219	1,363
PHF	#####	0.58	0.86	0.92	#####	0.64	0.77	0.70	#####	0.81	0.81	0.90	0.96
Movement PHF		0.92			0.94			0.73			0.96		0.96

PM Period (4:00 PM - 6:00 PM)													
	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
4:00 PM	0	9	77	154	0	12	2	7	0	7	110	100	478
4:15 PM	0	6	59	147	0	4	3	10	0	8	127	137	501
4:30 PM	0	4	61	150	0	4	11	9	0	2	130	106	477
4:45 PM	0	7	62	119	0	5	5	4	0	12	139	98	451
5:00 PM	0	5	76	127	0	6	3	7	0	10	111	108	453
5:15 PM	0	4	58	122	0	7	4	11	0	6	124	107	443
5:30 PM	0	5	56	103	0	2	5	5	0	11	114	104	405
5:45 PM	0	9	61	95	0	3	2	8	0	7	93	89	367
Total	0	49	510	1,017	0	43	35	61	0	63	948	849	3,575

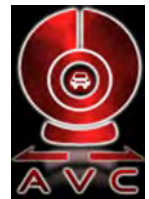
PM Intersection Peak Hour : **4:00 PM - 5:00 PM**

Intersection PHF : **0.95**

	Southbound			Westbound			Northbound			Eastbound			TOTAL
	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	Right	Thru	Left	
Volume	0	26	259	570	0	25	21	30	0	29	506	441	1907
PHF	#####	0.722	0.841	0.925	#####	0.521	0.477	0.75	#####	0.604	0.91	0.805	0.95
Movement PHF		0.83			0.90			0.64			0.90		0.95

24 Hour Segment Count

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



Location: a) SR-67, North of Maplevue Street

Orientation: North-South

Date of Count: Tuesday, March 17, 2015

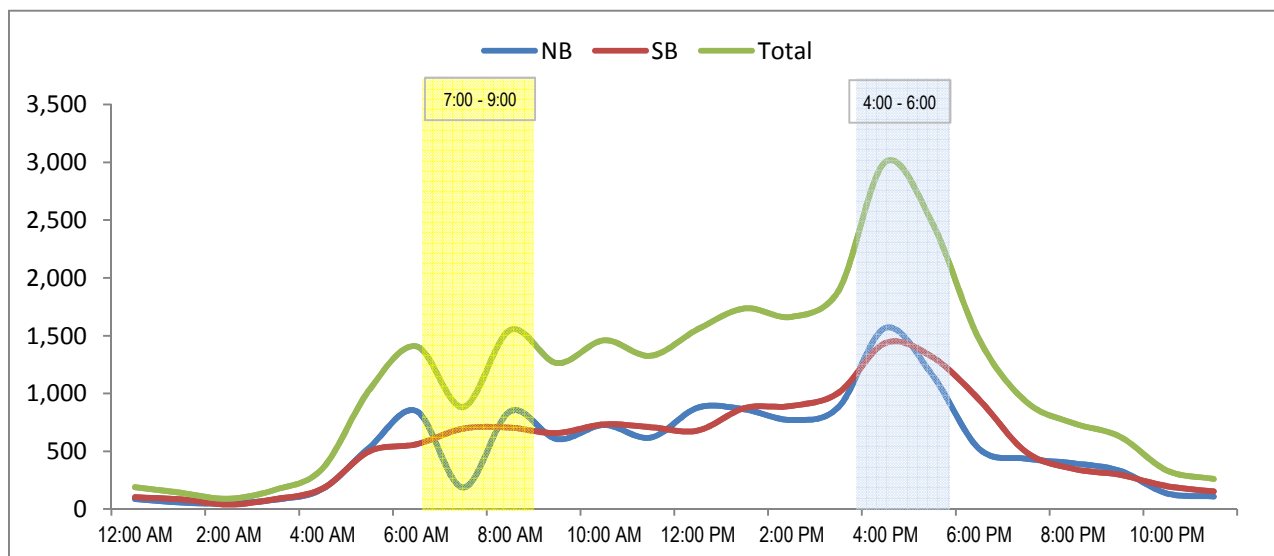
Analysts: DASH

Weather: Sunny

AVC Proj. No: 15-0329

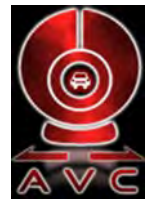
24 Hour Segment Volume						26,542				
Time		Hourly Volume				Time		Hourly Volume		
		NB	SB	Total				NB	SB	Total
12:00 AM - 1:00 AM		87	102	189		12:00 PM - 1:00 PM		877	679	1,556
1:00 AM - 2:00 AM		55	83	138		1:00 PM - 2:00 PM		862	874	1,736
2:00 AM - 3:00 AM		51	39	90		2:00 PM - 3:00 PM		771	892	1,663
3:00 AM - 4:00 AM		81	87	168		3:00 PM - 4:00 PM		881	1,006	1,887
4:00 AM - 5:00 AM		174	177	351		4:00 PM - 5:00 PM		1,567	1,436	3,003
5:00 AM - 6:00 AM		534	499	1,033		5:00 PM - 6:00 PM		1,161	1,316	2,477
6:00 AM - 7:00 AM		848	560	1,408		6:00 PM - 7:00 PM		521	947	1,468
7:00 AM - 8:00 AM		186	696	882		7:00 PM - 8:00 PM		436	494	930
8:00 AM - 9:00 AM		845	704	1,549		8:00 PM - 9:00 PM		396	348	744
9:00 AM - 10:00 AM		605	658	1,263	9:00 PM - 10:00 PM		331	296	627	
10:00 AM - 11:00 AM		727	733	1,460	10:00 PM - 11:00 PM		136	198	334	
11:00 AM - 12:00 PM		618	708	1326	11:00 PM - 12:00 AM		108	152	260	
Total		4,811	5,046	9,857	Total		8,047	8,638	16,685	

24-Hour	NB	Volume	12,858	24-Hour	SB	Volume	13,684
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24 Hour Segment Count

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



Location: b) SR-67, South of Maplevue Street

Orientation: North-South

Date of Count: Tuesday, March 17, 2015

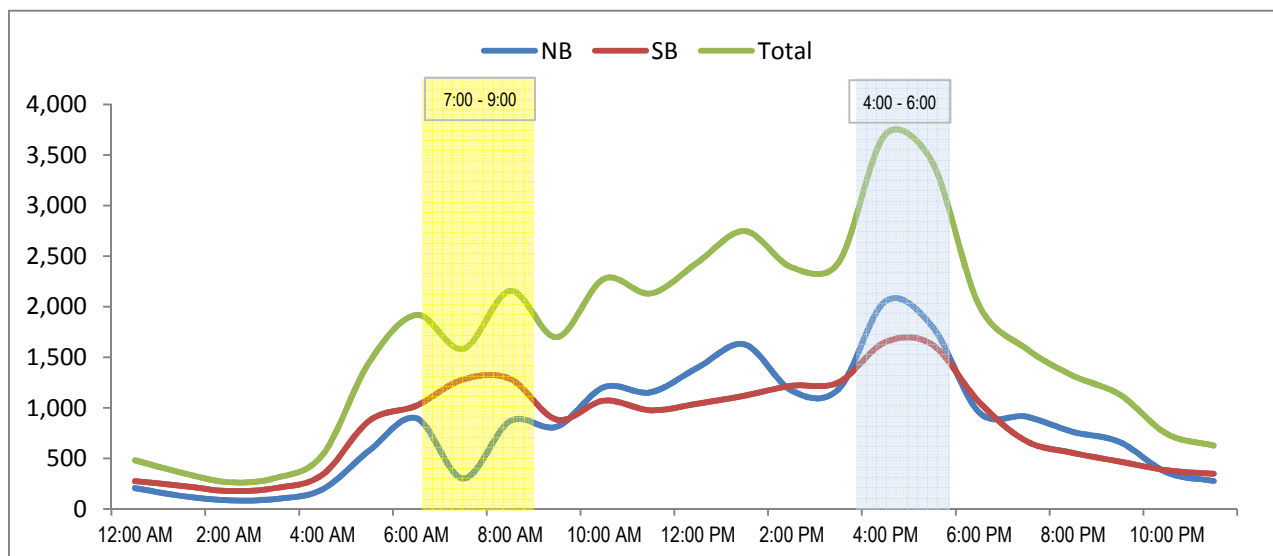
Analysts: DASH

Weather: Sunny

AVC Proj. No: 15-0329

24 Hour Segment Volume						39,744				
Time		Hourly Volume				Time		Hourly Volume		
		NB	SB	Total				NB	SB	Total
12:00 AM - 1:00 AM		207	275	482		12:00 PM - 1:00 PM		1,399	1,042	2,441
1:00 AM - 2:00 AM		129	230	359		1:00 PM - 2:00 PM		1,628	1,121	2,749
2:00 AM - 3:00 AM		87	178	265		2:00 PM - 3:00 PM		1,171	1,219	2,390
3:00 AM - 4:00 AM		99	208	307		3:00 PM - 4:00 PM		1,184	1,252	2,436
4:00 AM - 5:00 AM		195	340	535		4:00 PM - 5:00 PM		2,054	1,651	3,705
5:00 AM - 6:00 AM		580	875	1,455		5:00 PM - 6:00 PM		1,806	1,625	3,431
6:00 AM - 7:00 AM		898	1,022	1,920		6:00 PM - 7:00 PM		956	1,057	2,013
7:00 AM - 8:00 AM		302	1,282	1,584		7:00 PM - 8:00 PM		914	673	1,587
8:00 AM - 9:00 AM		870	1,287	2,157		8:00 PM - 9:00 PM		763	555	1,318
9:00 AM - 10:00 AM		815	884	1,699	9:00 PM - 10:00 PM		662	469	1,131	
10:00 AM - 11:00 AM		1,205	1,072	2,277	10:00 PM - 11:00 PM		361	383	744	
11:00 AM - 12:00 PM		1,155	977	2132	11:00 PM - 12:00 AM		278	349	627	
Total		6,542	8,630	15,172	Total		13,176	11,396	24,572	

24-Hour	NB	Volume	19,718	24-Hour	SB	Volume	20,026
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24 Hour Segment Count

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



Location: e) Maplevue Street, West of SR-67

Orientation: East-West

Date of Count: Tuesday, March 17, 2015

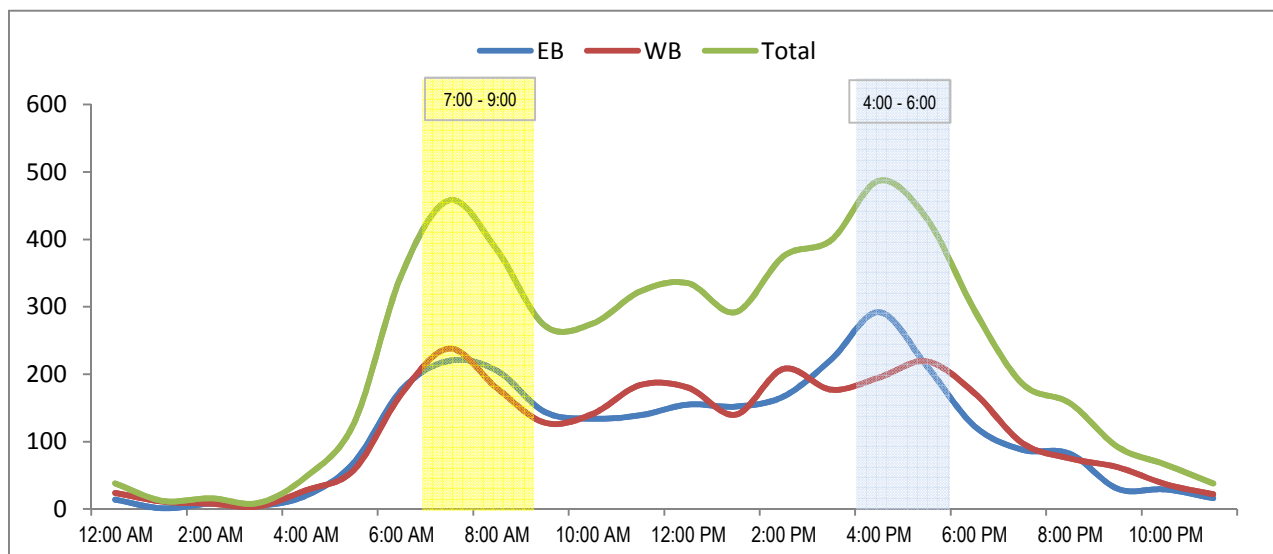
Analysts: DASH

Weather: Sunny

AVC Proj. No: 15-0329

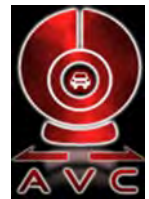
24 Hour Segment Volume						5,463				
Time		Hourly Volume				Time		Hourly Volume		
		EB	WB	Total				EB	WB	Total
12:00 AM - 1:00 AM		14	24	38		12:00 PM - 1:00 PM		155	180	335
1:00 AM - 2:00 AM		1	11	12		1:00 PM - 2:00 PM		152	140	292
2:00 AM - 3:00 AM		8	8	16		2:00 PM - 3:00 PM		167	208	375
3:00 AM - 4:00 AM		5	4	9		3:00 PM - 4:00 PM		222	177	399
4:00 AM - 5:00 AM		20	28	48		4:00 PM - 5:00 PM		292	195	487
5:00 AM - 6:00 AM		69	58	127		5:00 PM - 6:00 PM		212	219	431
6:00 AM - 7:00 AM		177	171	348		6:00 PM - 7:00 PM		123	172	295
7:00 AM - 8:00 AM		220	238	458		7:00 PM - 8:00 PM		88	98	186
8:00 AM - 9:00 AM		205	179	384		8:00 PM - 9:00 PM		82	75	157
9:00 AM - 10:00 AM		144	128	272	9:00 PM - 10:00 PM		30	62	92	
10:00 AM - 11:00 AM		134	141	275	10:00 PM - 11:00 PM		29	37	66	
11:00 AM - 12:00 PM		139	184	323	11:00 PM - 12:00 AM		16	22	38	
Total		1,136	1,174	2,310	Total		1,568	1,585	3,153	

24-Hour	EB	Volume	2,704	24-Hour	WB	Volume	2,759
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24 Hour Segment Count

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



Location: f) Maplevue Street, between SR-67 & Maine Avenue

Orientation: East-West

Date of Count: Tuesday, March 17, 2015

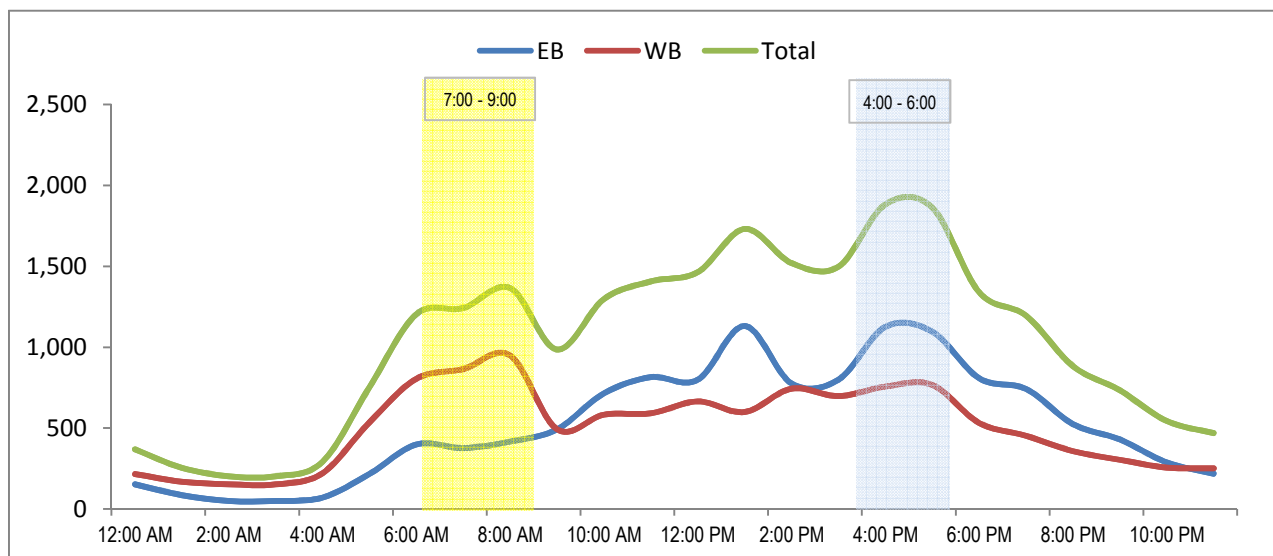
Analysts: DASH

Weather: Sunny

AVC Proj. No: 15-0329

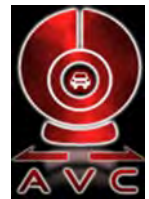
24 Hour Segment Volume						24,701				
Time		Hourly Volume				Time		Hourly Volume		
		EB	WB	Total				EB	WB	Total
12:00 AM - 1:00 AM		153	216	369		12:00 PM - 1:00 PM		799	665	1,464
1:00 AM - 2:00 AM		86	169	255		1:00 PM - 2:00 PM		1,131	600	1,731
2:00 AM - 3:00 AM		50	153	203		2:00 PM - 3:00 PM		776	744	1,520
3:00 AM - 4:00 AM		50	152	202		3:00 PM - 4:00 PM		800	698	1,498
4:00 AM - 5:00 AM		71	221	292		4:00 PM - 5:00 PM		1,126	757	1,883
5:00 AM - 6:00 AM		217	536	753		5:00 PM - 6:00 PM		1,096	767	1,863
6:00 AM - 7:00 AM		399	805	1,204		6:00 PM - 7:00 PM		808	532	1,340
7:00 AM - 8:00 AM		377	865	1,242		7:00 PM - 8:00 PM		742	453	1,195
8:00 AM - 9:00 AM		417	949	1,366		8:00 PM - 9:00 PM		525	358	883
9:00 AM - 10:00 AM		493	493	986		9:00 PM - 10:00 PM		430	304	734
10:00 AM - 11:00 AM		715	583	1,298	10:00 PM - 11:00 PM		288	256	544	
11:00 AM - 12:00 PM		815	592	1407	11:00 PM - 12:00 AM		218	251	469	
Total		3,843	5,734	9,577	Total		8,739	6,385	15,124	

24-Hour	EB	Volume	12,582	24-Hour	WB	Volume	12,119
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24 Hour Segment Count

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



Location: g) Maplevue Street, between Maine Avenue & Vine Street

Orientation: East-West

Date of Count: Tuesday, March 17, 2015

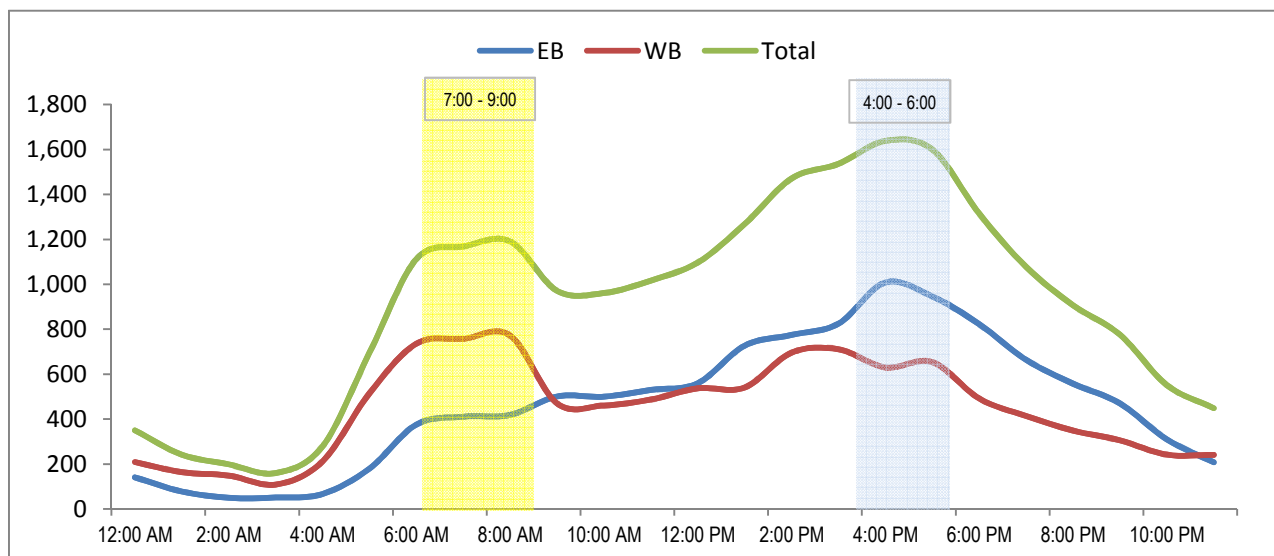
Analysts: DASH

Weather: Sunny

AVC Proj. No: 15-0329

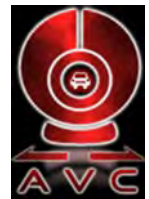
24 Hour Segment Volume						22,032				
Time		Hourly Volume				Time		Hourly Volume		
		EB	WB	Total				EB	WB	Total
12:00 AM - 1:00 AM		141	209	350		12:00 PM - 1:00 PM		560	537	1,097
1:00 AM - 2:00 AM		78	164	242		1:00 PM - 2:00 PM		727	541	1,268
2:00 AM - 3:00 AM		50	149	199		2:00 PM - 3:00 PM		775	696	1,471
3:00 AM - 4:00 AM		51	109	160		3:00 PM - 4:00 PM		825	711	1,536
4:00 AM - 5:00 AM		67	212	279		4:00 PM - 5:00 PM		1,008	630	1,638
5:00 AM - 6:00 AM		180	515	695		5:00 PM - 6:00 PM		946	654	1,600
6:00 AM - 7:00 AM		376	736	1,112		6:00 PM - 7:00 PM		823	492	1,315
7:00 AM - 8:00 AM		411	757	1,168		7:00 PM - 8:00 PM		664	414	1,078
8:00 AM - 9:00 AM		419	772	1,191		8:00 PM - 9:00 PM		558	349	907
9:00 AM - 10:00 AM		501	470	971	9:00 PM - 10:00 PM		470	306	776	
10:00 AM - 11:00 AM		500	461	961	10:00 PM - 11:00 PM		310	242	552	
11:00 AM - 12:00 PM		530	487	1017	11:00 PM - 12:00 AM		208	241	449	
Total		3,304	5,041	8,345	Total		7,874	5,813	13,687	

24-Hour	EB	Volume	11,178	24-Hour	WB	Volume	10,854
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24 Hour Segment Count

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



Location: h) Maplevue Street, between Vine Street & Ashwood Street

Orientation: East-West

Date of Count: Tuesday, March 17, 2015

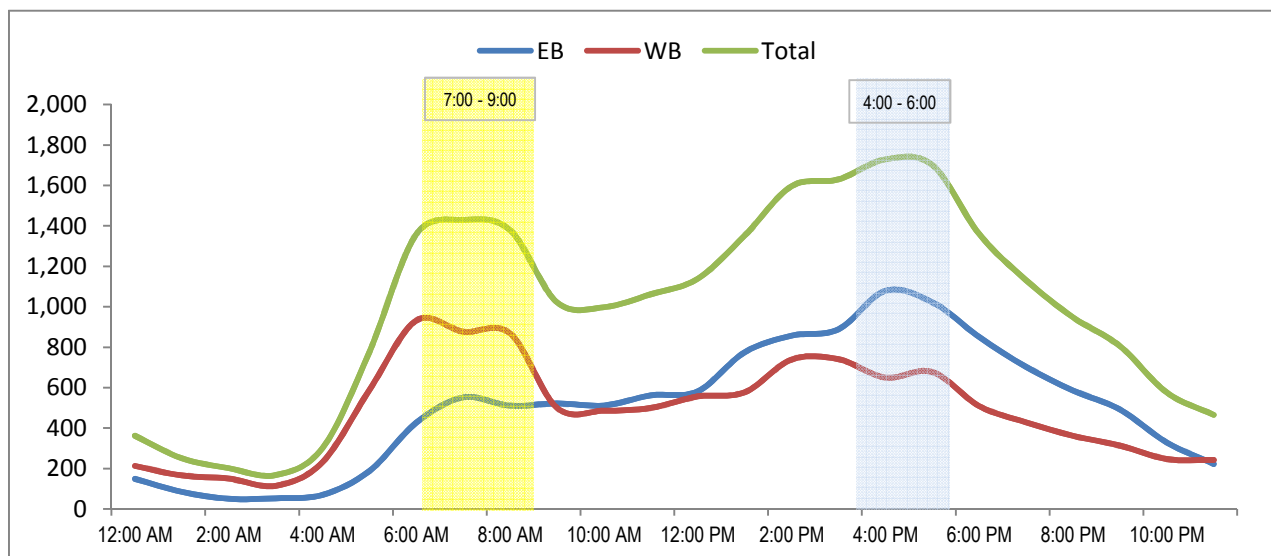
Analysts: DASH

Weather: Sunny

AVC Proj. No: 15-0329

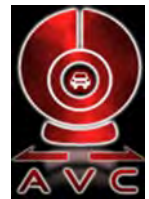
24 Hour Segment Volume						23,746				
Time		Hourly Volume				Time		Hourly Volume		
		EB	WB	Total				EB	WB	Total
12:00 AM - 1:00 AM		149	213	362		12:00 PM - 1:00 PM		582	557	1,139
1:00 AM - 2:00 AM		85	166	251		1:00 PM - 2:00 PM		775	577	1,352
2:00 AM - 3:00 AM		51	151	202		2:00 PM - 3:00 PM		857	739	1,596
3:00 AM - 4:00 AM		53	115	168		3:00 PM - 4:00 PM		889	741	1,630
4:00 AM - 5:00 AM		70	232	302		4:00 PM - 5:00 PM		1,079	650	1,729
5:00 AM - 6:00 AM		188	589	777		5:00 PM - 6:00 PM		1,023	678	1,701
6:00 AM - 7:00 AM		427	932	1,359		6:00 PM - 7:00 PM		851	509	1,360
7:00 AM - 8:00 AM		552	877	1,429		7:00 PM - 8:00 PM		703	429	1,132
8:00 AM - 9:00 AM		511	868	1,379		8:00 PM - 9:00 PM		586	362	948
9:00 AM - 10:00 AM		522	500	1,022	9:00 PM - 10:00 PM		492	314	806	
10:00 AM - 11:00 AM		512	486	998	10:00 PM - 11:00 PM		329	247	576	
11:00 AM - 12:00 PM		562	500	1062	11:00 PM - 12:00 AM		223	243	466	
Total		3,682	5,629	9,311	Total		8,389	6,046	14,435	

24-Hour	EB	Volume	12,071	24-Hour	WB	Volume	11,675
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24 Hour Segment Count

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



Location: i) Maplevue Street, between Ashwood Street & El Monte Road

Orientation: East-West

Date of Count: Tuesday, March 17, 2015

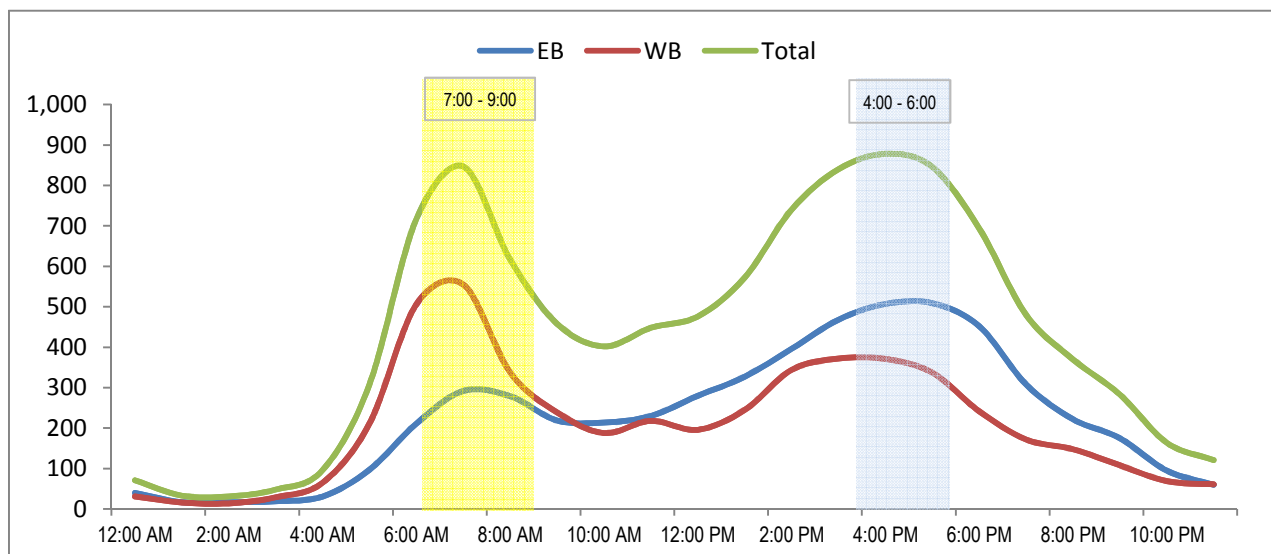
Analysts: DASH

Weather: Sunny

AVC Proj. No: 15-0329

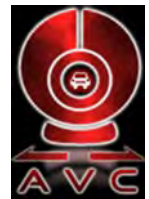
24 Hour Segment Volume						10,540				
Time		Hourly Volume				Time		Hourly Volume		
		EB	WB	Total				EB	WB	Total
12:00 AM - 1:00 AM		40	31	71		12:00 PM - 1:00 PM		280	196	476
1:00 AM - 2:00 AM		17	16	33		1:00 PM - 2:00 PM		327	245	572
2:00 AM - 3:00 AM		17	14	31		2:00 PM - 3:00 PM		396	344	740
3:00 AM - 4:00 AM		19	29	48		3:00 PM - 4:00 PM		468	372	840
4:00 AM - 5:00 AM		31	65	96		4:00 PM - 5:00 PM		507	371	878
5:00 AM - 6:00 AM		97	211	308		5:00 PM - 6:00 PM		509	337	846
6:00 AM - 7:00 AM		211	506	717		6:00 PM - 7:00 PM		452	242	694
7:00 AM - 8:00 AM		292	555	847		7:00 PM - 8:00 PM		308	172	480
8:00 AM - 9:00 AM		279	338	617		8:00 PM - 9:00 PM		222	148	370
9:00 AM - 10:00 AM		219	239	458	9:00 PM - 10:00 PM		175	108	283	
10:00 AM - 11:00 AM		214	188	402	10:00 PM - 11:00 PM		95	69	164	
11:00 AM - 12:00 PM		230	218	448	11:00 PM - 12:00 AM		60	61	121	
Total		1,666	2,410	4,076	Total		3,799	2,665	6,464	

24-Hour	EB	Volume	5,465	24-Hour	WB	Volume	5,075
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24 Hour Segment Count

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



Location: j) Lake Jennings Park Road, Between El Monte Road & Blossom Valley Road

Orientation: East-West

Date of Count: Tuesday, March 17, 2015

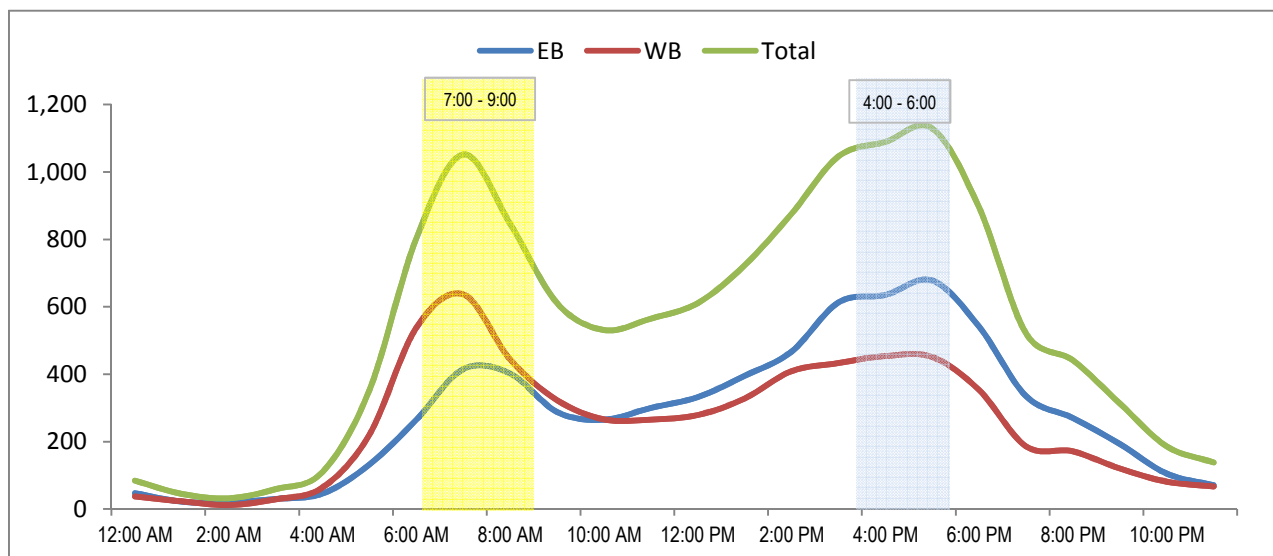
Analysts: DASH

Weather: Sunny

AVC Proj. No: 15-0329

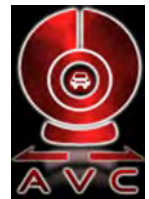
24 Hour Segment Volume						13,058				
Time		Hourly Volume				Time		Hourly Volume		
		EB	WB	Total				EB	WB	Total
12:00 AM - 1:00 AM		47	37	84		12:00 PM - 1:00 PM		332	279	611
1:00 AM - 2:00 AM		22	23	45		1:00 PM - 2:00 PM		395	328	723
2:00 AM - 3:00 AM		20	12	32		2:00 PM - 3:00 PM		467	409	876
3:00 AM - 4:00 AM		30	29	59		3:00 PM - 4:00 PM		613	433	1,046
4:00 AM - 5:00 AM		46	64	110		4:00 PM - 5:00 PM		635	454	1,089
5:00 AM - 6:00 AM		132	221	353		5:00 PM - 6:00 PM		678	451	1,129
6:00 AM - 7:00 AM		265	538	803		6:00 PM - 7:00 PM		541	353	894
7:00 AM - 8:00 AM		415	637	1,052		7:00 PM - 8:00 PM		335	186	521
8:00 AM - 9:00 AM		402	444	846		8:00 PM - 9:00 PM		270	171	441
9:00 AM - 10:00 AM		288	323	611		9:00 PM - 10:00 PM		193	120	313
10:00 AM - 11:00 AM		265	266	531	10:00 PM - 11:00 PM		105	81	186	
11:00 AM - 12:00 PM		300	265	565	11:00 PM - 12:00 AM		71	67	138	
Total		2,232	2,859	5,091	Total		4,635	3,332	7,967	

24-Hour	EB	Volume	6,867	24-Hour	WB	Volume	6,191
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24 Hour Segment Count

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



Location: k) Lake Jennings Park Road, Between Blossom Valley Road & I-8

Orientation: North-South

Date of Count: Tuesday, March 17, 2015

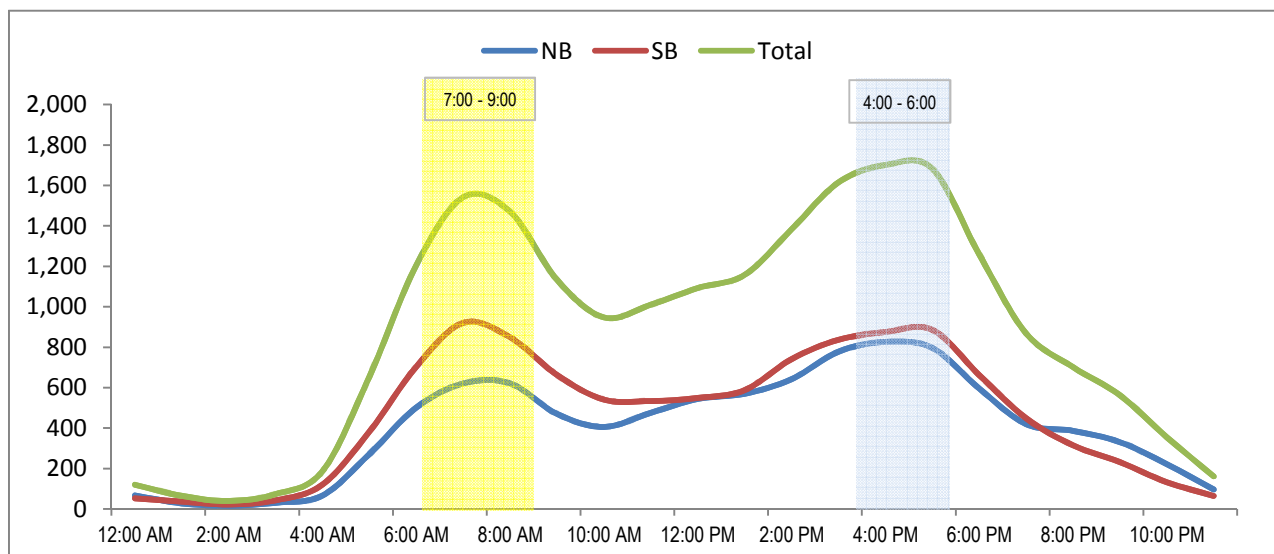
Analysts: DASH

Weather: Sunny

AVC Proj. No: 15-0329

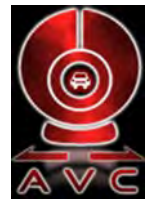
24 Hour Segment Volume						20,993				
Time		Hourly Volume				Time		Hourly Volume		
		NB	SB	Total				NB	SB	Total
12:00 AM - 1:00 AM		67	53	120		12:00 PM - 1:00 PM		544	549	1,093
1:00 AM - 2:00 AM		28	37	65		1:00 PM - 2:00 PM		570	588	1,158
2:00 AM - 3:00 AM		17	23	40		2:00 PM - 3:00 PM		642	741	1,383
3:00 AM - 4:00 AM		31	43	74		3:00 PM - 4:00 PM		778	837	1,615
4:00 AM - 5:00 AM		67	121	188		4:00 PM - 5:00 PM		826	875	1,701
5:00 AM - 6:00 AM		272	383	655		5:00 PM - 6:00 PM		797	886	1,683
6:00 AM - 7:00 AM		502	704	1,206		6:00 PM - 7:00 PM		596	663	1,259
7:00 AM - 8:00 AM		621	921	1,542		7:00 PM - 8:00 PM		420	449	869
8:00 AM - 9:00 AM		621	849	1,470		8:00 PM - 9:00 PM		387	315	702
9:00 AM - 10:00 AM		470	663	1,133	9:00 PM - 10:00 PM		331	232	563	
10:00 AM - 11:00 AM		406	541	947	10:00 PM - 11:00 PM		222	133	355	
11:00 AM - 12:00 PM		476	534	1010	11:00 PM - 12:00 AM		97	65	162	
Total		3,578	4,872	8,450	Total		6,210	6,333	12,543	

24-Hour	NB	Volume	9,788	24-Hour	SB	Volume	11,205
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24 Hour Segment Count

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



Location: c) El Monte Road, North of Lake Jennings Road

Orientation: North-South

Date of Count: Tuesday, March 17, 2015

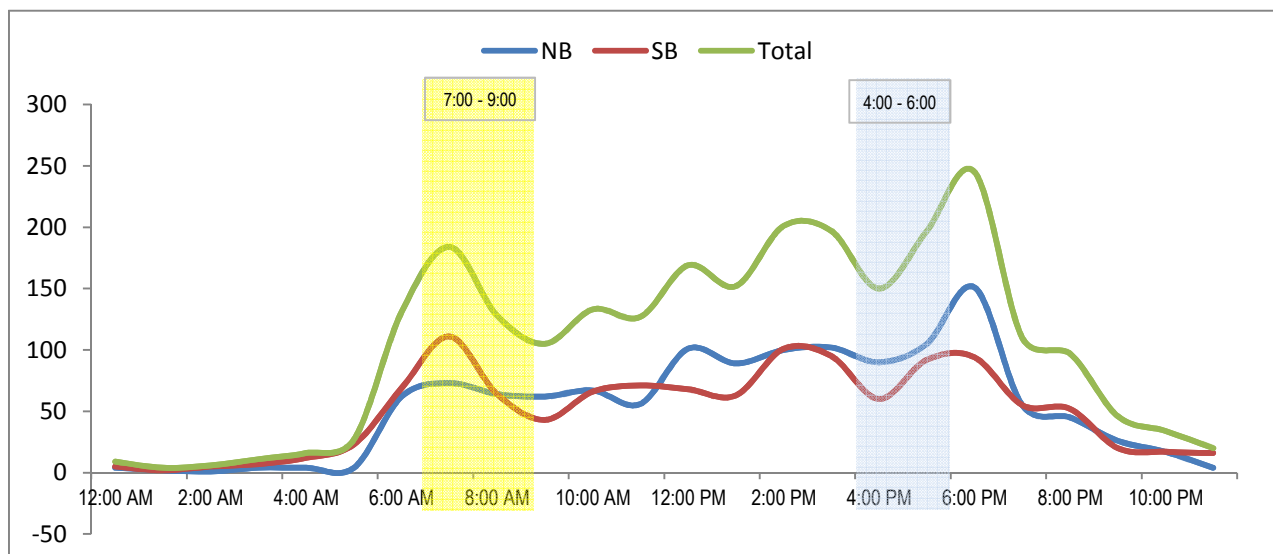
Analysts: DASH

Weather: Sunny

AVC Proj. No: 15-0329

24 Hour Segment Volume						2,499				
Time		Hourly Volume				Time		Hourly Volume		
		NB	SB	Total				NB	SB	Total
12:00 AM - 1:00 AM		4	5	9		12:00 PM - 1:00 PM		101	68	169
1:00 AM - 2:00 AM		2	2	4		1:00 PM - 2:00 PM		89	63	152
2:00 AM - 3:00 AM		1	5	6		2:00 PM - 3:00 PM		100	101	201
3:00 AM - 4:00 AM		4	7	11		3:00 PM - 4:00 PM		102	95	197
4:00 AM - 5:00 AM		4	12	16		4:00 PM - 5:00 PM		90	60	150
5:00 AM - 6:00 AM		4	23	27		5:00 PM - 6:00 PM		105	92	197
6:00 AM - 7:00 AM		62	69	131		6:00 PM - 7:00 PM		151	94	245
7:00 AM - 8:00 AM		73	111	184		7:00 PM - 8:00 PM		55	55	110
8:00 AM - 9:00 AM		64	64	128		8:00 PM - 9:00 PM		45	52	97
9:00 AM - 10:00 AM		62	43	105	9:00 PM - 10:00 PM		26	20	46	
10:00 AM - 11:00 AM		67	66	133	10:00 PM - 11:00 PM		17	17	34	
11:00 AM - 12:00 PM		56	71	127	11:00 PM - 12:00 AM		4	16	20	
Total		403	478	881	Total		885	733	1,618	

24-Hour	NB	Volume	1,288	24-Hour	SB	Volume	1,211
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APPENDIX B

INTERSECTION METHODOLOGY AND ANALYSIS SHEETS

SIGNALIZED INTERSECTIONS

For signalized intersections, level of service criteria are stated in terms of the average control delay per vehicle for a 15-minute analysis period. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. **Table 1** summarizes the delay thresholds for signalized intersections.

Level of service A describes operations with very low delay, (i.e. less than 10.0 seconds per vehicle). This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.

Level of service B describes operations with delay in the range 10.1 seconds and 20.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.

TABLE 1

LEVEL OF SERVICE THRESHOLDS FOR SIGNALIZED INTERSECTIONS

AVERAGE CONTROL DELAY PER VEHICLE (SECONDS/VEHICLE)				LEVEL OF SERVICE
0.0	≤	10.0		A
10.1	to	20.0		B
21.1	to	35.0		C
35.1	to	55.0		D
55.1	to	80.0		E
	≥	80.0		F

Source: Highway Capacity Manual, 2000.

Level of service C describes operations with delay in the range 20.1 seconds and 35.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.

Level of service D describes operations with delay in the range 35.1 seconds and 55.0 seconds per vehicle. At level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or higher v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are more frequent.

Level of service E describes operations with delay in the range of 55.1 seconds to 80.0 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.

Level of service F describes operations with delay in excess of over 80.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over-saturation (i.e., when arrival flow rates exceed the capacity of the intersection). It may also occur at high v/c ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

UNSIGNALIZED INTERSECTIONS

For unsignalized intersections, level of service is determined by the computed or measured control delay and is defined for each minor movement. Level of service is not defined for the intersection as a whole. **Table 2** depicts the criteria, which are based on the average control delay for any particular minor movement.

TABLE 2

LEVEL OF SERVICE THRESHOLDS FOR UNSIGNALIZED INTERSECTIONS

AVERAGE CONTROL DELAY PER VEHICLE (SECONDS/VEHICLE)			LEVEL OF SERVICE	EXPECTED DELAY TO MINOR STREET TRAFFIC
0.0	≤	10.0	A	Little or no delay
10.1	to	15.0	B	Short traffic delays
15.1	to	25.0	C	Average traffic delays
25.1	to	35.0	D	Long traffic delays
35.1	to	50.0	E	Very long traffic delays
	≥	50.0	F	Severe congestion

Source: Highway Capacity Manual, 2000.

Level of Service F exists when there are insufficient gaps of suitable size to allow a side street demand to safely cross through a major street traffic stream. This level of service is generally evident from extremely long control delays experienced by side-street traffic and by queuing on the minor-street approaches. The method, however, is based on a constant critical gap size; that is, the critical gap remains constant no matter how long the side-street motorist waits. LOS F may also appear in the form of side-street vehicles selecting smaller-than-usual gaps. In such cases, safety may be a problem, and some disruption to the major traffic stream may result. It is important to note that LOS F may not always result in long queues but may result in adjustments to normal gap acceptance behavior, which are more difficult to observe in the field than queuing.

APPENDIX C

COUNTY OF SAN DIEGO ROADWAY CLASSIFICATION TABLE, SANTEC ROADWAY CLASSIFICATION TABLE AND HCM PCE FACTORS

TABLE 1
AVERAGE DAILY VEHICLE TRIPS*

MOBILITY ELEMENT ROADS		LEVELS OF SERVICE				
Road Classification	# of Travel Lanes	A	B	C	D	E
Expressway (6.1)	6	<36,000	<54,000	<70,000	<86,000	<108,000
Prime Arterial (6.2)	6	<22,200	<37,000	<44,600	<50,000	<57,000
Major Road	w/ Raised Median (4.1A)	4	<14,800	<24,700	<29,600	<33,400
	w/ Intermittent Turn Lanes (4.1B)	4	<13,700	<22,800	<27,400	<30,800
Boulevard	w/ Raised Median (4.2A)	4	<18,000	<21,000	<24,000	<27,000
	w/ Intermittent Turn Lanes (4.2B)	4	<16,800	<19,600	<22,500	<25,000
Community Collector	w/ Raised Median (2.1A)	2	<10,000	<11,700	<13,400	<15,000
	w/ Continuous Left Turn Lane (2.1B)	2	<3,000	<6,000	<9,500	<13,500
	w/ Intermittent Turn Lane (2.1C)	2	<3,000	<6,000	<9,500	<13,500
	w/ Passing Lane (2.1D)	2	<3,000	<6,000	<9,500	<13,500
	No Median (2.1E)	2	<1,900	<4,100	<7,100	<10,900
Light Collector	w/ Raised Median (2.2A)	2	<3,000	<6,000	<9,500	<13,500
	w/ Continuous Left Turn Lane (2.2B)	2	<3,000	<6,000	<9,500	<13,500
	w/ Intermittent Turn Lane (2.2C)	2	<3,000	<6,000	<9,500	<13,500
	w/ Passing Lane (2.2D)	2	<3,000	<6,000	<9,500	<13,500
	No Median (2.2E)	2	<1,900	<4,100	<7,100	<10,900
	w/ Reduced Shoulder (2.2F)	2	<5,800	<6,800	<7,800	<8,700
Minor Collector	w/ Raised Median (2.3A)	2	<3,000	<6,000	<7,000	<8,000
	w/ Intermittent Turn Lane (2.3B)	2	<3,000	<6,000	<7,000	<8,000
	No Median (2.3C)	2	<1,900	<4,100	<6,000	<7,000
NON-MOBILITY ELEMENT ROADS**		LEVELS OF SERVICE				
Residential Collector	2	-	-	<4,500	-	-
Rural Residential Collector***	2	-	-	<4,500	-	-
Residential Road	2	-	-	<1,500	-	-
Rural Residential Road***	2	-	-	<1,500	-	-
Residential Cul-de-Sac or Loop Road	2	-	-	<200	-	-

* The values shown are subject to adjustment based on the geometry of the roadway, side frictions, and other relevant factors as determined by the Director, Department of Public Works.

** Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

*** Rural Residential Collectors and Rural Residential Roads are intended to serve areas with lot sizes of 2 acres or more which do not have a demand for on-street parking. On-street parking is not assured for these cross sections. Additional right-of-way is needed if on-street parking is in paved area.

**** See Tables 2A and 2B for roadway surfacing and right-of-way widths.

Table 2

**ROADWAY CLASSIFICATIONS, LEVELS OF SERVICE (LOS)
AND AVERAGE DAILY TRAFFIC (ADT)**

STREET CLASSIFICATION	LANES	CROSS SECTIONS* (APPROX.)	LEVEL OF SERVICE W/ADT**				
			A	B	C	D	E
Expressway	6 lanes	102-160/122-200	30,000	42,000	60,000	70,000	80,000
Prime Arterial	6 lanes	102-108/122-128	25,000	35,000	50,000	55,000	60,000
Major Arterial	6 lanes	102/122	20,000	28,000	40,000	45,000	50,000
Major Arterial	4 lanes	78-82/98-102	15,000	21,000	30,000	35,000	40,000
Secondary Arterial/ Collector	4 lanes	64-72/84-92	10,000	14,000	20,000	25,000	30,000
Collector (no center lane) (continuous left- turn lane)	4 lanes 2 lanes	64/84 50/70	5,000	7,000	10,000	13,000	15,000
Collector (no fronting property)	2 lanes	40/60	4,000	5,500	7,500	9,000	10,000
Collector (commercial- industrial fronting)	2 lanes	50/70	2,500	3,500	5,000	6,500	8,000
Collector (multi-family)	2 lanes	40/60	2,500	3,500	5,000	6,500	8,000
Sub-Collector (single-family)	2 lanes	36/56	—	—	2,200	—	—

LEGEND:

* Curb to curb width (feet)/right of way width (feet): based upon the City of San Diego Street Design Manual and other jurisdictions within the San Diego region.

** Approximate recommended ADT based upon the City of San Diego Street Design Manual.

NOTES:

1. The volumes and the average daily level of service listed above are only intended as a general planning guideline.
2. Levels of service are not applied to residential streets since their primary purpose is to serve abutting lots, not carry through traffic. Levels of service normally apply to roads carrying through traffic between major trip generators and attractors.

There are three categories of general terrain:

- *Level terrain:* Any combination of grades and horizontal or vertical alignment that permits heavy vehicles to maintain the same speed as passenger cars. This type of terrain typically contains short grades of no more than 2%.
- *Rolling terrain:* Any combination of grades and horizontal or vertical alignment that causes heavy vehicles to reduce their speed substantially below that of passenger cars but that does not cause heavy vehicles to operate at crawl speeds for any significant length of time or at frequent intervals. *Crawl speed* is the maximum sustained speed that trucks can maintain on an extended upgrade of a given percent. If the grade is long enough, trucks will be forced to decelerate to the crawl speed, which they can maintain for extended distances. Appendix A of Chapter 11, Basic Freeway Segments, contains truck performance curves that provide truck speeds for various lengths and severities of grade. The same curves may be used for uninterrupted-flow segments on multilane highways.
- *Mountainous terrain:* Any combination of grades and horizontal and vertical alignment that causes heavy vehicles to operate at crawl speed for significant distances or at frequent intervals.

Mountainous terrain is relatively rare. Generally, in segments severe enough to cause the type of operation described for mountainous terrain, there will be individual grades that are longer and steeper than the criteria for general terrain analysis.

Exhibit 14-12 shows PCEs for trucks and buses and RVs in general terrain segments.

Vehicle	PCE by Type of Terrain		
	Level	Rolling	Mountainous
Trucks and buses, E_T	1.5	2.5	4.5
RVs, E_R	1.2	2.0	4.0

The mountainous terrain category is rarely used, because individual grades will typically be longer and steeper than the criteria for general terrain analysis.

Exhibit 14-12
PCEs for Heavy Vehicles in General Terrain Segments

Equivalents for Specific Upgrades

Any grade between 2% and 3% and longer than 0.5 mi, or 3% or greater and longer than 0.25 mi, should be considered to be a separate segment. The analysis of such segments must consider the upgrade conditions and the downgrade conditions separately, as well as whether the grade is a single, isolated grade of constant percentage or part of a series forming a composite grade. Appendix A of Chapter 11 discusses the analysis of composite grades.

Exhibit 14-13 and Exhibit 14-14 give values of E_T and E_R for trucks and buses and for RVs, respectively. These factors vary with the percent of grade, length of grade, and the proportion of heavy vehicles in the traffic stream. Maximum values occur when there are only a few heavy vehicles in the traffic stream. The equivalents decrease as the number of heavy vehicles increases because these vehicles tend to form platoons. Because heavy vehicles have more uniform operating characteristics, fewer large gaps are created in the traffic stream when they platoon, and the impact of a single heavy vehicle in a platoon is less severe than that of a single heavy vehicle in a stream primarily composed of passenger

APPENDIX D

EXISTING INTERSECTION CALCULATION SHEETS

HCM 2010 Signalized Intersection Summary

1: SR 67 & Mapleview St

Ex AM
11/24/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	98	27	771	98	140	23	633	214	105	535	64
Future Volume (veh/h)	80	98	27	771	98	140	23	633	214	105	535	64
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	87	107	0	914	0	0	25	688	233	114	582	0
Adj No. of Lanes	0	1	1	2	0	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	101	124	196	1023	0	456	65	993	431	138	1153	516
Arrive On Green	0.12	0.12	0.00	0.29	0.00	0.00	0.04	0.28	0.28	0.08	0.33	0.00
Sat Flow, veh/h	817	1005	1583	3548	0	1583	1774	3539	1535	1774	3539	1583
Grp Volume(v), veh/h	194	0	0	914	0	0	25	688	233	114	582	0
Grp Sat Flow(s),veh/h/ln	1822	0	1583	1774	0	1583	1774	1770	1535	1774	1770	1583
Q Serve(g_s), s	13.6	0.0	0.0	32.1	0.0	0.0	1.8	22.5	16.7	8.2	17.2	0.0
Cycle Q Clear(g_c), s	13.6	0.0	0.0	32.1	0.0	0.0	1.8	22.5	16.7	8.2	17.2	0.0
Prop In Lane	0.45		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	226	0	196	1023	0	456	65	993	431	138	1153	516
V/C Ratio(X)	0.86	0.00	0.00	0.89	0.00	0.00	0.39	0.69	0.54	0.82	0.50	0.00
Avail Cap(c_a), veh/h	290	0	252	1358	0	606	109	993	431	183	1153	516
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	55.8	0.0	0.0	44.3	0.0	0.0	61.1	41.7	39.6	59.0	35.3	0.0
Incr Delay (d2), s/veh	20.1	0.0	0.0	6.4	0.0	0.0	3.7	4.0	4.8	20.0	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.1	0.0	0.0	16.6	0.0	0.0	0.9	11.5	7.7	4.8	8.7	0.0
LnGrp Delay(d),s/veh	75.9	0.0	0.0	50.7	0.0	0.0	64.8	45.7	44.4	79.0	36.9	0.0
LnGrp LOS	E			D			E	D	D	E	D	
Approach Vol, veh/h		194			914			946			696	
Approach Delay, s/veh		75.9			50.7			45.9			43.8	
Approach LOS		E			D			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.8	45.9		23.4	10.0	51.8		44.7				
Change Period (Y+Rc), s	* 5.7	9.5		7.3	* 5.2	9.5		7.3				
Max Green Setting (Gmax), s	* 13	36.4		20.7	* 8	42.3		49.7				
Max Q Clear Time (g_c+I1), s	10.2	24.5		15.6	3.8	19.2		34.1				
Green Ext Time (p_c), s	0.1	11.1		0.5	0.0	20.7		3.3				
Intersection Summary												
HCM 2010 Ctrl Delay			49.1									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

2: Main Ave & Mapleview St

Ex AM
11/24/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑		↑↑	↑		↑	↑		↑	
Traffic Volume (veh/h)	0	352	65	25	805	6	204	2	76	2	1	0
Future Volume (veh/h)	0	352	65	25	805	6	204	2	76	2	1	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.94	1.00		0.95	0.99		0.97	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	0	383	71	27	875	7	222	2	83	2	1	0
Adj No. of Lanes	0	1	1	0	2	1	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	427	342	29	999	427	510	4	970	238	109	0
Arrive On Green	0.00	0.23	0.23	0.28	0.28	0.28	0.34	0.34	0.34	0.34	0.34	0.00
Sat Flow, veh/h	0	1863	1493	104	3523	1504	1323	12	1540	550	323	0
Grp Volume(v), veh/h	0	383	71	483	419	7	224	0	83	3	0	0
Grp Sat Flow(s),veh/h/ln	0	1863	1493	1858	1770	1504	1335	0	1540	872	0	0
Q Serve(g_s), s	0.0	22.9	4.4	28.9	25.5	0.4	0.0	0.0	2.5	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	22.9	4.4	28.9	25.5	0.4	16.7	0.0	2.5	16.7	0.0	0.0
Prop In Lane	0.00		1.00	0.06		1.00	0.99		1.00	0.67		0.00
Lane Grp Cap(c), veh/h	0	427	342	527	502	427	514	0	970	347	0	0
V/C Ratio(X)	0.00	0.90	0.21	0.92	0.83	0.02	0.44	0.00	0.09	0.01	0.00	0.00
Avail Cap(c_a), veh/h	0	742	594	801	763	649	514	0	970	347	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	42.9	35.8	39.8	38.6	29.6	30.7	0.0	8.7	26.3	0.0	0.0
Incr Delay (d2), s/veh	0.0	3.7	0.1	8.3	3.0	0.0	2.7	0.0	0.2	0.0	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	12.3	1.8	16.0	12.9	0.2	6.1	0.0	1.9	0.1	0.0	0.0
LnGrp Delay(d),s/veh	0.0	46.6	35.9	48.1	41.5	29.6	33.3	0.0	8.9	26.3	0.0	0.0
LnGrp LOS		D	D	D	D	C	C		A	C		
Approach Vol, veh/h		454			909			307			3	
Approach Delay, s/veh		45.0			44.9			26.7			26.3	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		32.0		44.5		38.2		44.5				
Change Period (Y+Rc), s		5.7		5.7		5.7		* 5.7				
Max Green Setting (Gmax), s		45.7		37.7		49.5		* 39				
Max Q Clear Time (g_c+I1), s		24.9		18.7		30.9		18.7				
Green Ext Time (p_c), s		1.4		2.1		1.6		2.2				
Intersection Summary												
HCM 2010 Ctrl Delay			41.6									
HCM 2010 LOS			D									
Notes												

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	408	22	0	827	111	0	0	169	0	0	9
Future Vol, veh/h	0	408	22	0	827	111	0	0	169	0	0	9
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	443	24	0	899	121	0	0	184	0	0	10
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	909	0	0	477	0	0	924	1374	254	1141	1386	469
Stage 1	-	-	-	-	-	-	465	465	-	909	909	-
Stage 2	-	-	-	-	-	-	459	909	-	232	477	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	745	-	-	1082	-	-	224	144	745	156	142	541
Stage 1	-	-	-	-	-	-	547	561	-	296	352	-
Stage 2	-	-	-	-	-	-	551	352	-	750	554	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	738	-	-	1072	-	-	216	141	731	115	139	531
Mov Cap-2 Maneuver	-	-	-	-	-	-	216	141	-	115	139	-
Stage 1	-	-	-	-	-	-	542	556	-	293	349	-
Stage 2	-	-	-	-	-	-	536	349	-	556	549	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			11.6			11.9		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	731	738	-	-	1072	-	-	531				
HCM Lane V/C Ratio	0.251	-	-	-	-	-	-	0.018				
HCM Control Delay (s)	11.6	0	-	-	0	-	-	11.9				
HCM Lane LOS	B	A	-	-	A	-	-	B				
HCM 95th %tile Q(veh)	1	0	-	-	0	-	-	0.1				

HCM 2010 Signalized Intersection Summary
4: Ashwood St & Mapleview St/Lake Jennings Park Rd

Ex AM
11/24/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	404	329	97	59	374	290	35	162	41	203	177	468
Future Volume (veh/h)	404	329	97	59	374	290	35	162	41	203	177	468
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.92	1.00		0.69	1.00		0.85
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	439	358	105	64	407	315	38	176	45	221	192	509
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	458	994	286	87	575	740	34	159	41	310	269	429
Arrive On Green	0.26	0.37	0.37	0.05	0.16	0.16	0.14	0.14	0.14	0.32	0.32	0.32
Sat Flow, veh/h	1774	2678	772	1774	3539	1450	241	1118	286	971	843	1346
Grp Volume(v), veh/h	439	234	229	64	407	315	259	0	0	413	0	509
Grp Sat Flow(s),veh/h/ln	1774	1770	1681	1774	1770	1450	1646	0	0	1814	0	1346
Q Serve(g_s), s	36.0	14.2	14.6	5.3	16.1	21.3	21.0	0.0	0.0	29.6	0.0	47.1
Cycle Q Clear(g_c), s	36.0	14.2	14.6	5.3	16.1	21.3	21.0	0.0	0.0	29.6	0.0	47.1
Prop In Lane	1.00		0.46	1.00		1.00	0.15		0.17	0.54		1.00
Lane Grp Cap(c), veh/h	458	657	624	87	575	740	234	0	0	579	0	429
V/C Ratio(X)	0.96	0.36	0.37	0.73	0.71	0.43	1.11	0.00	0.00	0.71	0.00	1.19
Avail Cap(c_a), veh/h	465	657	624	143	616	757	234	0	0	579	0	429
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	54.0	33.7	33.8	69.2	58.5	25.4	63.3	0.0	0.0	44.3	0.0	50.3
Incr Delay (d2), s/veh	30.9	0.2	0.2	4.4	2.9	0.2	90.4	0.0	0.0	7.3	0.0	105.0
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	21.6	6.9	6.8	2.7	8.1	12.8	15.4	0.0	0.0	16.0	0.0	30.0
LnGrp Delay(d),s/veh	84.9	33.8	34.0	73.6	61.4	25.6	153.7	0.0	0.0	51.7	0.0	155.3
LnGrp LOS	F	C	C	E	E	C	F			D		F
Approach Vol, veh/h		902			786			259			922	
Approach Delay, s/veh		58.7			48.1			153.7			108.9	
Approach LOS		E			D			F			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.0	59.7		52.0	41.8	28.9		25.0				
Change Period (Y+Rc), s	3.7	4.9		4.9	3.7	4.9		4.0				
Max Green Setting (Gmax), s	11.9	52.5		47.1	38.7	25.7		21.0				
Max Q Clear Time (g_c+I1), s	7.3	16.6		49.1	38.0	23.3		23.0				
Green Ext Time (p_c), s	0.0	4.4		0.0	0.1	0.7		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				80.5								
HCM 2010 LOS				F								

Intersection																
Intersection Delay, s/veh34.2																
Intersection LOS D																
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	48	30	113	0	45	36	22	0	143	463	29	0	17	269	24
Future Vol, veh/h	0	48	30	113	0	45	36	22	0	143	463	29	0	17	269	24
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	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	52	33	123	0	49	39	24	0	155	503	32	0	18	292	26
Number of Lanes	0	0	1	1	0	0	1	1	0	1	1	0	0	1	2	0
Approach	EB				WB				NB				SB			
Opposing Approach	WB				EB				SB				NB			
Opposing Lanes	2				2				3				2			
Conflicting Approach Left	SB				NB				EB				WB			
Conflicting Lanes Left	3				2				2				2			
Conflicting Approach Right	NB				SB				WB				EB			
Conflicting Lanes Right	2				3				2				2			
HCM Control Delay	13				13.3				53.7				14.3			
HCM LOS	B				B				F				B			
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3							
Vol Left, %	100%	0%	62%	0%	56%	0%	100%	0%	0%							
Vol Thru, %	0%	94%	38%	0%	44%	0%	0%	100%	79%							
Vol Right, %	0%	6%	0%	100%	0%	100%	0%	0%	21%							
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop							
Traffic Vol by Lane	143	492	78	113	81	22	17	179	114							
LT Vol	143	0	48	0	45	0	17	0	0							
Through Vol	0	463	30	0	36	0	0	179	90							
RT Vol	0	29	0	113	0	22	0	0	24							
Lane Flow Rate	155	535	85	123	88	24	18	195	124							
Geometry Grp	8	8	8	8	8	8	8	8	8							
Degree of Util (X)	0.322	1	0.199	0.254	0.214	0.051	0.042	0.412	0.256							
Departure Headway (Hd)	7.452	6.901	8.462	7.433	8.73	7.729	8.112	7.601	7.45							
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes							
Cap	485	529	424	480	411	461	441	472	481							
Service Time	5.152	4.601	6.225	5.223	6.491	5.519	5.865	5.366	5.218							
HCM Lane V/C Ratio	0.32	1.011	0.2	0.256	0.214	0.052	0.041	0.413	0.258							
HCM Control Delay	13.7	65.3	13.3	12.8	13.9	10.9	11.2	15.6	12.8							
HCM Lane LOS	B	F	B	B	B	B	B	C	B							
HCM 95th-tile Q	1.4	14	0.7	1	0.8	0.2	0.1	2	1							

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	0	76	103	0	0	0
Future Vol, veh/h	0	76	103	0	0	0
Conflicting Peds, #/hr	10	0	0	10	10	10
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	0	83	112	0	0	0
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	122	0	-	0	205	132
Stage 1	-	-	-	-	122	-
Stage 2	-	-	-	-	83	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1465	-	-	-	783	917
Stage 1	-	-	-	-	903	-
Stage 2	-	-	-	-	940	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1451	-	-	-	768	900
Mov Cap-2 Maneuver	-	-	-	-	768	-
Stage 1	-	-	-	-	894	-
Stage 2	-	-	-	-	931	-
Approach	EB		WB		SB	
HCM Control Delay, s	0		0		0	
HCM LOS					A	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1451	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	-	-	0	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	-	

HCM 2010 Signalized Intersection Summary
 8: Lake Jennings Park Rd & Hwy 8 Bus/Blossom Valley Rd

Ex AM
 11/24/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	70	195	238	53	66	111	487	63	50	482	59
Future Volume (veh/h)	82	70	195	238	53	66	111	487	63	50	482	59
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	0.99		0.95	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	89	76	212	259	58	72	121	529	68	54	524	64
Adj No. of Lanes	0	1	1	0	1	0	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	316	250	501	283	47	57	135	820	669	68	750	611
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.08	0.44	0.44	0.04	0.40	0.40
Sat Flow, veh/h	738	754	1511	620	141	173	1774	1863	1521	1774	1863	1518
Grp Volume(v), veh/h	165	0	212	389	0	0	121	529	68	54	524	64
Grp Sat Flow(s),veh/h/ln	1493	0	1511	934	0	0	1774	1863	1521	1774	1863	1518
Q Serve(g_s), s	0.0	0.0	8.5	19.7	0.0	0.0	5.2	17.2	2.0	2.3	18.1	2.0
Cycle Q Clear(g_c), s	6.0	0.0	8.5	25.7	0.0	0.0	5.2	17.2	2.0	2.3	18.1	2.0
Prop In Lane	0.54		1.00	0.67		0.19	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	567	0	501	387	0	0	135	820	669	68	750	611
V/C Ratio(X)	0.29	0.00	0.42	1.00	0.00	0.00	0.90	0.65	0.10	0.79	0.70	0.10
Avail Cap(c_a), veh/h	567	0	501	387	0	0	135	820	669	124	750	611
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.2	0.0	20.1	30.9	0.0	0.0	35.5	17.0	12.7	36.9	19.2	14.4
Incr Delay (d2), s/veh	0.1	0.0	0.2	46.9	0.0	0.0	46.5	3.9	0.3	7.4	5.4	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	3.6	13.2	0.0	0.0	4.3	9.7	0.9	1.3	10.4	0.9
LnGrp Delay(d),s/veh	19.3	0.0	20.3	77.7	0.0	0.0	82.0	20.9	13.0	44.3	24.6	14.8
LnGrp LOS	B		C	F			F	C	B	D	C	B
Approach Vol, veh/h		377			389			718			642	
Approach Delay, s/veh		19.9			77.7			30.4			25.3	
Approach LOS		B			E			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.1	39.4		31.0	10.0	36.5		31.0				
Change Period (Y+Rc), s	4.1	5.3		5.3	4.1	5.3		5.3				
Max Green Setting (Gmax), s	5.4	31.7		17.2	5.9	31.2		25.7				
Max Q Clear Time (g_c+I1), s	4.3	19.2		10.5	7.2	20.1		27.7				
Green Ext Time (p_c), s	0.0	3.4		1.7	0.0	3.3		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			35.7									
HCM 2010 LOS			D									

Intersection												
Int Delay, s/veh	5.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	14	0	296	0	365	396	1	318	596
Future Vol, veh/h	0	0	0	14	0	296	0	365	396	1	318	596
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	Free
Storage Length	-	-	-	0	-	330	-	-	90	90	-	90
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	15	0	322	0	397	430	1	346	648
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				755	755	417	346	0	-	407	0	0
Stage 1				407	407	-	-	-	-	-	-	-
Stage 2				348	348	-	-	-	-	-	-	-
Critical Hdwy				6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1				5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy				3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver				376	338	636	1213	-	0	1152	-	0
Stage 1				672	597	-	-	-	0	-	-	0
Stage 2				715	634	-	-	-	0	-	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver				369	0	624	1201	-	-	1141	-	-
Mov Cap-2 Maneuver				369	0	-	-	-	-	-	-	-
Stage 1				666	0	-	-	-	-	-	-	-
Stage 2				708	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				16.6			0			0		
HCM LOS				C								
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBL	SBT						
Capacity (veh/h)	1201	-	369	624	1141	-						
HCM Lane V/C Ratio	-	-	0.041	0.516	0.001	-						
HCM Control Delay (s)	0	-	15.2	16.7	8.2	-						
HCM Lane LOS	A	-	C	C	A	-						
HCM 95th %tile Q(veh)	0	-	0.1	3	0	-						

Intersection												
Intersection Delay, s/veh	32.5											
Intersection LOS	D											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	219	284	13	0	28	0	557	0	0	56	37
Future Vol, veh/h	0	219	284	13	0	28	0	557	0	0	56	37
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	238	309	14	0	30	0	605	0	0	61	40
Number of Lanes	0	1	1	0	0	1	0	1	0	0	1	0
Approach	EB			WB				NB				
Opposing Approach	WB			EB				SB				
Opposing Lanes	2			2				1				
Conflicting Approach Left	SB			NB				EB				
Conflicting Lanes Left	1			1				2				
Conflicting Approach Right	NB			SB				WB				
Conflicting Lanes Right	1			1				2				
HCM Control Delay	17.4			54				12.5				
HCM LOS	C			F				B				
Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1						
Vol Left, %	0%	100%	0%	100%	0%	92%						
Vol Thru, %	60%	0%	96%	0%	0%	8%						
Vol Right, %	40%	0%	4%	0%	100%	0%						
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop						
Traffic Vol by Lane	93	219	297	28	557	169						
LT Vol	0	219	0	28	0	155						
Through Vol	56	0	284	0	0	14						
RT Vol	37	0	13	0	557	0						
Lane Flow Rate	101	238	323	30	605	184						
Geometry Grp	2	7	7	7	7	2						
Degree of Util (X)	0.209	0.471	0.59	0.06	0.984	0.381						
Departure Headway (Hd)	7.437	7.121	6.579	7.075	5.851	7.474						
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes						
Cap	481	505	549	506	618	481						
Service Time	5.502	4.87	4.327	4.818	3.593	5.529						
HCM Lane V/C Ratio	0.21	0.471	0.588	0.059	0.979	0.383						
HCM Control Delay	12.5	16.1	18.4	10.3	56.2	15.1						
HCM Lane LOS	B	C	C	B	F	C						
HCM 95th-tile Q	0.8	2.5	3.8	0.2	14.4	1.8						

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	155	14	0
Future Vol, veh/h	0	155	14	0
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	168	15	0
Number of Lanes	0	0	1	0

Approach

SB

Opposing Approach

NB

Opposing Lanes

1

Conflicting Approach Left

WB

Conflicting Lanes Left

2

Conflicting Approach Right

EB

Conflicting Lanes Right

2

HCM Control Delay

15.1

HCM LOS

C

Lane

HCM 2010 Signalized Intersection Summary

1: SR 67 & Mapleview St

Ex PM
11/24/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	137	12	583	81	111	29	1315	714	282	1069	87
Future Volume (veh/h)	144	137	12	583	81	111	29	1315	714	282	1069	87
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	157	149	0	697	0	0	32	1429	776	307	1162	0
Adj No. of Lanes	0	1	1	2	0	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	114	108	194	797	0	356	71	1132	492	225	1451	649
Arrive On Green	0.12	0.12	0.00	0.22	0.00	0.00	0.04	0.32	0.32	0.13	0.41	0.00
Sat Flow, veh/h	932	884	1583	3548	0	1583	1774	3539	1539	1774	3539	1583
Grp Volume(v), veh/h	306	0	0	697	0	0	32	1429	776	307	1162	0
Grp Sat Flow(s),veh/h/ln	1816	0	1583	1774	0	1583	1774	1770	1539	1774	1770	1583
Q Serve(g_s), s	17.7	0.0	0.0	27.4	0.0	0.0	2.5	46.2	46.2	18.3	41.7	0.0
Cycle Q Clear(g_c), s	17.7	0.0	0.0	27.4	0.0	0.0	2.5	46.2	46.2	18.3	41.7	0.0
Prop In Lane	0.51		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	223	0	194	797	0	356	71	1132	492	225	1451	649
V/C Ratio(X)	1.38	0.00	0.00	0.87	0.00	0.00	0.45	1.26	1.58	1.37	0.80	0.00
Avail Cap(c_a), veh/h	223	0	194	933	0	416	98	1132	492	225	1451	649
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	63.4	0.0	0.0	54.0	0.0	0.0	67.8	49.1	49.1	63.1	37.5	0.0
Incr Delay (d2), s/veh	194.6	0.0	0.0	8.2	0.0	0.0	4.4	125.4	269.2	190.6	4.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	20.9	0.0	0.0	14.4	0.0	0.0	1.3	42.2	56.3	20.8	21.3	0.0
LnGrp Delay(d),s/veh	258.0	0.0	0.0	62.3	0.0	0.0	72.2	174.5	318.3	253.7	42.2	0.0
LnGrp LOS	F			E			E	F	F	F	D	
Approach Vol, veh/h		306			697			2237			1469	
Approach Delay, s/veh		258.0			62.3			222.9			86.4	
Approach LOS		F			E			F			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	24.0	55.7		25.0	11.0	68.7		39.8				
Change Period (Y+Rc), s	* 5.7	9.5		7.3	* 5.2	9.5		7.3				
Max Green Setting (Gmax), s	* 18	46.2		17.7	* 8	57.0		38.0				
Max Q Clear Time (g_c+I1), s	20.3	48.2		19.7	4.5	43.7		29.4				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	13.3		1.8				
Intersection Summary												
HCM 2010 Ctrl Delay			158.8									
HCM 2010 LOS			F									
Notes												

HCM 2010 Signalized Intersection Summary

2: Main Ave & Mapleview St

Ex PM
11/24/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↕	↗		↕	↗		↕	
Traffic Volume (veh/h)	0	922	211	33	603	6	169	3	81	0	2	3
Future Volume (veh/h)	0	922	211	33	603	6	169	3	81	0	2	3
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.93	0.99		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	0	1002	229	36	655	7	184	3	88	0	2	3
Adj No. of Lanes	0	1	1	0	2	1	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	896	733	28	538	229	386	6	630	0	165	247
Arrive On Green	0.00	0.48	0.48	0.16	0.16	0.16	0.25	0.25	0.25	0.00	0.25	0.25
Sat Flow, veh/h	0	1863	1523	180	3443	1466	1359	22	1532	0	660	989
Grp Volume(v), veh/h	0	1002	229	370	321	7	187	0	88	0	0	5
Grp Sat Flow(s),veh/h/ln	0	1863	1523	1854	1770	1466	1382	0	1532	0	0	1649
Q Serve(g_s), s	0.0	72.7	13.9	23.6	23.6	0.6	17.6	0.0	5.5	0.0	0.0	0.3
Cycle Q Clear(g_c), s	0.0	72.7	13.9	23.6	23.6	0.6	18.0	0.0	5.5	0.0	0.0	0.3
Prop In Lane	0.00		1.00	0.10		1.00	0.98		1.00	0.00		0.60
Lane Grp Cap(c), veh/h	0	896	733	290	276	229	392	0	630	0	0	411
V/C Ratio(X)	0.00	1.12	0.31	1.28	1.16	0.03	0.48	0.00	0.14	0.00	0.00	0.01
Avail Cap(c_a), veh/h	0	896	733	290	276	229	392	0	630	0	0	411
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	39.2	23.9	63.8	63.7	54.1	49.4	0.0	28.3	0.0	0.0	42.7
Incr Delay (d2), s/veh	0.0	68.0	0.1	148.8	105.2	0.0	4.1	0.0	0.5	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	54.3	5.9	24.0	19.6	0.3	7.3	0.0	3.0	0.0	0.0	0.2
LnGrp Delay(d),s/veh	0.0	107.2	24.0	212.6	169.0	54.1	53.6	0.0	28.8	0.0	0.0	42.7
LnGrp LOS		F	C	F	F	D	D		C			D
Approach Vol, veh/h	1231				698		275				5	
Approach Delay, s/veh	91.7				190.9		45.6				42.7	
Approach LOS	F				F		D				D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	78.4		43.4		29.3		43.4					
Change Period (Y+Rc), s	5.7		5.7		5.7		* 5.7					
Max Green Setting (Gmax), s	72.7		36.6		23.6		* 38					
Max Q Clear Time (g_c+I1), s	74.7		2.3		25.6		20.0					
Green Ext Time (p_c), s	0.0		2.2		0.0		1.8					
Intersection Summary												
HCM 2010 Ctrl Delay			117.2									
HCM 2010 LOS			F									
Notes												

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	980	23	0	630	36	0	0	107	0	0	12
Future Vol, veh/h	0	980	23	0	630	36	0	0	107	0	0	12
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1065	25	0	685	39	0	0	116	0	0	13
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	695	0	0	1100	0	0	1440	1783	565	1238	1795	362
Stage 1	-	-	-	-	-	-	1088	1088	-	695	695	-
Stage 2	-	-	-	-	-	-	352	695	-	543	1100	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	897	-	-	630	-	-	93	81	468	132	80	635
Stage 1	-	-	-	-	-	-	230	290	-	399	442	-
Stage 2	-	-	-	-	-	-	638	442	-	492	286	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	888	-	-	624	-	-	89	79	459	97	78	623
Mov Cap-2 Maneuver	-	-	-	-	-	-	89	79	-	97	78	-
Stage 1	-	-	-	-	-	-	228	287	-	395	438	-
Stage 2	-	-	-	-	-	-	619	438	-	364	283	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			15.5			10.9		
HCM LOS							C			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	459	888	-	-	624	-	-	623				
HCM Lane V/C Ratio	0.253	-	-	-	-	-	-	0.021				
HCM Control Delay (s)	15.5	0	-	-	0	-	-	10.9				
HCM Lane LOS	C	A	-	-	A	-	-	B				
HCM 95th %tile Q(veh)	1	0	-	-	0	-	-	0.1				

HCM 2010 Signalized Intersection Summary
4: Ashwood St & Mapleview St/Lake Jennings Park Rd

Ex PM
11/24/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	457	395	45	45	256	181	28	143	46	218	142	327
Future Volume (veh/h)	457	395	45	45	256	181	28	143	46	218	142	327
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.91	1.00		0.96	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	497	429	49	49	278	197	30	155	50	237	154	355
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	522	1260	143	75	508	645	35	182	59	302	197	424
Arrive On Green	0.29	0.40	0.40	0.04	0.14	0.14	0.16	0.16	0.16	0.28	0.28	0.28
Sat Flow, veh/h	1774	3187	362	1774	3539	1448	225	1164	375	1096	712	1535
Grp Volume(v), veh/h	497	237	241	49	278	197	235	0	0	391	0	355
Grp Sat Flow(s),veh/h/ln	1774	1770	1779	1774	1770	1448	1765	0	0	1808	0	1535
Q Serve(g_s), s	36.9	12.6	12.7	3.7	9.8	12.3	17.4	0.0	0.0	26.9	0.0	29.3
Cycle Q Clear(g_c), s	36.9	12.6	12.7	3.7	9.8	12.3	17.4	0.0	0.0	26.9	0.0	29.3
Prop In Lane	1.00		0.20	1.00		1.00	0.13		0.21	0.61		1.00
Lane Grp Cap(c), veh/h	522	700	704	75	508	645	276	0	0	499	0	424
V/C Ratio(X)	0.95	0.34	0.34	0.66	0.55	0.31	0.85	0.00	0.00	0.78	0.00	0.84
Avail Cap(c_a), veh/h	624	852	856	128	714	729	276	0	0	499	0	424
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.5	28.4	28.4	63.4	53.5	26.2	55.2	0.0	0.0	44.9	0.0	45.8
Incr Delay (d2), s/veh	21.7	0.1	0.1	3.6	0.4	0.1	26.8	0.0	0.0	11.7	0.0	17.7
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	21.2	6.1	6.3	1.9	4.8	7.3	10.5	0.0	0.0	15.1	0.0	14.4
LnGrp Delay(d),s/veh	68.2	28.5	28.5	67.0	53.9	26.3	82.0	0.0	0.0	56.6	0.0	63.5
LnGrp LOS	E	C	C	E	D	C	F			E		E
Approach Vol, veh/h		975			524			235			746	
Approach Delay, s/veh		48.8			44.8			82.0			59.9	
Approach LOS		D			D			F			E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.4	58.0		42.0	43.2	24.2		25.0				
Change Period (Y+Rc), s	3.7	4.9		4.9	3.7	4.9		4.0				
Max Green Setting (Gmax), s	9.7	64.7		37.1	47.3	27.1		21.0				
Max Q Clear Time (g_c+I1), s	5.7	14.7		31.3	38.9	14.3		19.4				
Green Ext Time (p_c), s	0.0	3.4		1.8	0.6	2.8		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay				54.4								
HCM 2010 LOS				D								

Intersection																
Intersection Delay, s/veh22.9																
Intersection LOS C																
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	32	44	176	0	42	23	10	0	117	303	31	0	35	494	28
Future Vol, veh/h	0	32	44	176	0	42	23	10	0	117	303	31	0	35	494	28
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	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	35	48	191	0	46	25	11	0	127	329	34	0	38	537	30
Number of Lanes	0	0	1	1	0	0	1	1	0	1	1	0	0	1	2	0
Approach	EB				WB				NB				SB			
Opposing Approach	WB				EB				SB				NB			
Opposing Lanes	2				2				3				2			
Conflicting Approach Left	SB				NB				EB				WB			
Conflicting Lanes Left	3				2				2				2			
Conflicting Approach Right	NB				SB				WB				EB			
Conflicting Lanes Right	2				3				2				2			
HCM Control Delay	15.3				14.2				27.5				23.9			
HCM LOS	C				B				D				C			
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3							
Vol Left, %	100%	0%	42%	0%	65%	0%	100%	0%	0%							
Vol Thru, %	0%	91%	58%	0%	35%	0%	0%	100%	85%							
Vol Right, %	0%	9%	0%	100%	0%	100%	0%	0%	15%							
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop							
Traffic Vol by Lane	117	334	76	176	65	10	35	329	193							
LT Vol	117	0	32	0	42	0	35	0	0							
Through Vol	0	303	44	0	23	0	0	329	165							
RT Vol	0	31	0	176	0	10	0	0	28							
Lane Flow Rate	127	363	83	191	71	11	38	358	209							
Geometry Grp	8	8	8	8	8	8	8	8	8							
Degree of Util (X)	0.291	0.772	0.2	0.413	0.189	0.026	0.085	0.751	0.433							
Departure Headway (Hd)	8.234	7.657	8.709	7.777	9.63	8.474	8.067	7.556	7.452							
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes							
Cap	435	472	411	461	375	420	443	476	482							
Service Time	6.012	5.435	6.493	5.56	7.33	6.274	5.843	5.332	5.228							
HCM Lane V/C Ratio	0.292	0.769	0.202	0.414	0.189	0.026	0.086	0.752	0.434							
HCM Control Delay	14.4	32.1	13.7	16	14.6	11.5	11.6	29.9	15.9							
HCM Lane LOS	B	D	B	C	B	B	B	D	C							
HCM 95th-tile Q	1.2	6.7	0.7	2	0.7	0.1	0.3	6.3	2.2							

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	0	110	75	0	0	0
Future Vol, veh/h	0	110	75	0	0	0
Conflicting Peds, #/hr	10	0	0	10	10	10
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	0	120	82	0	0	0
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	92	0	-	0	212	102
Stage 1	-	-	-	-	92	-
Stage 2	-	-	-	-	120	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1503	-	-	-	776	953
Stage 1	-	-	-	-	932	-
Stage 2	-	-	-	-	905	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1489	-	-	-	761	935
Mov Cap-2 Maneuver	-	-	-	-	761	-
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	896	-
Approach	EB		WB		SB	
HCM Control Delay, s	0		0		0	
HCM LOS					A	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1489	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	-	-	0	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile O(veh)	0	-	-	-	-	

HCM 2010 Signalized Intersection Summary
 8: Lake Jennings Park Rd & Hwy 8 Bus/Blossom Valley Rd

Ex PM
 11/24/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	56	201	117	26	35	142	555	173	63	554	73
Future Volume (veh/h)	78	56	201	117	26	35	142	555	173	63	554	73
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.95	0.99		0.95	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	85	61	218	127	28	38	154	603	188	68	602	79
Adj No. of Lanes	0	1	1	0	1	0	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	277	179	379	225	52	47	191	916	750	87	807	658
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.11	0.49	0.49	0.05	0.43	0.43
Sat Flow, veh/h	777	706	1498	558	205	187	1774	1863	1524	1774	1863	1520
Grp Volume(v), veh/h	146	0	218	193	0	0	154	603	188	68	602	79
Grp Sat Flow(s),veh/h/ln	1483	0	1498	951	0	0	1774	1863	1524	1774	1863	1520
Q Serve(g_s), s	0.0	0.0	9.1	9.2	0.0	0.0	6.1	17.4	5.1	2.7	19.3	2.2
Cycle Q Clear(g_c), s	5.5	0.0	9.1	14.8	0.0	0.0	6.1	17.4	5.1	2.7	19.3	2.2
Prop In Lane	0.58		1.00	0.66		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	455	0	379	324	0	0	191	916	750	87	807	658
V/C Ratio(X)	0.32	0.00	0.57	0.59	0.00	0.00	0.81	0.66	0.25	0.78	0.75	0.12
Avail Cap(c_a), veh/h	455	0	379	409	0	0	221	916	750	134	807	658
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.8	0.0	23.3	26.8	0.0	0.0	31.1	13.6	10.5	33.6	16.9	12.1
Incr Delay (d2), s/veh	0.1	0.0	1.4	0.7	0.0	0.0	14.7	3.7	0.8	6.5	6.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	3.9	3.7	0.0	0.0	3.7	9.8	2.3	1.5	11.3	1.0
LnGrp Delay(d),s/veh	22.0	0.0	24.7	27.4	0.0	0.0	45.8	17.3	11.3	40.1	23.2	12.5
LnGrp LOS	C		C	C			D	B	B	D	C	B
Approach Vol, veh/h		364			193			945			749	
Approach Delay, s/veh		23.6			27.4			20.8			23.6	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	40.4		23.4	11.8	36.2		23.4				
Change Period (Y+Rc), s	4.1	5.3		5.3	4.1	5.3		5.3				
Max Green Setting (Gmax), s	5.4	34.4		17.2	8.9	30.9		23.0				
Max Q Clear Time (g_c+I1), s	4.7	19.4		11.1	8.1	21.3		16.8				
Green Ext Time (p_c), s	0.0	4.6		1.0	0.0	3.8		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			22.7									
HCM 2010 LOS			C									

Intersection												
Int Delay, s/veh	4.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	19	0	221	0	649	366	0	542	330
Future Vol, veh/h	0	0	0	19	0	221	0	649	366	0	542	330
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	Free
Storage Length	-	-	-	0	-	330	-	-	90	90	-	90
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	21	0	240	0	705	398	0	589	359
Major/Minor	Minor1			Major1			Major2					
Conflicting Flow All	1304			1304	725	589	0	-	715	0	0	
Stage 1	715			715	-	-	-	-	-	-	-	
Stage 2	589			589	-	-	-	-	-	-	-	
Critical Hdwy	6.42			6.52	6.22	4.12	-	-	4.12	-	-	
Critical Hdwy Stg 1	5.42			5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.42			5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518			4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	177			160	425	986	-	0	885	-	0	
Stage 1	485			434	-	-	-	0	-	-	0	
Stage 2	554			495	-	-	-	0	-	-	0	
Platoon blocked, %							-			-		
Mov Cap-1 Maneuver	174			0	417	977	-	-	877	-	-	
Mov Cap-2 Maneuver	174			0	-	-	-	-	-	-	-	
Stage 1	480			0	-	-	-	-	-	-	-	
Stage 2	549			0	-	-	-	-	-	-	-	
Approach	WB			NB			SB					
HCM Control Delay, s	25			0			0					
HCM LOS	D											
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBL	SBT						
Capacity (veh/h)	977	-	174	417	877	-						
HCM Lane V/C Ratio	-	-	0.119	0.576	-	-						
HCM Control Delay (s)	0	-	28.5	24.7	0	-						
HCM Lane LOS	A	-	D	C	A	-						
HCM 95th %tile Q(veh)	0	-	0.4	3.5	0	-						

Intersection												
Intersection Delay, s/veh	57.6											
Intersection LOS	F											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	441	506	29	0	25	0	570	0	0	30	21
Future Vol, veh/h	0	441	506	29	0	25	0	570	0	0	30	21
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	479	550	32	0	27	0	620	0	0	33	23
Number of Lanes	0	1	1	0	0	1	0	1	0	0	1	0
Approach	EB				WB				NB			
Opposing Approach	WB				EB				SB			
Opposing Lanes	2				2				1			
Conflicting Approach Left	SB				NB				EB			
Conflicting Lanes Left	1				1				2			
Conflicting Approach Right	NB				SB				WB			
Conflicting Lanes Right	1				1				2			
HCM Control Delay	67				62.5				12.7			
HCM LOS	F				F				B			
Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1						
Vol Left, %	0%	100%	0%	100%	0%	91%						
Vol Thru, %	59%	0%	95%	0%	0%	9%						
Vol Right, %	41%	0%	5%	0%	100%	0%						
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop						
Traffic Vol by Lane	51	441	535	25	570	285						
LT Vol	0	441	0	25	0	259						
Through Vol	30	0	506	0	0	26						
RT Vol	21	0	29	0	570	0						
Lane Flow Rate	55	479	582	27	620	310						
Geometry Grp	2	7	7	7	7	2						
Degree of Util (X)	0.13	1	1	0.06	1	0.639						
Departure Headway (Hd)	8.439	7.521	6.982	7.974	6.772	7.548						
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes						
Cap	427	484	523	451	539	480						
Service Time	6.443	5.233	4.694	5.696	4.495	5.548						
HCM Lane V/C Ratio	0.129	0.99	1.113	0.06	1.15	0.646						
HCM Control Delay	12.7	68.5	65.8	11.2	64.8	23						
HCM Lane LOS	B	F	F	B	F	C						
HCM 95th-tile Q	0.4	13.4	13.9	0.2	14.1	4.4						

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	259	26	0
Future Vol, veh/h	0	259	26	0
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	282	28	0
Number of Lanes	0	0	1	0

Approach

SB

Opposing Approach

NB

Opposing Lanes

1

Conflicting Approach Left

WB

Conflicting Lanes Left

2

Conflicting Approach Right

EB

Conflicting Lanes Right

2

HCM Control Delay

23

HCM LOS

C

Lane

APPENDIX E

EXISTING + PROJECT INTERSECTION CALCULATION SHEETS

HCM 2010 Signalized Intersection Summary

1: SR 67 & Mapleview St

Ex + P AM
2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	98	27	798	98	143	23	633	244	109	535	64
Future Volume (veh/h)	80	98	27	798	98	143	23	633	244	109	535	64
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1863	1863	1863	1863	1810	1863	1863	1863
Adj Flow Rate, veh/h	87	107	0	943	0	0	25	688	265	118	582	0
Adj No. of Lanes	0	1	1	2	0	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	5	2	2	2
Cap, veh/h	101	124	195	1047	0	467	65	976	411	142	1144	512
Arrive On Green	0.12	0.12	0.00	0.29	0.00	0.00	0.04	0.28	0.28	0.08	0.32	0.00
Sat Flow, veh/h	817	1005	1583	3548	0	1583	1774	3539	1491	1774	3539	1583
Grp Volume(v), veh/h	194	0	0	943	0	0	25	688	265	118	582	0
Grp Sat Flow(s),veh/h/ln	1822	0	1583	1774	0	1583	1774	1770	1491	1774	1770	1583
Q Serve(g_s), s	13.8	0.0	0.0	33.7	0.0	0.0	1.8	23.1	20.7	8.7	17.6	0.0
Cycle Q Clear(g_c), s	13.8	0.0	0.0	33.7	0.0	0.0	1.8	23.1	20.7	8.7	17.6	0.0
Prop In Lane	0.45		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	225	0	195	1047	0	467	65	976	411	142	1144	512
V/C Ratio(X)	0.86	0.00	0.00	0.90	0.00	0.00	0.39	0.70	0.64	0.83	0.51	0.00
Avail Cap(c_a), veh/h	286	0	248	1336	0	596	108	976	411	180	1144	512
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	56.8	0.0	0.0	44.7	0.0	0.0	62.2	43.0	42.1	59.8	36.2	0.0
Incr Delay (d2), s/veh	20.9	0.0	0.0	7.2	0.0	0.0	3.8	4.3	7.6	22.1	1.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	0.0	0.0	17.6	0.0	0.0	1.0	11.9	9.4	5.1	8.8	0.0
LnGrp Delay(d),s/veh	77.7	0.0	0.0	51.9	0.0	0.0	65.9	47.2	49.7	82.0	37.8	0.0
LnGrp LOS	E			D			E	D	D	F	D	
Approach Vol, veh/h		194			943			978			700	
Approach Delay, s/veh		77.7			51.9			48.4			45.2	
Approach LOS		E			D			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	16.3	45.9		23.6	10.0	52.2		46.2				
Change Period (Y+Rc), s	* 5.7	9.5		7.3	* 5.2	9.5		7.3				
Max Green Setting (Gmax), s	* 13	36.4		20.7	* 8	42.3		49.7				
Max Q Clear Time (g_c+I1), s	10.7	25.1		15.8	3.8	19.6		35.7				
Green Ext Time (p_c), s	0.1	10.7		0.5	0.0	20.6		3.3				
Intersection Summary												
HCM 2010 Ctrl Delay			50.8									
HCM 2010 LOS			D									
Notes												

HCM 2010 Signalized Intersection Summary

2: Main Ave & Mapleview St

Ex + P AM

2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	386	65	25	835	6	204	2	76	2	1	0
Future Volume (veh/h)	0	386	65	25	835	6	204	2	76	2	1	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.95	0.99		0.97	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1863	1900	1863	1863	1900	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	0	420	71	27	908	7	222	2	83	2	1	0
Adj No. of Lanes	0	1	1	0	2	1	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	461	374	29	1029	439	477	4	952	211	96	0
Arrive On Green	0.00	0.25	0.25	0.29	0.29	0.29	0.32	0.32	0.32	0.32	0.32	0.00
Sat Flow, veh/h	0	1845	1498	100	3527	1505	1315	12	1539	509	303	0
Grp Volume(v), veh/h	0	420	71	501	434	7	224	0	83	3	0	0
Grp Sat Flow(s),veh/h/ln	0	1845	1498	1858	1770	1505	1327	0	1539	812	0	0
Q Serve(g_s), s	0.0	27.0	4.6	31.9	28.1	0.4	0.0	0.0	2.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	27.0	4.6	31.9	28.1	0.4	18.3	0.0	2.7	18.3	0.0	0.0
Prop In Lane	0.00		1.00	0.05		1.00	0.99		1.00	0.67		0.00
Lane Grp Cap(c), veh/h	0	461	374	542	516	439	481	0	952	308	0	0
V/C Ratio(X)	0.00	0.91	0.19	0.92	0.84	0.02	0.47	0.00	0.09	0.01	0.00	0.00
Avail Cap(c_a), veh/h	0	691	561	754	718	611	481	0	952	308	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	44.4	36.0	41.9	40.5	30.7	34.6	0.0	9.8	29.6	0.0	0.0
Incr Delay (d2), s/veh	0.0	9.1	0.1	11.6	4.7	0.0	3.2	0.0	0.2	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	14.9	1.9	18.0	14.4	0.2	6.7	0.0	2.1	0.1	0.0	0.0
LnGrp Delay(d),s/veh	0.0	53.5	36.1	53.4	45.2	30.7	37.8	0.0	10.0	29.7	0.0	0.0
LnGrp LOS		D	D	D	D	C	D		A	C		
Approach Vol, veh/h		491			942			307			3	
Approach Delay, s/veh		51.0			49.5			30.3			29.7	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		36.2		44.5		41.3		44.5				
Change Period (Y+Rc), s		5.7		5.7		5.7		* 5.7				
Max Green Setting (Gmax), s		45.7		37.7		49.5		* 39				
Max Q Clear Time (g_c+I1), s		29.0		20.3		33.9		20.3				
Green Ext Time (p_c), s		1.5		2.0		1.7		2.1				
Intersection Summary												
HCM 2010 Ctrl Delay				46.5								
HCM 2010 LOS				D								
Notes												

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	442	22	0	857	111	0	0	169	0	0	9
Future Vol, veh/h	0	442	22	0	857	111	0	0	169	0	0	9
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	3	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	480	24	0	932	121	0	0	184	0	0	10
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	942	0	0	514	0	0	978	1444	272	1192	1456	486
Stage 1	-	-	-	-	-	-	502	502	-	942	942	-
Stage 2	-	-	-	-	-	-	476	942	-	250	514	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	724	-	-	1048	-	-	205	131	726	143	129	527
Stage 1	-	-	-	-	-	-	520	540	-	283	340	-
Stage 2	-	-	-	-	-	-	539	340	-	732	534	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	717	-	-	1038	-	-	197	129	712	104	127	517
Mov Cap-2 Maneuver	-	-	-	-	-	-	197	129	-	104	127	-
Stage 1	-	-	-	-	-	-	515	535	-	280	337	-
Stage 2	-	-	-	-	-	-	524	337	-	538	529	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			11.8			12.1		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	712	717	-	-	1038	-	-	517				
HCM Lane V/C Ratio	0.258	-	-	-	-	-	-	0.019				
HCM Control Delay (s)	11.8	0	-	-	0	-	-	12.1				
HCM Lane LOS	B	A	-	-	A	-	-	B				
HCM 95th %tile Q(veh)	1	0	-	-	0	-	-	0.1				

HCM 2010 Signalized Intersection Summary
 4: Ashwood St & Mapleview St/Lake Jennings Park Rd

Ex + P AM
 2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	404	363	97	59	404	290	35	162	41	203	177	468
Future Volume (veh/h)	404	363	97	59	404	290	35	162	41	203	177	468
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.92	1.00		0.70	1.00		0.85
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1848	1900	1863	1845	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	439	395	105	64	439	315	38	176	45	221	192	509
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	3	3	2	3	2	2	2	2	2	2	2
Cap, veh/h	457	1003	263	87	561	732	36	168	43	307	266	424
Arrive On Green	0.26	0.37	0.37	0.05	0.16	0.16	0.15	0.15	0.15	0.32	0.32	0.32
Sat Flow, veh/h	1774	2722	714	1774	3505	1449	242	1123	287	971	843	1343
Grp Volume(v), veh/h	439	253	247	64	439	315	259	0	0	413	0	509
Grp Sat Flow(s),veh/h/ln	1774	1756	1680	1774	1752	1449	1653	0	0	1814	0	1343
Q Serve(g_s), s	36.5	15.9	16.3	5.3	18.0	21.8	22.3	0.0	0.0	30.1	0.0	47.2
Cycle Q Clear(g_c), s	36.5	15.9	16.3	5.3	18.0	21.8	22.3	0.0	0.0	30.1	0.0	47.2
Prop In Lane	1.00		0.42	1.00		1.00	0.15		0.17	0.54		1.00
Lane Grp Cap(c), veh/h	457	647	619	87	561	732	247	0	0	573	0	424
V/C Ratio(X)	0.96	0.39	0.40	0.73	0.78	0.43	1.05	0.00	0.00	0.72	0.00	1.20
Avail Cap(c_a), veh/h	459	647	619	241	570	736	247	0	0	573	0	424
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	54.7	34.8	34.9	70.1	60.2	26.2	63.6	0.0	0.0	45.3	0.0	51.1
Incr Delay (d2), s/veh	31.7	0.2	0.2	4.4	6.3	0.2	71.1	0.0	0.0	7.6	0.0	110.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.9	7.8	7.6	2.7	9.2	13.0	15.0	0.0	0.0	16.4	0.0	30.5
LnGrp Delay(d),s/veh	86.4	35.0	35.1	74.4	66.6	26.4	134.7	0.0	0.0	52.9	0.0	161.6
LnGrp LOS	F	C	D	E	E	C	F			D		F
Approach Vol, veh/h		939			818			259			922	
Approach Delay, s/veh		59.0			51.7			134.7			112.9	
Approach LOS		E			D			F			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.1	60.0		52.1	42.2	28.8		26.3				
Change Period (Y+Rc), s	3.7	4.9		4.9	3.7	4.9		4.0				
Max Green Setting (Gmax), s	20.3	42.7		47.2	38.7	24.3		22.3				
Max Q Clear Time (g_c+I1), s	7.3	18.3		49.2	38.5	23.8		24.3				
Green Ext Time (p_c), s	0.0	4.6		0.0	0.0	0.2		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				80.6								
HCM 2010 LOS				F								

Intersection																
Intersection Delay, s/veh35.1																
Intersection LOS E																
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	48	30	113	0	76	36	52	0	143	463	64	0	51	269	24
Future Vol, veh/h	0	48	30	113	0	76	36	52	0	143	463	64	0	51	269	24
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	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	21	2	32	2	2	2	26	2	35	2	2
Mvmt Flow	0	52	33	123	0	83	39	57	0	155	503	70	0	55	292	26
Number of Lanes	0	0	1	1	0	0	1	1	0	1	1	0	0	1	2	0
Approach	EB				WB				NB				SB			
Opposing Approach	WB				EB				SB				NB			
Opposing Lanes	2				2				3				2			
Conflicting Approach Left	SB				NB				EB				WB			
Conflicting Lanes Left	3				2				2				2			
Conflicting Approach Right	NB				SB				WB				EB			
Conflicting Lanes Right	2				3				2				2			
HCM Control Delay	13.8				15				56.4				15.1			
HCM LOS	B				B				F				C			
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3							
Vol Left, %	100%	0%	62%	0%	68%	0%	100%	0%	0%							
Vol Thru, %	0%	88%	38%	0%	32%	0%	0%	100%	79%							
Vol Right, %	0%	12%	0%	100%	0%	100%	0%	0%	21%							
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop							
Traffic Vol by Lane	143	527	78	113	112	52	51	179	114							
LT Vol	143	0	48	0	76	0	51	0	0							
Through Vol	0	463	30	0	36	0	0	179	90							
RT Vol	0	64	0	113	0	52	0	0	24							
Lane Flow Rate	155	573	85	123	122	57	55	195	124							
Geometry Grp	8	8	8	8	8	8	8	8	8							
Degree of Util (X)	0.344	1	0.211	0.272	0.317	0.126	0.139	0.43	0.268							
Departure Headway (Hd)	7.968	7.37	8.974	7.973	9.381	8.028	9.125	8.064	7.917							
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes							
Cap	454	498	402	453	385	449	395	450	457							
Service Time	5.686	5.088	6.686	5.685	7.094	5.74	6.825	5.764	5.617							
HCM Lane V/C Ratio	0.341	1.151	0.211	0.272	0.317	0.127	0.139	0.433	0.271							
HCM Control Delay	14.8	67.7	14.1	13.6	16.4	11.9	13.3	16.7	13.5							
HCM Lane LOS	B	F	B	B	C	B	B	C	B							
HCM 95th-tile Q	1.5	13.5	0.8	1.1	1.3	0.4	0.5	2.1	1.1							

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	69	76	164	0	0	0
Future Vol, veh/h	69	76	164	0	0	0
Conflicting Peds, #/hr	10	0	0	10	10	10
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	71	2	18	2	2	2
Mvmt Flow	75	83	178	0	0	0
Major/Minor	Minor2		Major2			
Conflicting Flow All	188	188	-	0		
Stage 1	188	188	-	-		
Stage 2	0	0	-	-		
Critical Hdwy	7.81	6.52	-	-		
Critical Hdwy Stg 1	6.81	5.52	-	-		
Critical Hdwy Stg 2	-	-	-	-		
Follow-up Hdwy	4.139	4.018	-	-		
Pot Cap-1 Maneuver	643	707	-	-		
Stage 1	678	745	-	-		
Stage 2	-	-	-	-		
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	631	0	-	-		
Mov Cap-2 Maneuver	631	0	-	-		
Stage 1	672	0	-	-		
Stage 2	-	0	-	-		
Approach	EB		WB			
HCM Control Delay, s			0			
HCM LOS	-					
Minor Lane/Major Mvmt	EBLn1	EBLn2	WBT	WBR		
Capacity (veh/h)	631	-	-	-		
HCM Lane V/C Ratio	0.119	-	-	-		
HCM Control Delay (s)	11.5	-	-	-		
HCM Lane LOS	B	-	-	-		
HCM 95th %tile O(veh)	0.4	-	-	-		

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	0	76	103	0	0	61
Future Vol, veh/h	0	76	103	0	0	61
Conflicting Peds, #/hr	10	0	0	10	10	10
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	92
Mvmt Flow	0	83	112	0	0	66
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	122	0	-	0	205	132
Stage 1	-	-	-	-	122	-
Stage 2	-	-	-	-	83	-
Critical Hdwy	4.12	-	-	-	6.42	7.12
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	4.128
Pot Cap-1 Maneuver	1465	-	-	-	783	724
Stage 1	-	-	-	-	903	-
Stage 2	-	-	-	-	940	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1451	-	-	-	768	710
Mov Cap-2 Maneuver	-	-	-	-	768	-
Stage 1	-	-	-	-	894	-
Stage 2	-	-	-	-	931	-
Approach	EB		WB		SB	
HCM Control Delay, s	0		0		10.6	
HCM LOS					B	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1451	-	-	-	710	
HCM Lane V/C Ratio	-	-	-	-	0.093	
HCM Control Delay (s)	0	-	-	-	10.6	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

HCM 2010 Signalized Intersection Summary

8: Lake Jennings Park Rd & Hwy 8 Bus/Blossom Valley Rd

Ex + P AM
2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	70	195	238	53	66	111	522	63	50	513	59
Future Volume (veh/h)	82	70	195	238	53	66	111	522	63	50	513	59
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	0.99		0.95	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	89	76	212	259	58	72	121	567	68	54	558	64
Adj No. of Lanes	0	1	1	0	1	0	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	316	250	501	283	47	57	135	820	669	68	750	611
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.08	0.44	0.44	0.04	0.40	0.40
Sat Flow, veh/h	738	754	1511	620	141	173	1774	1863	1521	1774	1863	1518
Grp Volume(v), veh/h	165	0	212	389	0	0	121	567	68	54	558	64
Grp Sat Flow(s),veh/h/ln	1493	0	1511	934	0	0	1774	1863	1521	1774	1863	1518
Q Serve(g_s), s	0.0	0.0	8.5	19.7	0.0	0.0	5.2	19.0	2.0	2.3	19.8	2.0
Cycle Q Clear(g_c), s	6.0	0.0	8.5	25.7	0.0	0.0	5.2	19.0	2.0	2.3	19.8	2.0
Prop In Lane	0.54		1.00	0.67		0.19	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	567	0	501	387	0	0	135	820	669	68	750	611
V/C Ratio(X)	0.29	0.00	0.42	1.00	0.00	0.00	0.90	0.69	0.10	0.79	0.74	0.10
Avail Cap(c_a), veh/h	567	0	501	387	0	0	135	820	669	124	750	611
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.2	0.0	20.1	30.9	0.0	0.0	35.5	17.5	12.7	36.9	19.7	14.4
Incr Delay (d2), s/veh	0.1	0.0	0.2	46.9	0.0	0.0	46.5	4.8	0.3	7.4	6.6	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	3.6	13.2	0.0	0.0	4.3	10.7	0.9	1.3	11.5	0.9
LnGrp Delay(d),s/veh	19.3	0.0	20.3	77.7	0.0	0.0	82.0	22.2	13.0	44.3	26.3	14.8
LnGrp LOS	B		C	F			F	C	B	D	C	B
Approach Vol, veh/h		377			389			756			676	
Approach Delay, s/veh		19.9			77.7			31.0			26.7	
Approach LOS		B			E			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.1	39.4		31.0	10.0	36.5		31.0				
Change Period (Y+Rc), s	4.1	5.3		5.3	4.1	5.3		5.3				
Max Green Setting (Gmax), s	5.4	31.7		17.2	5.9	31.2		25.7				
Max Q Clear Time (g_c+I1), s	4.3	21.0		10.5	7.2	21.8		27.7				
Green Ext Time (p_c), s	0.0	3.5		1.7	0.0	3.3		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			36.0									
HCM 2010 LOS			D									

Intersection												
Int Delay, s/veh	5.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	14	0	297	0	399	396	1	318	627
Future Vol, veh/h	0	0	0	14	0	297	0	399	396	1	318	627
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	Free
Storage Length	-	-	-	0	-	330	-	-	90	90	-	90
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	3	2	2	2	2
Mvmt Flow	0	0	0	15	0	323	0	434	430	1	346	682
Major/Minor	Minor1			Major1			Major2					
Conflicting Flow All	792			792	454	346	0	-	444	0	0	
Stage 1	444			444	-	-	-	-	-	-	-	
Stage 2	348			348	-	-	-	-	-	-	-	
Critical Hdwy	6.42			6.52	6.22	4.12	-	-	4.12	-	-	
Critical Hdwy Stg 1	5.42			5.52	-	-	-	-	-	-	-	
Critical Hdwy Stg 2	5.42			5.52	-	-	-	-	-	-	-	
Follow-up Hdwy	3.518			4.018	3.318	2.218	-	-	2.218	-	-	
Pot Cap-1 Maneuver	358			322	606	1213	-	0	1116	-	0	
Stage 1	646			575	-	-	-	0	-	-	0	
Stage 2	715			634	-	-	-	0	-	-	0	
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver	351			0	595	1201	-	-	1105	-	-	
Mov Cap-2 Maneuver	351			0	-	-	-	-	-	-	-	
Stage 1	640			0	-	-	-	-	-	-	-	
Stage 2	708			0	-	-	-	-	-	-	-	
Approach	WB			NB			SB					
HCM Control Delay, s	17.9			0			0					
HCM LOS	C											
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBL	SBT						
Capacity (veh/h)	1201	-	351	595	1105	-						
HCM Lane V/C Ratio	-	-	0.043	0.543	0.001	-						
HCM Control Delay (s)	0	-	15.7	18	8.3	-						
HCM Lane LOS	A	-	C	C	A	-						
HCM 95th %tile O(veh)	0	-	0.1	3.2	0	-						

Intersection												
Intersection Delay, s/veh	34											
Intersection LOS	D											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	253	284	13	0	28	0	557	0	0	56	37
Future Vol, veh/h	0	253	284	13	0	28	0	557	0	0	56	37
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
Heavy Vehicles, %	2	5	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	275	309	14	0	30	0	605	0	0	61	40
Number of Lanes	0	1	1	0	0	1	0	1	0	0	1	0
Approach	EB				WB				NB			
Opposing Approach	WB				EB				SB			
Opposing Lanes	2				2				1			
Conflicting Approach Left	SB				NB				EB			
Conflicting Lanes Left	1				1				2			
Conflicting Approach Right	NB				SB				WB			
Conflicting Lanes Right	1				1				2			
HCM Control Delay	18.6				57.4				12.6			
HCM LOS	C				F				B			
Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1						
Vol Left, %	0%	100%	0%	100%	0%	92%						
Vol Thru, %	60%	0%	96%	0%	0%	8%						
Vol Right, %	40%	0%	4%	0%	100%	0%						
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop						
Traffic Vol by Lane	93	253	297	28	557	169						
LT Vol	0	253	0	28	0	155						
Through Vol	56	0	284	0	0	14						
RT Vol	37	0	13	0	557	0						
Lane Flow Rate	101	275	323	30	605	184						
Geometry Grp	2	7	7	7	7	2						
Degree of Util (X)	0.211	0.55	0.592	0.06	0.997	0.385						
Departure Headway (Hd)	7.526	7.199	6.604	7.152	5.927	7.549						
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes						
Cap	475	501	546	501	611	476						
Service Time	5.595	4.95	4.355	4.896	3.67	5.608						
HCM Lane V/C Ratio	0.213	0.549	0.592	0.06	0.99	0.387						
HCM Control Delay	12.6	18.5	18.6	10.4	59.8	15.3						
HCM Lane LOS	B	C	C	B	F	C						
HCM 95th-tile Q	0.8	3.3	3.8	0.2	14.9	1.8						

Intersection				
Intersection Delay, s/veh				
Intersection LOS				
Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	155	14	0
Future Vol, veh/h	0	155	14	0
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	168	15	0
Number of Lanes	0	0	1	0
Approach		SB		
Opposing Approach		NB		
Opposing Lanes		1		
Conflicting Approach Left		WB		
Conflicting Lanes Left		2		
Conflicting Approach Right		EB		
Conflicting Lanes Right		2		
HCM Control Delay		15.3		
HCM LOS		C		
Lane				

HCM 2010 Signalized Intersection Summary

1: SR 67 & Mapleview St

Ex + P PM
2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	137	12	613	81	115	29	1315	741	285	1069	87
Future Volume (veh/h)	144	137	12	613	81	115	29	1315	741	285	1069	87
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	157	149	0	729	0	0	32	1429	805	310	1162	0
Adj No. of Lanes	0	1	1	2	0	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	113	107	192	820	0	366	71	1181	514	194	1438	643
Arrive On Green	0.12	0.12	0.00	0.23	0.00	0.00	0.04	0.33	0.33	0.11	0.41	0.00
Sat Flow, veh/h	932	884	1583	3548	0	1583	1774	3539	1540	1774	3539	1583
Grp Volume(v), veh/h	306	0	0	729	0	0	32	1429	805	310	1162	0
Grp Sat Flow(s),veh/h/ln	1816	0	1583	1774	0	1583	1774	1770	1540	1774	1770	1583
Q Serve(g_s), s	17.7	0.0	0.0	29.0	0.0	0.0	2.6	48.6	48.6	15.9	42.3	0.0
Cycle Q Clear(g_c), s	17.7	0.0	0.0	29.0	0.0	0.0	2.6	48.6	48.6	15.9	42.3	0.0
Prop In Lane	0.51		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	221	0	192	820	0	366	71	1181	514	194	1438	643
V/C Ratio(X)	1.39	0.00	0.00	0.89	0.00	0.00	0.45	1.21	1.57	1.60	0.81	0.00
Avail Cap(c_a), veh/h	221	0	192	926	0	413	97	1181	514	194	1438	643
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	64.0	0.0	0.0	54.2	0.0	0.0	68.4	48.5	48.5	64.9	38.2	0.0
Incr Delay (d2), s/veh	199.5	0.0	0.0	9.8	0.0	0.0	4.5	102.7	264.4	293.3	5.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.1	0.0	0.0	15.3	0.0	0.0	1.3	40.5	58.3	23.5	21.7	0.0
LnGrp Delay(d),s/veh	263.5	0.0	0.0	64.0	0.0	0.0	72.8	151.2	312.9	358.1	43.2	0.0
LnGrp LOS	F			E			E	F	F	F	D	
Approach Vol, veh/h		306			729			2266			1472	
Approach Delay, s/veh		263.5			64.0			207.6			109.5	
Approach LOS		F			E			F			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	21.6	58.1		25.0	11.0	68.7		41.0				
Change Period (Y+Rc), s	* 5.7	9.5		7.3	* 5.2	9.5		7.3				
Max Green Setting (Gmax), s	* 16	48.6		17.7	* 8	57.0		38.0				
Max Q Clear Time (g_c+I1), s	17.9	50.6		19.7	4.6	44.3		31.0				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	12.7		1.7				
Intersection Summary												
HCM 2010 Ctrl Delay			159.0									
HCM 2010 LOS			F									
Notes												

HCM 2010 Signalized Intersection Summary

2: Main Ave & Mapleview St

Ex + P PM
2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↕	↗		↕	↗		↕	
Traffic Volume (veh/h)	0	952	211	33	637	6	169	3	81	0	2	3
Future Volume (veh/h)	0	952	211	33	637	6	169	3	81	0	2	3
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.94	0.99		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	0	1035	229	36	692	7	184	3	88	0	2	3
Adj No. of Lanes	0	1	1	0	2	1	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	800	653	38	769	332	365	5	710	0	154	231
Arrive On Green	0.00	0.43	0.43	0.22	0.22	0.22	0.23	0.23	0.23	0.00	0.23	0.23
Sat Flow, veh/h	0	1863	1520	171	3452	1491	1357	22	1530	0	659	988
Grp Volume(v), veh/h	0	1035	229	390	338	7	187	0	88	0	0	5
Grp Sat Flow(s),veh/h/ln	0	1863	1520	1854	1770	1491	1379	0	1530	0	0	1648
Q Serve(g_s), s	0.0	64.3	15.2	31.0	27.5	0.5	17.8	0.0	5.0	0.0	0.0	0.3
Cycle Q Clear(g_c), s	0.0	64.3	15.2	31.0	27.5	0.5	18.2	0.0	5.0	0.0	0.0	0.3
Prop In Lane	0.00		1.00	0.09		1.00	0.98		1.00	0.00		0.60
Lane Grp Cap(c), veh/h	0	800	653	413	394	332	370	0	710	0	0	385
V/C Ratio(X)	0.00	1.29	0.35	0.94	0.86	0.02	0.51	0.00	0.12	0.00	0.00	0.01
Avail Cap(c_a), veh/h	0	800	653	430	410	346	370	0	710	0	0	385
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	42.7	28.7	57.3	55.9	45.5	51.1	0.0	23.5	0.0	0.0	44.1
Incr Delay (d2), s/veh	0.0	141.5	0.1	28.6	15.2	0.0	4.9	0.0	0.4	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	64.3	6.4	19.2	15.1	0.2	7.4	0.0	3.0	0.0	0.0	0.2
LnGrp Delay(d),s/veh	0.0	184.2	28.8	85.8	71.1	45.5	55.9	0.0	23.8	0.0	0.0	44.2
LnGrp LOS		F	C	F	E	D	E		C			D
Approach Vol, veh/h	1264			735			275			5		
Approach Delay, s/veh	156.1			78.7			45.7			44.2		
Approach LOS	F			E			D			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	70.0		40.7		39.0		40.7					
Change Period (Y+Rc), s	5.7		5.7		5.7		* 5.7					
Max Green Setting (Gmax), s	64.3		33.9		34.7		* 35					
Max Q Clear Time (g_c+I1), s	66.3		2.3		33.0		20.2					
Green Ext Time (p_c), s	0.0		2.1		0.4		1.6					
Intersection Summary												
HCM 2010 Ctrl Delay	117.5											
HCM 2010 LOS	F											
Notes												

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	1010	23	0	664	36	0	0	107	0	0	12
Future Vol, veh/h	0	1010	23	0	664	36	0	0	107	0	0	12
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1098	25	0	722	39	0	0	116	0	0	13
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	732	0	0	1133	0	0	1491	1852	581	1291	1865	381
Stage 1	-	-	-	-	-	-	1120	1120	-	732	732	-
Stage 2	-	-	-	-	-	-	371	732	-	559	1133	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	868	-	-	612	-	-	86	73	457	121	72	617
Stage 1	-	-	-	-	-	-	220	280	-	379	425	-
Stage 2	-	-	-	-	-	-	622	425	-	481	276	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	860	-	-	606	-	-	83	72	448	88	71	605
Mov Cap-2 Maneuver	-	-	-	-	-	-	83	72	-	88	71	-
Stage 1	-	-	-	-	-	-	218	277	-	375	421	-
Stage 2	-	-	-	-	-	-	603	421	-	353	273	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			15.8			11.1		
HCM LOS							C			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	448	860	-	-	606	-	-	605				
HCM Lane V/C Ratio	0.26	-	-	-	-	-	-	0.022				
HCM Control Delay (s)	15.8	0	-	-	0	-	-	11.1				
HCM Lane LOS	C	A	-	-	A	-	-	B				
HCM 95th %tile O(veh)	1	0	-	-	0	-	-	0.1				

HCM 2010 Signalized Intersection Summary
4: Ashwood St & Mapleview St/Lake Jennings Park Rd

Ex + P PM
2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	457	425	45	45	290	181	28	143	46	218	142	327
Future Volume (veh/h)	457	425	45	45	290	181	28	143	46	218	142	327
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.91	1.00		0.96	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1846	1900	1863	1827	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	497	462	49	49	315	197	30	155	50	237	154	355
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	3	3	2	4	2	2	2	2	2	2	2
Cap, veh/h	521	1261	133	75	499	642	36	186	60	300	195	420
Arrive On Green	0.29	0.40	0.40	0.04	0.14	0.14	0.16	0.16	0.16	0.27	0.27	0.27
Sat Flow, veh/h	1774	3187	336	1774	3471	1448	225	1164	376	1096	712	1535
Grp Volume(v), veh/h	497	253	258	49	315	197	235	0	0	391	0	355
Grp Sat Flow(s),veh/h/ln	1774	1754	1769	1774	1736	1448	1765	0	0	1808	0	1535
Q Serve(g_s), s	37.2	13.8	14.0	3.7	11.6	12.4	17.5	0.0	0.0	27.2	0.0	29.6
Cycle Q Clear(g_c), s	37.2	13.8	14.0	3.7	11.6	12.4	17.5	0.0	0.0	27.2	0.0	29.6
Prop In Lane	1.00		0.19	1.00		1.00	0.13		0.21	0.61		1.00
Lane Grp Cap(c), veh/h	521	694	700	75	499	642	281	0	0	495	0	420
V/C Ratio(X)	0.95	0.36	0.37	0.66	0.63	0.31	0.84	0.00	0.00	0.79	0.00	0.85
Avail Cap(c_a), veh/h	619	830	837	127	679	716	281	0	0	495	0	420
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.9	28.9	29.0	64.0	54.6	26.6	55.2	0.0	0.0	45.6	0.0	46.5
Incr Delay (d2), s/veh	22.1	0.1	0.1	3.6	0.6	0.1	24.4	0.0	0.0	12.1	0.0	18.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.4	6.7	6.8	1.9	5.6	7.4	10.5	0.0	0.0	15.2	0.0	14.7
LnGrp Delay(d),s/veh	69.0	29.1	29.1	67.6	55.2	26.7	79.7	0.0	0.0	57.7	0.0	65.0
LnGrp LOS	E	C	C	E	E	C	E			E		E
Approach Vol, veh/h	1008			561				235		746		
Approach Delay, s/veh	48.8			46.3				79.7		61.2		
Approach LOS	D			D				E		E		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.4	58.5		42.0	43.5	24.4		25.6				
Change Period (Y+Rc), s	3.7	4.9		4.9	3.7	4.9		4.0				
Max Green Setting (Gmax), s	9.7	64.1		37.1	47.3	26.5		21.6				
Max Q Clear Time (g_c+I1), s	5.7	16.0		31.6	39.2	14.4		19.5				
Green Ext Time (p_c), s	0.0	3.8		1.7	0.6	3.0		0.2				
Intersection Summary												
HCM 2010 Ctrl Delay	54.7											
HCM 2010 LOS	D											

Intersection																
Intersection Delay, s/veh32.5																
Intersection LOS D																
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	32	44	176	0	77	23	44	0	117	303	62	0	65	494	28
Future Vol, veh/h	0	32	44	176	0	77	23	44	0	117	303	62	0	65	494	28
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	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	20	2	42	2	2	2	27	2	25	2	2
Mvmt Flow	0	35	48	191	0	84	25	48	0	127	329	67	0	71	537	30
Number of Lanes	0	0	1	1	0	0	1	1	0	1	1	0	0	1	2	0
Approach	EB				WB				NB				SB			
Opposing Approach	WB				EB				SB				NB			
Opposing Lanes	2				2				3				2			
Conflicting Approach Left	SB				NB				EB				WB			
Conflicting Lanes Left	3				2				2				2			
Conflicting Approach Right	NB				SB				WB				EB			
Conflicting Lanes Right	2				3				2				2			
HCM Control Delay	17.8				16.7				47				30.8			
HCM LOS	C				C				E				D			
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3							
Vol Left, %	100%	0%	42%	0%	77%	0%	100%	0%	0%							
Vol Thru, %	0%	83%	58%	0%	23%	0%	0%	100%	85%							
Vol Right, %	0%	17%	0%	100%	0%	100%	0%	0%	15%							
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop							
Traffic Vol by Lane	117	365	76	176	100	44	65	329	193							
LT Vol	117	0	32	0	77	0	65	0	0							
Through Vol	0	303	44	0	23	0	0	329	165							
RT Vol	0	62	0	176	0	44	0	0	28							
Lane Flow Rate	127	397	83	191	109	48	71	358	209							
Geometry Grp	8	8	8	8	8	8	8	8	8							
Degree of Util (X)	0.32	0.929	0.222	0.464	0.32	0.122	0.183	0.834	0.482							
Departure Headway (Hd)	9.064	8.426	9.675	8.735	10.606	9.164	9.301	8.383	8.279							
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes							
Cap	397	428	371	411	339	390	386	433	436							
Service Time	6.823	6.184	7.442	6.501	8.382	6.938	7.058	6.14	6.036							
HCM Lane V/C Ratio	0.32	0.928	0.224	0.465	0.322	0.123	0.184	0.827	0.479							
HCM Control Delay	16.1	56.9	15.2	18.9	18.3	13.2	14.1	41.3	18.6							
HCM Lane LOS	C	F	C	C	C	B	B	E	C							
HCM 95th-tile Q	1.4	10.4	0.8	2.4	1.3	0.4	0.7	7.9	2.6							

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	61	110	144	0	0	0
Future Vol, veh/h	61	110	144	0	0	0
Conflicting Peds, #/hr	10	0	0	10	10	10
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	92	2	21	2	2	2
Mvmt Flow	66	120	157	0	0	0
Major/Minor	Minor2		Major2			
Conflicting Flow All	167	167	-	0		
Stage 1	167	167	-	-		
Stage 2	0	0	-	-		
Critical Hdwy	8.02	6.52	-	-		
Critical Hdwy Stg 1	7.02	5.52	-	-		
Critical Hdwy Stg 2	-	-	-	-		
Follow-up Hdwy	4.328	4.018	-	-		
Pot Cap-1 Maneuver	633	726	-	-		
Stage 1	663	760	-	-		
Stage 2	-	-	-	-		
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	621	0	-	-		
Mov Cap-2 Maneuver	621	0	-	-		
Stage 1	657	0	-	-		
Stage 2	-	0	-	-		
Approach	EB		WB			
HCM Control Delay, s			0			
HCM LOS	-					
Minor Lane/Major Mvmt	EBLn1	EBLn2	WBT	WBR		
Capacity (veh/h)	621	-	-	-		
HCM Lane V/C Ratio	0.107	-	-	-		
HCM Control Delay (s)	11.5	-	-	-		
HCM Lane LOS	B	-	-	-		
HCM 95th %tile Q(veh)	0.4	-	-	-		

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	0	110	75	0	0	69
Future Vol, veh/h	0	110	75	0	0	69
Conflicting Peds, #/hr	10	0	0	10	10	10
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	70
Mvmt Flow	0	120	82	0	0	75
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	92	0	-	0	212	102
Stage 1	-	-	-	-	92	-
Stage 2	-	-	-	-	120	-
Critical Hdwy	4.12	-	-	-	6.42	6.9
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.93
Pot Cap-1 Maneuver	1503	-	-	-	776	796
Stage 1	-	-	-	-	932	-
Stage 2	-	-	-	-	905	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1489	-	-	-	761	781
Mov Cap-2 Maneuver	-	-	-	-	761	-
Stage 1	-	-	-	-	923	-
Stage 2	-	-	-	-	896	-
Approach	EB		WB		SB	
HCM Control Delay, s	0		0		10.1	
HCM LOS					B	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1489	-	-	-	781	
HCM Lane V/C Ratio	-	-	-	-	0.096	
HCM Control Delay (s)	0	-	-	-	10.1	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

HCM 2010 Signalized Intersection Summary
 8: Lake Jennings Park Rd & Hwy 8 Bus/Blossom Valley Rd

Ex + P PM

2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	78	56	201	117	26	35	142	586	173	63	589	73
Future Volume (veh/h)	78	56	201	117	26	35	142	586	173	63	589	73
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.95	0.99		0.95	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	85	61	218	127	28	38	154	637	188	68	640	79
Adj No. of Lanes	0	1	1	0	1	0	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	277	179	379	225	52	47	191	916	750	87	807	658
Arrive On Green	0.25	0.25	0.25	0.25	0.25	0.25	0.11	0.49	0.49	0.05	0.43	0.43
Sat Flow, veh/h	777	706	1498	558	205	187	1774	1863	1524	1774	1863	1520
Grp Volume(v), veh/h	146	0	218	193	0	0	154	637	188	68	640	79
Grp Sat Flow(s),veh/h/ln	1483	0	1498	951	0	0	1774	1863	1524	1774	1863	1520
Q Serve(g_s), s	0.0	0.0	9.1	9.2	0.0	0.0	6.1	18.8	5.1	2.7	21.2	2.2
Cycle Q Clear(g_c), s	5.5	0.0	9.1	14.8	0.0	0.0	6.1	18.8	5.1	2.7	21.2	2.2
Prop In Lane	0.58		1.00	0.66		0.20	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	455	0	379	324	0	0	191	916	750	87	807	658
V/C Ratio(X)	0.32	0.00	0.57	0.59	0.00	0.00	0.81	0.70	0.25	0.78	0.79	0.12
Avail Cap(c_a), veh/h	455	0	379	409	0	0	221	916	750	134	807	658
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.8	0.0	23.3	26.8	0.0	0.0	31.1	14.0	10.5	33.6	17.5	12.1
Incr Delay (d2), s/veh	0.1	0.0	1.4	0.7	0.0	0.0	14.7	4.3	0.8	6.5	7.9	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.4	0.0	3.9	3.7	0.0	0.0	3.7	10.7	2.3	1.5	12.6	1.0
LnGrp Delay(d),s/veh	22.0	0.0	24.7	27.4	0.0	0.0	45.8	18.3	11.3	40.1	25.4	12.5
LnGrp LOS	C		C	C			D	B	B	D	C	B
Approach Vol, veh/h		364			193			979			787	
Approach Delay, s/veh		23.6			27.4			21.3			25.4	
Approach LOS		C			C			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.6	40.4		23.4	11.8	36.2		23.4				
Change Period (Y+Rc), s	4.1	5.3		5.3	4.1	5.3		5.3				
Max Green Setting (Gmax), s	5.4	34.4		17.2	8.9	30.9		23.0				
Max Q Clear Time (g_c+I1), s	4.7	20.8		11.1	8.1	23.2		16.8				
Green Ext Time (p_c), s	0.0	4.7		1.0	0.0	3.5		0.3				
Intersection Summary												
HCM 2010 Ctrl Delay			23.5									
HCM 2010 LOS			C									

Intersection												
Int Delay, s/veh	4.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	19	0	221	0	680	366	0	543	364
Future Vol, veh/h	0	0	0	19	0	221	0	680	366	0	543	364
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	Free
Storage Length	-	-	-	0	-	330	-	-	90	90	-	90
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	3
Mvmt Flow	0	0	0	21	0	240	0	739	398	0	590	396
Major/Minor	Minor1			Major1			Major2					
Conflicting Flow All	1339			1339	759	590	0	-	749	0	0	
Stage 1	749			749	-	-	-	-	-	-	-	-
Stage 2	590			590	-	-	-	-	-	-	-	-
Critical Hdwy	6.42			6.52	6.22	4.12	-	-	4.12	-	-	-
Critical Hdwy Stg 1	5.42			5.52	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42			5.52	-	-	-	-	-	-	-	-
Follow-up Hdwy	3.518			4.018	3.318	2.218	-	-	2.218	-	-	-
Pot Cap-1 Maneuver	168			153	406	985	-	0	860	-	0	
Stage 1	467			419	-	-	-	0	-	-	0	
Stage 2	554			495	-	-	-	0	-	-	0	
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver	165			0	398	976	-	-	852	-	-	-
Mov Cap-2 Maneuver	165			0	-	-	-	-	-	-	-	-
Stage 1	463			0	-	-	-	-	-	-	-	-
Stage 2	549			0	-	-	-	-	-	-	-	-
Approach	WB			NB			SB					
HCM Control Delay, s	27.1			0			0					
HCM LOS	D											
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBL	SBT						
Capacity (veh/h)	976	-	165	398	852	-						
HCM Lane V/C Ratio	-	-	0.125	0.604	-	-						
HCM Control Delay (s)	0	-	29.9	26.9	0	-						
HCM Lane LOS	A	-	D	D	A	-						
HCM 95th %tile O(veh)	0	-	0.4	3.8	0	-						

Intersection												
Intersection Delay, s/veh	57.8											
Intersection LOS	F											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	472	506	29	0	25	0	570	0	0	30	21
Future Vol, veh/h	0	472	506	29	0	25	0	570	0	0	30	21
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
Heavy Vehicles, %	2	3	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	513	550	32	0	27	0	620	0	0	33	23
Number of Lanes	0	1	1	0	0	1	0	1	0	0	1	0
Approach	EB				WB				NB			
Opposing Approach	WB				EB				SB			
Opposing Lanes	2				2				1			
Conflicting Approach Left	SB				NB				EB			
Conflicting Lanes Left	1				1				2			
Conflicting Approach Right	NB				SB				WB			
Conflicting Lanes Right	1				1				2			
HCM Control Delay	67.1				62.5				12.7			
HCM LOS	F				F				B			
Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1						
Vol Left, %	0%	100%	0%	100%	0%	91%						
Vol Thru, %	59%	0%	95%	0%	0%	9%						
Vol Right, %	41%	0%	5%	0%	100%	0%						
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop						
Traffic Vol by Lane	51	472	535	25	570	285						
LT Vol	0	472	0	25	0	259						
Through Vol	30	0	506	0	0	26						
RT Vol	21	0	29	0	570	0						
Lane Flow Rate	55	513	582	27	620	310						
Geometry Grp	2	7	7	7	7	2						
Degree of Util (X)	0.13	1	1	0.06	1	0.641						
Departure Headway (Hd)	8.449	7.546	6.99	7.992	6.791	7.548						
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes						
Cap	427	482	523	451	539	480						
Service Time	6.449	5.255	4.699	5.699	4.498	5.548						
HCM Lane V/C Ratio	0.129	1.064	1.113	0.06	1.15	0.646						
HCM Control Delay	12.7	68.6	65.8	11.2	64.8	23.1						
HCM Lane LOS	B	F	F	B	F	C						
HCM 95th-tile Q	0.4	13.4	13.9	0.2	14.1	4.4						

Intersection				
Intersection Delay, s/veh				
Intersection LOS				
Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	259	26	0
Future Vol, veh/h	0	259	26	0
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	282	28	0
Number of Lanes	0	0	1	0
Approach		SB		
Opposing Approach		NB		
Opposing Lanes		1		
Conflicting Approach Left		WB		
Conflicting Lanes Left		2		
Conflicting Approach Right		EB		
Conflicting Lanes Right		2		
HCM Control Delay		23.1		
HCM LOS		C		
Lane				

APPENDIX F

NEAR-TERM WITHOUT PROJECT INTERSECTION CALCULATION SHEETS

HCM 2010 Signalized Intersection Summary

1: SR 67 & Mapleview St

NT AM
11/24/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	98	27	803	98	153	23	732	244	119	694	64
Future Volume (veh/h)	80	98	27	803	98	153	23	732	244	119	694	64
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	87	107	0	949	0	0	25	796	265	129	754	0
Adj No. of Lanes	0	1	1	2	0	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	99	122	193	1023	0	457	63	1039	451	152	1229	550
Arrive On Green	0.12	0.12	0.00	0.29	0.00	0.00	0.04	0.29	0.29	0.09	0.35	0.00
Sat Flow, veh/h	817	1005	1583	3548	0	1583	1774	3539	1537	1774	3539	1583
Grp Volume(v), veh/h	194	0	0	949	0	0	25	796	265	129	754	0
Grp Sat Flow(s),veh/h/ln	1822	0	1583	1774	0	1583	1774	1770	1537	1774	1770	1583
Q Serve(g_s), s	14.8	0.0	0.0	36.7	0.0	0.0	1.9	29.0	20.8	10.1	25.0	0.0
Cycle Q Clear(g_c), s	14.8	0.0	0.0	36.7	0.0	0.0	1.9	29.0	20.8	10.1	25.0	0.0
Prop In Lane	0.45		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	222	0	193	1023	0	457	63	1039	451	152	1229	550
V/C Ratio(X)	0.87	0.00	0.00	0.93	0.00	0.00	0.40	0.77	0.59	0.85	0.61	0.00
Avail Cap(c_a), veh/h	267	0	232	1119	0	499	100	1039	451	168	1229	550
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	61.0	0.0	0.0	48.9	0.0	0.0	66.7	45.5	42.6	63.8	38.3	0.0
Incr Delay (d2), s/veh	24.6	0.0	0.0	12.4	0.0	0.0	4.0	5.4	5.5	29.7	2.3	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	9.0	0.0	0.0	19.8	0.0	0.0	1.0	14.9	9.5	6.2	12.6	0.0
LnGrp Delay(d),s/veh	85.6	0.0	0.0	61.2	0.0	0.0	70.8	50.9	48.2	93.4	40.6	0.0
LnGrp LOS	F			E			E	D	D	F	D	
Approach Vol, veh/h		194			949			1086			883	
Approach Delay, s/veh		85.6			61.2			50.7			48.3	
Approach LOS		F			E			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.8	51.0		24.5	10.2	58.6		48.1				
Change Period (Y+Rc), s	* 5.7	9.5		7.3	* 5.2	9.5		7.3				
Max Green Setting (Gmax), s	* 13	41.5		20.7	* 8	47.4		44.6				
Max Q Clear Time (g_c+I1), s	12.1	31.0		16.8	3.9	27.0		38.7				
Green Ext Time (p_c), s	0.0	10.2		0.4	0.0	19.5		2.1				
Intersection Summary												
HCM 2010 Ctrl Delay			55.4									
HCM 2010 LOS			E									
Notes												

HCM 2010 Signalized Intersection Summary

2: Main Ave & Mapleview St

NT AM
11/24/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑		↑↑	↑		↑	↑		↑	
Traffic Volume (veh/h)	0	384	77	25	848	6	207	2	76	2	1	0
Future Volume (veh/h)	0	384	77	25	848	6	207	2	76	2	1	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.95	0.99		0.97	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	0	417	84	27	922	7	225	2	83	2	1	0
Adj No. of Lanes	0	1	1	0	2	1	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	458	368	29	1040	444	482	4	963	213	97	0
Arrive On Green	0.00	0.25	0.25	0.29	0.29	0.29	0.32	0.32	0.32	0.32	0.32	0.00
Sat Flow, veh/h	0	1863	1497	99	3529	1506	1315	12	1539	511	302	0
Grp Volume(v), veh/h	0	417	84	508	441	7	227	0	83	3	0	0
Grp Sat Flow(s),veh/h/ln	0	1863	1497	1858	1770	1506	1327	0	1539	812	0	0
Q Serve(g_s), s	0.0	27.2	5.6	33.2	29.2	0.4	0.0	0.0	2.7	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	27.2	5.6	33.2	29.2	0.4	19.0	0.0	2.7	19.0	0.0	0.0
Prop In Lane	0.00		1.00	0.05		1.00	0.99		1.00	0.67		0.00
Lane Grp Cap(c), veh/h	0	458	368	548	522	444	485	0	963	310	0	0
V/C Ratio(X)	0.00	0.91	0.23	0.93	0.84	0.02	0.47	0.00	0.09	0.01	0.00	0.00
Avail Cap(c_a), veh/h	0	682	548	714	680	579	485	0	963	310	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	45.8	37.7	42.8	41.4	31.2	35.1	0.0	9.7	30.0	0.0	0.0
Incr Delay (d2), s/veh	0.0	9.4	0.1	13.9	6.1	0.0	3.2	0.0	0.2	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	15.2	2.3	19.1	15.1	0.2	6.9	0.0	2.1	0.1	0.0	0.0
LnGrp Delay(d),s/veh	0.0	55.2	37.8	56.7	47.4	31.2	38.3	0.0	9.8	30.1	0.0	0.0
LnGrp LOS		E	D	E	D	C	D		A	C		
Approach Vol, veh/h		501			956			310			3	
Approach Delay, s/veh		52.3			52.2			30.7			30.1	
Approach LOS		D			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		36.4		46.0		42.5		46.0				
Change Period (Y+Rc), s		5.7		5.7		5.7		* 5.7				
Max Green Setting (Gmax), s		45.7		39.2		48.0		* 40				
Max Q Clear Time (g_c+I1), s		29.2		21.0		35.2		21.0				
Green Ext Time (p_c), s		1.5		2.1		1.6		2.1				
Intersection Summary												
HCM 2010 Ctrl Delay			48.4									
HCM 2010 LOS			D									
Notes												

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	440	22	0	870	111	0	0	169	0	0	9
Future Vol, veh/h	0	440	22	0	870	111	0	0	169	0	0	9
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	478	24	0	946	121	0	0	184	0	0	10
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	956	0	0	512	0	0	983	1456	271	1205	1468	493
Stage 1	-	-	-	-	-	-	500	500	-	956	956	-
Stage 2	-	-	-	-	-	-	483	956	-	249	512	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	715	-	-	1050	-	-	203	129	727	140	127	522
Stage 1	-	-	-	-	-	-	521	541	-	277	335	-
Stage 2	-	-	-	-	-	-	534	335	-	733	535	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	708	-	-	1040	-	-	195	127	713	102	125	512
Mov Cap-2 Maneuver	-	-	-	-	-	-	195	127	-	102	125	-
Stage 1	-	-	-	-	-	-	516	536	-	274	332	-
Stage 2	-	-	-	-	-	-	519	332	-	539	530	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			11.8			12.2		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	713	708	-	-	1040	-	-	512				
HCM Lane V/C Ratio	0.258	-	-	-	-	-	-	0.019				
HCM Control Delay (s)	11.8	0	-	-	0	-	-	12.2				
HCM Lane LOS	B	A	-	-	A	-	-	B				
HCM 95th %tile Q(veh)	1	0	-	-	0	-	-	0.1				

HCM 2010 Signalized Intersection Summary
4: Ashwood St & Mapleview St/Lake Jennings Park Rd

NT AM
11/24/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	412	352	98	60	409	294	38	162	44	211	177	472
Future Volume (veh/h)	412	352	98	60	409	294	38	162	44	211	177	472
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.92	1.00		0.68	1.00		0.85
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	448	383	107	65	445	320	41	176	48	229	192	513
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	462	1016	279	88	581	740	36	154	42	312	262	426
Arrive On Green	0.26	0.37	0.37	0.05	0.16	0.16	0.14	0.14	0.14	0.32	0.32	0.32
Sat Flow, veh/h	1774	2711	746	1774	3539	1451	253	1087	297	986	827	1344
Grp Volume(v), veh/h	448	248	242	65	445	320	265	0	0	421	0	513
Grp Sat Flow(s),veh/h/ln	1774	1770	1687	1774	1770	1451	1637	0	0	1813	0	1344
Q Serve(g_s), s	37.2	15.2	15.6	5.4	17.9	21.8	21.0	0.0	0.0	30.7	0.0	47.1
Cycle Q Clear(g_c), s	37.2	15.2	15.6	5.4	17.9	21.8	21.0	0.0	0.0	30.7	0.0	47.1
Prop In Lane	1.00		0.44	1.00		1.00	0.15		0.18	0.54		1.00
Lane Grp Cap(c), veh/h	462	663	632	88	581	740	231	0	0	574	0	426
V/C Ratio(X)	0.97	0.37	0.38	0.74	0.77	0.43	1.15	0.00	0.00	0.73	0.00	1.21
Avail Cap(c_a), veh/h	462	663	632	142	612	752	231	0	0	574	0	426
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	54.5	33.8	33.9	69.7	59.4	25.7	63.9	0.0	0.0	45.2	0.0	50.8
Incr Delay (d2), s/veh	34.1	0.2	0.2	4.4	4.9	0.2	104.3	0.0	0.0	8.1	0.0	112.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	22.5	7.4	7.3	2.7	9.2	13.1	16.1	0.0	0.0	16.7	0.0	30.8
LnGrp Delay(d),s/veh	88.5	34.0	34.1	74.1	64.3	25.9	168.2	0.0	0.0	53.3	0.0	163.5
LnGrp LOS	F	C	C	E	E	C	F			D		F
Approach Vol, veh/h		938			830			265			934	
Approach Delay, s/veh		60.1			50.3			168.2			113.8	
Approach LOS		E			D			F			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.1	60.6		52.0	42.4	29.3		25.0				
Change Period (Y+Rc), s	3.7	4.9		4.9	3.7	4.9		4.0				
Max Green Setting (Gmax), s	11.9	52.5		47.1	38.7	25.7		21.0				
Max Q Clear Time (g_c+I1), s	7.4	17.6		49.1	39.2	23.8		23.0				
Green Ext Time (p_c), s	0.0	4.7		0.0	0.0	0.6		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				83.9								
HCM 2010 LOS				F								

Intersection																
Intersection Delay, s/veh35.5																
Intersection LOS E																
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	55	30	125	0	45	36	22	0	162	521	29	0	17	319	28
Future Vol, veh/h	0	55	30	125	0	45	36	22	0	162	521	29	0	17	319	28
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	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	60	33	136	0	49	39	24	0	176	566	32	0	18	347	30
Number of Lanes	0	0	1	1	0	0	1	1	0	1	1	0	0	1	2	0
Approach	EB				WB				NB				SB			
Opposing Approach	WB				EB				SB				NB			
Opposing Lanes	2				2				3				2			
Conflicting Approach Left	SB				NB				EB				WB			
Conflicting Lanes Left	3				2				2				2			
Conflicting Approach Right	NB				SB				WB				EB			
Conflicting Lanes Right	2				3				2				2			
HCM Control Delay	13.8				13.7				55				16.1			
HCM LOS	B				B				F				C			
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3							
Vol Left, %	100%	0%	65%	0%	56%	0%	100%	0%	0%							
Vol Thru, %	0%	95%	35%	0%	44%	0%	0%	100%	79%							
Vol Right, %	0%	5%	0%	100%	0%	100%	0%	0%	21%							
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop							
Traffic Vol by Lane	162	550	85	125	81	22	17	213	134							
LT Vol	162	0	55	0	45	0	17	0	0							
Through Vol	0	521	30	0	36	0	0	213	106							
RT Vol	0	29	0	125	0	22	0	0	28							
Lane Flow Rate	176	598	92	136	88	24	18	231	146							
Geometry Grp	8	8	8	8	8	8	8	8	8							
Degree of Util (X)	0.374	1	0.223	0.29	0.221	0.053	0.042	0.498	0.308							
Departure Headway (Hd)	7.653	7.106	8.694	7.677	9.018	8.046	8.252	7.752	7.606							
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes							
Cap	467	508	412	466	396	443	433	462	472							
Service Time	5.453	4.905	6.47	5.452	6.81	5.839	6.026	5.526	5.38							
HCM Lane V/C Ratio	0.377	1.177	0.223	0.292	0.222	0.054	0.042	0.5	0.309							
HCM Control Delay	15	66.8	14	13.6	14.4	11.3	11.4	18	13.8							
HCM Lane LOS	B	F	B	B	B	B	B	C	B							
HCM 95th-tile Q	1.7	13.7	0.8	1.2	0.8	0.2	0.1	2.7	1.3							

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	0	76	103	0	0	0
Future Vol, veh/h	0	76	103	0	0	0
Conflicting Peds, #/hr	10	0	0	10	10	10
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	0	83	112	0	0	0
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	122	0	-	0	205	132
Stage 1	-	-	-	-	122	-
Stage 2	-	-	-	-	83	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1465	-	-	-	783	917
Stage 1	-	-	-	-	903	-
Stage 2	-	-	-	-	940	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1451	-	-	-	768	900
Mov Cap-2 Maneuver	-	-	-	-	768	-
Stage 1	-	-	-	-	894	-
Stage 2	-	-	-	-	931	-
Approach	EB		WB		SB	
HCM Control Delay, s	0		0		0	
HCM LOS					A	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1451	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	-	-	0	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	-	

HCM 2010 Signalized Intersection Summary
 8: Lake Jennings Park Rd & Hwy 8 Bus/Blossom Valley Rd

NT AM
 11/24/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	71	215	313	57	84	130	539	98	59	561	62
Future Volume (veh/h)	83	71	215	313	57	84	130	539	98	59	561	62
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	0.99		0.95	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	90	77	234	340	62	91	141	586	107	64	610	67
Adj No. of Lanes	0	1	1	0	1	0	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	322	255	501	286	38	56	135	806	658	82	750	611
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.08	0.43	0.43	0.05	0.40	0.40
Sat Flow, veh/h	754	769	1511	626	114	168	1774	1863	1520	1774	1863	1518
Grp Volume(v), veh/h	167	0	234	493	0	0	141	586	107	64	610	67
Grp Sat Flow(s),veh/h/ln	1524	0	1511	908	0	0	1774	1863	1520	1774	1863	1518
Q Serve(g_s), s	0.0	0.0	9.5	19.7	0.0	0.0	5.9	20.2	3.3	2.8	22.5	2.1
Cycle Q Clear(g_c), s	6.0	0.0	9.5	25.7	0.0	0.0	5.9	20.2	3.3	2.8	22.5	2.1
Prop In Lane	0.54		1.00	0.69		0.18	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	577	0	501	379	0	0	135	806	658	82	750	611
V/C Ratio(X)	0.29	0.00	0.47	1.30	0.00	0.00	1.04	0.73	0.16	0.78	0.81	0.11
Avail Cap(c_a), veh/h	577	0	501	379	0	0	135	806	658	124	750	611
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.2	0.0	20.5	30.9	0.0	0.0	35.8	18.2	13.4	36.6	20.6	14.5
Incr Delay (d2), s/veh	0.1	0.0	0.3	152.8	0.0	0.0	89.6	5.7	0.5	8.3	9.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	4.0	24.1	0.0	0.0	6.2	11.5	1.5	1.5	13.5	1.0
LnGrp Delay(d),s/veh	19.3	0.0	20.7	183.7	0.0	0.0	125.8	23.9	13.9	44.9	30.0	14.8
LnGrp LOS	B		C	F			F	C	B	D	C	B
Approach Vol, veh/h		401			493			834			741	
Approach Delay, s/veh		20.1			183.7			39.8			29.9	
Approach LOS		C			F			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.7	38.8		31.0	10.0	36.5		31.0				
Change Period (Y+Rc), s	4.1	5.3		5.3	4.1	5.3		5.3				
Max Green Setting (Gmax), s	5.4	31.7		17.2	5.9	31.2		25.7				
Max Q Clear Time (g_c+I1), s	4.8	22.2		11.5	7.9	24.5		27.7				
Green Ext Time (p_c), s	0.0	3.6		1.9	0.0	2.9		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			62.4									
HCM 2010 LOS			E									

Intersection												
Int Delay, s/veh	6.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	33	0	311	0	459	524	1	414	674
Future Vol, veh/h	0	0	0	33	0	311	0	459	524	1	414	674
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	Free
Storage Length	-	-	-	0	-	330	-	-	90	90	-	90
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	36	0	338	0	499	570	1	450	733
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				961	961	519	450	0	-	509	0	0
Stage 1				509	509	-	-	-	-	-	-	-
Stage 2				452	452	-	-	-	-	-	-	-
Critical Hdwy				6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1				5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy				3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver				284	256	557	1110	-	0	1056	-	0
Stage 1				604	538	-	-	-	0	-	-	0
Stage 2				641	570	-	-	-	0	-	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver				278	0	546	1099	-	-	1046	-	-
Mov Cap-2 Maneuver				278	0	-	-	-	-	-	-	-
Stage 1				598	0	-	-	-	-	-	-	-
Stage 2				634	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				21.5			0			0		
HCM LOS				C								
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBL	SBT						
Capacity (veh/h)	1099	-	278	546	1046	-						
HCM Lane V/C Ratio	-	-	0.129	0.619	0.001	-						
HCM Control Delay (s)	0	-	19.9	21.7	8.4	-						
HCM Lane LOS	A	-	C	C	A	-						
HCM 95th %tile Q(veh)	0	-	0.4	4.2	0	-						

Intersection												
Intersection Delay, s/veh	50.5											
Intersection LOS	F											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	253	346	89	0	31	0	655	0	0	162	45
Future Vol, veh/h	0	253	346	89	0	31	0	655	0	0	162	45
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	275	376	97	0	34	0	712	0	0	176	49
Number of Lanes	0	1	1	0	0	1	0	1	0	0	1	0
Approach	EB			WB				NB				
Opposing Approach	WB			EB				SB				
Opposing Lanes	2			2				1				
Conflicting Approach Left	SB			NB				EB				
Conflicting Lanes Left	1			1				2				
Conflicting Approach Right	NB			SB				WB				
Conflicting Lanes Right	1			1				2				
HCM Control Delay	53.4			65.4				20.9				
HCM LOS	F			F				C				
Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1						
Vol Left, %	0%	100%	0%	100%	0%	81%						
Vol Thru, %	78%	0%	80%	0%	0%	19%						
Vol Right, %	22%	0%	20%	0%	100%	0%						
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop						
Traffic Vol by Lane	207	253	435	31	655	248						
LT Vol	0	253	0	31	0	200						
Through Vol	162	0	346	0	0	48						
RT Vol	45	0	89	0	655	0						
Lane Flow Rate	225	275	473	34	712	270						
Geometry Grp	2	7	7	7	7	2						
Degree of Util (X)	0.533	0.643	1	0.08	1	0.64						
Departure Headway (Hd)	8.534	8.422	7.777	8.573	7.33	8.55						
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes						
Cap	423	429	468	417	498	423						
Service Time	6.558	6.162	5.516	6.33	5.125	6.571						
HCM Lane V/C Ratio	0.532	0.641	1.011	0.082	1.43	0.638						
HCM Control Delay	20.9	25.2	69.8	12.1	67.9	25.6						
HCM Lane LOS	C	D	F	B	F	D						
HCM 95th-tile Q	3	4.4	13.1	0.3	13.5	4.3						

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	200	48	0
Future Vol, veh/h	0	200	48	0
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	217	52	0
Number of Lanes	0	0	1	0

Approach

SB

Opposing Approach

NB

Opposing Lanes

1

Conflicting Approach Left

WB

Conflicting Lanes Left

2

Conflicting Approach Right

EB

Conflicting Lanes Right

2

HCM Control Delay

25.6

HCM LOS

D

Lane

HCM 2010 Signalized Intersection Summary

1: SR 67 & Mapleview St

NT PM
11/24/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	137	12	622	81	129	29	1507	748	300	1182	87
Future Volume (veh/h)	144	137	12	622	81	129	29	1507	748	300	1182	87
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	157	149	0	739	0	0	32	1638	813	326	1285	0
Adj No. of Lanes	0	1	1	2	0	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	113	107	192	827	0	369	71	1120	487	222	1434	642
Arrive On Green	0.12	0.12	0.00	0.23	0.00	0.00	0.04	0.32	0.32	0.13	0.41	0.00
Sat Flow, veh/h	932	884	1583	3548	0	1583	1774	3539	1539	1774	3539	1583
Grp Volume(v), veh/h	306	0	0	739	0	0	32	1638	813	326	1285	0
Grp Sat Flow(s),veh/h/ln	1816	0	1583	1774	0	1583	1774	1770	1539	1774	1770	1583
Q Serve(g_s), s	17.7	0.0	0.0	29.5	0.0	0.0	2.6	46.2	46.2	18.3	49.5	0.0
Cycle Q Clear(g_c), s	17.7	0.0	0.0	29.5	0.0	0.0	2.6	46.2	46.2	18.3	49.5	0.0
Prop In Lane	0.51		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	220	0	192	827	0	369	71	1120	487	222	1434	642
V/C Ratio(X)	1.39	0.00	0.00	0.89	0.00	0.00	0.45	1.46	1.67	1.47	0.90	0.00
Avail Cap(c_a), veh/h	220	0	192	923	0	412	97	1120	487	222	1434	642
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	64.2	0.0	0.0	54.2	0.0	0.0	68.6	49.9	49.9	63.9	40.6	0.0
Incr Delay (d2), s/veh	201.0	0.0	0.0	10.3	0.0	0.0	4.5	213.3	310.6	232.9	9.1	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.2	0.0	0.0	15.7	0.0	0.0	1.4	55.7	61.6	23.3	25.9	0.0
LnGrp Delay(d),s/veh	265.2	0.0	0.0	64.6	0.0	0.0	73.0	263.2	360.5	296.7	49.6	0.0
LnGrp LOS	F			E			E	F	F	F	D	
Approach Vol, veh/h		306			739			2483			1611	
Approach Delay, s/veh		265.2			64.6			292.6			99.6	
Approach LOS		F			E			F			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	24.0	55.7		25.0	11.0	68.7		41.3				
Change Period (Y+Rc), s	* 5.7	9.5		7.3	* 5.2	9.5		7.3				
Max Green Setting (Gmax), s	* 18	46.2		17.7	* 8	57.0		38.0				
Max Q Clear Time (g_c+I1), s	20.3	48.2		19.7	4.6	51.5		31.5				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	5.5		1.7				
Intersection Summary												
HCM 2010 Ctrl Delay			197.7									
HCM 2010 LOS			F									
Notes												

HCM 2010 Signalized Intersection Summary

2: Main Ave & Mapleview St

NT PM
11/24/2015

	           											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	973	212	33	644	6	185	3	81	0	2	3
Future Volume (veh/h)	0	973	212	33	644	6	185	3	81	0	2	3
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.94	0.99		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	0	1058	230	36	700	7	201	3	88	0	2	3
Adj No. of Lanes	0	1	1	0	2	1	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	749	610	39	795	343	387	5	743	0	163	245
Arrive On Green	0.00	0.40	0.40	0.23	0.23	0.23	0.25	0.25	0.25	0.00	0.25	0.25
Sat Flow, veh/h	0	1863	1518	169	3454	1493	1361	20	1532	0	660	989
Grp Volume(v), veh/h	0	1058	230	394	342	7	204	0	88	0	0	5
Grp Sat Flow(s),veh/h/ln	0	1863	1518	1854	1770	1493	1381	0	1532	0	0	1649
Q Serve(g_s), s	0.0	56.9	15.1	29.4	26.1	0.5	18.3	0.0	4.5	0.0	0.0	0.3
Cycle Q Clear(g_c), s	0.0	56.9	15.1	29.4	26.1	0.5	18.7	0.0	4.5	0.0	0.0	0.3
Prop In Lane	0.00		1.00	0.09		1.00	0.99		1.00	0.00		0.60
Lane Grp Cap(c), veh/h	0	749	610	426	407	343	392	0	743	0	0	408
V/C Ratio(X)	0.00	1.41	0.38	0.92	0.84	0.02	0.52	0.00	0.12	0.00	0.00	0.01
Avail Cap(c_a), veh/h	0	749	610	551	526	444	392	0	743	0	0	408
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	42.3	29.8	53.3	52.0	42.2	47.3	0.0	20.5	0.0	0.0	40.2
Incr Delay (d2), s/veh	0.0	193.8	0.1	16.4	7.5	0.0	4.9	0.0	0.3	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	69.4	6.3	17.0	13.6	0.2	7.6	0.0	2.8	0.0	0.0	0.2
LnGrp Delay(d),s/veh	0.0	236.1	30.0	69.7	59.5	42.2	52.1	0.0	20.8	0.0	0.0	40.3
LnGrp LOS		F	C	E	E	D	D		C			D
Approach Vol, veh/h	1288			743			292			5		
Approach Delay, s/veh	199.3			64.8			42.7			40.3		
Approach LOS	F			E			D			D		
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	62.6		40.7		38.3		40.7					
Change Period (Y+Rc), s	5.7		5.7		5.7		* 5.7					
Max Green Setting (Gmax), s	56.9		33.9		42.1		* 35					
Max Q Clear Time (g_c+I1), s	58.9		2.3		31.4		20.7					
Green Ext Time (p_c), s	0.0		2.3		1.2		1.7					
Intersection Summary												
HCM 2010 Ctrl Delay	136.4											
HCM 2010 LOS	F											
Notes												

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	1031	23	0	671	36	0	0	107	0	0	12
Future Vol, veh/h	0	1031	23	0	671	36	0	0	107	0	0	12
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1121	25	0	729	39	0	0	116	0	0	13
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	739	0	0	1156	0	0	1518	1882	593	1309	1895	385
Stage 1	-	-	-	-	-	-	1143	1143	-	739	739	-
Stage 2	-	-	-	-	-	-	375	739	-	570	1156	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	863	-	-	600	-	-	82	70	449	117	69	613
Stage 1	-	-	-	-	-	-	213	273	-	375	422	-
Stage 2	-	-	-	-	-	-	618	422	-	474	269	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	855	-	-	594	-	-	79	69	440	84	68	601
Mov Cap-2 Maneuver	-	-	-	-	-	-	79	69	-	84	68	-
Stage 1	-	-	-	-	-	-	211	270	-	371	418	-
Stage 2	-	-	-	-	-	-	599	418	-	345	266	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			16.1			11.1		
HCM LOS							C			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	440	855	-	-	594	-	-	601				
HCM Lane V/C Ratio	0.264	-	-	-	-	-	-	0.022				
HCM Control Delay (s)	16.1	0	-	-	0	-	-	11.1				
HCM Lane LOS	C	A	-	-	A	-	-	B				
HCM 95th %tile Q(veh)	1.1	0	-	-	0	-	-	0.1				

HCM 2010 Signalized Intersection Summary
4: Ashwood St & Mapleview St/Lake Jennings Park Rd

NT PM
11/24/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	461	438	49	49	285	191	30	143	48	222	142	337
Future Volume (veh/h)	461	438	49	49	285	191	30	143	48	222	142	337
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.92	1.00		0.96	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1863	1900	1863	1863	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	501	476	53	53	310	208	33	155	52	241	154	366
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	525	1276	141	78	521	646	37	176	59	301	193	419
Arrive On Green	0.30	0.40	0.40	0.04	0.15	0.15	0.15	0.15	0.15	0.27	0.27	0.27
Sat Flow, veh/h	1774	3197	354	1774	3539	1450	242	1138	382	1103	705	1535
Grp Volume(v), veh/h	501	262	267	53	310	208	240	0	0	395	0	366
Grp Sat Flow(s),veh/h/ln	1774	1770	1781	1774	1770	1450	1762	0	0	1808	0	1535
Q Serve(g_s), s	37.6	14.2	14.4	4.0	11.1	13.2	18.1	0.0	0.0	27.6	0.0	30.9
Cycle Q Clear(g_c), s	37.6	14.2	14.4	4.0	11.1	13.2	18.1	0.0	0.0	27.6	0.0	30.9
Prop In Lane	1.00		0.20	1.00		1.00	0.14		0.22	0.61		1.00
Lane Grp Cap(c), veh/h	525	706	711	78	521	646	272	0	0	494	0	419
V/C Ratio(X)	0.95	0.37	0.37	0.68	0.59	0.32	0.88	0.00	0.00	0.80	0.00	0.87
Avail Cap(c_a), veh/h	618	843	848	127	706	722	272	0	0	494	0	419
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.9	28.8	28.8	63.9	54.1	26.6	56.2	0.0	0.0	45.9	0.0	47.1
Incr Delay (d2), s/veh	22.4	0.1	0.2	3.7	0.5	0.1	31.0	0.0	0.0	12.8	0.0	21.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.6	7.0	7.1	2.0	5.5	7.8	11.1	0.0	0.0	15.6	0.0	15.6
LnGrp Delay(d),s/veh	69.3	28.9	29.0	67.7	54.6	26.8	87.2	0.0	0.0	58.7	0.0	68.6
LnGrp LOS	E	C	C	E	D	C	F			E		E
Approach Vol, veh/h	1030				571		240				761	
Approach Delay, s/veh	48.6				45.7		87.2				63.4	
Approach LOS	D				D		F				E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	9.7	59.1	42.0		43.9	24.9	25.0					
Change Period (Y+Rc), s	3.7	4.9	4.9		3.7	4.9	4.0					
Max Green Setting (Gmax), s	9.7	64.7	37.1		47.3	27.1	21.0					
Max Q Clear Time (g_c+I1), s	6.0	16.4	32.9		39.6	15.2	20.1					
Green Ext Time (p_c), s	0.0	3.9	1.4		0.6	3.1	0.1					
Intersection Summary												
HCM 2010 Ctrl Delay	55.9											
HCM 2010 LOS	E											

Intersection																
Intersection Delay, s/veh42.3																
Intersection LOS E																
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	34	44	201	0	43	23	10	0	132	366	31	0	35	570	31
Future Vol, veh/h	0	34	44	201	0	43	23	10	0	132	366	31	0	35	570	31
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	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	37	48	218	0	47	25	11	0	143	398	34	0	38	620	34
Number of Lanes	0	0	1	1	0	0	1	1	0	1	1	0	0	1	2	0
Approach	EB				WB				NB				SB			
Opposing Approach	WB				EB				SB				NB			
Opposing Lanes	2				2				3				2			
Conflicting Approach Left	SB				NB				EB				WB			
Conflicting Lanes Left	3				2				2				2			
Conflicting Approach Right	NB				SB				WB				EB			
Conflicting Lanes Right	2				3				2				2			
HCM Control Delay	18.8				15.7				57.7				42.9			
HCM LOS	C				C				F				E			
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3							
Vol Left, %	100%	0%	44%	0%	65%	0%	100%	0%	0%							
Vol Thru, %	0%	92%	56%	0%	35%	0%	0%	100%	86%							
Vol Right, %	0%	8%	0%	100%	0%	100%	0%	0%	14%							
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop							
Traffic Vol by Lane	132	397	78	201	66	10	35	380	221							
LT Vol	132	0	34	0	43	0	35	0	0							
Through Vol	0	366	44	0	23	0	0	380	190							
RT Vol	0	31	0	201	0	10	0	0	31							
Lane Flow Rate	143	432	85	218	72	11	38	413	240							
Geometry Grp	8	8	8	8	8	8	8	8	8							
Degree of Util (X)	0.354	0.996	0.224	0.521	0.211	0.029	0.092	0.944	0.542							
Departure Headway (Hd)	8.88	8.31	9.524	8.578	10.594	9.526	8.739	8.226	8.125							
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes							
Cap	406	436	377	422	339	376	410	442	444							
Service Time	6.628	6.058	7.273	6.327	8.359	7.291	6.486	5.972	5.871							
HCM Lane V/C Ratio	0.352	0.991	0.225	0.517	0.212	0.029	0.093	0.934	0.541							
HCM Control Delay	16.4	71.4	15	20.3	16.2	12.6	12.4	59	20.1							
HCM Lane LOS	C	F	B	C	C	B	B	F	C							
HCM 95th-tile Q	1.6	12.6	0.8	2.9	0.8	0.1	0.3	11	3.2							

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	0	110	76	0	0	0
Future Vol, veh/h	0	110	76	0	0	0
Conflicting Peds, #/hr	10	0	0	10	10	10
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	0	120	83	0	0	0
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	93	0	-	0	213	103
Stage 1	-	-	-	-	93	-
Stage 2	-	-	-	-	120	-
Critical Hdwy	4.12	-	-	-	6.42	6.22
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.318
Pot Cap-1 Maneuver	1501	-	-	-	775	952
Stage 1	-	-	-	-	931	-
Stage 2	-	-	-	-	905	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1487	-	-	-	760	934
Mov Cap-2 Maneuver	-	-	-	-	760	-
Stage 1	-	-	-	-	922	-
Stage 2	-	-	-	-	896	-
Approach	EB		WB		SB	
HCM Control Delay, s	0		0		0	
HCM LOS					A	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1487	-	-	-	-	
HCM Lane V/C Ratio	-	-	-	-	-	
HCM Control Delay (s)	0	-	-	-	0	
HCM Lane LOS	A	-	-	-	A	
HCM 95th %tile Q(veh)	0	-	-	-	-	

HCM 2010 Signalized Intersection Summary
 8: Lake Jennings Park Rd & Hwy 8 Bus/Blossom Valley Rd

NT PM
 11/24/2015

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	60	233	172	28	46	172	652	274	85	624	74
Future Volume (veh/h)	80	60	233	172	28	46	172	652	274	85	624	74
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.95	0.99		0.95	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	87	65	253	187	30	50	187	709	298	92	678	80
Adj No. of Lanes	0	1	1	0	1	0	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	310	213	447	261	45	52	204	833	680	118	743	605
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.11	0.45	0.45	0.07	0.40	0.40
Sat Flow, veh/h	797	717	1506	615	153	177	1774	1863	1521	1774	1863	1518
Grp Volume(v), veh/h	152	0	253	267	0	0	187	709	298	92	678	80
Grp Sat Flow(s),veh/h/ln	1514	0	1506	944	0	0	1774	1863	1521	1774	1863	1518
Q Serve(g_s), s	0.0	0.0	11.0	16.1	0.0	0.0	8.1	26.3	10.4	4.0	26.7	2.6
Cycle Q Clear(g_c), s	5.8	0.0	11.0	21.9	0.0	0.0	8.1	26.3	10.4	4.0	26.7	2.6
Prop In Lane	0.57		1.00	0.70		0.19	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	522	0	447	359	0	0	204	833	680	118	743	605
V/C Ratio(X)	0.29	0.00	0.57	0.74	0.00	0.00	0.92	0.85	0.44	0.78	0.91	0.13
Avail Cap(c_a), veh/h	522	0	447	359	0	0	204	833	680	124	743	605
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.1	0.0	23.0	28.7	0.0	0.0	33.9	19.1	14.7	35.6	22.0	14.8
Incr Delay (d2), s/veh	0.1	0.0	1.1	7.2	0.0	0.0	40.2	10.6	2.0	23.5	17.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	4.7	6.4	0.0	0.0	6.2	15.9	4.8	2.7	17.2	1.2
LnGrp Delay(d),s/veh	21.2	0.0	24.1	35.9	0.0	0.0	74.1	29.8	16.8	59.2	39.6	15.2
LnGrp LOS	C		C	D			E	C	B	E	D	B
Approach Vol, veh/h		405			267			1194			850	
Approach Delay, s/veh		23.0			35.9			33.5			39.4	
Approach LOS		C			D			C			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.2	40.0		28.3	13.0	36.2		28.3				
Change Period (Y+Rc), s	4.1	5.3		5.3	4.1	5.3		5.3				
Max Green Setting (Gmax), s	5.4	34.4		17.2	8.9	30.9		23.0				
Max Q Clear Time (g_c+I1), s	6.0	28.3		13.0	10.1	28.7		23.9				
Green Ext Time (p_c), s	0.0	3.4		1.0	0.0	1.5		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			34.0									
HCM 2010 LOS			C									

Intersection												
Int Delay, s/veh	12											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	56	0	265	0	838	568	0	656	374
Future Vol, veh/h	0	0	0	56	0	265	0	838	568	0	656	374
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	Free
Storage Length	-	-	-	0	-	330	-	-	90	90	-	90
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	0	0	61	0	288	0	911	617	0	713	407
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				1634	1634	931	713	0	-	921	0	0
Stage 1				921	921	-	-	-	-	-	-	-
Stage 2				713	713	-	-	-	-	-	-	-
Critical Hdwy				6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1				5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy				3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver				111	101	324	887	-	0	741	-	0
Stage 1				388	349	-	-	-	0	-	-	0
Stage 2				486	435	-	-	-	0	-	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver				109	0	318	879	-	-	734	-	-
Mov Cap-2 Maneuver				109	0	-	-	-	-	-	-	-
Stage 1				384	0	-	-	-	-	-	-	-
Stage 2				481	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				67.6			0			0		
HCM LOS				F								
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBL	SBT						
Capacity (veh/h)	879	-	109	318	734	-						
HCM Lane V/C Ratio	-	-	0.558	0.906	-	-						
HCM Control Delay (s)	0	-	73.5	66.3	0	-						
HCM Lane LOS	A	-	F	F	A	-						
HCM 95th %tile Q(veh)	0	-	2.6	8.7	0	-						

Intersection												
Intersection Delay, s/veh	70											
Intersection LOS	F											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	541	585	194	0	36	0	739	0	0	179	44
Future Vol, veh/h	0	541	585	194	0	36	0	739	0	0	179	44
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	588	636	211	0	39	0	803	0	0	195	48
Number of Lanes	0	1	1	0	0	1	0	1	0	0	1	0
Approach	EB				WB				NB			
Opposing Approach	WB				EB				SB			
Opposing Lanes	2				2				1			
Conflicting Approach Left	SB				NB				EB			
Conflicting Lanes Left	1				1				2			
Conflicting Approach Right	NB				SB				WB			
Conflicting Lanes Right	1				1				2			
HCM Control Delay	75.7				69.6				27.9			
HCM LOS	F				F				D			
Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1						
Vol Left, %	0%	100%	0%	100%	0%	79%						
Vol Thru, %	80%	0%	75%	0%	0%	21%						
Vol Right, %	20%	0%	25%	0%	100%	0%						
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop						
Traffic Vol by Lane	223	541	779	36	739	417						
LT Vol	0	541	0	36	0	330						
Through Vol	179	0	585	0	0	87						
RT Vol	44	0	194	0	739	0						
Lane Flow Rate	242	588	847	39	803	453						
Geometry Grp	2	7	7	7	7	2						
Degree of Util (X)	0.64	1	1	0.103	1	1						
Departure Headway (Hd)	9.51	9.448	8.774	9.519	8.319	8.812						
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes						
Cap	383	388	423	378	442	412						
Service Time	7.51	7.18	6.506	7.247	6.048	6.851						
HCM Lane V/C Ratio	0.632	1.515	2.002	0.103	1.817	1.1						
HCM Control Delay	27.9	77.5	74.5	13.3	72.3	75						
HCM Lane LOS	D	F	F	B	F	F						
HCM 95th-tile Q	4.3	11.9	12.4	0.3	12.7	12.4						

Intersection				
Intersection Delay, s/veh				
Intersection LOS				
Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	330	87	0
Future Vol, veh/h	0	330	87	0
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	359	95	0
Number of Lanes	0	0	1	0
Approach		SB		
Opposing Approach		NB		
Opposing Lanes		1		
Conflicting Approach Left		WB		
Conflicting Lanes Left		2		
Conflicting Approach Right		EB		
Conflicting Lanes Right		2		
HCM Control Delay		75		
HCM LOS		F		
Lane				

APPENDIX G

NEAR-TERM WITH PROJECT INTERSECTION CALCULATION SHEETS

HCM 2010 Signalized Intersection Summary

1: SR 67 & Mapleview St

NT + P AM
2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	98	27	830	98	156	23	732	274	123	694	64
Future Volume (veh/h)	80	98	27	830	98	156	23	732	274	123	694	64
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1863	1863	1863	1863	1827	1863	1863	1863
Adj Flow Rate, veh/h	87	107	0	978	0	0	25	796	298	134	754	0
Adj No. of Lanes	0	1	1	2	0	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	4	2	2	2
Cap, veh/h	104	128	202	1068	0	477	65	908	386	153	1098	491
Arrive On Green	0.13	0.13	0.00	0.30	0.00	0.00	0.04	0.26	0.26	0.09	0.31	0.00
Sat Flow, veh/h	817	1005	1583	3548	0	1583	1774	3539	1503	1774	3539	1583
Grp Volume(v), veh/h	194	0	0	978	0	0	25	796	298	134	754	0
Grp Sat Flow(s),veh/h/ln	1822	0	1583	1774	0	1583	1774	1770	1503	1774	1770	1583
Q Serve(g_s), s	13.6	0.0	0.0	34.7	0.0	0.0	1.8	28.2	24.0	9.7	24.4	0.0
Cycle Q Clear(g_c), s	13.6	0.0	0.0	34.7	0.0	0.0	1.8	28.2	24.0	9.7	24.4	0.0
Prop In Lane	0.45		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	233	0	202	1068	0	477	65	908	386	153	1098	491
V/C Ratio(X)	0.83	0.00	0.00	0.92	0.00	0.00	0.39	0.88	0.77	0.87	0.69	0.00
Avail Cap(c_a), veh/h	428	0	372	1214	0	542	109	908	386	153	1098	491
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	55.6	0.0	0.0	44.0	0.0	0.0	61.5	46.6	45.0	59.0	39.5	0.0
Incr Delay (d2), s/veh	10.4	0.0	0.0	10.1	0.0	0.0	3.7	11.7	14.0	38.6	3.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.5	0.0	0.0	18.5	0.0	0.0	0.9	15.3	11.4	6.4	12.5	0.0
LnGrp Delay(d),s/veh	66.0	0.0	0.0	54.1	0.0	0.0	65.2	58.3	59.0	97.5	43.0	0.0
LnGrp LOS	E			D			E	E	E	F	D	
Approach Vol, veh/h		194			978			1119			888	
Approach Delay, s/veh		66.0			54.1			58.6			51.2	
Approach LOS		E			D			E			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	17.0	43.0		24.0	10.0	50.0		46.6				
Change Period (Y+Rc), s	* 5.7	9.5		7.3	* 5.2	9.5		7.3				
Max Green Setting (Gmax), s	* 11	33.5		30.7	* 8	37.3		44.7				
Max Q Clear Time (g_c+I1), s	11.7	30.2		15.6	3.8	26.4		36.7				
Green Ext Time (p_c), s	0.0	3.3		1.1	0.0	10.6		2.6				
Intersection Summary												
HCM 2010 Ctrl Delay			55.6									
HCM 2010 LOS			E									
Notes												

HCM 2010 Signalized Intersection Summary

2: Main Ave & Mapleview St

NT + P AM
2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↑		↑↑	↑		↑	↑		↑	
Traffic Volume (veh/h)	0	418	77	25	878	6	207	2	76	2	1	0
Future Volume (veh/h)	0	418	77	25	878	6	207	2	76	2	1	0
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.95	0.99		0.97	0.99		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1845	1863	1900	1863	1863	1900	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	0	454	84	27	954	7	225	2	83	2	1	0
Adj No. of Lanes	0	1	1	0	2	1	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	3	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	492	400	29	1071	457	445	3	939	182	82	0
Arrive On Green	0.00	0.27	0.27	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.00
Sat Flow, veh/h	0	1845	1501	95	3532	1507	1305	12	1537	456	276	0
Grp Volume(v), veh/h	0	454	84	526	455	7	227	0	83	3	0	0
Grp Sat Flow(s),veh/h/ln	0	1845	1501	1858	1770	1507	1316	0	1537	732	0	0
Q Serve(g_s), s	0.0	31.1	5.6	35.7	31.4	0.4	0.0	0.0	3.0	0.0	0.0	0.0
Cycle Q Clear(g_c), s	0.0	31.1	5.6	35.7	31.4	0.4	20.4	0.0	3.0	20.5	0.0	0.0
Prop In Lane	0.00		1.00	0.05		1.00	0.99		1.00	0.67		0.00
Lane Grp Cap(c), veh/h	0	492	400	563	536	457	448	0	939	265	0	0
V/C Ratio(X)	0.00	0.92	0.21	0.93	0.85	0.02	0.51	0.00	0.09	0.01	0.00	0.00
Avail Cap(c_a), veh/h	0	649	528	708	674	574	448	0	939	265	0	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	1.00	0.00	0.00
Uniform Delay (d), s/veh	0.0	46.4	37.0	44.0	42.5	31.7	39.1	0.0	10.9	33.5	0.0	0.0
Incr Delay (d2), s/veh	0.0	14.0	0.1	15.5	6.9	0.0	4.0	0.0	0.2	0.1	0.0	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	17.8	2.3	20.7	16.3	0.2	7.5	0.0	2.3	0.1	0.0	0.0
LnGrp Delay(d),s/veh	0.0	60.4	37.1	59.4	49.4	31.7	43.2	0.0	11.1	33.5	0.0	0.0
LnGrp LOS		E	D	E	D	C	D		B	C		
Approach Vol, veh/h		538			988			310			3	
Approach Delay, s/veh		56.8			54.6			34.6			33.5	
Approach LOS		E			D			C			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		40.3		44.5		45.1		44.5				
Change Period (Y+Rc), s		5.7		5.7		5.7		* 5.7				
Max Green Setting (Gmax), s		45.7		37.7		49.5		* 39				
Max Q Clear Time (g_c+I1), s		33.1		22.5		37.7		22.4				
Green Ext Time (p_c), s		1.5		1.9		1.7		2.0				
Intersection Summary												
HCM 2010 Ctrl Delay			51.8									
HCM 2010 LOS			D									
Notes												

Intersection												
Int Delay, s/veh	1.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	474	22	0	900	111	0	0	169	0	0	9
Future Vol, veh/h	0	474	22	0	900	111	0	0	169	0	0	9
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	3	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	515	24	0	978	121	0	0	184	0	0	10
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	988	0	0	549	0	0	1036	1525	290	1256	1537	509
Stage 1	-	-	-	-	-	-	537	537	-	988	988	-
Stage 2	-	-	-	-	-	-	499	988	-	268	549	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	695	-	-	1017	-	-	186	117	707	128	115	509
Stage 1	-	-	-	-	-	-	496	521	-	265	323	-
Stage 2	-	-	-	-	-	-	522	323	-	714	515	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	688	-	-	1007	-	-	179	115	694	92	113	499
Mov Cap-2 Maneuver	-	-	-	-	-	-	179	115	-	92	113	-
Stage 1	-	-	-	-	-	-	491	516	-	262	320	-
Stage 2	-	-	-	-	-	-	507	320	-	520	510	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			12			12.4		
HCM LOS							B			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	694	688	-	-	1007	-	-	499				
HCM Lane V/C Ratio	0.265	-	-	-	-	-	-	0.02				
HCM Control Delay (s)	12	0	-	-	0	-	-	12.4				
HCM Lane LOS	B	A	-	-	A	-	-	B				
HCM 95th %tile Q(veh)	1.1	0	-	-	0	-	-	0.1				

HCM 2010 Signalized Intersection Summary
4: Ashwood St & Mapleview St/Lake Jennings Park Rd

NT + P AM
2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	412	386	98	60	439	294	38	162	44	211	177	472
Future Volume (veh/h)	412	386	98	60	439	294	38	162	44	211	177	472
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	1.00		0.92	1.00		0.70	1.00		0.85
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1848	1900	1863	1845	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	448	420	107	65	477	320	41	176	48	229	192	513
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	3	3	2	3	2	2	2	2	2	2	2
Cap, veh/h	458	1018	256	88	568	726	39	168	46	306	256	415
Arrive On Green	0.26	0.37	0.37	0.05	0.16	0.16	0.15	0.15	0.15	0.31	0.31	0.31
Sat Flow, veh/h	1774	2749	692	1774	3505	1450	255	1096	299	986	827	1339
Grp Volume(v), veh/h	448	266	261	65	477	320	265	0	0	421	0	513
Grp Sat Flow(s),veh/h/ln	1774	1756	1685	1774	1752	1450	1650	0	0	1813	0	1339
Q Serve(g_s), s	37.6	16.9	17.3	5.4	19.8	22.4	23.0	0.0	0.0	31.3	0.0	46.5
Cycle Q Clear(g_c), s	37.6	16.9	17.3	5.4	19.8	22.4	23.0	0.0	0.0	31.3	0.0	46.5
Prop In Lane	1.00		0.41	1.00		1.00	0.15		0.18	0.54		1.00
Lane Grp Cap(c), veh/h	458	650	624	88	568	726	253	0	0	562	0	415
V/C Ratio(X)	0.98	0.41	0.42	0.74	0.84	0.44	1.05	0.00	0.00	0.75	0.00	1.24
Avail Cap(c_a), veh/h	458	650	624	141	568	726	253	0	0	562	0	415
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	55.2	35.0	35.2	70.3	61.0	26.8	63.5	0.0	0.0	46.5	0.0	51.8
Incr Delay (d2), s/veh	36.3	0.2	0.2	4.5	10.4	0.2	69.6	0.0	0.0	8.9	0.0	125.2
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	23.0	8.3	8.1	2.8	10.4	13.3	15.4	0.0	0.0	17.1	0.0	31.7
LnGrp Delay(d),s/veh	91.6	35.2	35.4	74.8	71.3	27.0	133.1	0.0	0.0	55.4	0.0	177.0
LnGrp LOS	F	D	D	E	E	C	F			E		F
Approach Vol, veh/h		975			862			265			934	
Approach Delay, s/veh		61.2			55.1			133.1			122.2	
Approach LOS		E			E			F			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	11.1	60.5		51.4	42.4	29.2		27.0				
Change Period (Y+Rc), s	3.7	4.9		4.9	3.7	4.9		4.0				
Max Green Setting (Gmax), s	11.9	51.1		46.5	38.7	24.3		23.0				
Max Q Clear Time (g_c+I1), s	7.4	19.3		48.5	39.6	24.4		25.0				
Green Ext Time (p_c), s	0.0	5.1		0.0	0.0	0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay				84.5								
HCM 2010 LOS				F								

Intersection																
Intersection Delay, s/veh36.8																
Intersection LOS E																
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	55	30	125	0	76	36	52	0	162	521	64	0	51	319	28
Future Vol, veh/h	0	55	30	125	0	76	36	52	0	162	521	64	0	51	319	28
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	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	21	2	32	2	2	2	26	2	35	2	2
Mvmt Flow	0	60	33	136	0	83	39	57	0	176	566	70	0	55	347	30
Number of Lanes	0	0	1	1	0	0	1	1	0	1	1	0	0	1	2	0
Approach	EB				WB				NB				SB			
Opposing Approach	WB				EB				SB				NB			
Opposing Lanes	2				2				3				2			
Conflicting Approach Left	SB				NB				EB				WB			
Conflicting Lanes Left	3				2				2				2			
Conflicting Approach Right	NB				SB				WB				EB			
Conflicting Lanes Right	2				3				2				2			
HCM Control Delay	14.8				15.7				58				17.3			
HCM LOS	B				C				F				C			
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3							
Vol Left, %	100%	0%	65%	0%	68%	0%	100%	0%	0%							
Vol Thru, %	0%	89%	35%	0%	32%	0%	0%	100%	79%							
Vol Right, %	0%	11%	0%	100%	0%	100%	0%	0%	21%							
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop							
Traffic Vol by Lane	162	585	85	125	112	52	51	213	134							
LT Vol	162	0	55	0	76	0	51	0	0							
Through Vol	0	521	30	0	36	0	0	213	106							
RT Vol	0	64	0	125	0	52	0	0	28							
Lane Flow Rate	176	636	92	136	122	57	55	231	146							
Geometry Grp	8	8	8	8	8	8	8	8	8							
Degree of Util (X)	0.406	1	0.238	0.311	0.329	0.131	0.143	0.528	0.328							
Departure Headway (Hd)	8.298	7.707	9.257	8.24	9.725	8.372	9.291	8.23	8.084							
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes							
Cap	435	477	389	438	371	429	387	439	447							
Service Time	6.034	5.443	6.986	5.969	7.456	6.103	7.018	5.956	5.81							
HCM Lane V/C Ratio	0.405	1.333	0.237	0.311	0.329	0.133	0.142	0.526	0.327							
HCM Control Delay	16.6	69.5	14.9	14.7	17.2	12.4	13.6	19.8	14.7							
HCM Lane LOS	C	F	B	B	C	B	B	C	B							
HCM 95th-tile Q	1.9	13.2	0.9	1.3	1.4	0.4	0.5	3	1.4							

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	69	76	164	0	0	0
Future Vol, veh/h	69	76	164	0	0	0
Conflicting Peds, #/hr	10	0	0	10	10	10
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	71	2	18	2	2	2
Mvmt Flow	75	83	178	0	0	0
Major/Minor	Minor2		Major2			
Conflicting Flow All	188	188	-	0		
Stage 1	188	188	-	-		
Stage 2	0	0	-	-		
Critical Hdwy	7.81	6.52	-	-		
Critical Hdwy Stg 1	6.81	5.52	-	-		
Critical Hdwy Stg 2	-	-	-	-		
Follow-up Hdwy	4.139	4.018	-	-		
Pot Cap-1 Maneuver	643	707	-	-		
Stage 1	678	745	-	-		
Stage 2	-	-	-	-		
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	631	0	-	-		
Mov Cap-2 Maneuver	631	0	-	-		
Stage 1	672	0	-	-		
Stage 2	-	0	-	-		
Approach	EB		WB			
HCM Control Delay, s			0			
HCM LOS	-					
Minor Lane/Major Mvmt	EBLn1	EBLn2	WBT	WBR		
Capacity (veh/h)	631	-	-	-		
HCM Lane V/C Ratio	0.119	-	-	-		
HCM Control Delay (s)	11.5	-	-	-		
HCM Lane LOS	B	-	-	-		
HCM 95th %tile Q(veh)	0.4	-	-	-		

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	0	76	103	0	0	61
Future Vol, veh/h	0	76	103	0	0	61
Conflicting Peds, #/hr	10	0	0	10	10	10
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	92
Mvmt Flow	0	83	112	0	0	66
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	122	0	-	0	205	132
Stage 1	-	-	-	-	122	-
Stage 2	-	-	-	-	83	-
Critical Hdwy	4.12	-	-	-	6.42	7.12
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	4.128
Pot Cap-1 Maneuver	1465	-	-	-	783	724
Stage 1	-	-	-	-	903	-
Stage 2	-	-	-	-	940	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1451	-	-	-	768	710
Mov Cap-2 Maneuver	-	-	-	-	768	-
Stage 1	-	-	-	-	894	-
Stage 2	-	-	-	-	931	-
Approach	EB		WB		SB	
HCM Control Delay, s	0		0		10.6	
HCM LOS					B	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1451	-	-	-	710	
HCM Lane V/C Ratio	-	-	-	-	0.093	
HCM Control Delay (s)	0	-	-	-	10.6	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

HCM 2010 Signalized Intersection Summary
 8: Lake Jennings Park Rd & Hwy 8 Bus/Blossom Valley Rd

NT + P AM
 2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	83	71	215	313	57	84	130	574	98	59	592	62
Future Volume (veh/h)	83	71	215	313	57	84	130	574	98	59	592	62
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.95	0.99		0.95	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	90	77	234	340	62	91	141	624	107	64	643	67
Adj No. of Lanes	0	1	1	0	1	0	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	322	255	501	286	38	56	135	806	658	82	750	611
Arrive On Green	0.33	0.33	0.33	0.33	0.33	0.33	0.08	0.43	0.43	0.05	0.40	0.40
Sat Flow, veh/h	754	769	1511	626	114	168	1774	1863	1520	1774	1863	1518
Grp Volume(v), veh/h	167	0	234	493	0	0	141	624	107	64	643	67
Grp Sat Flow(s),veh/h/ln	1524	0	1511	908	0	0	1774	1863	1520	1774	1863	1518
Q Serve(g_s), s	0.0	0.0	9.5	19.7	0.0	0.0	5.9	22.1	3.3	2.8	24.4	2.1
Cycle Q Clear(g_c), s	6.0	0.0	9.5	25.7	0.0	0.0	5.9	22.1	3.3	2.8	24.4	2.1
Prop In Lane	0.54		1.00	0.69		0.18	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	577	0	501	379	0	0	135	806	658	82	750	611
V/C Ratio(X)	0.29	0.00	0.47	1.30	0.00	0.00	1.04	0.77	0.16	0.78	0.86	0.11
Avail Cap(c_a), veh/h	577	0	501	379	0	0	135	806	658	124	750	611
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	19.2	0.0	20.5	30.9	0.0	0.0	35.8	18.8	13.4	36.6	21.1	14.5
Incr Delay (d2), s/veh	0.1	0.0	0.3	152.8	0.0	0.0	89.6	7.2	0.5	8.3	12.1	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	0.0	4.0	24.1	0.0	0.0	6.2	12.9	1.5	1.5	15.0	1.0
LnGrp Delay(d),s/veh	19.3	0.0	20.7	183.7	0.0	0.0	125.8	25.9	13.9	44.9	33.3	14.8
LnGrp LOS	B		C	F			F	C	B	D	C	B
Approach Vol, veh/h		401			493			872			774	
Approach Delay, s/veh		20.1			183.7			40.6			32.6	
Approach LOS		C			F			D			C	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.7	38.8		31.0	10.0	36.5		31.0				
Change Period (Y+Rc), s	4.1	5.3		5.3	4.1	5.3		5.3				
Max Green Setting (Gmax), s	5.4	31.7		17.2	5.9	31.2		25.7				
Max Q Clear Time (g_c+I1), s	4.8	24.1		11.5	7.9	26.4		27.7				
Green Ext Time (p_c), s	0.0	3.3		1.9	0.0	2.4		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			62.7									
HCM 2010 LOS			E									

Intersection												
Int Delay, s/veh	6.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	33	0	312	0	493	524	1	414	705
Future Vol, veh/h	0	0	0	33	0	312	0	493	524	1	414	705
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	Free
Storage Length	-	-	-	0	-	330	-	-	90	90	-	90
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	3	2	2	2	2
Mvmt Flow	0	0	0	36	0	339	0	536	570	1	450	766
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				998	998	556	450	0	-	546	0	0
Stage 1				546	546	-	-	-	-	-	-	-
Stage 2				452	452	-	-	-	-	-	-	-
Critical Hdwy				6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1				5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy				3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver				270	244	531	1110	-	0	1023	-	0
Stage 1				580	518	-	-	-	0	-	-	0
Stage 2				641	570	-	-	-	0	-	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver				265	0	521	1099	-	-	1013	-	-
Mov Cap-2 Maneuver				265	0	-	-	-	-	-	-	-
Stage 1				574	0	-	-	-	-	-	-	-
Stage 2				634	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				23.6			0			0		
HCM LOS				C								
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBL	SBT						
Capacity (veh/h)	1099	-	265	521	1013	-						
HCM Lane V/C Ratio	-	-	0.135	0.651	0.001	-						
HCM Control Delay (s)	0	-	20.7	23.9	8.6	-						
HCM Lane LOS	A	-	C	C	A	-						
HCM 95th %tile Q(veh)	0	-	0.5	4.6	0	-						

Intersection												
Intersection Delay, s/veh	51											
Intersection LOS	F											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	287	346	89	0	31	0	655	0	0	162	45
Future Vol, veh/h	0	287	346	89	0	31	0	655	0	0	162	45
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
Heavy Vehicles, %	2	4	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	312	376	97	0	34	0	712	0	0	176	49
Number of Lanes	0	1	1	0	0	1	0	1	0	0	1	0
Approach	EB			WB				NB				
Opposing Approach	WB			EB				SB				
Opposing Lanes	2			2				1				
Conflicting Approach Left	SB			NB				EB				
Conflicting Lanes Left	1			1				2				
Conflicting Approach Right	NB			SB				WB				
Conflicting Lanes Right	1			1				2				
HCM Control Delay	54.5			65.6				20.9				
HCM LOS	F			F				C				
Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1						
Vol Left, %	0%	100%	0%	100%	0%	81%						
Vol Thru, %	78%	0%	80%	0%	0%	19%						
Vol Right, %	22%	0%	20%	0%	100%	0%						
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop						
Traffic Vol by Lane	207	287	435	31	655	248						
LT Vol	0	287	0	31	0	200						
Through Vol	162	0	346	0	0	48						
RT Vol	45	0	89	0	655	0						
Lane Flow Rate	225	312	473	34	712	270						
Geometry Grp	2	7	7	7	7	2						
Degree of Util (X)	0.534	0.734	1	0.081	1	0.641						
Departure Headway (Hd)	8.539	8.466	7.786	8.621	7.378	8.555						
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes						
Cap	423	427	468	416	491	423						
Service Time	6.56	6.201	5.52	6.362	5.156	6.573						
HCM Lane V/C Ratio	0.532	0.731	1.011	0.082	1.45	0.638						
HCM Control Delay	20.9	31.3	69.8	12.1	68.1	25.7						
HCM Lane LOS	C	D	F	B	F	D						
HCM 95th-tile Q	3.1	5.8	13.1	0.3	13.5	4.4						

Intersection

Intersection Delay, s/veh

Intersection LOS

Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	200	48	0
Future Vol, veh/h	0	200	48	0
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	217	52	0
Number of Lanes	0	0	1	0

Approach

SB

Opposing Approach

NB

Opposing Lanes

1

Conflicting Approach Left

WB

Conflicting Lanes Left

2

Conflicting Approach Right

EB

Conflicting Lanes Right

2

HCM Control Delay

25.7

HCM LOS

D

Lane

HCM 2010 Signalized Intersection Summary

1: SR 67 & Mapleview St

NT + P PM
2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	144	137	12	652	81	133	29	1507	775	303	1182	87
Future Volume (veh/h)	144	137	12	652	81	133	29	1507	775	303	1182	87
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.97	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	157	149	0	772	0	0	32	1638	842	329	1285	0
Adj No. of Lanes	0	1	1	2	0	1	1	2	1	1	2	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	72	68	122	868	0	387	71	1188	517	237	1531	685
Arrive On Green	0.08	0.08	0.00	0.24	0.00	0.00	0.04	0.34	0.34	0.13	0.43	0.00
Sat Flow, veh/h	932	884	1583	3548	0	1583	1774	3539	1540	1774	3539	1583
Grp Volume(v), veh/h	306	0	0	772	0	0	32	1638	842	329	1285	0
Grp Sat Flow(s),veh/h/ln	1816	0	1583	1774	0	1583	1774	1770	1540	1774	1770	1583
Q Serve(g_s), s	11.0	0.0	0.0	30.0	0.0	0.0	2.5	47.9	47.9	19.1	46.2	0.0
Cycle Q Clear(g_c), s	11.0	0.0	0.0	30.0	0.0	0.0	2.5	47.9	47.9	19.1	46.2	0.0
Prop In Lane	0.51		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	140	0	122	868	0	387	71	1188	517	237	1531	685
V/C Ratio(X)	2.19	0.00	0.00	0.89	0.00	0.00	0.45	1.38	1.63	1.39	0.84	0.00
Avail Cap(c_a), veh/h	140	0	122	1049	0	468	99	1188	517	237	1531	685
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	65.9	0.0	0.0	52.0	0.0	0.0	66.9	47.4	47.4	61.8	36.1	0.0
Incr Delay (d2), s/veh	556.4	0.0	0.0	8.4	0.0	0.0	4.3	175.9	291.8	197.5	5.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	27.1	0.0	0.0	15.7	0.0	0.0	1.3	52.3	62.1	22.3	23.7	0.0
LnGrp Delay(d),s/veh	622.3	0.0	0.0	60.4	0.0	0.0	71.3	223.3	339.2	259.3	41.7	0.0
LnGrp LOS	F			E			E	F	F	F	D	
Approach Vol, veh/h		306			772			2512			1614	
Approach Delay, s/veh		622.3			60.4			260.2			86.1	
Approach LOS		F			E			F			F	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	24.8	57.4		18.3	11.0	71.2		42.2				
Change Period (Y+Rc), s	* 5.7	9.5		7.3	* 5.2	9.5		7.3				
Max Green Setting (Gmax), s	* 19	47.9		11.0	* 8	59.5		42.2				
Max Q Clear Time (g_c+I1), s	21.1	49.9		13.0	4.5	48.2		32.0				
Green Ext Time (p_c), s	0.0	0.0		0.0	0.0	11.3		2.2				
Intersection Summary												
HCM 2010 Ctrl Delay			197.8									
HCM 2010 LOS			F									
Notes												

HCM 2010 Signalized Intersection Summary

2: Main Ave & Mapleview St

NT + P PM
2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↑	↗		↕	↗		↕	↗		↕	
Traffic Volume (veh/h)	0	1003	212	33	678	6	185	3	81	0	2	3
Future Volume (veh/h)	0	1003	212	33	678	6	185	3	81	0	2	3
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.94	0.99		0.97	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	0	1863	1863	1900	1863	1863	1900	1863	1863	1900	1863	1900
Adj Flow Rate, veh/h	0	1090	230	36	737	7	201	3	88	0	2	3
Adj No. of Lanes	0	1	1	0	2	1	0	1	1	0	1	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	0	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	0	793	647	37	795	343	362	5	718	0	153	229
Arrive On Green	0.00	0.43	0.43	0.23	0.23	0.23	0.23	0.23	0.23	0.00	0.23	0.23
Sat Flow, veh/h	0	1863	1520	161	3463	1493	1358	20	1529	0	659	988
Grp Volume(v), veh/h	0	1090	230	414	359	7	204	0	88	0	0	5
Grp Sat Flow(s),veh/h/ln	0	1863	1520	1855	1770	1493	1379	0	1529	0	0	1647
Q Serve(g_s), s	0.0	64.3	15.5	33.4	29.6	0.5	20.0	0.0	5.0	0.0	0.0	0.4
Cycle Q Clear(g_c), s	0.0	64.3	15.5	33.4	29.6	0.5	20.3	0.0	5.0	0.0	0.0	0.4
Prop In Lane	0.00		1.00	0.09		1.00	0.99		1.00	0.00		0.60
Lane Grp Cap(c), veh/h	0	793	647	426	406	343	367	0	718	0	0	382
V/C Ratio(X)	0.00	1.38	0.36	0.97	0.88	0.02	0.56	0.00	0.12	0.00	0.00	0.01
Avail Cap(c_a), veh/h	0	793	647	426	406	343	367	0	718	0	0	382
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00	0.00	0.00	1.00
Uniform Delay (d), s/veh	0.0	43.4	29.4	57.7	56.3	45.0	52.6	0.0	23.3	0.0	0.0	44.7
Incr Delay (d2), s/veh	0.0	176.7	0.1	35.9	19.4	0.0	6.0	0.0	0.4	0.0	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	71.9	6.5	21.4	16.7	0.2	8.3	0.0	3.1	0.0	0.0	0.2
LnGrp Delay(d),s/veh	0.0	220.1	29.5	93.6	75.6	45.1	58.6	0.0	23.6	0.0	0.0	44.8
LnGrp LOS		F	C	F	E	D	E		C			D
Approach Vol, veh/h	1320				780		292				5	
Approach Delay, s/veh	186.9				84.9		48.0				44.8	
Approach LOS	F				F		D				D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	2		4		6		8					
Phs Duration (G+Y+Rc), s	70.0		40.7		40.4		40.7					
Change Period (Y+Rc), s	5.7		5.7		5.7		* 5.7					
Max Green Setting (Gmax), s	64.3		33.9		34.7		* 35					
Max Q Clear Time (g_c+I1), s	66.3		2.4		35.4		22.3					
Green Ext Time (p_c), s	0.0		2.3		0.0		1.6					
Intersection Summary												
HCM 2010 Ctrl Delay			136.5									
HCM 2010 LOS			F									
Notes												

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	1061	23	0	705	36	0	0	107	0	0	12
Future Vol, veh/h	0	1061	23	0	705	36	0	0	107	0	0	12
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	50	-	-	0	-	-	0
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	1153	25	0	766	39	0	0	116	0	0	13
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	776	0	0	1188	0	0	1569	1952	609	1363	1964	403
Stage 1	-	-	-	-	-	-	1176	1176	-	776	776	-
Stage 2	-	-	-	-	-	-	393	776	-	587	1188	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.54	6.54	6.94	7.54	6.54	6.94
Critical Hdwy Stg 1	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.54	5.54	-	6.54	5.54	-
Follow-up Hdwy	2.22	-	-	2.22	-	-	3.52	4.02	3.32	3.52	4.02	3.32
Pot Cap-1 Maneuver	836	-	-	583	-	-	75	63	438	107	62	597
Stage 1	-	-	-	-	-	-	203	263	-	356	406	-
Stage 2	-	-	-	-	-	-	603	406	-	463	260	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	828	-	-	577	-	-	72	62	430	77	61	586
Mov Cap-2 Maneuver	-	-	-	-	-	-	72	62	-	77	61	-
Stage 1	-	-	-	-	-	-	201	260	-	353	402	-
Stage 2	-	-	-	-	-	-	584	402	-	335	258	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0			0			16.4			11.3		
HCM LOS							C			B		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1				
Capacity (veh/h)	430	828	-	-	577	-	-	586				
HCM Lane V/C Ratio	0.27	-	-	-	-	-	-	0.022				
HCM Control Delay (s)	16.4	0	-	-	0	-	-	11.3				
HCM Lane LOS	C	A	-	-	A	-	-	B				
HCM 95th %tile Q(veh)	1.1	0	-	-	0	-	-	0.1				

HCM 2010 Signalized Intersection Summary
4: Ashwood St & Mapleview St/Lake Jennings Park Rd

NT + P PM
2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	461	468	49	49	319	191	30	143	48	222	142	337
Future Volume (veh/h)	461	468	49	49	319	191	30	143	48	222	142	337
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.96	1.00		0.92	1.00		0.95	1.00		0.97
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1863	1846	1900	1863	1827	1863	1900	1863	1900	1900	1863	1863
Adj Flow Rate, veh/h	501	509	53	53	347	208	33	155	52	241	154	366
Adj No. of Lanes	1	2	0	1	2	1	0	1	0	0	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	3	3	2	4	2	2	2	2	2	2	2
Cap, veh/h	525	1274	132	78	511	649	37	175	59	303	194	422
Arrive On Green	0.30	0.40	0.40	0.04	0.15	0.15	0.15	0.15	0.15	0.27	0.27	0.27
Sat Flow, veh/h	1774	3193	331	1774	3471	1450	242	1138	382	1103	705	1535
Grp Volume(v), veh/h	501	279	283	53	347	208	240	0	0	395	0	366
Grp Sat Flow(s),veh/h/ln	1774	1754	1770	1774	1736	1450	1762	0	0	1808	0	1535
Q Serve(g_s), s	37.9	15.5	15.7	4.0	13.0	13.2	18.3	0.0	0.0	27.8	0.0	31.1
Cycle Q Clear(g_c), s	37.9	15.5	15.7	4.0	13.0	13.2	18.3	0.0	0.0	27.8	0.0	31.1
Prop In Lane	1.00		0.19	1.00		1.00	0.14		0.22	0.61		1.00
Lane Grp Cap(c), veh/h	525	700	706	78	511	649	272	0	0	497	0	422
V/C Ratio(X)	0.95	0.40	0.40	0.68	0.68	0.32	0.88	0.00	0.00	0.80	0.00	0.87
Avail Cap(c_a), veh/h	613	822	829	126	672	716	272	0	0	497	0	422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	47.3	29.4	29.4	64.5	55.3	26.7	56.7	0.0	0.0	46.1	0.0	47.3
Incr Delay (d2), s/veh	22.8	0.2	0.2	3.8	0.9	0.1	31.4	0.0	0.0	12.4	0.0	20.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	21.8	7.5	7.7	2.1	6.3	7.8	11.2	0.0	0.0	15.5	0.0	15.6
LnGrp Delay(d),s/veh	70.0	29.5	29.6	68.2	56.2	26.8	88.1	0.0	0.0	58.5	0.0	68.1
LnGrp LOS	E	C	C	E	E	C	F			E		E
Approach Vol, veh/h	1063				608		240				761	
Approach Delay, s/veh	48.6				47.2		88.1				63.1	
Approach LOS	D				D		F				E	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	9.7	59.5	42.5		44.2	25.1	25.1					
Change Period (Y+Rc), s	3.7	4.9	4.9		3.7	4.9	4.0					
Max Green Setting (Gmax), s	9.7	64.1	37.6		47.3	26.5	21.1					
Max Q Clear Time (g_c+I1), s	6.0	17.7	33.1		39.9	15.2	20.3					
Green Ext Time (p_c), s	0.0	4.2	1.5		0.6	3.2	0.1					
Intersection Summary												
HCM 2010 Ctrl Delay			56.0									
HCM 2010 LOS			E									

Intersection																
Intersection Delay, s/veh45.6																
Intersection LOS E																
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	34	44	201	0	78	23	44	0	132	366	62	0	65	570	31
Future Vol, veh/h	0	34	44	201	0	78	23	44	0	132	366	62	0	65	570	31
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	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2	2	20	2	42	2	2	2	27	2	25	2	2
Mvmt Flow	0	37	48	218	0	85	25	48	0	143	398	67	0	71	620	34
Number of Lanes	0	0	1	1	0	0	1	1	0	1	1	0	0	1	2	0
Approach	EB				WB				NB				SB			
Opposing Approach	WB				EB				SB				NB			
Opposing Lanes	2				2				3				2			
Conflicting Approach Left	SB				NB				EB				WB			
Conflicting Lanes Left	3				2				2				2			
Conflicting Approach Right	NB				SB				WB				EB			
Conflicting Lanes Right	2				3				2				2			
HCM Control Delay	20.5				17.6				61.7				48.6			
HCM LOS	C				C				F				E			
Lane	NBLn1	NBLn2	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3							
Vol Left, %	100%	0%	44%	0%	77%	0%	100%	0%	0%							
Vol Thru, %	0%	86%	56%	0%	23%	0%	0%	100%	86%							
Vol Right, %	0%	14%	0%	100%	0%	100%	0%	0%	14%							
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop							
Traffic Vol by Lane	132	428	78	201	101	44	65	380	221							
LT Vol	132	0	34	0	78	0	65	0	0							
Through Vol	0	366	44	0	23	0	0	380	190							
RT Vol	0	62	0	201	0	44	0	0	31							
Lane Flow Rate	143	465	85	218	110	48	71	413	240							
Geometry Grp	8	8	8	8	8	8	8	8	8							
Degree of Util (X)	0.378	1	0.234	0.548	0.334	0.127	0.186	0.985	0.566							
Departure Headway (Hd)	9.485	8.863	9.935	9.024	10.95	9.568	9.475	8.583	8.485							
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes							
Cap	377	409	361	400	328	374	379	421	425							
Service Time	7.283	6.66	7.711	6.8	8.735	7.353	7.24	6.348	6.25							
HCM Lane V/C Ratio	0.379	1.137	0.235	0.545	0.335	0.128	0.187	0.981	0.565							
HCM Control Delay	18	75.2	15.7	22.3	19.2	13.8	14.4	70	21.8							
HCM Lane LOS	C	F	C	C	C	B	B	F	C							
HCM 95th-tile Q	1.7	12.3	0.9	3.2	1.4	0.4	0.7	12	3.4							

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	61	110	145	0	0	0
Future Vol, veh/h	61	110	145	0	0	0
Conflicting Peds, #/hr	10	0	0	10	10	10
Sign Control	Stop	Stop	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	120	-	-	-	-	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	92	2	21	2	2	2
Mvmt Flow	66	120	158	0	0	0
Major/Minor	Minor2		Major2			
Conflicting Flow All	168	168	-	0		
Stage 1	168	168	-	-		
Stage 2	0	0	-	-		
Critical Hdwy	8.02	6.52	-	-		
Critical Hdwy Stg 1	7.02	5.52	-	-		
Critical Hdwy Stg 2	-	-	-	-		
Follow-up Hdwy	4.328	4.018	-	-		
Pot Cap-1 Maneuver	632	725	-	-		
Stage 1	662	759	-	-		
Stage 2	-	-	-	-		
Platoon blocked, %			-	-		
Mov Cap-1 Maneuver	620	0	-	-		
Mov Cap-2 Maneuver	620	0	-	-		
Stage 1	656	0	-	-		
Stage 2	-	0	-	-		
Approach	EB		WB			
HCM Control Delay, s	0					
HCM LOS	-					
Minor Lane/Major Mvmt	EBLn1	EBLn2	WBT	WBR		
Capacity (veh/h)	620	-	-	-		
HCM Lane V/C Ratio	0.107	-	-	-		
HCM Control Delay (s)	11.5	-	-	-		
HCM Lane LOS	B	-	-	-		
HCM 95th %tile Q(veh)	0.4	-	-	-		

Intersection						
Int Delay, s/veh	2.7					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Traffic Vol, veh/h	0	110	76	0	0	69
Future Vol, veh/h	0	110	76	0	0	69
Conflicting Peds, #/hr	10	0	0	10	10	10
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	70
Mvmt Flow	0	120	83	0	0	75
Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	93	0	-	0	213	103
Stage 1	-	-	-	-	93	-
Stage 2	-	-	-	-	120	-
Critical Hdwy	4.12	-	-	-	6.42	6.9
Critical Hdwy Stg 1	-	-	-	-	5.42	-
Critical Hdwy Stg 2	-	-	-	-	5.42	-
Follow-up Hdwy	2.218	-	-	-	3.518	3.93
Pot Cap-1 Maneuver	1501	-	-	-	775	795
Stage 1	-	-	-	-	931	-
Stage 2	-	-	-	-	905	-
Platoon blocked, %	-	-	-	-	-	-
Mov Cap-1 Maneuver	1487	-	-	-	760	780
Mov Cap-2 Maneuver	-	-	-	-	760	-
Stage 1	-	-	-	-	922	-
Stage 2	-	-	-	-	896	-
Approach	EB		WB		SB	
HCM Control Delay, s	0		0		10.1	
HCM LOS					B	
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	
Capacity (veh/h)	1487	-	-	-	780	
HCM Lane V/C Ratio	-	-	-	-	0.096	
HCM Control Delay (s)	0	-	-	-	10.1	
HCM Lane LOS	A	-	-	-	B	
HCM 95th %tile Q(veh)	0	-	-	-	0.3	

HCM 2010 Signalized Intersection Summary

8: Lake Jennings Park Rd & Hwy 8 Bus/Blossom Valley Rd

NT + P PM
2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	80	60	233	172	28	46	172	683	274	85	659	74
Future Volume (veh/h)	80	60	233	172	28	46	172	683	274	85	659	74
Number	7	4	14	3	8	18	5	2	12	1	6	16
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		0.95	0.99		0.95	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1900	1863	1863	1863	1863	1863	1863
Adj Flow Rate, veh/h	87	65	253	187	30	50	187	742	298	92	716	80
Adj No. of Lanes	0	1	1	0	1	0	1	1	1	1	1	1
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	310	213	447	261	45	52	204	833	680	118	743	605
Arrive On Green	0.30	0.30	0.30	0.30	0.30	0.30	0.11	0.45	0.45	0.07	0.40	0.40
Sat Flow, veh/h	797	717	1506	615	153	177	1774	1863	1521	1774	1863	1518
Grp Volume(v), veh/h	152	0	253	267	0	0	187	742	298	92	716	80
Grp Sat Flow(s),veh/h/ln	1514	0	1506	944	0	0	1774	1863	1521	1774	1863	1518
Q Serve(g_s), s	0.0	0.0	11.0	16.1	0.0	0.0	8.1	28.4	10.4	4.0	29.1	2.6
Cycle Q Clear(g_c), s	5.8	0.0	11.0	21.9	0.0	0.0	8.1	28.4	10.4	4.0	29.1	2.6
Prop In Lane	0.57		1.00	0.70		0.19	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	522	0	447	359	0	0	204	833	680	118	743	605
V/C Ratio(X)	0.29	0.00	0.57	0.74	0.00	0.00	0.92	0.89	0.44	0.78	0.96	0.13
Avail Cap(c_a), veh/h	522	0	447	359	0	0	204	833	680	124	743	605
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.1	0.0	23.0	28.7	0.0	0.0	33.9	19.7	14.7	35.6	22.8	14.8
Incr Delay (d2), s/veh	0.1	0.0	1.1	7.2	0.0	0.0	40.2	13.7	2.0	23.5	25.3	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	0.0	4.7	6.4	0.0	0.0	6.2	17.6	4.8	2.7	20.1	1.2
LnGrp Delay(d),s/veh	21.2	0.0	24.1	35.9	0.0	0.0	74.1	33.4	16.8	59.2	48.1	15.2
LnGrp LOS	C		C	D			E	C	B	E	D	B
Approach Vol, veh/h		405			267			1227			888	
Approach Delay, s/veh		23.0			35.9			35.6			46.3	
Approach LOS		C			D			D			D	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	9.2	40.0		28.3	13.0	36.2		28.3				
Change Period (Y+Rc), s	4.1	5.3		5.3	4.1	5.3		5.3				
Max Green Setting (Gmax), s	5.4	34.4		17.2	8.9	30.9		23.0				
Max Q Clear Time (g_c+I1), s	6.0	30.4		13.0	10.1	31.1		23.9				
Green Ext Time (p_c), s	0.0	2.5		1.0	0.0	0.0		0.0				
Intersection Summary												
HCM 2010 Ctrl Delay			37.2									
HCM 2010 LOS			D									

Intersection												
Int Delay, s/veh	13.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Traffic Vol, veh/h	0	0	0	56	0	265	0	869	568	0	657	408
Future Vol, veh/h	0	0	0	56	0	265	0	869	568	0	657	408
Conflicting Peds, #/hr	10	0	10	10	0	10	10	0	10	10	0	10
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	Free	-	-	Free
Storage Length	-	-	-	0	-	330	-	-	90	90	-	90
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	92	92	92	92	92	92	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	3
Mvmt Flow	0	0	0	61	0	288	0	945	617	0	714	443
Major/Minor				Minor1			Major1			Major2		
Conflicting Flow All				1669	1669	965	714	0	-	955	0	0
Stage 1				955	955	-	-	-	-	-	-	-
Stage 2				714	714	-	-	-	-	-	-	-
Critical Hdwy				6.42	6.52	6.22	4.12	-	-	4.12	-	-
Critical Hdwy Stg 1				5.42	5.52	-	-	-	-	-	-	-
Critical Hdwy Stg 2				5.42	5.52	-	-	-	-	-	-	-
Follow-up Hdwy				3.518	4.018	3.318	2.218	-	-	2.218	-	-
Pot Cap-1 Maneuver				106	96	309	886	-	0	720	-	0
Stage 1				374	337	-	-	-	0	-	-	0
Stage 2				485	435	-	-	-	0	-	-	0
Platoon blocked, %								-			-	
Mov Cap-1 Maneuver				104	0	303	878	-	-	713	-	-
Mov Cap-2 Maneuver				104	0	-	-	-	-	-	-	-
Stage 1				370	0	-	-	-	-	-	-	-
Stage 2				480	0	-	-	-	-	-	-	-
Approach				WB			NB			SB		
HCM Control Delay, s				78.2			0			0		
HCM LOS				F								
Minor Lane/Major Mvmt	NBL	NBT	WBLn1	WBLn2	SBL	SBT						
Capacity (veh/h)	878	-	104	303	713	-						
HCM Lane V/C Ratio	-	-	0.585	0.951	-	-						
HCM Control Delay (s)	0	-	79.8	77.9	0	-						
HCM Lane LOS	A	-	F	F	A	-						
HCM 95th %tile Q(veh)	0	-	2.8	9.5	0	-						

Intersection												
Intersection Delay, s/veh	70.1											
Intersection LOS	F											
Movement	EBU	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBU	NBL	NBT	NBR
Traffic Vol, veh/h	0	572	585	194	0	36	0	739	0	0	179	44
Future Vol, veh/h	0	572	585	194	0	36	0	739	0	0	179	44
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
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	622	636	211	0	39	0	803	0	0	195	48
Number of Lanes	0	1	1	0	0	1	0	1	0	0	1	0
Approach	EB			WB				NB				
Opposing Approach	WB			EB				SB				
Opposing Lanes	2			2				1				
Conflicting Approach Left	SB			NB				EB				
Conflicting Lanes Left	1			1				2				
Conflicting Approach Right	NB			SB				WB				
Conflicting Lanes Right	1			1				2				
HCM Control Delay	75.8			69.6				27.9				
HCM LOS	F			F				D				
Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1						
Vol Left, %	0%	100%	0%	100%	0%	79%						
Vol Thru, %	80%	0%	75%	0%	0%	21%						
Vol Right, %	20%	0%	25%	0%	100%	0%						
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop						
Traffic Vol by Lane	223	572	779	36	739	417						
LT Vol	0	572	0	36	0	330						
Through Vol	179	0	585	0	0	87						
RT Vol	44	0	194	0	739	0						
Lane Flow Rate	242	622	847	39	803	453						
Geometry Grp	2	7	7	7	7	2						
Degree of Util (X)	0.64	1	1	0.103	1	1						
Departure Headway (Hd)	9.51	9.448	8.774	9.519	8.319	8.812						
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes						
Cap	383	392	423	378	442	412						
Service Time	7.51	7.18	6.506	7.247	6.048	6.851						
HCM Lane V/C Ratio	0.632	1.587	2.002	0.103	1.817	1.1						
HCM Control Delay	27.9	77.5	74.5	13.3	72.3	75						
HCM Lane LOS	D	F	F	B	F	F						
HCM 95th-tile Q	4.3	11.9	12.4	0.3	12.7	12.4						

Intersection				
Intersection Delay, s/veh				
Intersection LOS				
Movement	SBU	SBL	SBT	SBR
Traffic Vol, veh/h	0	330	87	0
Future Vol, veh/h	0	330	87	0
Peak Hour Factor	0.92	0.92	0.92	0.92
Heavy Vehicles, %	2	2	2	2
Mvmt Flow	0	359	95	0
Number of Lanes	0	0	1	0
Approach		SB		
Opposing Approach		NB		
Opposing Lanes		1		
Conflicting Approach Left		WB		
Conflicting Lanes Left		2		
Conflicting Approach Right		EB		
Conflicting Lanes Right		2		
HCM Control Delay		75		
HCM LOS		F		
Lane				

APPENDIX H

POST MITIGATION INTERSECTION ANALYSIS CALCULATION SHEETS AND SIGNAL WARRANT ANALYSIS SHEET

HCM 2010 Signalized Intersection Summary
5: Lake Jennings Park Rd & Julian Ave/El Monte Rd

Ex + P with Mitigation AM

2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	48	30	113	76	36	52	143	463	64	51	269	24
Future Volume (veh/h)	48	30	113	76	36	52	143	463	64	51	269	24
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	0.99		1.00	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	52	33	0	83	39	0	155	503	70	55	292	26
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	284	148	473	308	119	379	205	706	98	100	1260	111
Arrive On Green	0.18	0.18	0.00	0.18	0.18	0.00	0.12	0.44	0.44	0.06	0.38	0.38
Sat Flow, veh/h	809	808	1583	908	648	1583	1774	1592	221	1774	3277	289
Grp Volume(v), veh/h	85	0	0	122	0	0	155	0	573	55	157	161
Grp Sat Flow(s),veh/h/ln	1617	0	1583	1556	0	1583	1774	0	1813	1774	1770	1797
Q Serve(g_s), s	0.0	0.0	0.0	1.0	0.0	0.0	3.6	0.0	11.0	1.3	2.5	2.6
Cycle Q Clear(g_c), s	1.7	0.0	0.0	2.7	0.0	0.0	3.6	0.0	11.0	1.3	2.5	2.6
Prop In Lane	0.61		1.00	0.68		1.00	1.00		0.12	1.00		0.16
Lane Grp Cap(c), veh/h	433	0	473	427	0	379	205	0	804	100	680	691
V/C Ratio(X)	0.20	0.00	0.00	0.29	0.00	0.00	0.76	0.00	0.71	0.55	0.23	0.23
Avail Cap(c_a), veh/h	1044	0	1115	1028	0	1022	654	0	1783	396	1483	1505
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.9	0.0	0.0	15.2	0.0	0.0	18.3	0.0	9.6	19.6	8.9	8.9
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.4	0.0	0.0	5.6	0.0	1.2	4.7	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	1.3	0.0	0.0	2.1	0.0	5.7	0.8	1.2	1.3
LnGrp Delay(d),s/veh	15.1	0.0	0.0	15.6	0.0	0.0	23.9	0.0	10.8	24.3	9.0	9.0
LnGrp LOS	B			B			C		B	C	A	A
Approach Vol, veh/h		85			122			728			373	
Approach Delay, s/veh		15.1			15.6			13.6			11.3	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		12.3	9.4	20.9		12.3	6.9	23.4				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		25.1	15.7	35.7		25.1	9.5	41.9				
Max Q Clear Time (g_c+I1), s		3.7	5.6	4.6		4.7	3.3	13.0				
Green Ext Time (p_c), s		1.1	0.2	5.4		1.0	0.0	5.3				
Intersection Summary												
HCM 2010 Ctrl Delay			13.2									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary
5: Lake Jennings Park Rd & Julian Ave/El Monte Rd

Ex + P with Mitigation PM

2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	32	44	176	77	23	44	117	303	62	65	494	28
Future Volume (veh/h)	32	44	176	77	23	44	117	303	62	65	494	28
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	0.99		1.00	1.00		0.96	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	35	48	0	84	25	0	127	329	67	71	537	30
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	218	230	447	359	86	403	171	587	120	123	1244	69
Arrive On Green	0.19	0.19	0.00	0.19	0.19	0.00	0.10	0.39	0.39	0.07	0.37	0.37
Sat Flow, veh/h	455	1240	1583	1041	464	1583	1774	1490	303	1774	3396	189
Grp Volume(v), veh/h	83	0	0	109	0	0	127	0	396	71	279	288
Grp Sat Flow(s),veh/h/ln	1695	0	1583	1505	0	1583	1774	0	1794	1774	1770	1816
Q Serve(g_s), s	0.0	0.0	0.0	0.7	0.0	0.0	2.7	0.0	6.6	1.5	4.6	4.6
Cycle Q Clear(g_c), s	1.5	0.0	0.0	2.2	0.0	0.0	2.7	0.0	6.6	1.5	4.6	4.6
Prop In Lane	0.42		1.00	0.77		1.00	1.00		0.17	1.00		0.10
Lane Grp Cap(c), veh/h	448	0	447	445	0	403	171	0	706	123	648	665
V/C Ratio(X)	0.19	0.00	0.00	0.24	0.00	0.00	0.74	0.00	0.56	0.58	0.43	0.43
Avail Cap(c_a), veh/h	1387	0	1369	1276	0	1326	716	0	1658	531	1451	1489
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	13.3	0.0	0.0	13.6	0.0	0.0	16.9	0.0	9.1	17.3	9.2	9.2
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.3	0.0	0.0	6.2	0.0	0.7	4.3	0.5	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.8	0.0	0.0	1.0	0.0	0.0	1.6	0.0	3.3	0.9	2.3	2.3
LnGrp Delay(d),s/veh	13.5	0.0	0.0	13.9	0.0	0.0	23.1	0.0	9.8	21.6	9.6	9.6
LnGrp LOS	B			B			C		A	C	A	A
Approach Vol, veh/h		83			109			523			638	
Approach Delay, s/veh		13.5			13.9			13.0			10.9	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		11.6	8.2	18.6		11.6	7.2	19.6				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		29.5	15.5	31.5		29.5	11.5	35.5				
Max Q Clear Time (g_c+I1), s		3.5	4.7	6.6		4.2	3.5	8.6				
Green Ext Time (p_c), s		1.0	0.2	5.4		1.0	0.1	5.5				
Intersection Summary												
HCM 2010 Ctrl Delay			12.1									
HCM 2010 LOS			B									

HCM 2010 Signalized Intersection Summary
5: Lake Jennings Park Rd & Julian Ave/El Monte Rd

NT + P with Mitigation AM

2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	55	30	125	76	36	52	162	521	64	51	319	28
Future Volume (veh/h)	55	30	125	76	36	52	162	521	64	51	319	28
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	0.99		1.00	1.00		0.96	1.00		0.96
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	60	33	0	83	39	0	176	566	70	55	347	30
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	286	130	490	297	115	370	231	762	94	98	1299	111
Arrive On Green	0.18	0.18	0.00	0.18	0.18	0.00	0.13	0.47	0.47	0.05	0.40	0.40
Sat Flow, veh/h	877	730	1583	920	645	1583	1774	1618	200	1774	3286	282
Grp Volume(v), veh/h	93	0	0	122	0	0	176	0	636	55	186	191
Grp Sat Flow(s),veh/h/ln	1606	0	1583	1565	0	1583	1774	0	1818	1774	1770	1799
Q Serve(g_s), s	0.0	0.0	0.0	0.9	0.0	0.0	4.4	0.0	13.0	1.4	3.2	3.3
Cycle Q Clear(g_c), s	2.0	0.0	0.0	2.9	0.0	0.0	4.4	0.0	13.0	1.4	3.2	3.3
Prop In Lane	0.65		1.00	0.68		1.00	1.00		0.11	1.00		0.16
Lane Grp Cap(c), veh/h	417	0	490	412	0	370	231	0	856	98	699	711
V/C Ratio(X)	0.22	0.00	0.00	0.30	0.00	0.00	0.76	0.00	0.74	0.56	0.27	0.27
Avail Cap(c_a), veh/h	1016	0	1125	1007	0	1006	653	0	1652	330	1287	1308
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	16.2	0.0	0.0	16.5	0.0	0.0	19.2	0.0	9.8	21.0	9.3	9.3
Incr Delay (d2), s/veh	0.3	0.0	0.0	0.4	0.0	0.0	5.1	0.0	1.3	5.0	0.2	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	0.0	0.0	1.4	0.0	0.0	2.5	0.0	6.7	0.8	1.6	1.6
LnGrp Delay(d),s/veh	16.5	0.0	0.0	16.9	0.0	0.0	24.3	0.0	11.1	26.1	9.5	9.5
LnGrp LOS	B			B			C		B	C	A	A
Approach Vol, veh/h		93			122			812			432	
Approach Delay, s/veh		16.5			16.9			14.0			11.6	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		12.7	10.5	22.5		12.7	7.0	26.0				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		26.5	16.8	33.2		26.5	8.5	41.5				
Max Q Clear Time (g_c+I1), s		4.0	6.4	5.3		4.9	3.4	15.0				
Green Ext Time (p_c), s		1.1	0.3	6.2		1.1	0.0	6.1				
Intersection Summary												
HCM 2010 Ctrl Delay			13.7									
HCM 2010 LOS			B									
Notes												

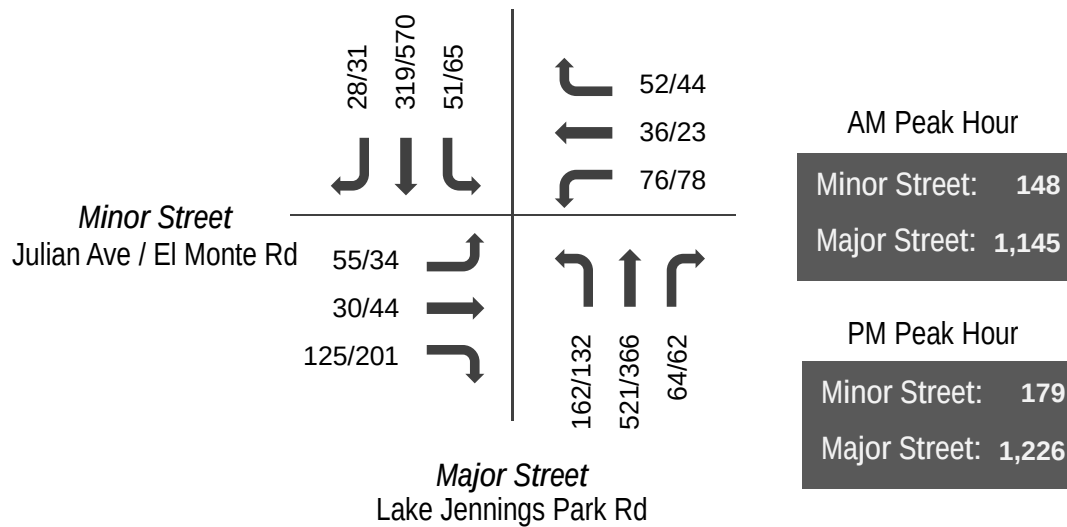
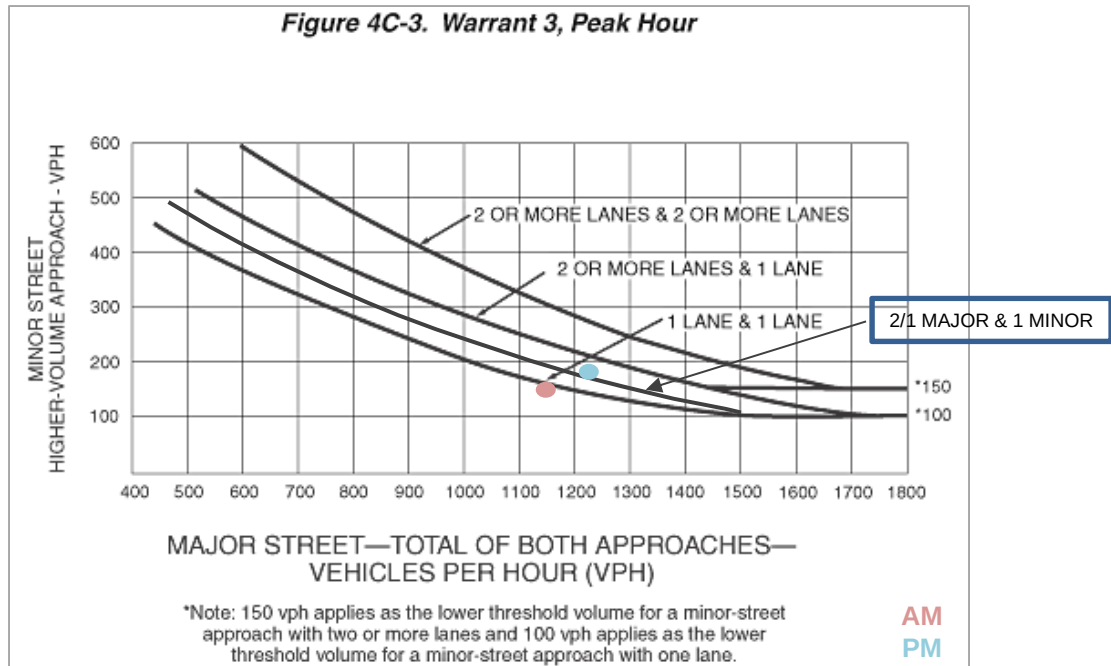
HCM 2010 Signalized Intersection Summary
5: Lake Jennings Park Rd & Julian Ave/El Monte Rd

NT + P with Mitigation PM

2/3/2016

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	34	44	201	78	23	44	132	366	62	65	570	31
Future Volume (veh/h)	34	44	201	78	23	44	132	366	62	65	570	31
Number	5	2	12	1	6	16	3	8	18	7	4	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	0.99		1.00	0.99		1.00	1.00		0.96	1.00		0.94
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Adj Sat Flow, veh/h/ln	1900	1863	1863	1900	1863	1863	1863	1863	1900	1863	1863	1900
Adj Flow Rate, veh/h	37	48	0	85	25	0	143	398	67	71	620	34
Adj No. of Lanes	0	1	1	0	1	1	1	1	0	1	2	0
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	212	216	453	343	82	391	189	661	111	119	1321	72
Arrive On Green	0.18	0.18	0.00	0.18	0.18	0.00	0.11	0.43	0.43	0.07	0.39	0.39
Sat Flow, veh/h	486	1201	1583	1052	456	1583	1774	1544	260	1774	3400	186
Grp Volume(v), veh/h	85	0	0	110	0	0	143	0	465	71	322	332
Grp Sat Flow(s),veh/h/ln	1687	0	1583	1508	0	1583	1774	0	1804	1774	1770	1817
Q Serve(g_s), s	0.0	0.0	0.0	0.7	0.0	0.0	3.3	0.0	8.2	1.6	5.7	5.7
Cycle Q Clear(g_c), s	1.6	0.0	0.0	2.4	0.0	0.0	3.3	0.0	8.2	1.6	5.7	5.7
Prop In Lane	0.44		1.00	0.77		1.00	1.00		0.14	1.00		0.10
Lane Grp Cap(c), veh/h	427	0	453	425	0	391	189	0	772	119	688	706
V/C Ratio(X)	0.20	0.00	0.00	0.26	0.00	0.00	0.75	0.00	0.60	0.59	0.47	0.47
Avail Cap(c_a), veh/h	1202	0	1218	1112	0	1155	705	0	1673	449	1385	1422
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	14.6	0.0	0.0	14.9	0.0	0.0	18.0	0.0	9.2	18.8	9.5	9.5
Incr Delay (d2), s/veh	0.2	0.0	0.0	0.3	0.0	0.0	6.0	0.0	0.8	4.7	0.5	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.0	0.0	1.1	0.0	0.0	1.9	0.0	4.2	0.9	2.8	2.9
LnGrp Delay(d),s/veh	14.9	0.0	0.0	15.2	0.0	0.0	24.0	0.0	9.9	23.5	10.0	10.0
LnGrp LOS	B			B			C		A	C	A	A
Approach Vol, veh/h		85			110			608			725	
Approach Delay, s/veh		14.9			15.2			13.2			11.3	
Approach LOS		B			B			B			B	
Timer	1	2	3	4	5	6	7	8				
Assigned Phs		2	3	4		6	7	8				
Phs Duration (G+Y+Rc), s		12.0	8.9	20.6		12.0	7.3	22.3				
Change Period (Y+Rc), s		4.5	4.5	4.5		4.5	4.5	4.5				
Max Green Setting (Gmax), s		27.5	16.5	32.5		27.5	10.5	38.5				
Max Q Clear Time (g_c+I1), s		3.6	5.3	7.7		4.4	3.6	10.2				
Green Ext Time (p_c), s		1.0	0.2	6.5		1.0	0.1	6.7				
Intersection Summary												
HCM 2010 Ctrl Delay			12.6									
HCM 2010 LOS			B									

Intersection #5
Lake Jennings Park Road / El Monte Road / Julian Avenue



General Notes:

1. Lake Jennings Park Road includes 2-lanes on the SB approach, whereas 1-lane on the NB approach. Therefore, the warrant lines were interpolated.

RESULT: SIGNAL WARRANTED