
Appendix M

Traffic Impact Analysis



Lake and Mountain Shopping Center

TRAFFIC IMPACT ANALYSIS

CITY OF LAKE ELSINORE

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12768-03 TIA Report

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
CA MUTCD	California Manual on Uniform Traffic Control Devices
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CMP	Congestion Management Program
E+P	Existing Plus Project
EAP	Existing Plus Ambient Growth Plus Project
EAPC	Existing Plus Ambient Growth Plus Project Plus Cumulative
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
PHF	Peak Hour Factor
Project	Lake and Mountain Shopping Center
RCTC	Riverside County Transportation Commission
RTA	Riverside Transport Authority
TIA	Traffic Impact Analysis
TIF	Transportation Impact Fee
TUMF	Transportation Uniform Mitigation Fee
v/c	Volume to Capacity
WRCOG	Western Riverside Council of Governments

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1 INTRODUCTION

This report presents the results of the traffic impact analysis (TIA) for the proposed Lake and Mountain Shopping Center ("Project"), which is located on the northwest corner of Lake Street and Mountain Street in the City of Lake Elsinore, as shown on Exhibit 1-1.

The purpose of this TIA is to evaluate the potential circulation system deficiencies that may result from the development of the proposed Project, and to recommend improvements to achieve acceptable circulation system operational conditions. As directed by City of Lake Elsinore staff, this traffic study has been prepared in accordance with the County of Riverside Traffic Impact Analysis Preparation Guide, the California Department of Transportation (Caltrans) Guide for the Preparation of Traffic Impact Studies, and consultation with City staff during the scoping process. (1) (2) The approved Project Traffic Study Scoping agreement is provided in Appendix 1.1 of this TIA.

1.1 SUMMARY OF FINDINGS

The Project is proposing to construct the following improvements as design features in conjunction with development of the site. The Project is not anticipated to contribute to any off-site traffic impacts, as such, no off-site intersection improvements have been recommended.

Recommendation 1.1 – Driveway 1/Ginger Root Way & Mountain Street (#1) – The following improvement is necessary to accommodate site access:

- Project to install a stop control on the southbound approach and construct a southbound shared left-through-right turn lane.

Recommendation 2.1 – Driveway 2 & Mountain Street (#2) – The following improvement is necessary to accommodate site access:

- Project to install a stop control on the southbound approach and construct a southbound right turn lane. Project will construct a pork chop island to restrict access to right-in/right-out only.

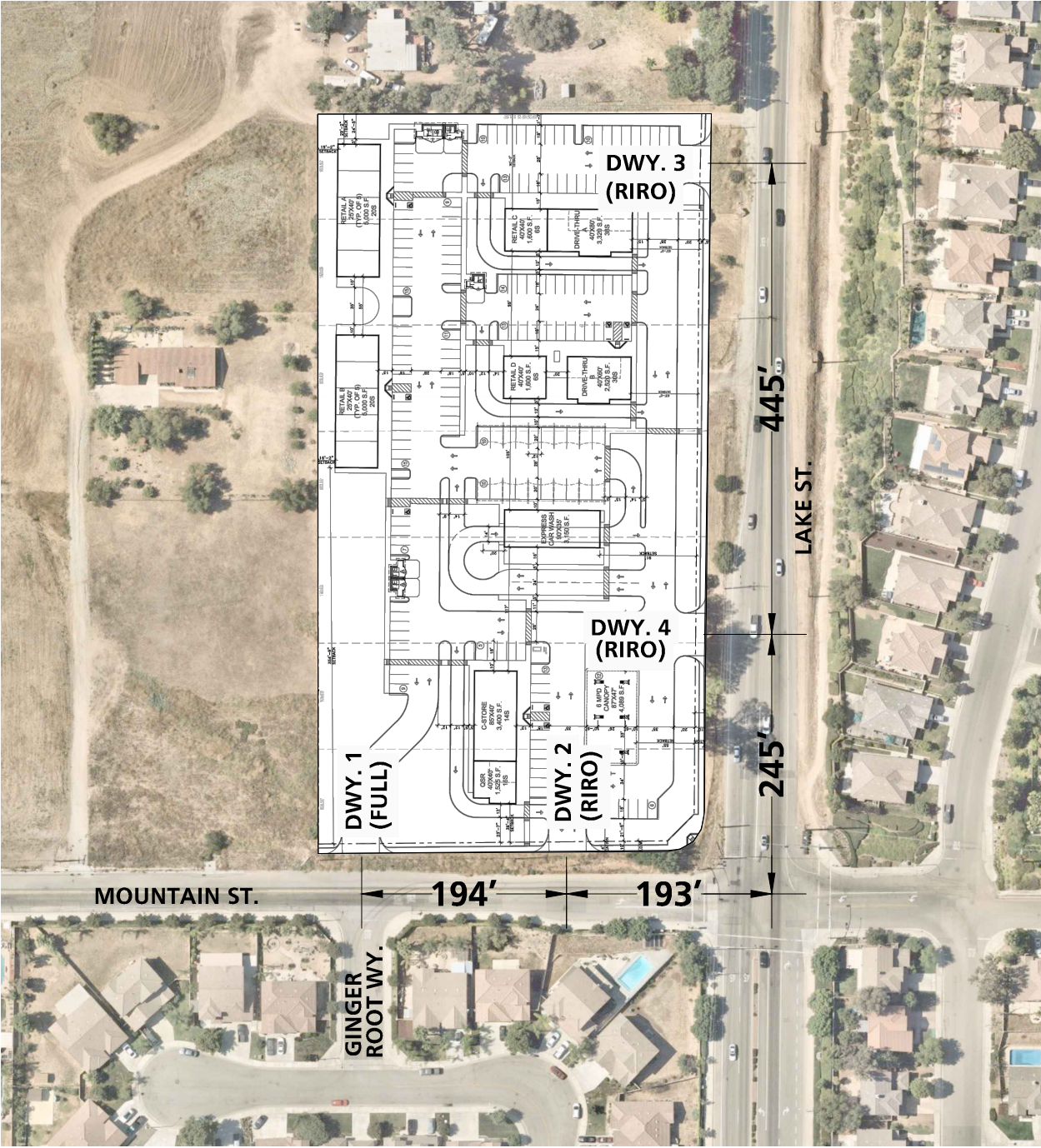
Recommendation 3.1 – Lake Street & Driveway 3 (#5) – The following improvement is necessary to accommodate site access:

- Project to install a stop control on the eastbound approach and construct an eastbound right turn lane. Project will construct a raised median on Lake Street to restrict access at this driveway to right-in/right-out only.

Recommendation 4.1 – Lake Street & Driveway 4 (#6) – The following improvement is necessary to accommodate site access:

- Project to install a stop control on the eastbound approach and construct an eastbound right turn lane. Project will construct a raised median on Lake Street to restrict access at this driveway to right-in/right-out only.

EXHIBIT 1-1: PRELIMINARY SITE PLAN



LEGEND:

RIRO = RIGHT-IN/RIGHT-OUT ONLY ACCESS



Recommendation 5.1 – Lake Street & Mountain Street (#7) – The following improvement is necessary to accommodate peak hour queues:

- Maintain the existing traffic control and lane geometrics, however, the Project should modify the existing median on Lake Street to accommodate a 285-foot northbound left turn lane.

Recommendation 6.1 – Mountain Street – Mountain Street is an east-west oriented roadway located at the southern Project boundary. Construct Mountain Street to its ultimate half-section along the Project's frontage on the north side as a Local Street (60-foot right-of-way) in compliance with applicable City of Lake Elsinore standards. The Project will construct a pork chop island to restrict access to right-in/right-out access only for Driveway 2.

Recommendation 7.1 – Lake Street – Lake Street is a north-south oriented roadway located at the eastern Project boundary. Construct Lake Street to its ultimate half-section along the Project's frontage on the west side as an Urban Arterial Highway (120-foot right-of-way) in compliance with applicable City of Lake Elsinore standards. The Project will construct the raised median on Lake Street to restrict access to right-in/right-out access only at the two driveways on Lake Street.

Additional details are provided in Section 1.6 *Recommendations* of this report.

1.2 PROJECT OVERVIEW

Exhibit 1-1 illustrates the preliminary site plan. As indicated on Exhibit 1-1, the Project is proposed to consist of 13,200 square feet of shopping center use, a gasoline service station with a 3,400 square foot convenience market, 7,365 square feet of fast-food restaurant with drive-through window use, and an automated car wash tunnel. It is anticipated that the Project would be developed in a single phase with an anticipated Opening Year of 2021. For the purpose of this analysis, the following driveways will provide access to the Project site:

- Driveway 1 via Mountain Street – Full Access
- Driveway 2 via Mountain Street – Right-in/Right-out access only
- Driveway 3 via Lake Street – Right-in/Right-out access only
- Driveway 4 via Lake Street – Right-in/Right-out access only

Regional access to the Project site is available from the I-15 Freeway and Lake Street and Nichols Road interchanges.

Trips generated by the Project's proposed land uses have been estimated based on the Institute of Transportation Engineers (ITE) Trip Generation Manual (10th Edition, 2017) for Shopping Center (ITE Land Use Code 820), Fast-Food Restaurant with Drive-Through Window (ITE Land Use Code 934), Super Convenience Market/Gas Station (ITE Land Use Code 960), and Automated Car Wash (ITE Land Use Code 948). (3) The proposed Project is anticipated to generate a net total of 3,696 trip-ends per day with 380 AM peak hour trips and 319 PM peak hour trips. The assumptions and methods used to estimate the Project's trip generation characteristics are discussed in greater detail in Section 4.1 *Project Trip Generation* of this report.

1.3 ANALYSIS SCENARIOS

For the purposes of this traffic study, potential impacts to traffic and circulation have been assessed for each of the following conditions:

- Existing (2019) Conditions
- Existing Plus Project (E+P) Conditions
- Existing Plus Ambient Growth Plus Project (EAP) (2021)
- Existing Plus Ambient Growth Plus Project Plus Cumulative Projects (EAPC) (2021)

1.3.1 EXISTING (2019) CONDITIONS

Information for Existing (2019) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared.

1.3.2 EXISTING PLUS PROJECT CONDITIONS

The Existing Plus Project (E+P) analysis determines circulation system deficiencies that would occur on the existing roadway system in the scenario of the Project being placed upon Existing conditions. The E+P analysis is intended to identify the project-specific traffic impacts associated solely with the development of the proposed Project based on a comparison of the E+P traffic conditions to Existing (2019) conditions.

1.3.3 EXISTING PLUS AMBIENT GROWTH PLUS PROJECT (2021) CONDITIONS

The EAP (2021) conditions analyses determines the traffic impacts based on a comparison of the EAP (2021) traffic conditions to Existing (2019) traffic conditions. To account for background traffic growth, an ambient growth factor from Existing (2019) conditions of 4.04% (2% per year compounded annually for two years) is included for EAP (2021) traffic conditions. The EAP analysis is intended to identify “Opening Year” deficiencies associated with the development of the proposed Project based on the expected background growth within the study area.

1.3.4 EXISTING PLUS AMBIENT GROWTH PLUS PROJECT PLUS CUMULATIVE (2021) CONDITIONS

The EAPC (2021) traffic conditions analysis determines the potential near-term cumulative circulation system deficiencies. To account for background traffic growth, traffic associated with other known cumulative development projects in conjunction with an ambient growth factor of 4.04% (2% per year compounded annually for two years) from Existing conditions are included for EAPC (2021) traffic conditions.

1.4 STUDY AREA

To ensure that this TIA satisfies the City of Lake Elsinore's traffic study requirements, Urban Crossroads, Inc. prepared a traffic study scoping package for review by City staff prior to the preparation of this report. The Agreement provides an outline of the Project study area, trip generation, trip distribution, and analysis methodology and is included in Appendix 1.1.

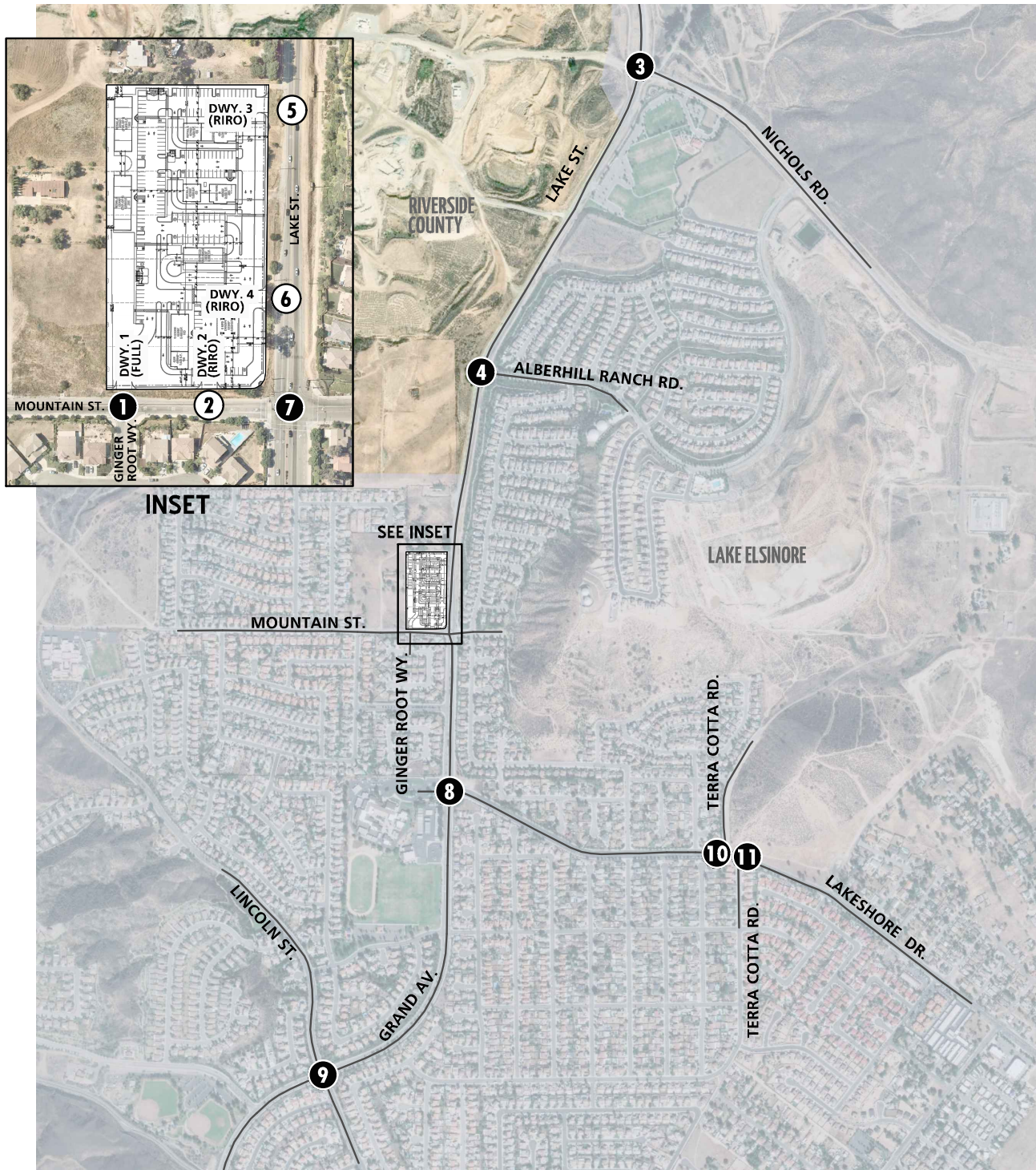
The following 11 study area intersections shown on Exhibit 1-2 and listed in Table 1-1 were selected for this TIA based on consultation with City of Lake Elsinore staff and have generally been selected based on the "50 peak hour trip" criterion. The "50 peak hour trip" criterion is consistent with the methodology employed by the City of Lake Elsinore and County of Riverside, and generally represents a minimum number of trips at which a typical intersection would have the potential to be substantively impacted by a given development proposal. Although each intersection may have unique operating characteristics, this traffic engineering rule of thumb is a widely utilized tool for estimating a potential area of impact (i.e., study area).

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction	CMP?
1	Driveway 1/Ginger Root Wy. & Mountain St.	Lake Elsinore	No
2	Driveway 2 & Mountain St. – Future Intersection	Lake Elsinore	No
3	Lake St. & Nichols Rd.	Lake Elsinore	No
4	Lake St. & Alberhill Ranch Rd.	Lake Elsinore	No
5	Lake St. & Driveway 3 – Future Intersection	Lake Elsinore	No
6	Lake St. & Driveway 4 – Future Intersection	Lake Elsinore	No
7	Lake St. & Mountain St.	Lake Elsinore	No
8	Lake St./Grand Av. & Lakeshore Dr.	Lake Elsinore	No
9	Lincoln St. & Grand Av.	Lake Elsinore	No
10	Terra Cotta Rd. (N) & Lakeshore Dr.	Lake Elsinore	No
11	Terra Cotta Rd. (S) & Lakeshore Dr.	Lake Elsinore	No

The intent of a Congestion Management Program (CMP) is to more directly link land use, transportation, and air quality, thereby prompting reasonable growth management programs that will effectively utilize new transportation funds, alleviate traffic congestion and related impacts, and improve air quality. The County of Riverside CMP became effective with the passage of Proposition 111 in 1990 and updated most recently updated in 2011. The Riverside County Transportation Commission (RCTC) adopted the 2011 CMP for the County of Riverside in December 2011. (4) None of the study area intersections are identified as CMP facilities in the Riverside County CMP.

EXHIBIT 1-2: LOCATION MAP



LEGEND:

- ① = EXISTING INTERSECTION ANALYSIS LOCATION
- ② = FUTURE INTERSECTION ANALYSIS LOCATION



1.5 ANALYSIS FINDINGS

This section provides a summary of analysis results for E+P, EAP (2021), and EAPC (2021) traffic conditions. A summary of level of service (LOS) results for all analysis scenarios is presented on Exhibit 1-3.

1.5.1 EXISTING (2019) CONDITIONS

All study area intersections are currently operating at an acceptable LOS during the peak hours under Existing (2019) traffic conditions.

1.5.2 E+P CONDITIONS

All study area intersections are anticipated to continue to operate at an acceptable LOS during the peak hours with the addition of Project traffic for E+P traffic conditions.

1.5.3 EAP (2021) CONDITIONS

All study area intersections are anticipated to continue to operate at an acceptable LOS during the peak hours under EAP (2021) traffic conditions.

1.5.4 EAPC (2021) CONDITIONS

All study area intersections are anticipated to continue to operate at an acceptable LOS during the peak hours under EAPC (2021) traffic conditions.

1.6 RECOMMENDATIONS

The following recommendations are based on the improvements needed to accommodate site access and peak hour queues. Exhibit 1-4 shows the site adjacent recommendations.

Recommendation 1.1 – Driveway 1/Ginger Root Way & Mountain Street (#1) – The following improvement is necessary to accommodate site access:

- Project to install a stop control on the southbound approach and construct a southbound shared left-through-right turn lane.

Recommendation 2.1 – Driveway 2 & Mountain Street (#2) – The following improvement is necessary to accommodate site access:

- Project to install a stop control on the southbound approach and construct a southbound right turn lane. Project will construct a pork chop island to restrict access to right-in/right-out only.

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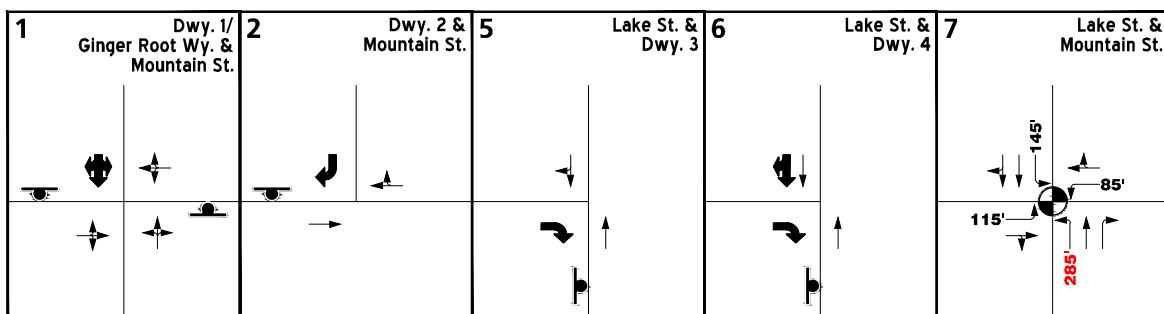
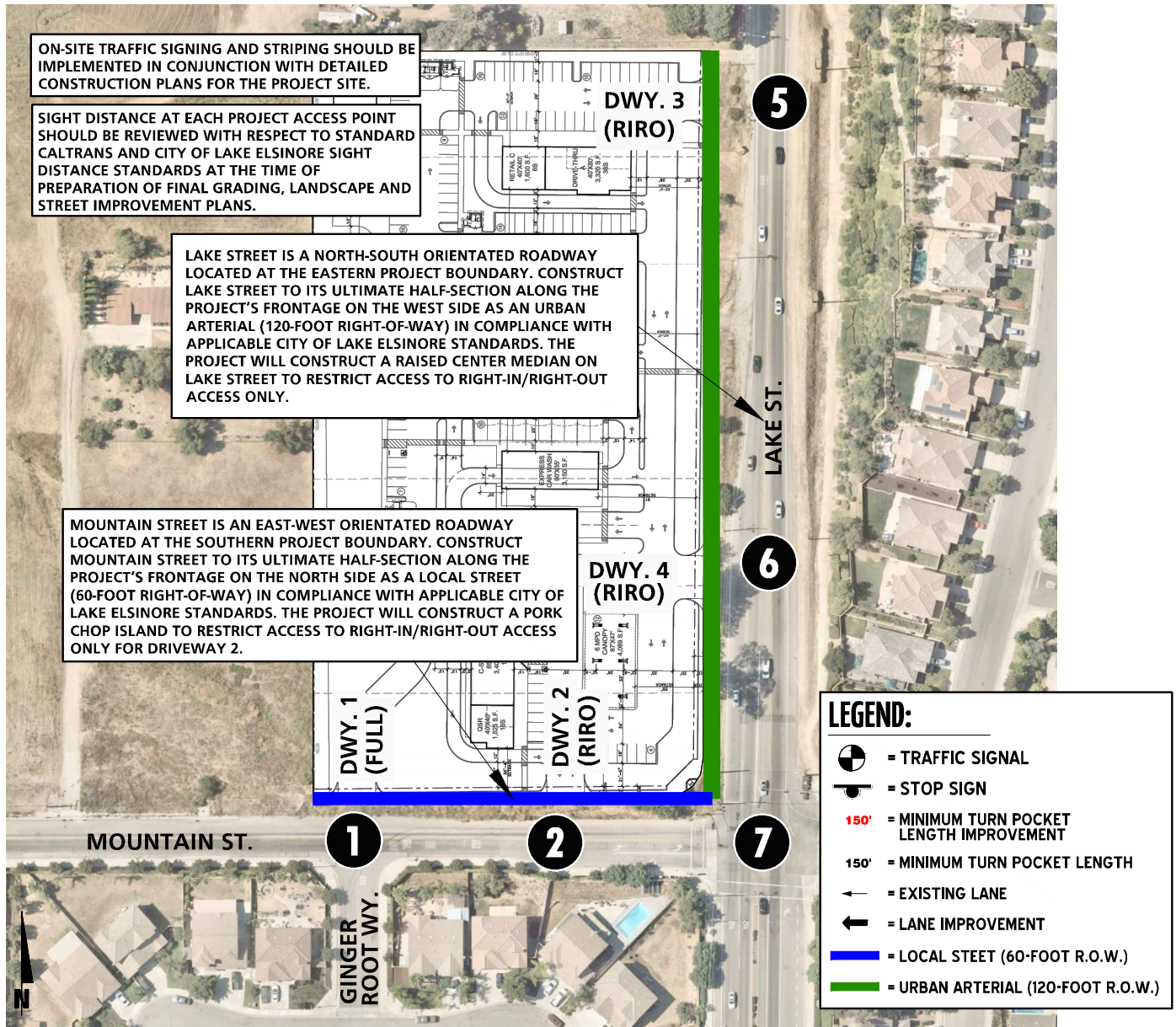
EXHIBIT 1-3: SUMMARY OF DEFICIENT INTERSECTIONS BY ANALYSIS SCENARIO

#	Intersection	Existing (2019)	E+P	EAP (2021)	EAPC (2021)
1	Dwy. 1 / Ginger Root Wy. & Mountain St.	●	●	●	●
2	Dwy. 2 & Mountain St.	NA	●	●	●
3	Lake St. & Nichols Rd.	●	●	●	●
4	Lake St. & Alberhill Ranch Rd.	●	●	●	●
5	Lake St. & Dwy. 3	NA	●	●	●
6	Lake St. & Dwy. 4	NA	●	●	●
7	Lake St. & Mountain St.	●	●	●	●
8	Lake St. / Grand Av. & Lakeshore Dr.	●	●	●	●
9	Lincoln St. & Grand Av.	●	●	●	●
10	Terra Cotta Rd. (N) & Lakeshore Dr.	●	●	●	●
11	Terra Cotta Rd. (S) & Lakeshore Dr.	●	●	●	●

LEGEND:

- 
 ■ AM PEAK HOUR
- 
 ■ PM PEAK HOUR
- 
 ■ LOS A-D
- 
 ■ LOS E
- 
 ■ LOS F
- NA ■ NOT AN ANALYSIS LOCATION FOR THIS SCENARIO

EXHIBIT 1-4: SITE ADJACENT ROADWAY AND SITE ACCESS RECOMMENDATIONS



Recommendation 4.1 – Lake Street & Driveway 4 (#6) – The following improvement is necessary to accommodate site access:

- Project to install a stop control on the eastbound approach and construct an eastbound right turn lane. Project will construct a raised median on Lake Street to restrict access at this driveway to right-in/right-out only.

Recommendation 5.1 – Lake Street & Mountain Street (#7) – The following improvement is necessary to accommodate peak hour queues:

- Maintain the existing traffic control and lane geometrics, however, the Project should modify the existing median on Lake Street to accommodate a 285-foot northbound left turn lane.
- Appendix 1.2 contains the site adjacent queuing analysis worksheets for all analysis scenarios. The resulting 95th percentile queue results for each analysis scenario are summarized on Table 1-2 below for the northbound left turn lane at Lake Street and Mountain Street.

TABLE 1-2: QUEUING ANALYSIS SUMMARY

Scenario:	Existing	E+P	EAP	EAPC
Northbound Left Queue (Feet)				
AM Peak Hour:	82	255	261	262
PM Peak Hour:	80	272	280	282

Recommendation 6.1 – Mountain Street – Mountain Street is an east-west oriented roadway located at the southern Project boundary. Construct Mountain Street to its ultimate half-section along the Project's frontage on the north side as a Local Street (60-foot right-of-way) in compliance with applicable City of Lake Elsinore standards. The Project will construct a pork chop island to restrict access to right-in/right-out access only for Driveway 2.

Recommendation 7.1 – Lake Street – Lake Street is a north-south oriented roadway located at the eastern Project boundary. Construct Lake Street to its ultimate half-section along the Project's frontage on the west side as an Urban Arterial Highway (120-foot right-of-way) in compliance with applicable City of Lake Elsinore standards. The Project will construct the raised median on Lake Street to restrict access to right-in/right-out access only at the two driveways on Lake Street.

Wherever necessary, roadways adjacent to the Project, site access points and site-adjacent intersections will be constructed to be consistent with the identified roadway classifications and respective cross-sections in the City of Lake Elsinore General Plan Circulation Element.

On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the Project site.

2 METHODOLOGIES

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are generally consistent with City of Lake Elsinore traffic study guidelines.

2.1 LEVEL OF SERVICE

Traffic operations of roadway facilities are described using the term "Level of Service" (LOS). LOS is a qualitative description of traffic flow based on several factors such as speed, travel time, delay, and freedom to maneuver. Six levels are typically defined ranging from LOS A, representing completely free-flow conditions, to LOS F, representing breakdown in flow resulting in stop-and-go conditions. LOS E represents operations at or near capacity, an unstable level where vehicles are operating with the minimum spacing for maintaining uniform flow.

2.2 INTERSECTION CAPACITY ANALYSIS

The definitions of LOS for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control. The LOS is typically dependent on the quality of traffic flow at the intersections along a roadway. The Highway Capacity Manual (HCM), 6th Edition, methodology expresses the LOS at an intersection in terms of delay time for the various intersection approaches. (5) The HCM uses different procedures depending on the type of intersection control.

2.2.1 SIGNALIZED INTERSECTIONS

City of Lake Elsinore

The City of Lake Elsinore requires signalized intersection operations analysis based on the methodology described in the HCM. (5) Intersection LOS operations are based on an intersection's average control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections LOS is directly related to the average control delay per vehicle and is correlated to a LOS designation as described in Table 2-1. Study area intersections have been evaluated using the Synchro (Version 10) analysis software package.

Synchro is a macroscopic traffic software program that is based on the signalized intersection capacity analysis as specified in the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length. The level of service and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

TABLE 2-1: SIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay (Seconds), V/C ≤ 1.0	Level of Service, V/C ≤ 1.0	Level of Service, V/C > 1.0
Operations with very low delay occurring with favorable progression and/or short cycle length.	0 to 10.00	A	F
Operations with low delay occurring with good progression and/or short cycle lengths.	10.01 to 20.00	B	F
Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.01 to 35.00	C	F
Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.01 to 55.00	D	F
Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.01 to 80.00	E	F
Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	80.01 and up	F	F

Source: HCM (6th Edition)

The peak hour traffic volumes have been adjusted using a peak hour factor (PHF) to reflect peak 15-minute volumes. Common practice for LOS analysis is to use a peak 15-minute rate of flow. However, flow rates are typically expressed in vehicles per hour. The PHF is the relationship between the peak 15-minute flow rate and the full hourly volume (e.g. $PHF = [Hourly Volume] / [4 \times Peak\ 15\text{-minute Flow Rate}]$). The use of a 15-minute PHF produces a more detailed analysis as compared to analyzing vehicles per hour. Existing PHFs have been used for all near-term analysis scenarios. Per the HCM, PHF values over 0.95 often are indicative of high traffic volumes with capacity constraints on peak hour flows while lower PHF values are indicative of greater variability of flow during the peak hour. (5)

2.2.2 UNSIGNALIZED INTERSECTIONS

The City of Lake Elsinore requires the operations of unsignalized intersections be evaluated using the methodology described in the HCM. (5) The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-2).

TABLE 2-2: UNSIGNALIZED INTERSECTION LOS THRESHOLDS

Description	Average Control Delay Per Vehicle (Seconds)	Level of Service, V/C ≤ 1.0	Level of Service, V/C > 1.0
Little or no delays.	0 to 10.00	A	F
Short traffic delays.	10.01 to 15.00	B	F
Average traffic delays.	15.01 to 25.00	C	F
Long traffic delays.	25.01 to 35.00	D	F
Very long traffic delays.	35.01 to 50.00	E	F
Extreme traffic delays with intersection capacity exceeded.	> 50.00	F	F

Source: HCM (6th Edition)

At two-way or side-street stop-controlled intersections, LOS is calculated for each controlled movement and for the left turn movement from the major street, as well as for the intersection as a whole. For approaches composed of a single lane, the delay is computed as the average of all movements in that lane. For all-way stop controlled intersections, LOS is computed for the intersection as a whole.

2.3 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

The term "signal warrants" refers to the list of established criteria used by Caltrans and other public agencies to quantitatively justify or ascertain the potential need for installation of a traffic signal at an otherwise unsignalized intersection. This TIA update uses the signal warrant criteria presented in the latest edition of the Caltrans' California Manual on Uniform Traffic Control Devices (CA MUTCD), for all study area intersections. (6)

The signal warrant criteria for Existing study area intersections are based upon several factors, including volume of vehicular and pedestrian traffic, frequency of accidents, and location of school areas. The CA MUTCD indicates that the installation of a traffic signal should be considered if one or more of the signal warrants are met. (6) Specifically, this TIA utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis for existing traffic conditions. Warrant 3 is appropriate to use for this TIA update because it provides specialized warrant criteria for intersections with rural characteristics (e.g. located in communities with populations of less than 10,000 persons or with adjacent major streets operating above 40 miles per hour). For the purposes of this study, the speed limit was the basis for determining whether Urban or Rural warrants were used for a given intersection.

As shown in Table 2-3, traffic signal warrant analyses were performed for the following unsignalized study area intersection during the peak weekday conditions wherein the Project is anticipated to contribute the highest trips:

TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction
1	Driveway 1/Ginger Root Wy. & Mountain St.	Lake Elsinore
10	Terra Cotta Rd. (N) & Lakeshore Dr.	Lake Elsinore

Traffic signal warrant analyses were not performed for Driveway 2, Driveway 3, or Driveway 4 as these locations are proposed to be restricted to right-in/right-out access only and would not be suitable for signalization.

The Existing conditions traffic signal warrant analysis is presented in the subsequent section, Section 3 *Area Conditions* of this report. The traffic signal warrant analyses for future conditions are presented in Section 5 *E+P Traffic Conditions*, Section 6 *EAP (2021) Traffic Conditions*, and Section 7 *EAPC (2021) Traffic Conditions* of this report.

It is important to note that a signal warrant defines the minimum condition under which the installation of a traffic signal might be warranted. Meeting this threshold condition does not require that a traffic control signal be installed at a particular location, but rather, that other traffic factors and conditions be evaluated in order to determine whether the signal is truly justified. It should also be noted that signal warrants do not necessarily correlate with LOS. An intersection may satisfy a signal warrant condition and operate at or above acceptable LOS or operate below acceptable LOS and not meet a signal warrant.

2.4 MINIMUM ACCEPTABLE LEVELS OF SERVICE (LOS) AND INTERSECTION DEFICIENCY CRITERIA

The City, pursuant to its 2011 General Plan, requires that peak hour intersection operations be at LOS D or better to be considered acceptable. Therefore, City intersections operating at LOS E or F would be considered deficient.

2.5 THRESHOLDS OF SIGNIFICANCE

The following types of traffic deficiencies are considered to be significant under the California Environmental Quality Act (CEQA):

- When existing traffic conditions exceed the General Plan target LOS (e.g., LOS D or better).
- When project traffic, when added to existing traffic, will deteriorate the LOS to below the target LOS, and impacts cannot be mitigated through project conditions of approval.
- When cumulative traffic exceeds the target LOS, and impacts cannot be mitigated through the Transportation Uniform Mitigation Fee (TUMF) network (or other funding mechanism), project conditions of approval, or other implementation mechanism.

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3 AREA CONDITIONS

This section provides a summary of the existing circulation network, the City of Lake Elsinore General Plan Circulation Network, and a review of existing peak hour intersection operations and traffic signal warrant analyses.

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the agreement with City of Lake Elsinore staff (Appendix 1.1), the study area includes a total of 11 existing intersections as shown previously on Exhibit 1-2. Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

3.2 CITY OF LAKE ELSINORE GENERAL PLAN CIRCULATION ELEMENT

As noted previously, the Project site is located within the City of Lake Elsinore. The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways within the study area, as identified in the City of Lake Elsinore General Plan Circulation Element, are described subsequently. Exhibit 3-2 shows the City of Lake Elsinore General Plan Circulation Element, and Exhibit 3-3 illustrates the City of Lake Elsinore General Plan roadway cross-sections.

Study area roadways that are classified as an Urban Arterial are identified as having six lanes of travel. The following study area roadways within the City of Lake Elsinore are classified as an Urban Arterial:

- Lake Street
- Nichols Road
- Lakeshore Drive

Study area roadways that are classified as a Major are identified as having four lanes of travel. The following study area roadways within the City of Lake Elsinore are classified as a Major:

- Grand Avenue
- Lincoln Street (south of Grand Avenue)

Study area roadways that are classified as a Secondary are identified as having two lanes of travel. The following study area roadway within the City of Lake Elsinore is classified as a Secondary:

- Lincoln Street (north of Grand Avenue)

EXHIBIT 3-1: EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS

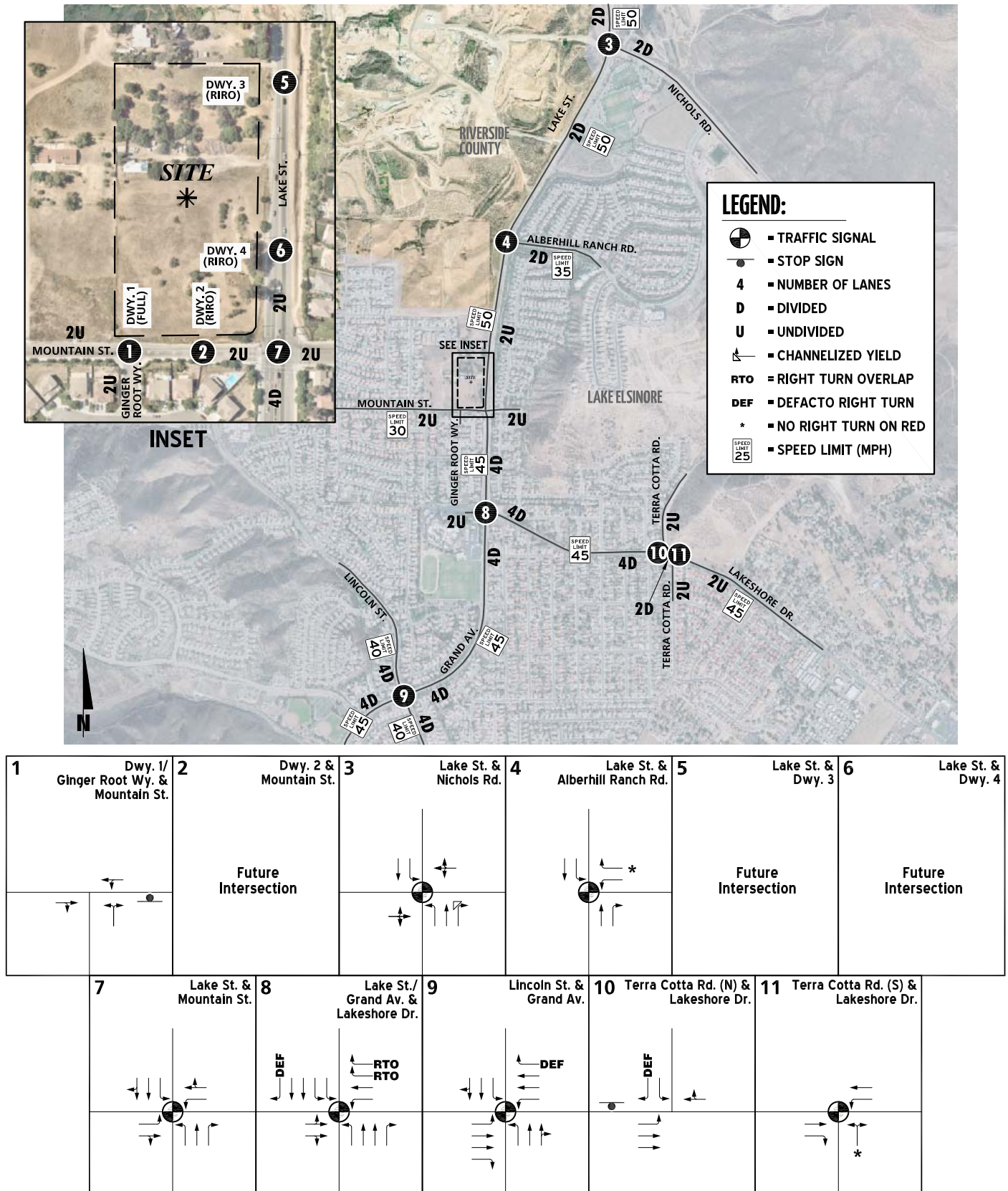
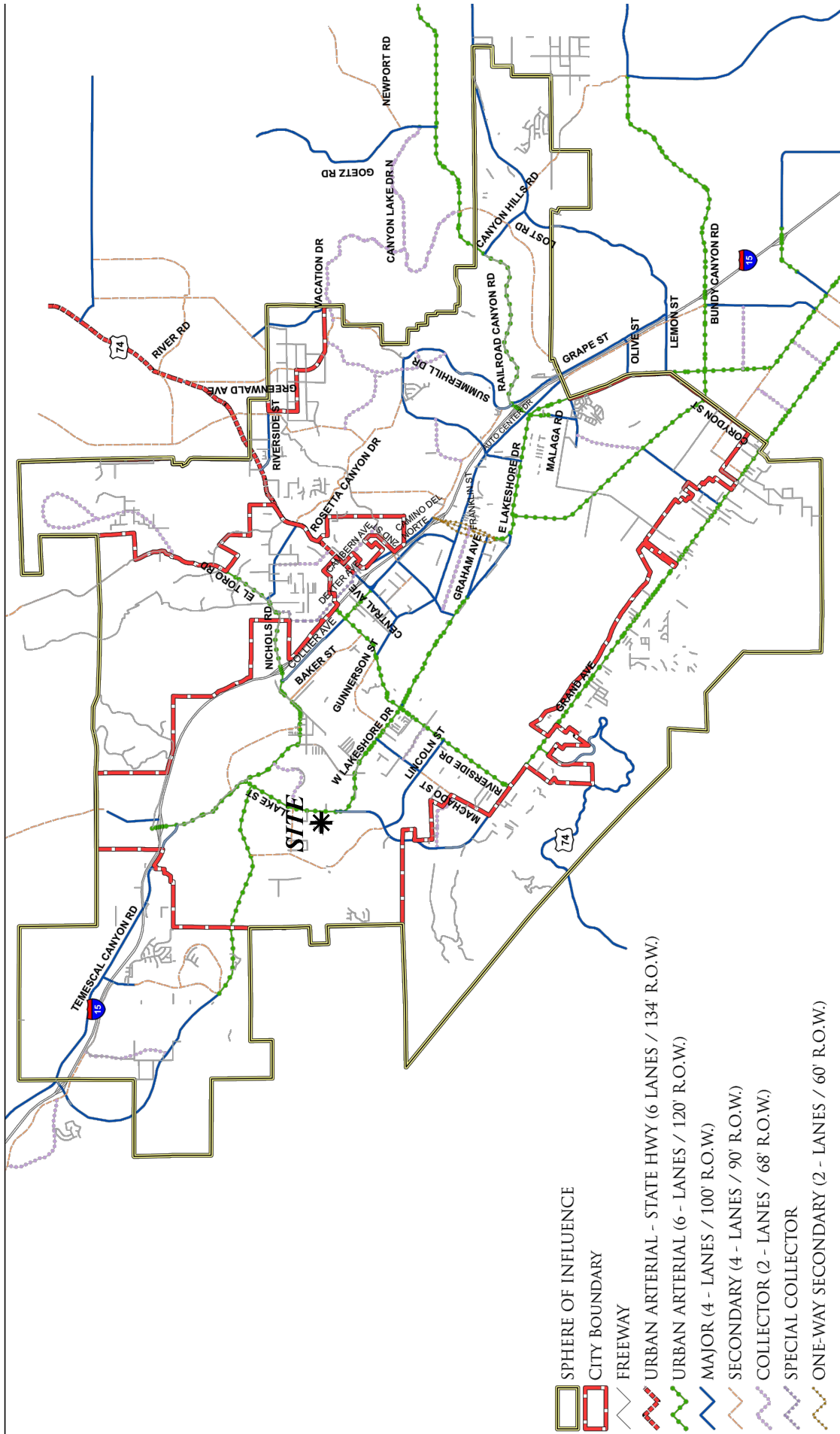


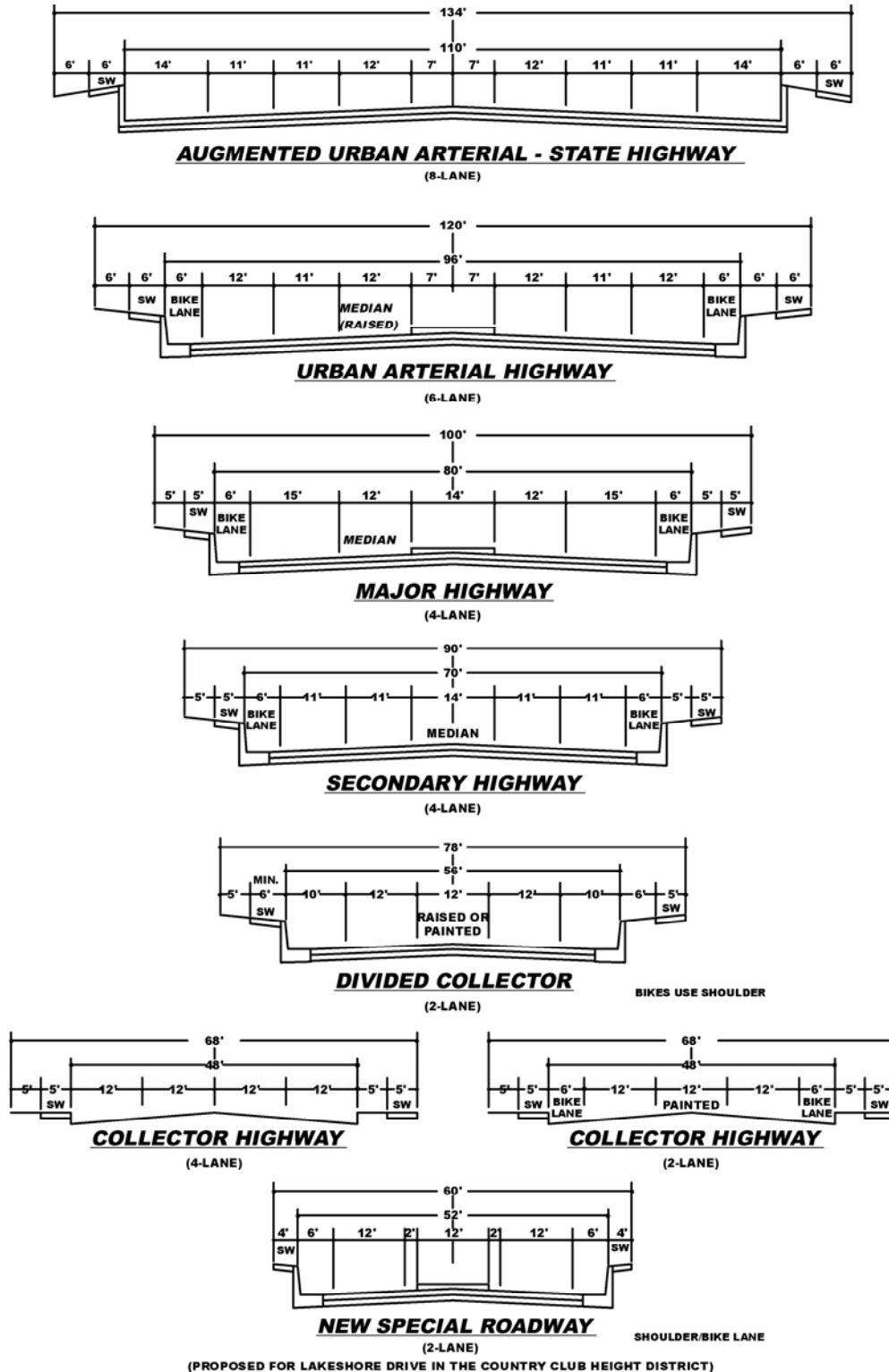
EXHIBIT 3-2: CITY OF LAKE ELSINORE GENERAL PLAN CIRCULATION ELEMENT



SOURCE: CITY OF LAKE ELSINORE GENERAL PLAN (ADOPTED 12-13-2011)



EXHIBIT 3-3: CITY OF LAKE ELSINORE GENERAL PLAN ROADWAY CROSS-SECTIONS



* BIKE LANES ARE NOT MANDATORY UNLESS SHOWN ON THE BIKEWAY CIRCULATION ELEMENT PLAN
PRECISE SIDEWALK LOCATION SUBJECT TO CITY ENGINEER APPROVAL
NOTE: CHECK THE DISTRICT PLAN OF YOUR AREA FOR ANY REQUIRED SPECIAL ROADWAY CROSS-SECTION,
ESPECIALLY THE LAKE EDGE AND COUNTRY CLUB HEIGHTS DISTRICT PLANS.
STRIPPING OF COLLECTOR HIGHWAY AS DIRECTED BY CITY ENGINEER.

SOURCE: CITY OF LAKE ELSINORE GENERAL PLAN (ADOPTED 12-13-2011)

3.3 BICYCLE AND PEDESTRIAN FACILITIES

The City of Lake Elsinore Area Trails System is shown on Exhibit 3-4 while the City of Lake Elsinore Bikeway Plan is shown on Exhibit 3-5. There is currently a historic trail along Lake Street within the study area. Nichols Road, Lake Street, Lakeshore Drive, and Lincoln Avenue (south of Grand Avenue) are designated as Class II bike facilities per the City of Lake Elsinore General Plan.

There is also a planned Class II bike path along Lakeshore Drive within the study area. Existing pedestrian facilities within the study area are shown on Exhibit 3-6. Field observations conducted in September 2019 indicate nominal pedestrian and bicycle activity within the study area.

3.4 TRANSIT SERVICE

The Riverside Transit Authority (RTA) currently serves the City of Lake Elsinore. Transit service is reviewed and updated by RTA periodically to address ridership, budget, and community demand needs. RTA Route 8 runs along Lakeshore Drive and Riverside Drive and RTA Route 9 and Route 205/206 run along Collier Avenue and the I-15 Freeway. However, there are currently no transit routes within the vicinity of the Project site. Existing transit routes in the vicinity of the study area are illustrated on Exhibit 3-7. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate. As such, it is recommended that the applicant work in conjunction with RTA to potentially provide additional bus service to the site.

3.5 EXISTING (2019) TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected on Thursday, September 19, 2019. The following peak hours were selected for analysis:

- Weekday AM Peak Hour (peak hour between 7:00 AM and 9:00 AM)
- Weekday PM Peak Hour (peak hour between 4:00 PM and 6:00 PM)

The weekday AM and weekday PM peak hour count data are representative of typical weekday peak hour traffic conditions in the study area. There were no observations made in the field that would indicate atypical traffic conditions on the count dates, such as construction activity or detour routes and near-by schools were in session and operating on normal schedules. The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1.

Existing weekday Average Daily Traffic (ADT) volumes are shown on Exhibit 3-8. Where actual 24-hour tube count data was not available, Existing ADT volumes were based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

$$\text{Weekday PM Peak Hour (Approach Volume + Exit Volume)} \times 14.02 = \text{Leg Volume}$$

EXHIBIT 3-4: CITY OF LAKE ELSINORE AREA TRAILS SYSTEM

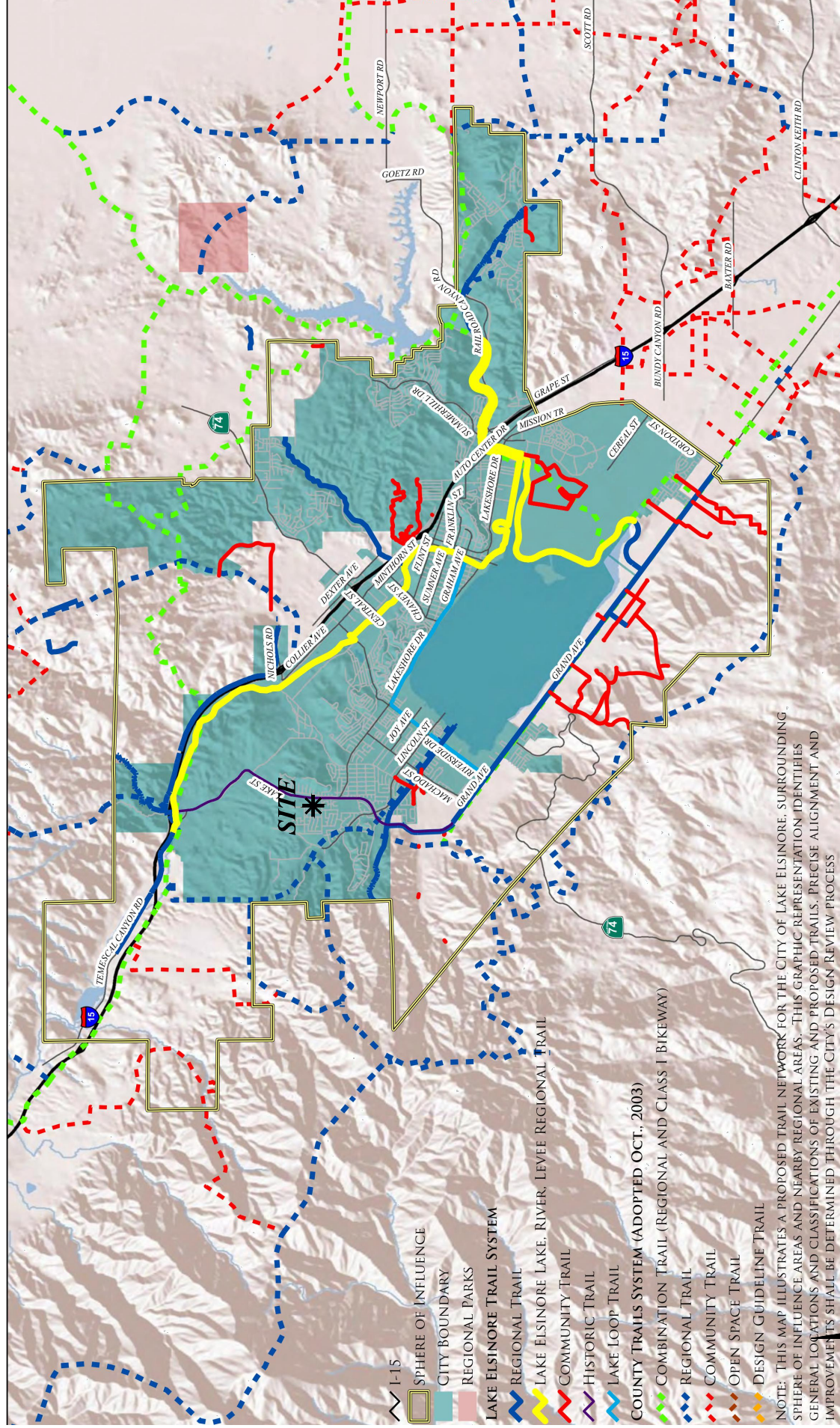
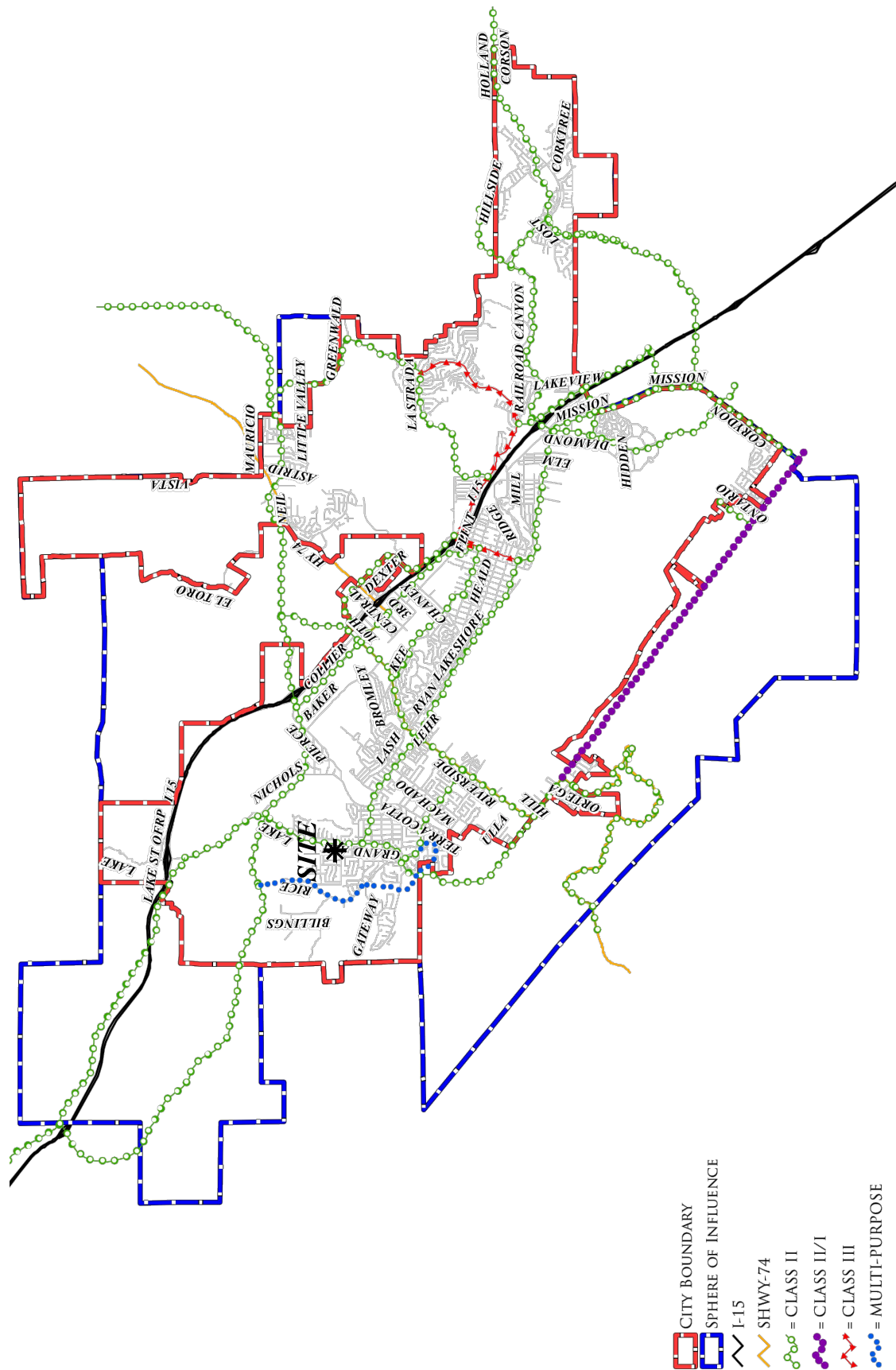


EXHIBIT 3-5: CITY OF LAKE ELSINORE BIKEWAY PLAN



SOURCE: CITY OF LAKE ELSINORE GENERAL PLAN (ADOPTED 12-13-2011)



EXHIBIT 3-6: EXISTING PEDESTRIAN and BICYCLE FACILITIES

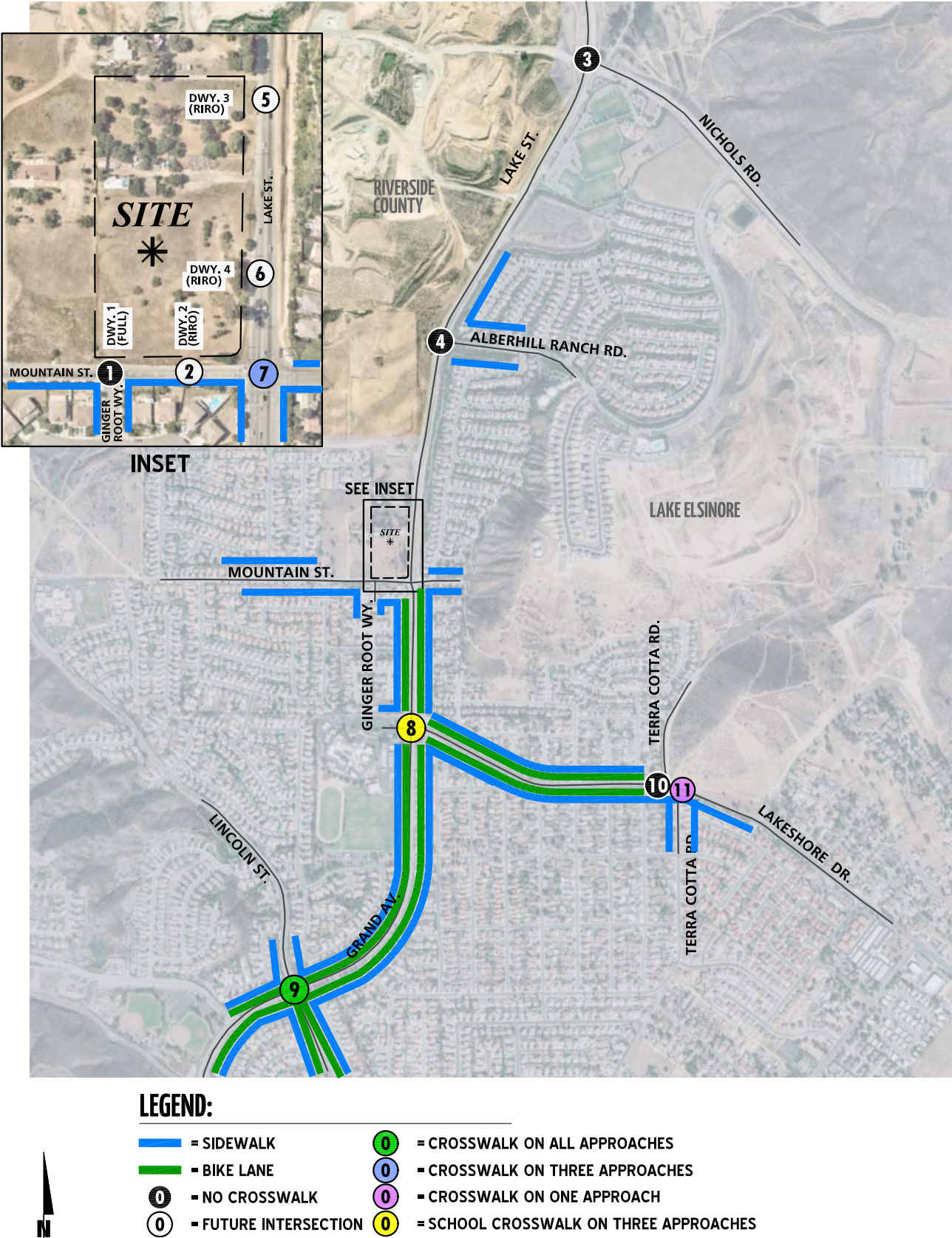


EXHIBIT 3-7: EXISTING TRANSIT ROUTES

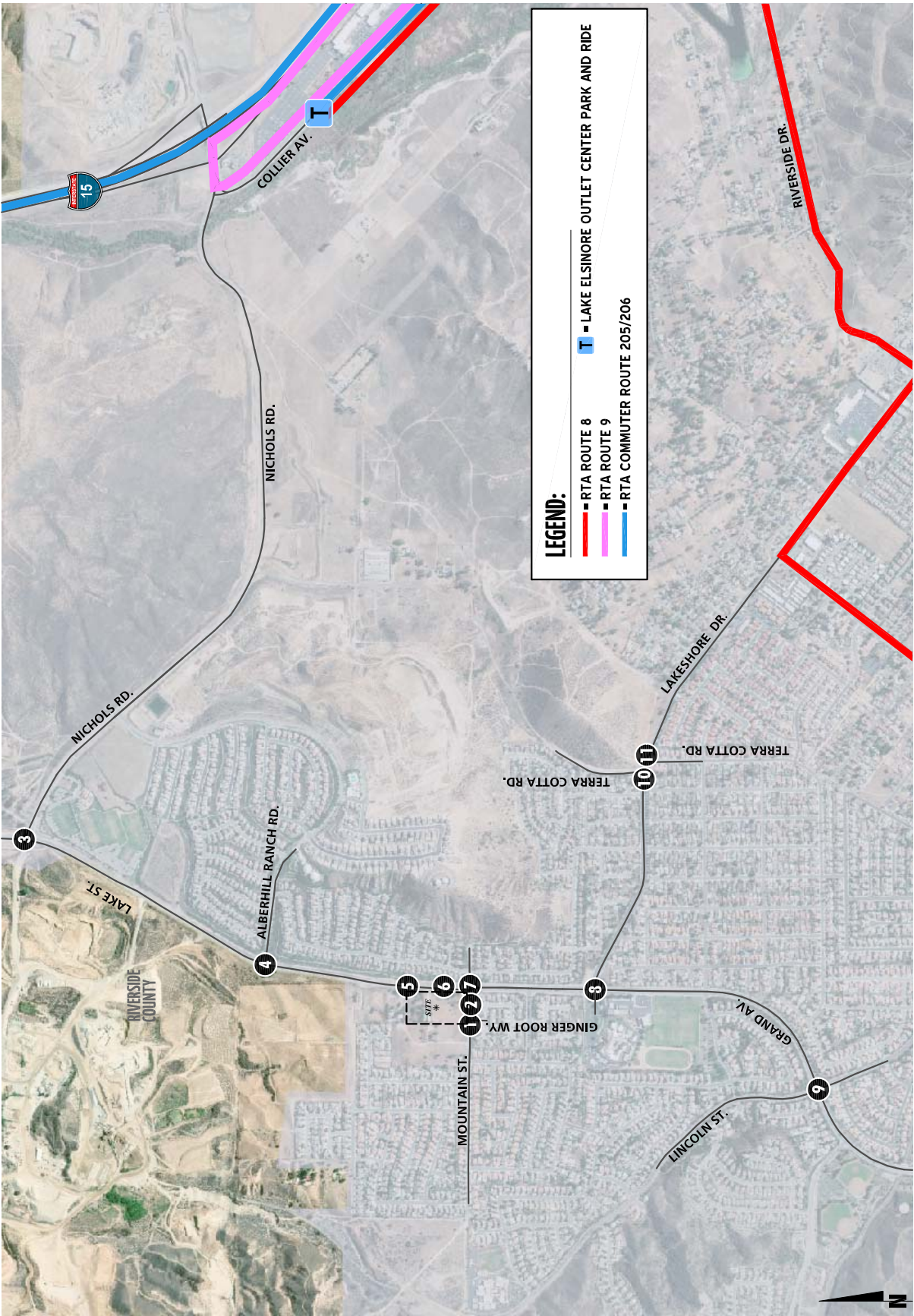
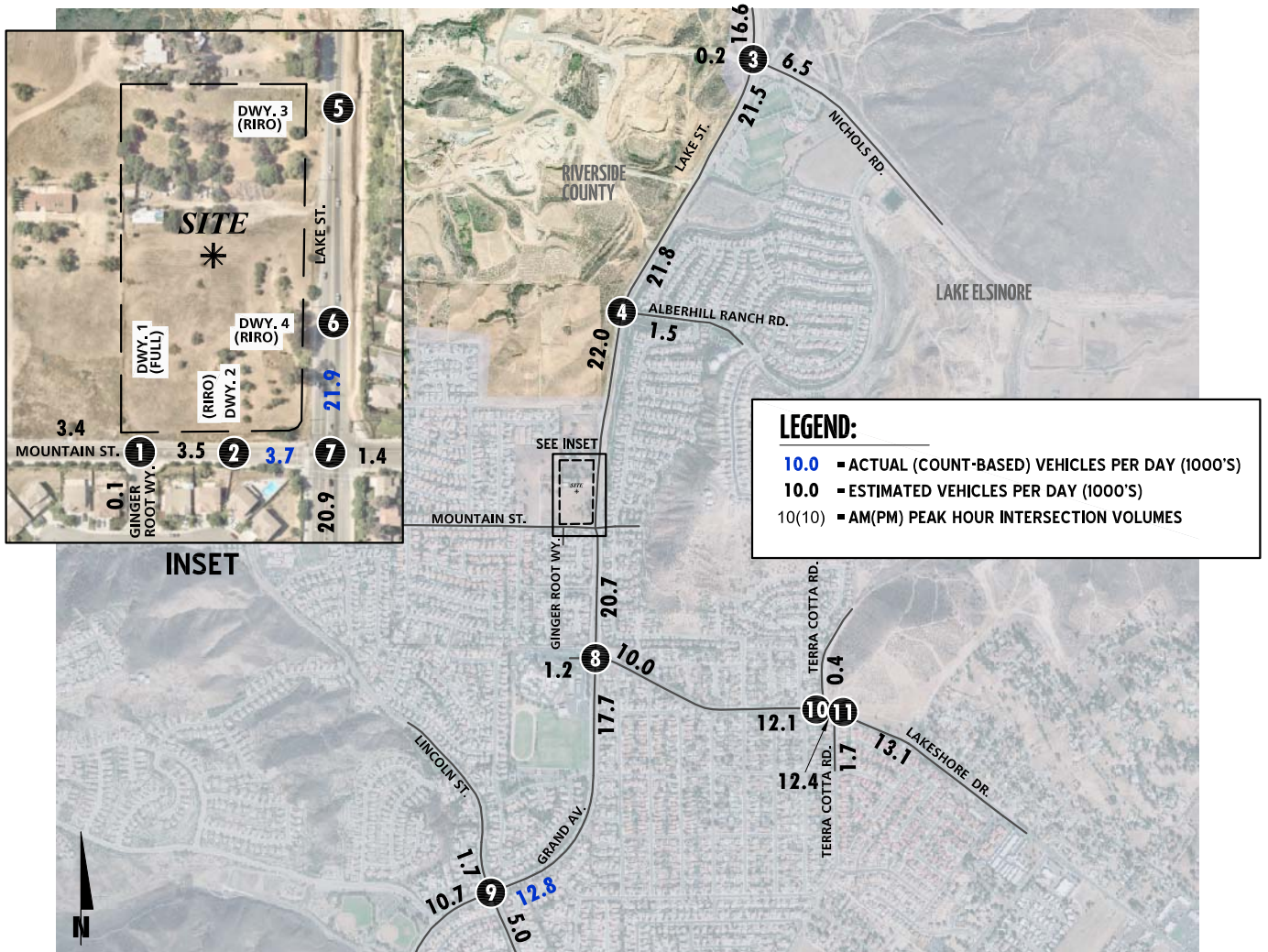


EXHIBIT 3-8: EXISTING (2019) TRAFFIC VOLUMES



1 Dwy. 1/ Ginger Root Wy. & Mountain St. 	2 Dwy. 2 & Mountain St. Future Intersection	3 Lake St. & Nichols Rd. 	4 Lake St. & Alberhill Ranch Rd. 	5 Lake St. & Dwy. 3 Future Intersection	6 Lake St. & Dwy. 4 Future Intersection
7 Lake St. & Mountain St. 	8 Lake St./ Grand Av. & Lakeshore Dr. 	9 Lincoln St. & Grand Av. 	10 Terra Cotta Rd. (N) & Lakeshore Dr. 	11 Terra Cotta Rd. (S) & Lakeshore Dr. 	

A comparison of the PM peak hour and daily traffic volumes of various roadway segments within the study area indicated that the peak-to-daily relationship is approximately 7.13 percent. As such, the above equation utilizing a factor of 14.02 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 7.13 percent (i.e., $1/0.0713 = 14.02$) and was assumed to sufficiently estimate ADT volumes for planning-level analyses. Existing weekday AM and weekday PM peak hour intersection volumes are also shown on Exhibit 3-8.

3.6 INTERSECTION OPERATIONS ANALYSIS

Existing peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2.2 *Intersection Capacity Analysis* of this report. The intersection operations analysis results are summarized in Table 3-1, which indicates that all the study area intersections are currently operating at an acceptable LOS during the peak hours under Existing (2019) traffic conditions.

Consistent with Table 3-1, a summary of the peak hour intersection LOS for Existing (2019) traffic conditions is shown on Exhibit 3-9. The intersection operations analysis worksheets are included in Appendix 3.2 of this TIA.

3.7 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants for Existing (2019) traffic conditions are based on existing peak hour intersection turning volumes. There are no unsignalized study area intersections that currently warrant a traffic signal under Existing (2019) traffic conditions. Existing (2019) conditions traffic signal warrant analysis worksheets are provided in Appendix 3.3.

3.8 RECOMMENDED IMPROVEMENTS

As shown in Table 3-1, the study area intersections are currently operating at an acceptable LOS during the peak hours under Existing (2019) traffic conditions. As such, no improvements have been recommended.

Table 3-1

Intersection Analysis for Existing (2019) Conditions

#	Intersection	Traffic Control ³	Intersection Approach Lanes ¹												Delay ² (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
1	Driveway 1/Ginger Root Wy. & Mountain St.	CSS	0	1	0	0	0	0	0	1	0	0	1	0	9.9	8.8	A	A
2	Driveway 2 & Mountain St.		Future Intersection															
3	Lake St. & Nichols Rd.	TS	1	1	1	1	1	0	0	1	0	0	1	0	18.6	21.3	B	C
4	Lake St. & Alberhill Ranch Rd.	TS	0	1	1	1	1	0	0	0	0	1	0	1	12.5	8.1	B	A
5	Lake St. & Driveway 3		Future Intersection															
6	Lake St. & Driveway 4		Future Intersection															
7	Lake St. & Mountain St.	TS	1	1	1	1	1	0	1	1	0	1	1	0	19.6	11.6	B	B
8	Lake St./Grand Av. & Lakeshore Dr.	TS	1	2	1	2	2	d	0	2	0	1	1	2>	34.9	20.5	C	C
9	Lincoln St. & Grand Av.	TS	1	2	0	1	2	0	1	2	1	1	2	d	28.2	18.5	C	B
10	Terra Cotta Rd. (N) & Lakeshore Dr.	CSS	0	0	0	1	0	d	1	2	0	0	1	0	16.6	12.5	C	B
11	Terra Cotta Rd. (S) & Lakeshore Dr.	TS	0	1	0	0	0	0	0	1	1	1	1	0	9.2	8.4	A	A

¹ When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.

L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing; d= Defacto Right Turn Lane

² Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. HCM delay reported in seconds.

³ CSS = Cross-street Stop; TS = Traffic Signal

EXHIBIT 3-9: EXISTING (2019) SUMMARY OF LOS



4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project's trip assignment onto the study area roadway network. The Project is proposed to consist of 13,200 square feet of shopping center use, a gasoline service station with a 3,400 square foot convenience market, 7,365 square feet of fast-food restaurant with drive-through window use, and an automated car wash tunnel. It is anticipated that the Project would be developed in a single phase with an anticipated Opening Year of 2021. For the purpose of this analysis, the following driveways will provide access to the Project site:

- Driveway 1 via Mountain Street – Full Access
- Driveway 2 via Mountain Street – Right-in/Right-out access only
- Driveway 3 via Lake Street – Right-in/Right-out access only
- Driveway 4 via Lake Street – Right-in/Right-out access only

Regional access to the Project site is available from the I-15 Freeway and Lake Street and Nichols Road interchanges.

4.1 PROJECT TRIP GENERATION

Trip generation represents the amount of traffic which is both attracted to and produced by a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to and produced by the specific land uses being proposed for a given development.

Trip generation rates used to estimate Project traffic are shown in Table 4-1. A summary of the Project's trip generation is shown in Table 4-2. The trip generation rates used for this analysis are based upon information collected by the ITE as provided in their Trip Generation Manual (10th Edition, 2017) for Shopping Center (ITE Land Use Code 820), Fast-Food Restaurant with Drive-Through Window (ITE Land Use Code 934), Super Convenience Market/Gas Station (ITE Land Use Code 960), and Automated Car Wash (ITE Land Use Code 948). (3)

As the project is proposed to include shopping center, gas station, and other complementary uses, pass-by percentages have been obtained from the ITE Trip Generation Handbook (3rd Edition, 2017). (7) Patrons of the gas station may also visit other uses on-site, including the restaurants, car wash, and retail uses, without leaving the site. The ITE Trip Generation Handbook has been utilized to determine the internal capture for the applicable mix of uses. Pass-by trip reductions at the Project driveways and site adjacent intersection of Lake Street and Mountain Street are shown on Exhibit 4-2.

Table 4-1

Project Trip Generation Rates

Land Use ¹	Units ²	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Shopping Center ³	TSF	820	7.440	4.560	12.000	4.420	4.780	9.200	114.930
Fast-Food Restaurant with Drive-Through Window	TSF	934	20.497	19.693	40.190	16.988	15.682	32.670	470.950
Super Convenience Mkt./Gas Station	TSF	960	41.570	41.570	83.140	34.640	34.640	69.280	837.580
Automated Car Wash ⁴	TUN	948	N/A	N/A	N/A	38.750	38.750	77.500	775.000

¹ Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Tenth Edition (2017).

² TSF = thousand square feet; TUN = Tunnels

³ Trip generation rates are based on the regression equation.

⁴ AM peak hour and daily trip generation rate not available. Daily rate estimated at 10 times the PM peak hour rate.

Table 4-2

Project Trip Generation Summary

Project Land Uses	Quantity	Units ¹	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Shopping Center	13,200	TSF	98	60	158	58	63	121	1,517
Internal Capture (Retail to Restaurant) ² :			-1	-1	-2	-5	-4	-9	-113
Net External Trips:			97	59	156	53	59	112	1,404
Pass-by Reduction (PM/Daily: 34%) ³ :			0	0	0	-18	-18	-36	-478
<i>Shopping Center Total:</i>			97	59	156	35	41	76	926
Gasoline/Service Station w/Convenience Mkt.	3,400	TSF	141	141	282	118	118	236	2,848
Internal Capture (Retail to Restaurant) ² :			-18	-25	-43	-42	-32	-74	-894
Net External Trips:			123	116	239	76	86	162	1,954
Pass-by Reduction (AM: 62%; PM/Daily: 56%) ³ :			-72	-72	-144	-43	-43	-86	-1,094
<i>Gasoline/Service Station w/Conven. Mkt. Total:</i>			51	44	95	33	43	76	860
Fast-Food Restaurant with Drive-Through Window	7,365	TSF	151	145	296	125	115	240	3,470
Internal Capture (Restaurant to Retail) ² :			-26	-19	-45	-36	-47	-83	-1,202
Net External Trips:			125	126	251	89	68	157	2,268
Pass-by Reduction (AM: 49%, PM: 50%, Daily: 50%) ³ :			-61	-61	-122	-34	-34	-68	-1,134
<i>Fast-Food Restaurant with Drive-Through Window Total:</i>			64	65	129	55	34	89	1,134
Automated Car Wash	1,000	TUN	N/A	N/A	N/A	39	39	78	776
Total Net Trips			212	168	380	162	157	319	3,696

¹ TSF = thousand square feet; TUN = Tunnels² Internal capture calculated from NCHRP 684 Internal Trip Capture Estimation Tool.³ Source: ITE [Trip Generation Handbook](#), 3rd Edition, 2017.

Internal capture is a percentage reduction that can be applied to the trip generation estimates for individual land uses to account for trips internal to the site. In other words, trips may be made between individual retail uses on-site and can be made either by walking or using internal roadways without using external streets. As the trip generation for the site was conservatively estimated based on individual land uses as opposed to the average ITE Shopping Center rate, an internal capture reduction was applied to recognize the interactions that would occur between the various complementary land uses. The internal capture is based on the National Cooperative Highway Research Program's (NCHRP Report 684) internal capture trip capture estimation tool. These internal capture worksheets are attached to this scoping agreement.

As shown in Table 4-2, the proposed Project is anticipated to generate a net total of 3,696 trip-ends per day with 380 AM peak hour trips and 319 PM peak hour trips.

4.2 PROJECT TRIP DISTRIBUTION

The Project trip distribution and assignment process represents the directional orientation of traffic to and from the Project site. The trip distribution pattern is heavily influenced by the geographical location of the site, the location of surrounding uses, and the proximity to the regional freeway system. The Project trip distribution pattern is graphically depicted on Exhibit 4-2. The Project trip distribution pattern was reviewed by the City of Lake Elsinore as part of the traffic study scoping process (see Appendix 1.1).

4.3 MODAL SPLIT

The potential for Project trips to be reduced by the use of public transit, walking or bicycling have not been included as part of the Project's estimated trip generation. Essentially, the Project's traffic projections are "conservative" in that these alternative travel modes would reduce the forecasted traffic volumes.

4.4 PROJECT TRIP ASSIGNMENT

The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project traffic generation and trip distribution patterns, Project only ADT and peak hour intersection turning movement volumes are shown on Exhibit 4-3.

EXHIBIT 4-2: PROJECT TRIP DISTRIBUTION

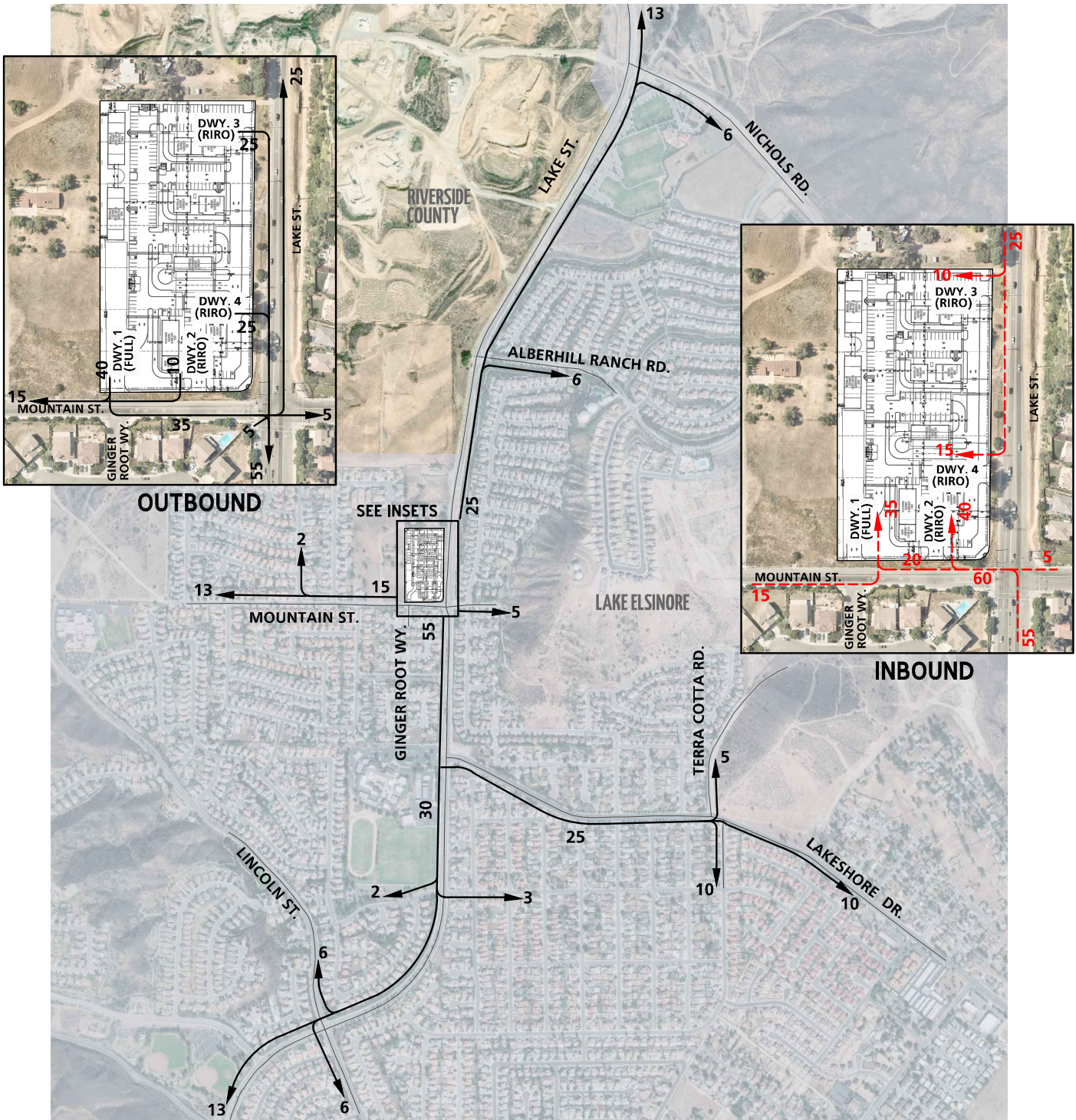
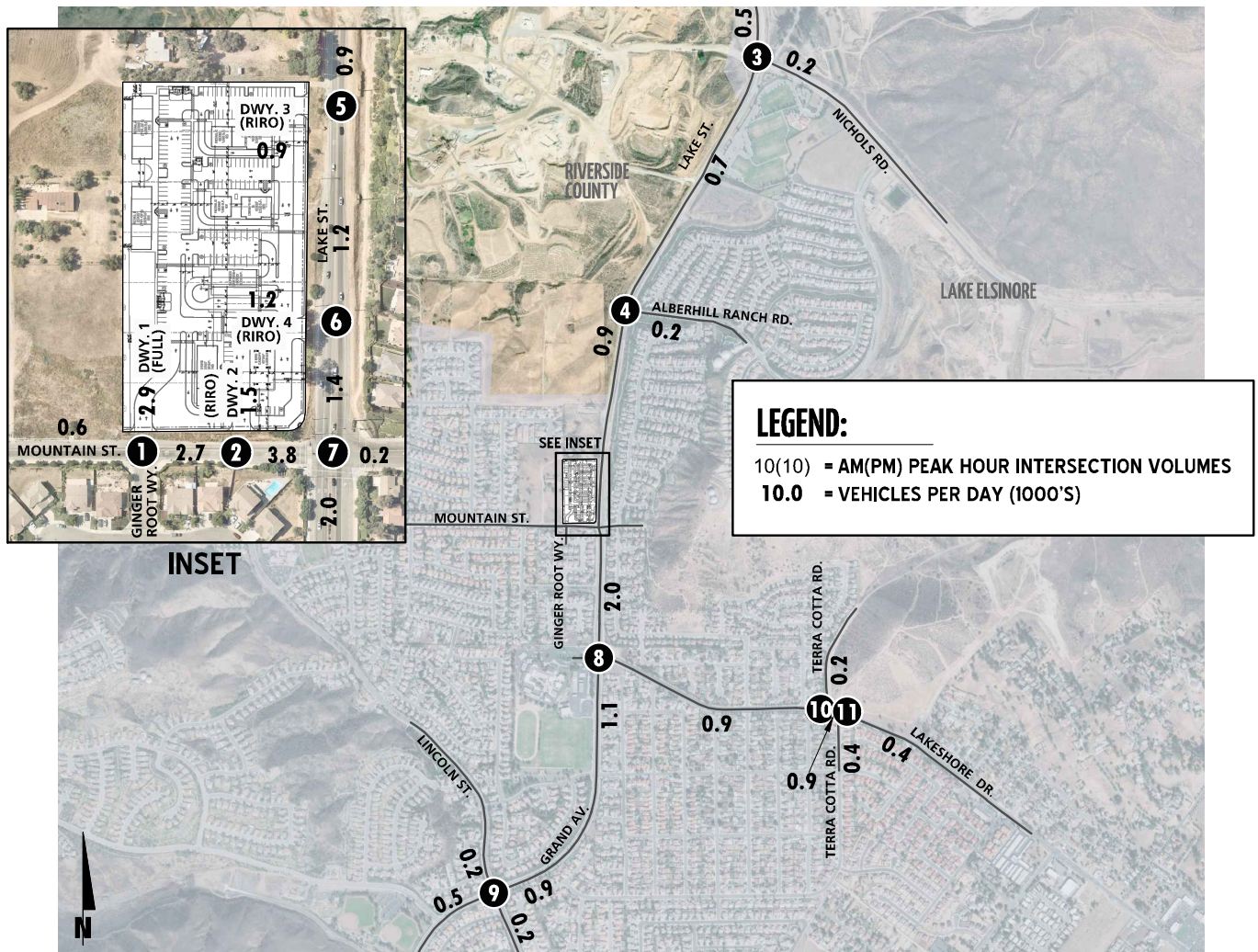


EXHIBIT 4-3: PROJECT ONLY TRAFFIC VOLUMES



1 Dwy. 1/ Ginger Root WY. & Mountain St. 	2 Dwy. 2 & Mountain St. 	3 Lake St. & Nichols Rd. 	4 Lake St. & Alberhill Ranch Rd. 	5 Lake St. & Dwy. 3 	6 Lake St. & Dwy. 4
7 Lake St. & Mountain St. 	8 Lake St./ Grand Av. & Lakeshore Dr. 	9 Lincoln St. & Grand Av. 	10 Terra Cotta Rd. (N) & Lakeshore Dr. 	11 Terra Cotta Rd. (S) & Lakeshore Dr. 	

4.5 BACKGROUND TRAFFIC

Future year traffic forecasts have been based upon background (ambient) growth of 4.04% (2% per year compounded annually over two years) for 2021 traffic conditions. This ambient growth rate is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects. Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications have been filed and are under consideration by governing agencies. EAP (2021) and EAPC (2021) traffic volumes are provided in Section 6 and Section 7 of this report, respectively.

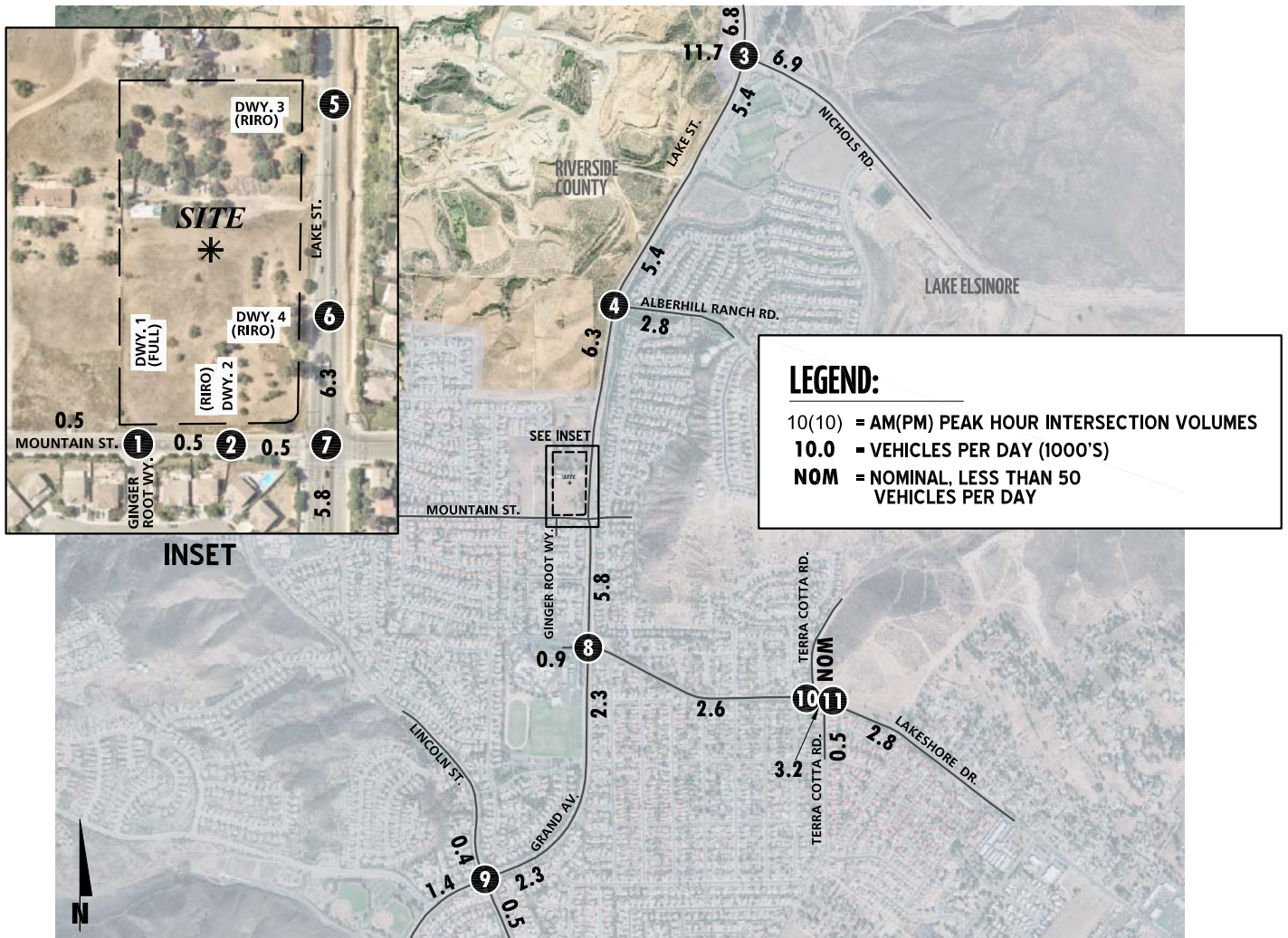
4.6 CUMULATIVE DEVELOPMENT TRAFFIC

CEQA guidelines require that other reasonably foreseeable development projects which are either approved or being processed concurrently in the study area also be included as part of a cumulative analysis scenario. A cumulative project list was developed for the purposes of this analysis through consultation with planning and engineering staff from the City of Lake Elsinore.

Exhibit 4-4 illustrates the cumulative development location map. A summary of cumulative development projects and their proposed land uses are shown in Table 4-3. If applicable, the traffic generated by individual cumulative projects was manually added to the EAP (2021) forecasts to ensure that traffic generated by the listed cumulative development projects in Table 4-3 are reflected as part of the background traffic to estimate EAPC (2021) traffic forecasts.

For the purposes of this study, an absorption percentage has been applied to the cumulative development traffic. It is unlikely that each cumulative development project shown on Exhibit 4-4 will be fully constructed and occupied by the year 2021. As such, 15% of the cumulative development traffic is added on top of EAP (2021) traffic volumes. Cumulative ADT and peak hour intersection turning movement volumes are shown on Exhibit 4-5. Cumulative Project Trip Generation is available in Appendix 4.1 of this TIA.

EXHIBIT 4-5: CUMULATIVE ONLY TRAFFIC VOLUMES



1 Dwy. 1/ Ginger Root Wy. & Mountain St. 	2 Dwy. 2 & Mountain St. Future Intersection	3 Lake St. & Nichols Rd. 	4 Lake St. & Alberhill Ranch Rd. 	5 Lake St. & Dwy. 3 Future Intersection	6 Lake St. & Dwy. 4 Future Intersection
7 Lake St. & Mountain St. 	8 Lake St./ Grand Av. & Lakeshore Dr. 	9 Lincoln St. & Grand Av. 	10 Terra Cotta Rd. (N) & Lakeshore Dr. 	11 Terra Cotta Rd. (S) & Lakeshore Dr. 	

Table 4-3

Page 1 of 2

Summary of Cumulative Development Land Uses

No.	Project Name	Location	Land Use	Quantity ¹	
City of Lake Elsinore					
LE1	Greenwald ²	Lake Elsinore	Shopping Center	104.450	TSF
LE2	Ramsgate	Lake Elsinore	Single Family Residential	1,306	DU
			Condo/Townhomes	120	DU
LE3	Honda	Lake Elsinore	Automobile Sales	53.400	TSF
LE4	Fairway Business Park	Lake Elsinore	Warehouse	279.445	TSF
LE5	Ness Industrial Garage	Lake Elsinore	Warehouse	12.000	TSF
LE6	Spyglass Ranch ³	Lake Elsinore	Single Family Residential	523	DU
			Condo/Townhomes	171	DU
			Shopping Center	145.00	TSF
LE7	South Shore I (Tract 31593)	Lake Elsinore	Single Family Residential	521	DU
	South Shore II (Tract 36567)	Lake Elsinore	Single Family Residential	147	DU
LE8	La Strada (Tract 32077)	Lake Elsinore	Single Family Residential	134	DU
LE9	Tuscany West (Tract 25473)	Lake Elsinore	Single Family Residential	164	DU
LE10	Marina Village Condos (Tract 33820) ⁶	Lake Elsinore	Condo/Townhomes	94	DU
LE11	La Quinta Inn	Lake Elsinore	Hotel	64	RM
LE12	LE Sports Complex	Lake Elsinore	Recreational Community Center	525.000	TSF
LE13	TAG Property ⁴	Lake Elsinore	New Car Sales	50.000	TSF
LE14	City Center Condos ⁴	Lake Elsinore	Condo/Townhomes	144	DU
LE15	Kassab Travel Center	Lake Elsinore	High Turnover (Sit-Down) Restaurant	17.200	TSF
LE16	Diamond Specific Plan ⁵	Lake Elsinore	Condo/Townhomes	600	DU
			Hotel	150	RM
			General Office	425.000	TSF
			Shopping Center	472.000	TSF
LE17	The Colony ⁴	Lake Elsinore	Apartments	211	DU
	Back Basin Specific Plan & East Lake Specific Plan	Lake Elsinore	Single Family Residential	2,407	DU
			Condo/Townhomes	324	DU
	John Laing Homes (Phase 2)	Lake Elsinore	Single Family Residential	506	DU
			Condo/Townhomes	1,141	DU
			Apartments	308	DU
			Shopping Center	117.000	TSF
LE18	Canyon Hills Estates (Tract 34249)	Lake Elsinore	Single Family Residential	302	DU
	Canyon Hills (Multiple Tracts)	Lake Elsinore	Single Family Residential	2,700	DU
			Apartments	1,575	DU
	Audie Murphy (Tract 36484)	Lake Elsinore	Single Family Residential	109	DU
	Audie Murphy (Tract 36485)	Lake Elsinore	Single Family Residential	1,003	DU
LE19	Artisan Alley	Lake Elsinore	Shopping Center	95.100	TSF
LE20	Quikrete Plant	Lake Elsinore	Warehouse	163.900	TSF
LE21	Alberhill Ridge (Tract 35001)	Lake Elsinore	Single Family Residential	1,056	DU
			Apartments	345	DU
			Shopping Center	679.000	TSF
			General Office	679.000	TSF

Table 4-3

Page 2 of 2

Summary of Cumulative Development Land Uses

No.	Project Name	Location	Land Use	Quantity ¹	
LE22	Alberhill Ranch	Lake Elsinore	Single Family Residential	1,986	DU
LE23	Lake Elsinore Walmart	Lake Elsinore	Free-Standing Discount Superstore	154.487	TSF
			Specialty Retail	4.600	TSF
			Fast Food w/Drive Thru	6.800	TSF
			Fast Food w/o Drive Thru	4.600	TSF
LE24	Circle K	Lake Elsinore	Gas Station	4.500	TSF
LE25	Alberhill Villages	Lake Elsinore	Single Family Residential	9,536	DU
LE26	Terracina	Lake Elsinore	Single Family Residential	365	DU
LE27	Lakeshore Senior Apartments	Lake Elsinore	Senior Adult Housing Attached	121	DU
LE28	North Peak Plaza	Lake Elsinore	Condo/Townhomes	92	DU
			Shopping Center	92.000	TSF
LE29	Running Deer (TR 31957)	Lake Elsinore	Single Family Residential	101	DU
LE30	Wake Rider Beach Resort	Lake Elsinore	Beach Resort	11.350	TSF
LE31	Lakeshore Town Center	Lake Elsinore	Town Center	237.400	TSF
LE32	Ortega	Lake Elsinore	Single Family Residential	105	DU
LE33	Summerly	Lake Elsinore	Single Family Residential	142	DU
LE34	Beazer, KB Homes, McMillin Homes, Richmond American	Lake Elsinore	Single Family Residential	395	DU
LE35	Village at Lake Elsinore SPA #1	Lake Elsinore	Single Family Residential	163	DU
LE36	Lakeview Manor	Lake Elsinore	Condo/Townhomes	104	DU
LE37	Nichols Ranch	Lake Elsinore	Single Family Residential	168	DU
			Park	8.3	AC
			Hotel	130	RM
			Fast-food with Drive-Through	6.000	TSF
			Fast-food without Drive-Through	5.500	TSF
			High Turnover (Sit-Down) Restaurant	9.400	TSF
			Shopping Center	4.400	TSF
			Health & Fitness Club	8.000	TSF
			General Office	43.000	TSF
			Gas Station w/ Market and Car Wash	16	VFP
LE38	Tige Watersports	Lake Elsinore	Shopping Center	34.500	TSF
County of Riverside					
RC1	Lennar (Tract 31792)	County of Riverside	Single Family Residential	191	DU
RC2	PM33840	County of Riverside	Single Family Residential	4	DU
RC3	PP20158R1	County of Riverside	Storage Facility	103.727	TSF
RC4	CUP03651	County of Riverside	Recycling Facility	0.504	TSF

¹ TSF = Thousand Square Feet; DU = Dwelling Unit; AC = Acres; STU = Students; VFP = Vehicle Fueling Positions

² Source: Greenwald Avenue Commercial Center TIA, Urban Crossroads, Inc., May 2008.

³ Source: Spyglass Ranch TIA (Revised), Kunzman Associates, February 2007.

⁴ Source: Lake Elsinore TAG Property TIA (Revised), Urban Crossroads, Inc., August 2008.

⁵ Source: The Diamond Specific Plan TIA, Urban Crossroads, Inc., April 2009.

5 E+P TRAFFIC CONDITIONS

This section discusses the traffic forecasts for Existing plus Project (E+P) conditions and the resulting intersection operations and traffic signal warrant analyses.

5.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for E+P conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for E+P conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways).

5.2 EXISTING PLUS PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus Project traffic. The ADT volumes and weekday AM and PM peak hour intersection turning movement volumes which can be expected for E+P traffic conditions are shown on Exhibit 5-1.

5.3 INTERSECTION OPERATIONS ANALYSIS

E+P peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TIA. The intersection analysis results are summarized in Table 5-1, which indicates that there are no study area intersections anticipated to operate at an unacceptable LOS with the addition of Project traffic, consistent with Existing (2019) traffic conditions.

Consistent with Table 5-1, a summary of the peak hour intersection LOS for E+P traffic conditions is shown on Exhibit 5-2. The intersection operations analysis worksheets for E+P traffic conditions are included in Appendix 5.1 of this TIA.

5.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

With the addition of Project traffic, the following unsignalized study area intersection is anticipated to warrant a traffic signal for E+P traffic conditions:

- Driveway 1/Ginger Root Way & Mountain Street

The intersection of Driveway 1/Ginger Root Way and Mountain Street is anticipated to operate at an acceptable LOS during the peak hours as an unsignalized, cross-street stop-controlled intersection under E+P traffic conditions. As such, a traffic signal has not been recommended at this intersection. However, the intersection should be monitored, and a traffic signal should be installed at the discretion of the City's Traffic Engineer. E+P conditions traffic signal warrant analysis worksheets are provided in Appendix 5.2.

EXHIBIT 5-1: E+P TRAFFIC VOLUMES

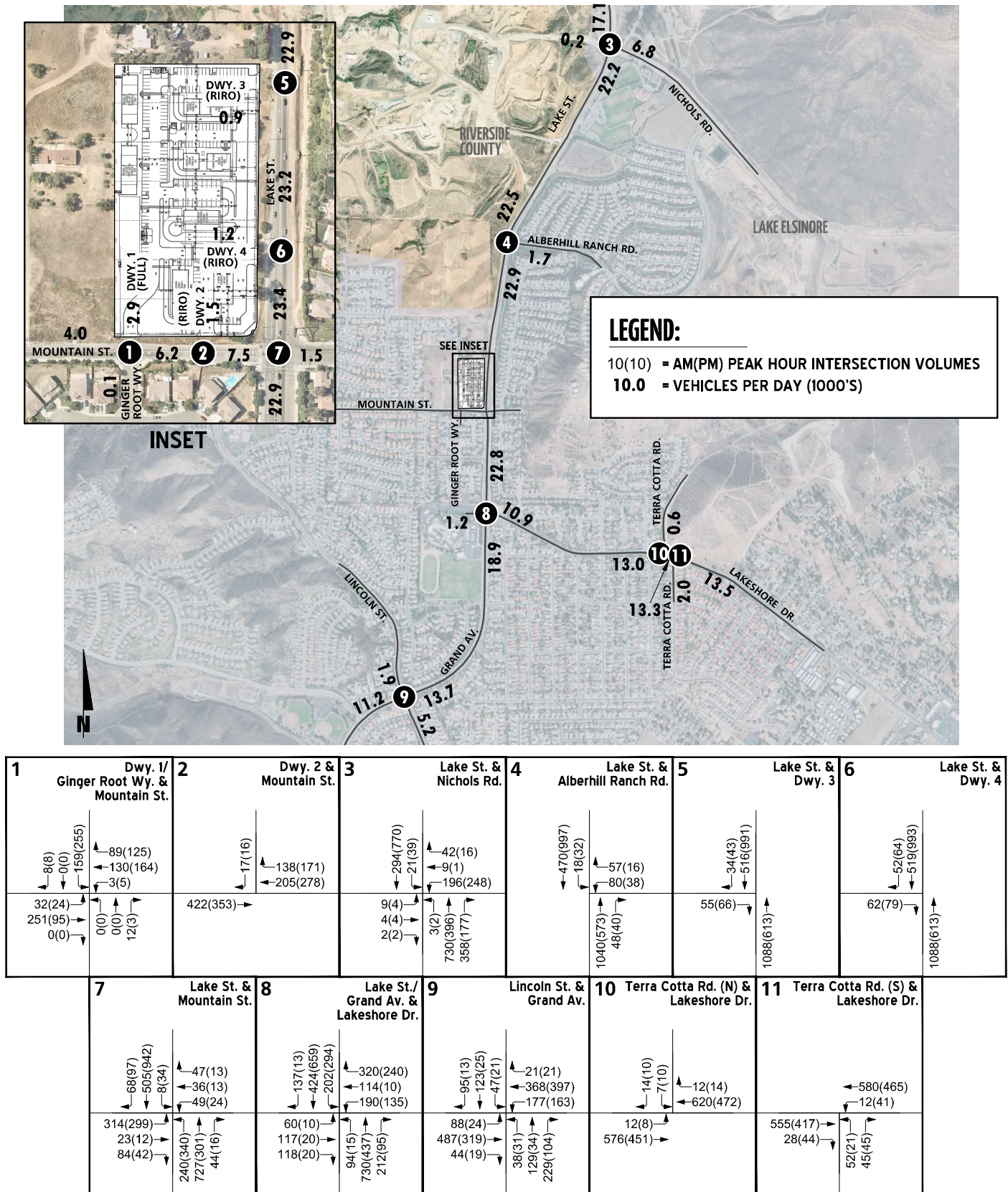


EXHIBIT 5-2: E+P SUMMARY OF LOS

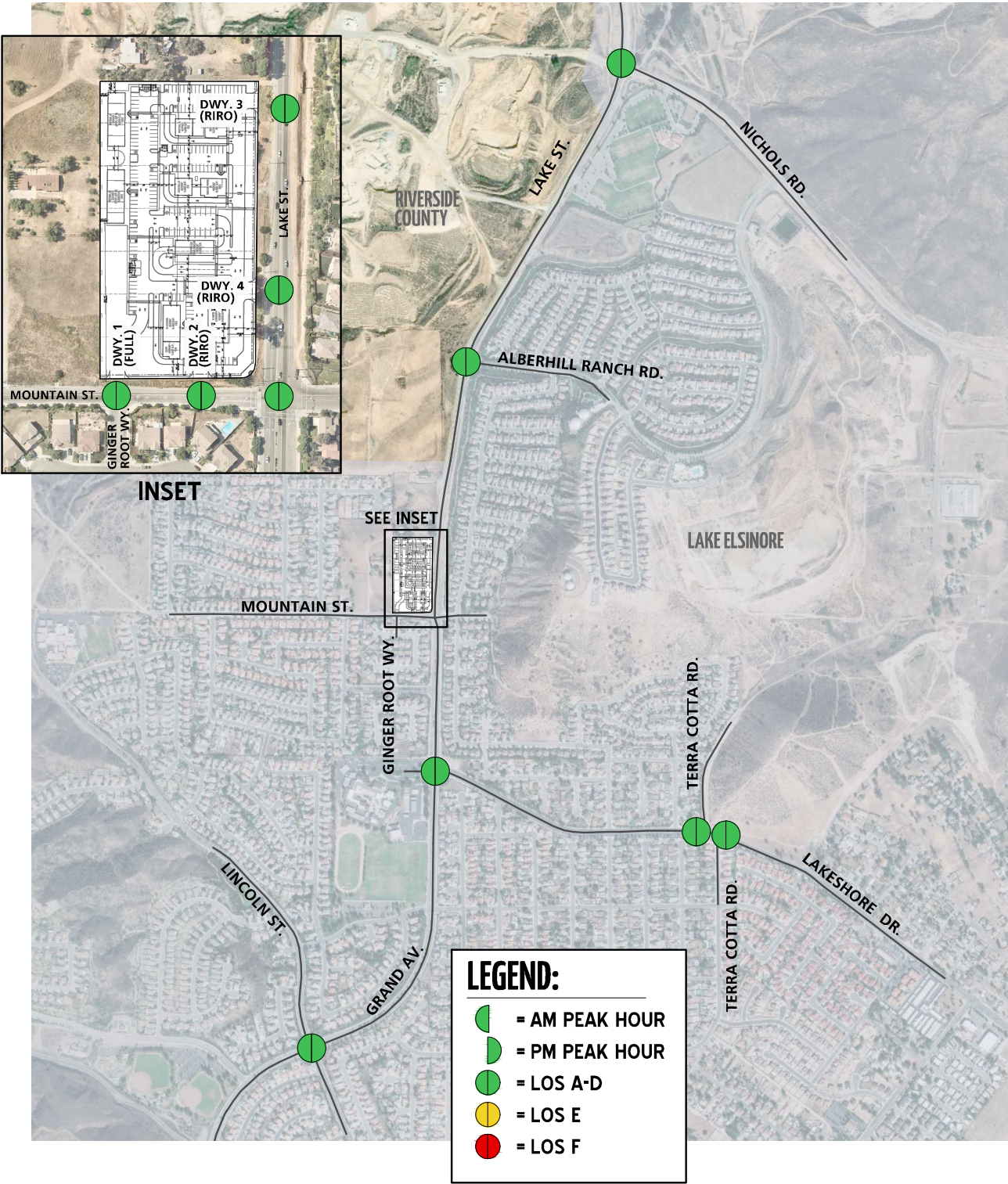


Table 5-1

Intersection Analysis for E+P Conditions

#	Intersection	Traffic Control ²	Existing (2019)				E+P			
			Delay ¹ (secs.)		Level of Service		Delay ¹ (secs.)		Level of Service	
			AM	PM	AM	PM	AM	PM	AM	PM
1	Driveway 1/Ginger Root Wy. & Mountain St.	CSS	9.9	8.8	A	A	21.8	23.0	C	C
2	Driveway 2 & Mountain St.	<u>CSS</u>	Future Intersection				10.0	10.7	B	B
3	Lake St. & Nichols Rd.	TS	18.6	21.3	B	C	19.3	22.2	B	C
4	Lake St. & Alberhill Ranch Rd.	TS	12.5	8.1	B	A	13.1	8.8	B	A
5	Lake St. & Driveway 3	<u>CSS</u>	Future Intersection				12.9	24.2	B	C
6	Lake St. & Driveway 4	<u>CSS</u>	Future Intersection				10.8	14.6	B	B
7	Lake St. & Mountain St.	TS	19.6	11.6	B	B	32.6	42.9	C	D
8	Lake St./Grand Av. & Lakeshore Dr.	TS	34.9	20.5	C	C	37.1	21.4	D	C
9	Lincoln St. & Grand Av.	TS	28.2	18.5	C	B	29.3	18.8	C	B
10	Terra Cotta Rd. (N) & Lakeshore Dr.	CSS	16.6	12.5	C	B	17.8	13.0	C	B
11	Terra Cotta Rd. (S) & Lakeshore Dr.	TS	9.2	8.4	A	A	10.6	9.2	B	A

¹ Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. HCM delay reported in seconds.

² CSS = Cross-street Stop; TS = Traffic Signal; CSS = Improvement

5.5 RECOMMENDED IMPROVEMENTS

As shown in Table 5-1, the study area intersections are anticipated to operate at an acceptable LOS during the peak hours under E+P traffic conditions. As such, no improvements have been recommended.

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6 EAP (2021) TRAFFIC CONDITIONS

This section discusses the methods used to develop EAP (2021) traffic forecasts, and the resulting intersection operations and traffic signal warrant analyses.

6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for EAP (2021) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EAP (2021) conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).

6.2 EAP (2021) TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth factor of 4.04% (2% per year compounded annually for two years). The weekday ADT and weekday AM and PM peak hour volumes which can be expected for EAP (2021) traffic conditions are shown on Exhibit 6-1.

6.3 INTERSECTION OPERATIONS ANALYSIS

LOS calculations were conducted for the study intersections to evaluate their operations under EAP (2021) traffic conditions with the roadway and intersection geometrics consistent with Section 6.1 *Roadway Improvements*. As shown in Table 6-1, there are no study area intersections anticipated to operate at an unacceptable LOS during the peak hours under EAP (2021) traffic conditions, consistent with Existing (2019) traffic conditions.

A summary of the peak hour intersection LOS for EAP (2021) traffic conditions is shown on Exhibit 6-2. The intersection operations analysis worksheets for EAP (2021) traffic conditions are included in Appendix 6.1.

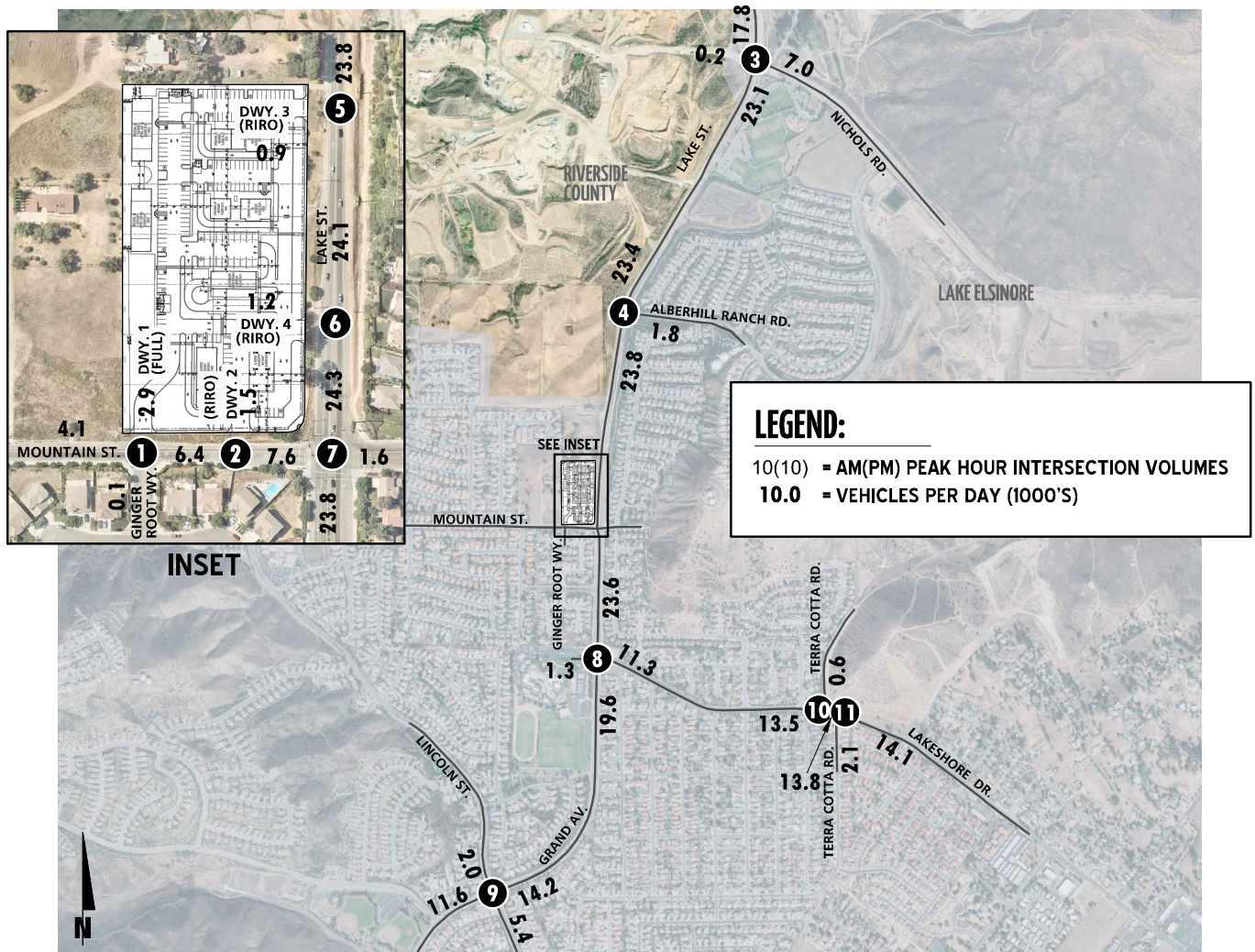
6.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no additional unsignalized study area intersections that are anticipated to warrant a traffic signal for EAP (2021) traffic conditions, in addition to the intersection identified under E+P traffic conditions. EAP (2021) conditions traffic signal warrant analysis worksheets are provided in Appendix 6.2.

6.5 RECOMMENDED IMPROVEMENTS

As shown in Table 6-1, the study area intersections are anticipated to operate at an acceptable LOS during the peak hours under EAP (2021) traffic conditions. As such, no improvements have been recommended.

EXHIBIT 6-1: EAP (2021) TRAFFIC VOLUMES



1 Dwy. 1/ Ginger Root Wy. & Mountain St. 	2 Dwy. 2 & Mountain St. 	3 Lake St. & Nichols Rd. 	4 Lake St. & Alberhill Ranch Rd. 	5 Lake St. & Dwy. 3 	6 Lake St. & Dwy. 4
7 Lake St. & Mountain St. 	8 Lake St./ Grand Av. & Lakeshore Dr. 	9 Lincoln St. & Grand Av. 	10 Terra Cotta Rd. (N) & Lakeshore Dr. 	11 Terra Cotta Rd. (S) & Lakeshore Dr. 	

EXHIBIT 6-2: EAP (2021) SUMMARY OF LOS

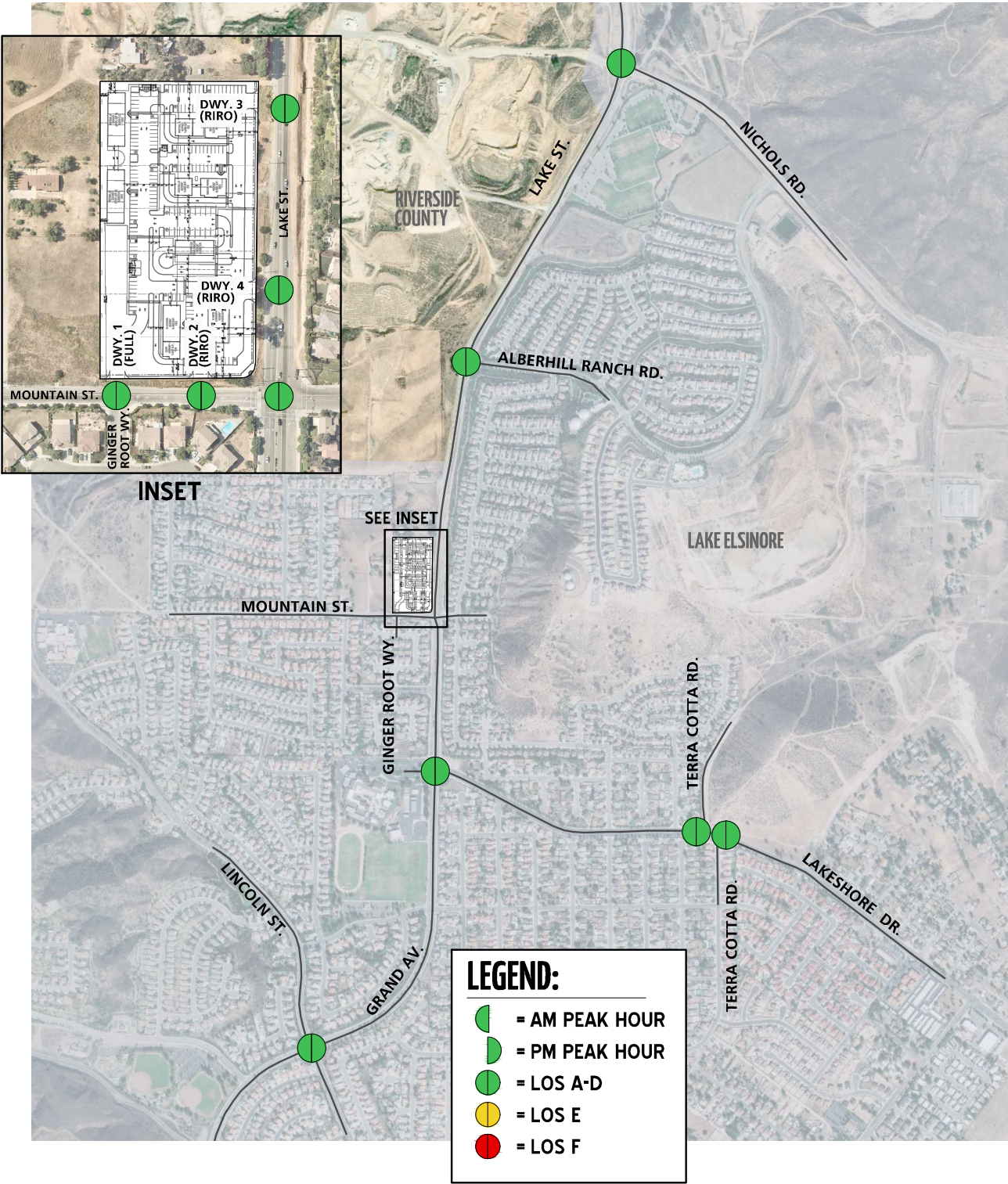


Table 6-1

Intersection Analysis for EAP (2021) Conditions

#	Intersection	Traffic Control ²	Existing (2019)				EAP (2021)			
			Delay ¹ (secs.)		Level of Service		Delay ¹ (secs.)		Level of Service	
			AM	PM	AM	PM	AM	PM	AM	PM
1	Driveway 1/Ginger Root Wy. & Mountain St.	CSS	9.9	8.8	A	A	22.6	23.8	C	C
2	Driveway 2 & Mountain St.	<u>CSS</u>	Future Intersection				10.0	10.7	B	B
3	Lake St. & Nichols Rd.	TS	18.6	21.3	B	C	20.1	23.5	C	C
4	Lake St. & Alberhill Ranch Rd.	TS	12.5	8.1	B	A	13.9	9.2	B	A
5	Lake St. & Driveway 3	<u>CSS</u>	Future Intersection				13.2	25.9	B	D
6	Lake St. & Driveway 4	<u>CSS</u>	Future Intersection				10.9	15.0	B	C
7	Lake St. & Mountain St.	TS	19.6	11.6	B	B	33.4	44.5	C	D
8	Lake St./Grand Av. & Lakeshore Dr.	TS	34.9	20.5	C	C	38.6	21.9	D	C
9	Lincoln St. & Grand Av.	TS	28.2	18.5	C	B	30.0	19.0	C	B
10	Terra Cotta Rd. (N) & Lakeshore Dr.	CSS	16.6	12.5	C	B	18.4	13.2	C	B
11	Terra Cotta Rd. (S) & Lakeshore Dr.	TS	9.2	8.4	A	A	11.0	9.3	B	A

¹ Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. HCM delay reported in seconds.

² CSS = Cross-street Stop; TS = Traffic Signal; CSS = Improvement

7 EAPC (2021) TRAFFIC CONDITIONS

This section discusses the methods used to develop EAPC (2021) traffic forecasts, and the resulting intersection operations and traffic signal warrant analyses.

7.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for EAPC (2021) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EAPC (2021) conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for EAPC (2021) conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways).

7.2 EAPC (2021) TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth factor of 4.04% (2% per year compounded annually for two years) plus traffic from pending and approved but not yet constructed known development projects in the area, in conjunction with Project traffic. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for EAPC (2021) traffic conditions are shown on Exhibit 7-1.

7.3 INTERSECTION OPERATIONS ANALYSIS

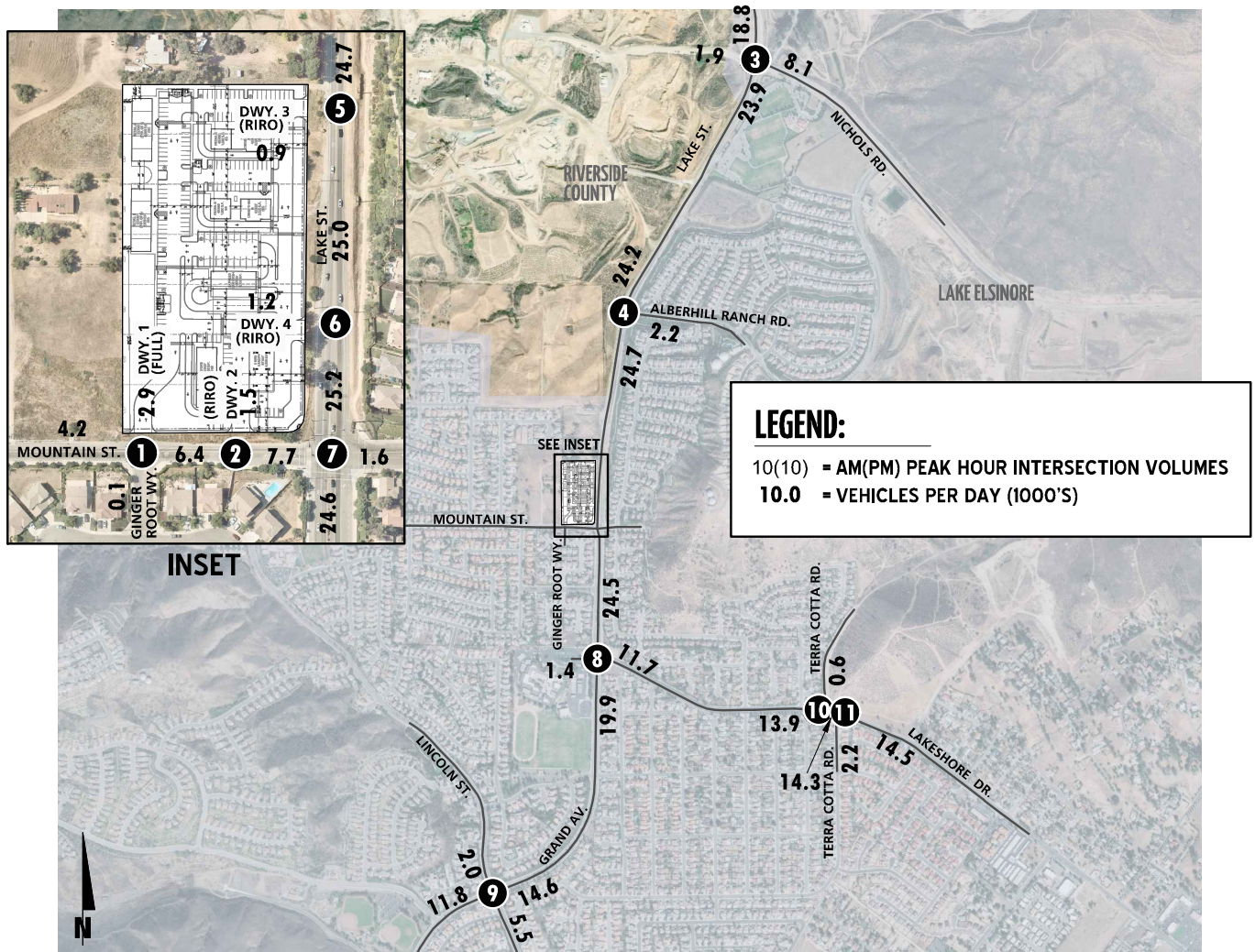
LOS calculations were conducted for the study intersections to evaluate their operations under EAPC (2021) traffic conditions with the roadway and intersection geometrics consistent with Section 7.1 *Roadway Improvements*. As shown in Table 7-1, there are no study area intersections anticipated to operate at an unacceptable LOS during the peak hours under EAPC (2021) traffic conditions, consistent with Existing (2019) traffic conditions.

A summary of the peak hour intersection LOS for EAPC (2021) traffic conditions is shown on Exhibit 7-2. The intersection operations analysis worksheets for EAPC (2021) traffic conditions is included in Appendix 7.1.

7.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no additional unsignalized study area intersections that are anticipated to warrant a traffic signal for EAPC (2021) traffic conditions, in addition to the intersection identified under E+P traffic conditions. EAPC (2021) conditions traffic signal warrant analysis worksheets are provided in Appendix 7.2.

EXHIBIT 7-1: EAPC (2021) TRAFFIC VOLUMES



1 Dwy. 1/ Ginger Root Wy. & Mountain St. 	2 Dwy. 2 & Mountain St. 	3 Lake St. & Nichols Rd. 	4 Lake St. & Alberhill Ranch Rd. 	5 Lake St. & Dwy. 3 	6 Lake St. & Dwy. 4
7 Lake St. & Mountain St. 	8 Lake St./ Grand Av. & Lakeshore Dr. 	9 Lincoln St. & Grand Av. 	10 Terra Cotta Rd. (N) & Lakeshore Dr. 	11 Terra Cotta Rd. (S) & Lakeshore Dr. 	

EXHIBIT 7-2: EAPC (2021) SUMMARY OF LOS

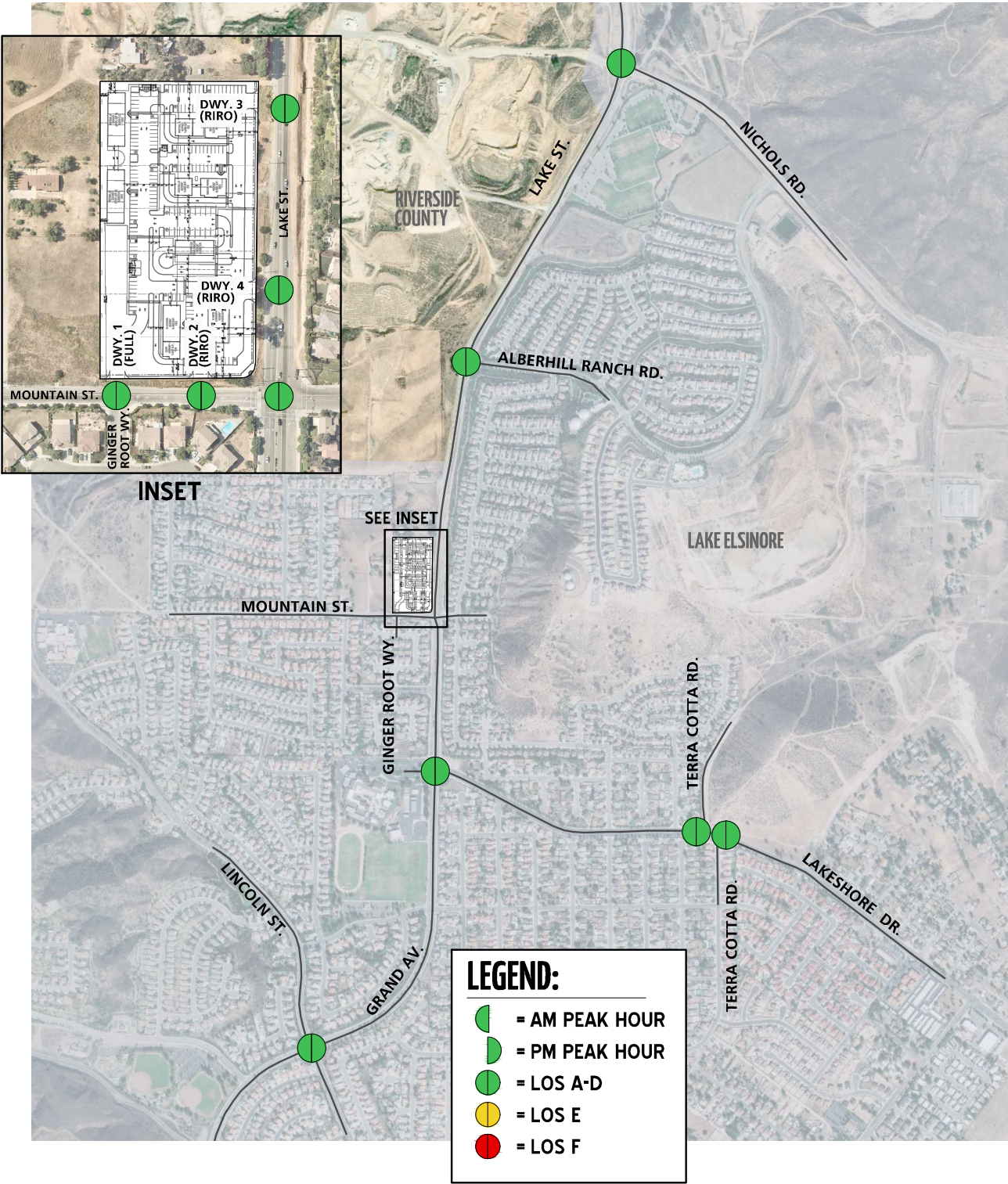


Table 7-1

Intersection Analysis for EAPC (2021) Conditions

#	Intersection	Traffic Control ²	EAPC (2021)			
			Delay ¹ (secs.)		Level of Service	
			AM	PM	AM	PM
1	Driveway 1/Ginger Root Wy. & Mountain St.	CSS	22.8	24.4	C	C
2	Driveway 2 & Mountain St.	<u>CSS</u>	10.0	10.7	B	B
3	Lake St. & Nichols Rd.	TS	23.7	34.1	C	C
4	Lake St. & Alberhill Ranch Rd.	TS	15.1	10.7	B	B
5	Lake St. & Driveway 3	<u>CSS</u>	13.7	27.9	B	D
6	Lake St. & Driveway 4	<u>CSS</u>	11.1	15.4	B	C
7	Lake St. & Mountain St.	TS	33.9	46.3	C	D
8	Lake St./Grand Av. & Lakeshore Dr.	TS	39.6	23.0	D	C
9	Lincoln St. & Grand Av.	TS	30.3	19.0	C	B
10	Terra Cotta Rd. (N) & Lakeshore Dr.	CSS	18.6	13.4	C	B
11	Terra Cotta Rd. (S) & Lakeshore Dr.	TS	11.3	9.4	B	A

¹ Per the Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. HCM delay reported in seconds.

² CSS = Cross-street Stop; TS = Traffic Signal; CSS = Improvement

7.5 RECOMMENDED IMPROVEMENTS

As shown in Table 7-1, the study area intersections are anticipated to operate at an acceptable LOS during the peak hours under EAPC (2021) traffic conditions. As such, no improvements have been recommended.

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8 LOCAL AND REGIONAL FUNDING MECHANISMS

Transportation improvements within the City of Lake Elsinore are funded through a combination of improvements constructed by the Project, development impact fee programs or fair share contributions. Identification and timing of needed improvements is generally determined through local jurisdictions based upon a variety of factors.

8.1 CITY OF LAKE ELSINORE TRANSPORTATION IMPACT FEE (TIF) PROGRAM

Transportation improvements throughout the City of Lake Elsinore are funded through a combination of project mitigation, fair share contributions or development impact fee programs, such as the Western Riverside Council of Governments (WRCOG) Transportation Uniform Mitigation Fee (TUMF) program or the City's Transportation Impact Fee (TIF) program. Identification and timing of needed improvements is generally determined through local jurisdictions based upon a variety of factors. These fees are collected as part of a funding mechanism aimed at ensuring that regional highways and arterial expansions keep pace with the projected vehicle trip increases.

Fees from new residential, commercial and industrial development are collected to fund local facilities. Under the City's TIF program, the City may grant to developers a credit against specific components of fees when those developers construct certain facilities and landscaped medians identified in the list of improvements funded by the TIF program.

The timing to use the TIF fees is established through periodic capital improvement programs which are overseen by the City's Engineering Department. Periodic traffic counts, review of traffic accidents, and a review of traffic trends throughout the City are also periodically performed by City staff and consultants. The City uses this data to determine the timing of the improvements listed in its facilities list. The City also uses this data to ensure that the improvements listed on the facilities list are constructed before the LOS falls below the LOS performance standards adopted by the City. In this way, the improvements are constructed before the LOS falls below the City's LOS performance thresholds. The City's TIF program establishes a timeline to fund, design, and build the improvements.

8.2 TRANSPORTATION UNIFORM MITIGATION FEE (TUMF) PROGRAM

The TUMF program is administered by the WRCOG based upon a regional Nexus Study most recently updated in 2016 to address major changes in right of way acquisition and improvement cost factors. (8) This regional program was put into place to ensure that development pays its fair share and that funding is in place for construction of facilities needed to maintain the requisite level of service and critical to mobility in the region. TUMF is a truly regional mitigation fee program and is imposed and implemented in every jurisdiction in Western Riverside County.

TUMF guidelines empower a local zone committee to prioritize and arbitrate certain projects. The Project is located in the Southwest Zone. The zone has developed a 5-year capital improvement program to prioritize public construction of certain roads. TUMF is focused on improvements necessitated by regional growth.

8.3 FAIR SHARE CONTRIBUTION

Project improvement may include a combination of fee payments to established programs, construction of specific improvements, payment of a fair share contribution toward future improvements or a combination of these approaches. Improvements constructed by development may be eligible for a fee credit or reimbursement through the program where appropriate (to be determined at the City's discretion).

When off-site improvements are identified with a minor share of responsibility assigned to proposed development, the approving jurisdiction may elect to collect a fair share contribution or require the development to construct improvements. These fees are collected with the proceeds solely used as part of a funding mechanism aimed at ensuring that regional highways and arterial expansions keep pace with the projected population increases.

9 REFERENCES

1. **Riverside County Transportation Department.** *Traffic Impact Analysis Preparation Guide*. Riverside County : s.n., April 2008.
2. **California Department of Transportation.** *Guide for the Preparation of Traffic Impact Studies*. December 2002.
3. **Institute of Transportation Engineers.** *Trip Generation Manual*. 10th Edition. 2017.
4. **Riverside County Transportation Commission.** *2011 Riverside County Congestion Management Program*. County of Riverside : RCTC, December 14, 2011.
5. **Transportation Research Board.** *Highway Capacity Manual (HCM)*. 6th Edition. s.l. : National Academy of Sciences, 2016.
6. **Caltrans.** *Manual on Uniform Traffic Control Devices (MUTCD)*. [book auth.] California Department of Transportation. *California Manual on Uniform Traffic Control Devices (CAMUTCD)*. 2014.
7. **Institute of Transportation Engineers.** *Trip Generation Handbook*. 3rd Edition. 2017.
8. **Western Riverside Council of Governments.** *TUMF Nexus Study, 2016 Program Update*. July 2017.

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APPENDIX 1.1:

APPROVED TRAFFIC STUDY SCOPING AGREEMENT

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SCOPING AGREEMENT FOR TRAFFIC IMPACT STUDY

This letter acknowledges the City of Lake Elsinore requirements for traffic impact analysis of the following project. The analysis must follow the Riverside County Transportation Department Traffic Study Guidelines dated February 2008.

Case No. _____
Related Cases - _____
SP No. _____
EIR No. _____
GPA No. _____
CZ No. _____
Project Name: Lake & Mountain Shopping Center
Project Address: Northwest Corner of Lake Street and Mountain Street
Project Description: 3,400 sf super convenience market w/ gas station and 1,525 SF QSR, 13,200 SF of shopping center, 5,840 SF of fast-food with drive-through window, 3,150 SF express car wash (with 1 tunnel)

	<u>Consultant</u>	<u>Developer</u> Representative
Name:	<u>Urban Crossroads, Inc. - Charlene So</u>	<u>Empire Design Group, Inc.</u>
Address:	<u>260 E. Baker St., Suite 200</u> <u>Costa Mesa, CA 92626</u>	<u>24861 Washington Av.</u> <u>Murrieta, CA 92562</u>
Telephone:	<u>949-336-5982</u>	<u>951-696-1490</u>
Fax:	_____	_____

A. Trip Generation Source: (ITE latest Edition) ITE Trip Generation Manual, 10th Edition (2017)

Current GP Land Use	Proposed Land Use
<u>Retail/Commercial</u>	<u>Retail/Commercial</u>
Current Zoning <u>C-2 - General Commercial</u>	Proposed Zoning <u>C-2 - General Commercial</u>

Current Trip Generation	Proposed Trip Generation
In	In
Out	Out
Total	Total
AM Trips <u>0</u>	<u>212</u>
<u>0</u>	<u>168</u>
<u>0</u>	<u>380</u>
PM Trips <u>0</u>	<u>162</u>
<u>0</u>	<u>157</u>
<u>0</u>	<u>319</u>

Internal Trip Allowance	☒ Yes	☐ No	(<u>Per ITE</u> % Trip Discount)
Pass-By Trip Allowance	☒ Yes	☐ No	(<u>Per ITE</u> % Trip Discount)

A passby trip discount of 25% is allowed for appropriate land uses. The passby trips at adjacent study area intersections and project driveways shall be indicated on a report figure.

B. Trip Geographic Distribution: N 19 % S 24 % E 24 % W 33 %
(attach exhibit for detailed assignment)

C. Background Traffic

Project Build-out Year: 2021 Annual Ambient Growth Rate: 2.0 %

Phase Year(s) No Phasing

Other area projects to be analyzed: Latest list of cumulative projects to be provided by the City's Planning Department

Model/Forecast methodology Not Applicable - No Horizon Year analysis scenario proposed

D. Study intersections: (NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.)

- | | |
|--|-------------------------------------|
| 1. Driveway 1/Ginger Root Wy. & Mountain St. | 6. Lake St. & Driveway 4 (RIRO) |
| 2. Driveway 2 & Mountain St. (RIRO) | 7. Lake St. & Mountain St. |
| 3. Lake St. & Nichols Rd. | 8. Lake St. & Lakeshore Dr. |
| 4. Lake St. & Alberhill Ranch Rd. | 9. Lincoln St. & Lake St. |
| 5. Lake St. & Driveway 3 (RIRO) | 10. Terra Cotta Rd. & Lakeshore Dr. |

E. Study Roadway Segments: (NOTE: Subject to revision after other projects, trip generation and distribution are determined, or comments from other agencies.)

- | | |
|---------|-----|
| 1. None | 6. |
| 2. | 7. |
| 3. | 8. |
| 4. | 9. |
| 5. | 10. |

E. Other Jurisdictional Impacts

Is this project within another Sphere of Influence or one-mile radius of City boundaries? ☒ Yes ☐ No

If so, name of Jurisdiction: Unincorporated County of Riverside

F. Site Plan (please attach reduced copy)

G. Specific issues to be addressed in the Study (in addition to the standard analysis described in the Guideline) (To be filled out by City Staff)

(NOTE: If the traffic study states that "a traffic signal is warranted" (or "a traffic signal appears to be warranted," or similar statement) at an existing unsignalized intersection under existing conditions, 8-hour approach traffic volume information must be submitted in addition to the peak hourly turning movement counts for that intersection.)

Site access queues; On-site Circulation/traffic calming measures; TIA to discuss how RIRO driveways will be restricted/enforced

H. Existing Conditions

Traffic count data must be new or recent. Provide traffic count dates if using other than new counts.

Date of counts Counts to be taken when schools are in session and operating on normal bell schedules on a Tues, Wed or Thurs

***NOTE* Traffic Study Submittal Form and appropriate fee must be submitted with, or prior to submittal of this form. Staff will not process the Scoping Agreement prior to receipt of the fee.**

Recommended by:

Charlene S.
Consultant's Representative

09/25/2019

Date

Approved Scoping Agreement:

NRL
City of Lake Elsinore

10/1/2019

Date

Scoping Agreement Submitted on 08/30/2019

Revised on 09/09/2019, 09/25/2019, _____

Date: September 25, 2019

Mr. Justin Kirk
City of Lake Elsinore
130 South Main Street
Lake Elsinore, CA 92530

SUBJECT: LAKE & MOUNTAIN SHOPPING CENTER SCOPING AGREEMENT

Dear Mr. Justin Kirk:

The firm of Urban Crossroads, Inc. is pleased to submit this Scoping Agreement for the proposed Lake & Mountain Shopping Center development (referred to as “Project”), which is located on the northwest corner of Lake Street and Mountain Street in the City of Lake Elsinore. It is our understanding that the Project is to consist of the following uses:

- Retail A: 5,000 sf of shopping center use
- Retail B: 5,000 sf of shopping center use
- Retail C: 1,600 sf of shopping center use
- Retail D: 1,600 sf of shopping center use
- Drive Thru A: 3,320 sf of fast-food with drive-through window
- Drive Thru B: 2,520 sf of fast-food with drive-through window
- 3,150 sf Express Car Wash
- 1,525 sf Quick Serve Restaurant with drive-through window
- 12 vehicle fueling position gas station (with 3,400 sf convenience store)

For purposes of the traffic analysis it is anticipated that the Project will be developed in a single phase with an anticipated Opening Year of 2021.

Our goal is to obtain comments from City of Lake Elsinore staff, to ensure that the traffic study fully addresses the potential impacts of the proposed Project. The remainder of this letter describes the draft proposed analysis methodology, project trip generation, trip distribution, and project traffic assignment/project trips on the surrounding roadway network, which have been used to establish the draft proposed project study area and analysis locations.

Exhibit 1 depicts the location of the proposed Project in relation to the existing roadway network. As indicated on Exhibit 1, access to the Project site is proposed to be provided to both Mountain Street and Lake Street. Driveway 1 on Mountain Street will be the only full access driveway while Driveway 2 and the driveways on Lake Street will be limited to right-in/right-out access only.

STUDY AREA

Exhibit 2 identifies the proposed study area intersections based on the Project's trip generation, trip distribution patterns, and contribution of 50 or more peak hour trips.

ANALYSIS SCENARIOS

Consistent with traffic study guidelines adopted by multiple local jurisdictions throughout the County of Riverside, peak hour operations at each of the study area intersections and site access driveways will be assessed for the following analysis scenarios:

1. Existing (2019) Conditions (Baseline)
2. Existing plus Project (E+P) Conditions
3. Existing plus Ambient Growth plus Project (2021) Conditions
4. Existing plus Ambient Growth plus Project plus Cumulative (2021) Conditions

Analysis Scenario #1 establishes the baseline for CEQA purposes.

Consistent with recent CEQA case law, Analysis Scenarios #2 (compared to Scenario #1) and #4 (compared to Scenario #3) identify significant traffic impacts associated with the proposed Project.

Analysis Scenario #5 would identify cumulative impacts for Opening Year Cumulative traffic conditions. It is assumed that intersection improvements required to address Opening Year Cumulative traffic impacts will be addressed through either an existing fee program, or through a fair-share contribution.

Peak hour operations and level of service for study area intersections will be evaluated for the following time periods:

- Weekday AM Peak Hour (7PM-9PM)
- Weekday PM Peak Hour (4PM-6PM)

TRIP GENERATION

Trip generation represents the amount of traffic which is both attracted to and produced by a development. Determining traffic generation for a specific project is therefore based upon forecasting the amount of traffic that is expected to be both attracted to and produced by the specific land uses being proposed for a given development.

Trip generation rates used to estimate Project traffic are shown in Table 1. The trip generation rates used for this analysis are based upon information collected by the Institute of Transportation Engineers (ITE) as provided in their Trip Generation Manual, 10th Edition, 2017. The trip generation rates are

based upon data collected by the ITE for Shopping Center (ITE Land Use Code 820), Fast-Food with Drive-Through Window Restaurant (ITE Land Use Code 934), Super Convenience Market/Gas Station (ITE Land Use Code 960), and Automated Car Wash (ITE Land Use Code 948).

As the project is proposed to include shopping center, gas station, and other complementary uses, pass-by percentages have been obtained from the ITE Trip Generation Handbook (3rd Edition, 2017). Patrons of the gas station may also visit other uses on-site, including the restaurants, car wash, and retail uses, without leaving the site. The ITE Trip Generation Handbook has been utilized to determine the internal capture for the applicable mix of uses.

Internal capture is a percentage reduction that can be applied to the trip generation estimates for individual land uses to account for trips internal to the site. In other words, trips may be made between individual retail uses on-site and can be made either by walking or using internal roadways without using external streets. As the trip generation for the site was conservatively estimated based on individual land uses as opposed to the average ITE Shopping Center rate, an internal capture reduction was applied to recognize the interactions that would occur between the various complementary land uses. The internal capture is based on the National Cooperative Highway Research Program's (Report 684) internal capture trip capture estimation tool. These internal capture worksheets are attached to this scoping agreement.

As shown in Table 2, the proposed Project is anticipated to generate a net total of 3,696 trip-ends per day, 380 AM peak hour trips and 319 PM peak hour trips.

TRIP DISTRIBUTION

The Project trip distribution patterns were developed based on an understanding of existing travel patterns in the area, the geographical location of the site, and the site's proximity to the regional arterial and state highway system. Project travel patterns were derived for each of the proposed land uses. Exhibit 3 shows the trip distribution patterns for the Project.

LEVEL OF SERVICE (LOS) CRITERIA

The City of Lake Elsinore has established LOS D as the minimum level of service for its intersections. Therefore, any intersection operating at LOS E or F will be considered deficient for the purposes of this analysis.

CEQA COMPLIANCE AND DOCUMENTATION

The following types of traffic impacts are considered to be significant under CEQA:

- When existing traffic conditions exceed the General Plan target LOS (e.g., LOS D or better).
- When project traffic, when added to existing traffic, will deteriorate the LOS to below the target LOS, and impacts cannot be mitigated through project conditions of approval.
- When cumulative traffic exceeds the target LOS, and impacts cannot be mitigated through the TUMF network (or other funding mechanism), project conditions of approval, or other implementation mechanism.

EXISTING COUNT DATA

The weekday traffic counts will be conducted on a typical day (Tuesday, Wednesday, or Thursday), when local schools are in session and operating on normal bell schedules.

AMBIENT GROWTH

Consistent with other studies performed in the area, an ambient growth rate of 2% per year is proposed for the study area intersections to approximate background traffic growth not identified by nearby cumulative development projects. The rate will be compounded over a two-year period (i.e., $1.02^{2\text{years}} = 1.0404$ or 4.04% for 2021).

SPECIAL ISSUES

The following special issues will also be addressed as part of the TIA:

- Site Access Evaluation: The turn pocket lengths will be determined through peak hour traffic simulations developed using SimTraffic software in an effort to identify the required storage capacity for turn lanes at each applicable Project driveway.
- On-site Circulation: Provide a qualitative assessment of the on-site circulation and potential traffic calming measures.
- Right-in/Right-out Access: Provide a discussion on how the proposed right-in/right-out driveways will be restricted/enforced.

CUMULATIVE DEVELOPMENT PROJECTS

The updated list of cumulative projects is provided on Table 3 and shown graphically on Exhibit 4 based on information provided by City staff.

Mr. Justin Kirk
City of Lake Elsinore
September 25, 2019
Page 5 of 5

If you have any questions, please contact me directly at (949) 336-5982.

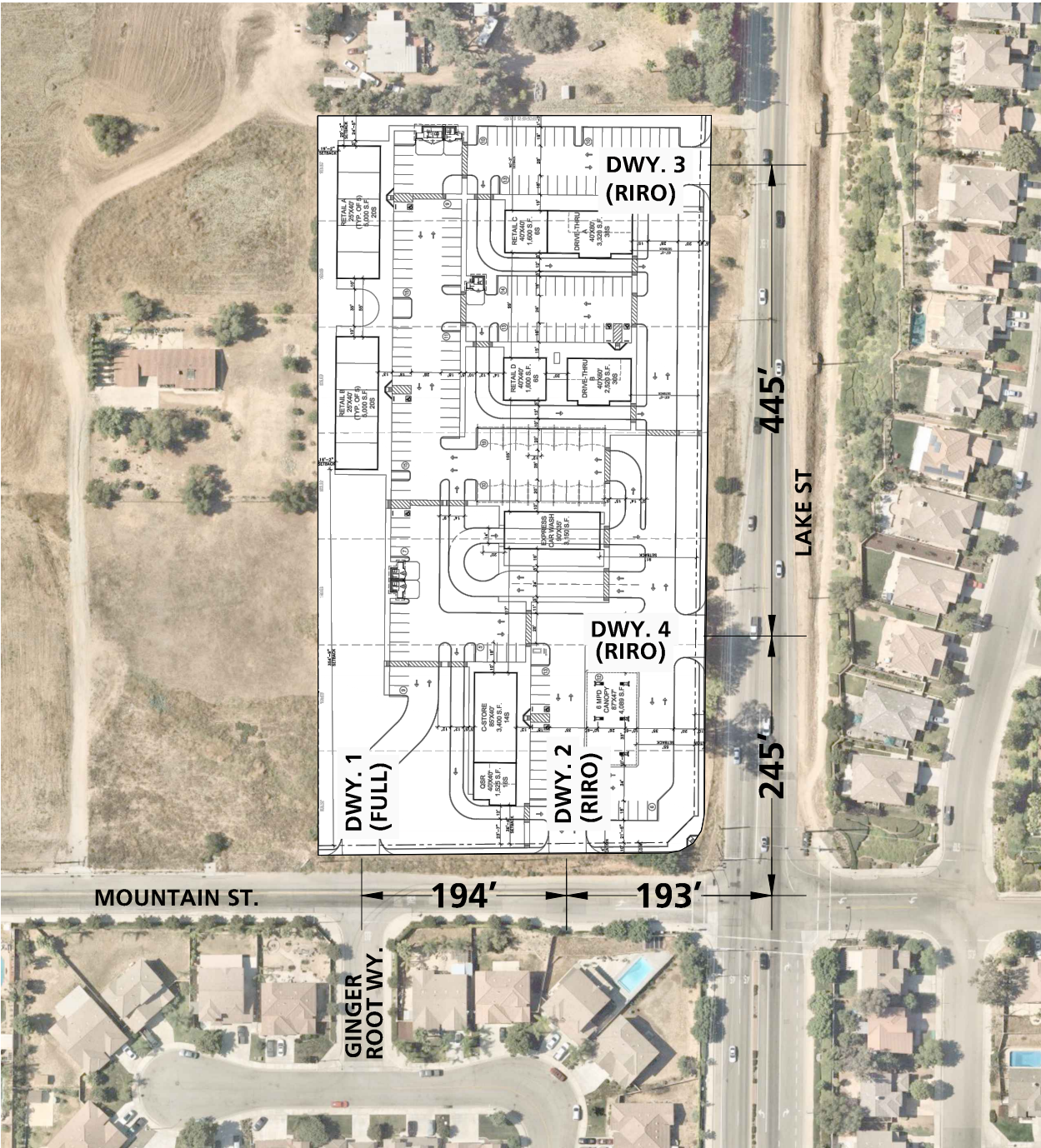
Respectfully submitted,

URBAN CROSSROADS, INC.

A handwritten signature in cursive script that reads "Charlene So".

Charlene So, PE
Associate Principal

EXHIBIT 1: PRELIMINARY SITE PLAN



LEGEND:

RIRO = RIGHT-IN/RIGHT-OUT ONLY ACCESS



EXHIBIT 2: LOCATION MAP

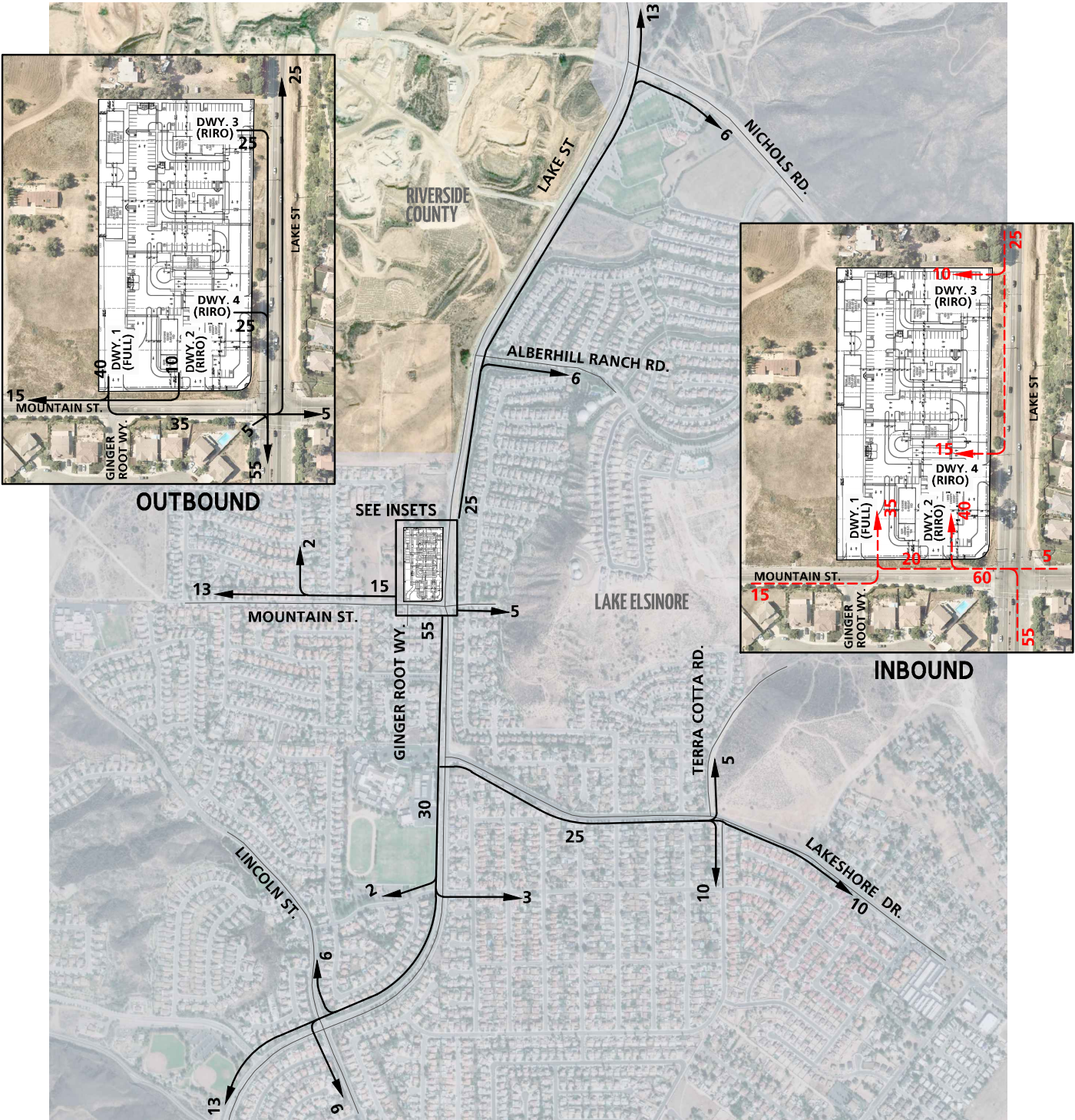


LEGEND:

- ① = EXISTING INTERSECTION ANALYSIS LOCATION
- ② = FUTURE INTERSECTION ANALYSIS LOCATION



EXHIBIT 3: PROJECT TRIP DISTRIBUTION



LEGEND:

- 10 = PERCENT TO/FROM PROJECT
- ← = OUTBOUND
- = INBOUND



EXHIBIT 4: CUMULATIVE DEVELOPMENT LOCATION MAP

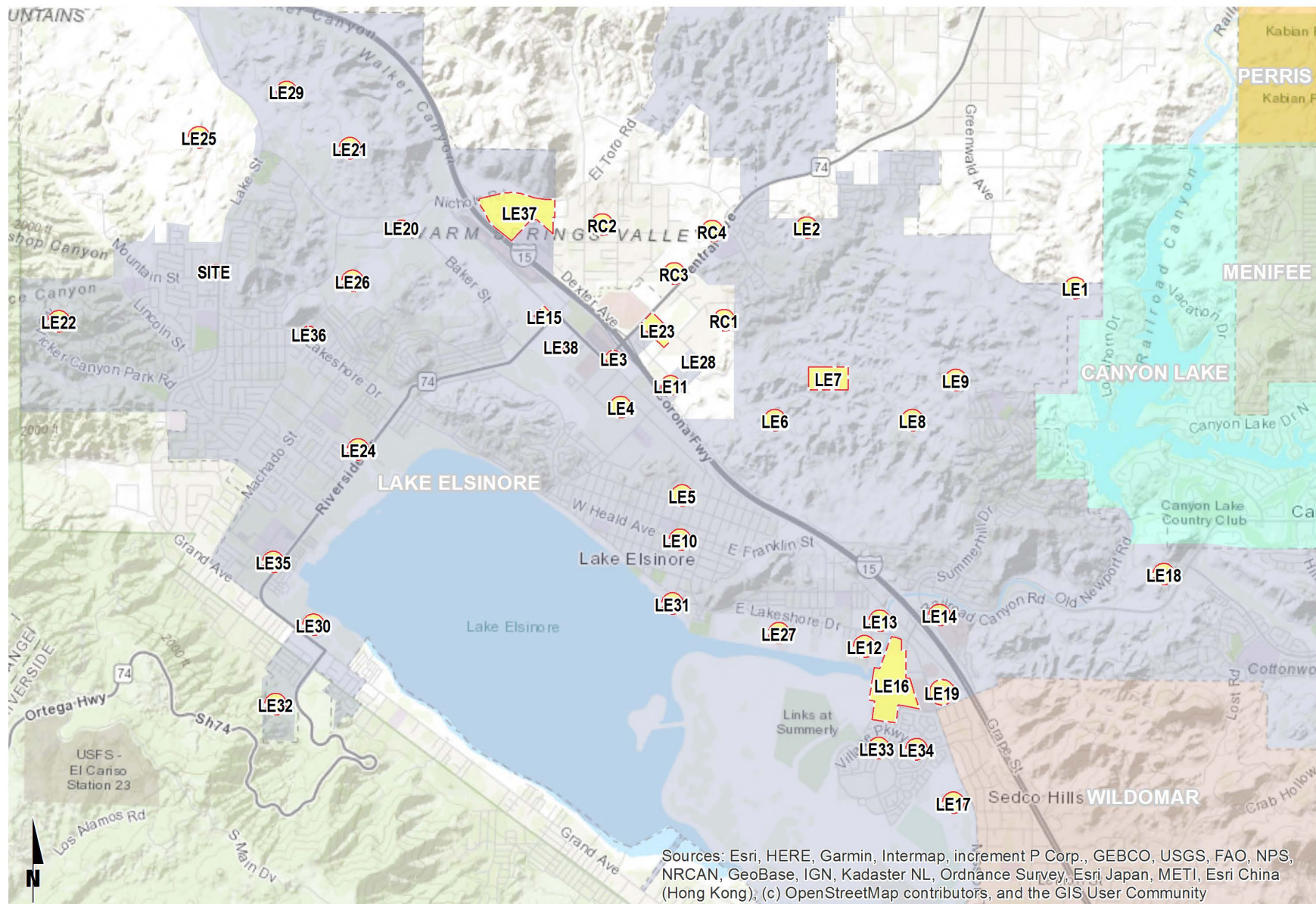


Table 1

Project Trip Generation Rates

Land Use ¹	Units ²	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Shopping Center ³	TSF	820	7.440	4.560	12.000	4.420	4.780	9.200	114.930
Fast-Food Restaurant with Drive-Through Window	TSF	934	20.497	19.693	40.190	16.988	15.682	32.670	470.950
Super Convenience Mkt./Gas Station	TSF	960	41.570	41.570	83.140	34.640	34.640	69.280	837.580
Automated Car Wash ⁴	TUN	948	N/A	N/A	N/A	38.750	38.750	77.500	775.000

¹ Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, Tenth Edition (2017).

² TSF = thousand square feet; TUN = Tunnels

³ Trip generation rates are based on the regression equation.

⁴ AM peak hour and daily trip generation rate not available. Daily rate estimated at 10 times the PM peak hour rate.

Table 2

Project Trip Generation Summary

Project Land Uses	Quantity	Units ¹	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Shopping Center	13.200	TSF	98	60	158	58	63	121	1,517
Internal Capture (Retail to Restaurant) ² :			-1	-1	-2	-5	-4	-9	-113
Net External Trips:			97	59	156	53	59	112	1,404
Pass-by Reduction (PM/Daily: 34%) ³ :			0	0	0	-18	-18	-36	-478
<i>Shopping Center Total:</i>			97	59	156	35	41	76	926
Gasoline/Service Station w/Convenience Mkt.	3.400	TSF	141	141	282	118	118	236	2,848
Internal Capture (Retail to Restaurant) ² :			-18	-25	-43	-42	-32	-74	-894
Net External Trips:			123	116	239	76	86	162	1,954
Pass-by Reduction (AM: 62%; PM/Daily: 56%) ³ :			-72	-72	-144	-43	-43	-86	-1,094
<i>Gasoline/Service Station w/Conven. Mkt. Total:</i>			51	44	95	33	43	76	860
Fast-Food Restaurant with Drive-Through Window	7.365	TSF	151	145	296	125	115	240	3,470
Internal Capture (Restaurant to Retail) ² :			-26	-19	-45	-36	-47	-83	-1,202
Net External Trips:			125	126	251	89	68	157	2,268
Pass-by Reduction (AM: 49%, PM: 50%, Daily: 50%) ³ :			-61	-61	-122	-34	-34	-68	-1,134
<i>Fast-Food Restaurant with Drive-Through Window Total:</i>			64	65	129	55	34	89	1,134
Automated Car Wash	1.000	TUN	N/A	N/A	N/A	39	39	78	776
Total Net Trips			212	168	380	162	157	319	3,696

¹ TSF = thousand square feet; TUN = Tunnels

² Internal capture calculated from NCHRP 684 Internal Trip Capture Estimation Tool.

³ Source: ITE [Trip Generation Handbook](#), 3rd Edition, 2017.

Table 3
Page 1 of 2

Summary of Cumulative Development Land Uses

No.	Project Name	Location	Land Use	Quantity ¹	
City of Lake Elsinore					
LE1	Greenwald ²	Lake Elsinore	Shopping Center	104.450	TSF
LE2	Ramsgate	Lake Elsinore	Single Family Residential	1,306	DU
			Condo/Townhomes	120	DU
LE3	Honda	Lake Elsinore	Automobile Sales	53.400	TSF
LE4	Fairway Business Park	Lake Elsinore	Warehouse	279.445	TSF
LE5	Ness Industrial Garage	Lake Elsinore	Warehouse	12.000	TSF
LE6	Spyglass Ranch ³	Lake Elsinore	Single Family Residential	523	DU
			Condo/Townhomes	171	DU
			Shopping Center	145.00	TSF
LE7	South Shore I (Tract 31593)	Lake Elsinore	Single Family Residential	521	DU
	South Shore II (Tract 36567)	Lake Elsinore	Single Family Residential	147	DU
LE8	La Strada (Tract 32077)	Lake Elsinore	Single Family Residential	134	DU
LE9	Tuscany West (Tract 25473)	Lake Elsinore	Single Family Residential	164	DU
LE10	Marina Village Condos (Tract 33820) ⁶	Lake Elsinore	Condo/Townhomes	94	DU
LE11	La Quinta Inn	Lake Elsinore	Hotel	64	RM
LE12	LE Sports Complex	Lake Elsinore	Recreational Community Center	525.000	TSF
LE13	TAG Property ⁴	Lake Elsinore	New Car Sales	50.000	TSF
LE14	City Center Condos ⁴	Lake Elsinore	Condo/Townhomes	144	DU
LE15	Kassab Travel Center	Lake Elsinore	High Turnover (Sit-Down) Restaurant	17.200	TSF
LE16	Diamond Specific Plan ⁵	Lake Elsinore	Condo/Townhomes	600	DU
			Hotel	150	RM
			General Office	425.000	TSF
			Shopping Center	472.000	TSF
LE17	The Colony ⁴	Lake Elsinore	Apartments	211	DU
	Back Basin Specific Plan & East Lake Specific Plan	Lake Elsinore	Single Family Residential	2,407	DU
			Condo/Townhomes	324	DU
	John Laing Homes (Phase 2)	Lake Elsinore	Single Family Residential	506	DU
			Condo/Townhomes	1,141	DU
			Apartments	308	DU
			Shopping Center	117.000	TSF
LE18	Canyon Hills Estates (Tract 34249)	Lake Elsinore	Single Family Residential	302	DU
	Canyon Hills (Multiple Tracts)	Lake Elsinore	Single Family Residential	2,700	DU
			Apartments	1,575	DU
	Audie Murphy (Tract 36484)	Lake Elsinore	Single Family Residential	109	DU
	Audie Murphy (Tract 36485)	Lake Elsinore	Single Family Residential	1,003	DU
LE19	Artisan Alley	Lake Elsinore	Shopping Center	95.100	TSF
LE20	Quikrete Plant	Lake Elsinore	Warehouse	163.900	TSF
LE21	Alberhill Ridge (Tract 35001)	Lake Elsinore	Single Family Residential	1,056	DU
			Apartments	345	DU
			Shopping Center	679.000	TSF
			General Office	679.000	TSF

Table 3
Page 2 of 2

Summary of Cumulative Development Land Uses

No.	Project Name	Location	Land Use	Quantity ¹	
LE22	Alberhill Ranch	Lake Elsinore	Single Family Residential	1,986	DU
LE23	Lake Elsinore Walmart	Lake Elsinore	Free-Standing Discount Superstore	154.487	TSF
			Specialty Retail	4.600	TSF
			Fast Food w/Drive Thru	6.800	TSF
			Fast Food w/o Drive Thru	4.600	TSF
LE24	Circle K	Lake Elsinore	Gas Station	4.500	TSF
LE25	Alberhill Villages	Lake Elsinore	Single Family Residential	9,536	DU
LE26	Terracina	Lake Elsinore	Single Family Residential	365	DU
LE27	Lakeshore Senior Apartments	Lake Elsinore	Senior Adult Housing Attached	121	DU
LE28	North Peak Plaza	Lake Elsinore	Condo/Townhomes	92	DU
			Shopping Center	92.000	TSF
LE29	Running Deer (TR 31957)	Lake Elsinore	Single Family Residential	101	DU
LE30	Wake Rider Beach Resort	Lake Elsinore	Beach Resort	11.350	TSF
LE31	Lakeshore Town Center	Lake Elsinore	Town Center	237.400	TSF
LE32	Ortega	Lake Elsinore	Single Family Residential	105	DU
LE33	Summerly	Lake Elsinore	Single Family Residential	142	DU
LE34	Beazer, KB Homes, McMillin Homes, Richmond American	Lake Elsinore	Single Family Residential	395	DU
LE35	Village at Lake Elsinore SPA #1	Lake Elsinore	Single Family Residential	163	DU
LE36	Lakeview Manor	Lake Elsinore	Condo/Townhomes	104	DU
LE37	Nichols Ranch	Lake Elsinore	Single Family Residential	168	DU
			Park	8.3	AC
			Hotel	130	RM
			Fast-food with Drive-Through	6.000	TSF
			Fast-food without Drive-Through	5.500	TSF
			High Turnover (Sit-Down) Restaurant	9.400	TSF
			Shopping Center	4.400	TSF
			Health & Fitness Club	8.000	TSF
			General Office	43.000	TSF
			Gas Station w/ Market and Car Wash	16	VFP
LE38	Tige Watersports	Lake Elsinore	Shopping Center	34.500	TSF
County of Riverside					
RC1	Lennar (Tract 31792)	County of Riverside	Single Family Residential	191	DU
RC2	PM33840	County of Riverside	Single Family Residential	4	DU
RC3	PP20158R1	County of Riverside	Storage Facility	103.727	TSF
RC4	CUP03651	County of Riverside	Recycling Facility	0.504	TSF

¹ TSF = Thousand Square Feet; DU = Dwelling Unit; AC = Acres; STU = Students; VFP = Vehicle Fueling Positions

² Source: Greenwald Avenue Commercial Center TIA, Urban Crossroads, Inc., May 2008.

³ Source: Spyglass Ranch TIA (Revised), Kunzman Associates, February 2007.

⁴ Source: Lake Elsinore TAG Property TIA (Revised), Urban Crossroads, Inc., August 2008.

⁵ Source: The Diamond Specific Plan TIA, Urban Crossroads, Inc., April 2009.

NCHRP 684 Internal Trip Capture Estimation Tool					
Project Name:	Lake and Mountain			Organization:	Urban Crossroads, Inc.
Project Location:	NWC Lake and Mountain			Performed By:	CS
Scenario Description:				Date:	9/9/2019
Analysis Year:				Checked By:	
Analysis Period:	AM Street Peak Hour			Date:	

Table 1-A: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				440	239	201
Restaurant				296	151	145
Cinema/Entertainment				0		
Residential				0		
Hotel				0		
All Other Land Uses ²				0		
				736	390	346

Table 2-A: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-A: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-A: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		26	0	0	0
Restaurant	0	19		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-A: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	736	390	346
Internal Capture Percentage	12%	12%	13%
External Vehicle-Trips ⁵	646	345	301
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-A: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	8%	13%
Restaurant	17%	13%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	N/A	N/A

¹ Land Use Codes (LUCs) from <i>Trip Generation Manual</i> , published by the Institute of Transportation Engineers.
² Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.
³ Enter trips assuming no transit or non-motorized trips (as assumed in ITE <i>Trip Generation Manual</i>).
⁴ Enter vehicle occupancy assumed in Table 1-A vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be made to Tables 5-A, 9-A (O and D). Enter transit, non-motorized percentages that will result with proposed mixed-use project complete.
⁵ Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-A.
⁶ Person-Trips
*Indicates computation that has been rounded to the nearest whole number.
Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

NCHRP 684 Internal Trip Capture Estimation Tool					
Project Name:	Lake and Mountain			Organization:	Urban Crossroads, Inc.
Project Location:	NWC Lake and Mountain			Performed By:	CS
Scenario Description:				Date:	9/9/2019
Analysis Year:				Checked By:	
Analysis Period:	PM Street Peak Hour			Date:	

Table 1-P: Base Vehicle-Trip Generation Estimates (Single-Use Site Estimate)						
Land Use	Development Data (For Information Only)			Estimated Vehicle-Trips ³		
	ITE LUCs ¹	Quantity	Units	Total	Entering	Exiting
Office				0		
Retail				435	215	220
Restaurant				240	125	115
Cinema/Entertainment				0		
Residential				0		
Hotel				0		
All Other Land Uses ²				0		
				675	340	335

Table 2-P: Mode Split and Vehicle Occupancy Estimates						
Land Use	Entering Trips			Exiting Trips		
	Veh. Occ. ⁴	% Transit	% Non-Motorized	Veh. Occ. ⁴	% Transit	% Non-Motorized
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						
All Other Land Uses ²						

Table 3-P: Average Land Use Interchange Distances (Feet Walking Distance)						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office						
Retail						
Restaurant						
Cinema/Entertainment						
Residential						
Hotel						

Table 4-P: Internal Person-Trip Origin-Destination Matrix*						
Origin (From)	Destination (To)					
	Office	Retail	Restaurant	Cinema/Entertainment	Residential	Hotel
Office		0	0	0	0	0
Retail	0		36	0	0	0
Restaurant	0	47		0	0	0
Cinema/Entertainment	0	0	0		0	0
Residential	0	0	0	0		0
Hotel	0	0	0	0	0	

Table 5-P: Computations Summary			
	Total	Entering	Exiting
All Person-Trips	675	340	335
Internal Capture Percentage	25%	24%	25%
External Vehicle-Trips ⁵	509	257	252
External Transit-Trips ⁶	0	0	0
External Non-Motorized Trips ⁶	0	0	0

Table 6-P: Internal Trip Capture Percentages by Land Use		
Land Use	Entering Trips	Exiting Trips
Office	N/A	N/A
Retail	22%	16%
Restaurant	29%	41%
Cinema/Entertainment	N/A	N/A
Residential	N/A	N/A
Hotel	N/A	N/A

¹ Land Use Codes (LUCs) from <i>Trip Generation Manual</i> , published by the Institute of Transportation Engineers.
² Total estimate for all other land uses at mixed-use development site is not subject to internal trip capture computations in this estimator.
³ Enter trips assuming no transit or non-motorized trips (as assumed in ITE <i>Trip Generation Manual</i>).
⁴ Enter vehicle occupancy assumed in Table 1-P vehicle trips. If vehicle occupancy changes for proposed mixed-use project, manual adjustments must be
⁵ Vehicle-trips computed using the mode split and vehicle occupancy values provided in Table 2-P.
⁶ Person-Trips
*Indicates computation that has been rounded to the nearest whole number.
Estimation Tool Developed by the Texas A&M Transportation Institute - Version 2013.1

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APPENDIX 1.2:

SITE ADJACENT QUEUING WORKSHEETS

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Existing (2019) Conditions

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Queuing and Blocking Report
Existing (2019) Conditions - AM Peak Hour

01/16/2020

Intersection: 1: Ginger Root Wy./Dwy. 1 & Mountain St.

Movement	WB	NB
Directions Served	LT	LTR
Maximum Queue (ft)	21	39
Average Queue (ft)	1	9
95th Queue (ft)	9	33
Link Distance (ft)	128	160
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Lake St. & Mountain St.

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	TR
Maximum Queue (ft)	98	182	74	89	108	489	44	46	125	140
Average Queue (ft)	76	95	30	33	26	162	10	9	50	56
95th Queue (ft)	109	189	64	73	82	365	32	32	110	122
Link Distance (ft)		98		435		1317	1317		141	141
Upstream Blk Time (%)	8	11							0	0
Queuing Penalty (veh)	0	28							0	1
Storage Bay Dist (ft)	75		85		170			145		
Storage Blk Time (%)	26	5	1	1		6			0	
Queuing Penalty (veh)	24	9	1	0		1			0	

Zone Summary

Zone wide Queuing Penalty: 64

Queuing and Blocking Report
Existing (2019) Conditions - PM Peak Hour

01/16/2020

Intersection: 1: Ginger Root Wy./Dwy. 1 & Mountain St.

Movement	WB	NB
Directions Served	LT	LTR
Maximum Queue (ft)	16	31
Average Queue (ft)	1	4
95th Queue (ft)	8	21
Link Distance (ft)	128	160
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 7: Lake St. & Mountain St.

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	TR
Maximum Queue (ft)	81	106	53	37	91	222	26	94	157	152
Average Queue (ft)	42	30	16	9	41	76	3	31	79	76
95th Queue (ft)	75	75	40	27	80	174	17	73	148	150
Link Distance (ft)		98		435		1317	1317		141	141
Upstream Blk Time (%)	0	0						0	1	1
Queuing Penalty (veh)	0	0						0	5	4
Storage Bay Dist (ft)	75		85		170			145		
Storage Blk Time (%)	5	0				1		0	1	
Queuing Penalty (veh)	2	0				0		0	0	

Zone Summary

Zone wide Queuing Penalty: 12

E+P Conditions

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Intersection: 1: Ginger Root Wy./Dwy. 1 & Mountain St.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	94	28	56	97
Average Queue (ft)	16	1	13	53
95th Queue (ft)	61	9	42	85
Link Distance (ft)	724	130	160	176
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Mountain St. & Dwy. 2

Movement	EB	SB
Directions Served	T	R
Maximum Queue (ft)	201	31
Average Queue (ft)	62	11
95th Queue (ft)	167	35
Link Distance (ft)	130	167
Upstream Blk Time (%)	4	
Queuing Penalty (veh)	17	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Lake St. & Dwy. 3

Movement	EB
Directions Served	R
Maximum Queue (ft)	87
Average Queue (ft)	28
95th Queue (ft)	59
Link Distance (ft)	180
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
E+P Conditions - AM Peak Hour

01/16/2020

Intersection: 6: Lake St. & Dwy. 4

Movement	EB	SB	SB
Directions Served	R	T	TR
Maximum Queue (ft)	96	73	49
Average Queue (ft)	36	5	6
95th Queue (ft)	63	30	27
Link Distance (ft)	81	394	394
Upstream Blk Time (%)	2		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: Lake St. & Mountain St.

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	TR
Maximum Queue (ft)	98	208	81	83	250	496	27	30	159	162
Average Queue (ft)	95	158	30	36	170	191	8	6	103	110
95th Queue (ft)	104	199	67	68	255	365	27	24	162	163
Link Distance (ft)		98		435		1317	1317		141	141
Upstream Blk Time (%)	21	28							4	4
Queuing Penalty (veh)	0	117							12	13
Storage Bay Dist (ft)	75		85		170			145		
Storage Blk Time (%)	50	8	0	1	10	8			4	
Queuing Penalty (veh)	53	27	0	0	75	18			0	

Zone Summary

Zone wide Queuing Penalty: 332

Queuing and Blocking Report
E+P Conditions - PM Peak Hour

01/16/2020

Intersection: 1: Ginger Root Wy./Dwy. 1 & Mountain St.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	53	51	31	122
Average Queue (ft)	5	2	2	70
95th Queue (ft)	26	17	15	108
Link Distance (ft)	724	130	160	176
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Mountain St. & Dwy. 2

Movement	EB	SB
Directions Served	T	R
Maximum Queue (ft)	158	55
Average Queue (ft)	39	17
95th Queue (ft)	121	46
Link Distance (ft)	130	167
Upstream Blk Time (%)	1	
Queuing Penalty (veh)	3	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Lake St. & Dwy. 3

Movement	EB
Directions Served	R
Maximum Queue (ft)	51
Average Queue (ft)	30
95th Queue (ft)	47
Link Distance (ft)	180
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
E+P Conditions - PM Peak Hour

01/16/2020

Intersection: 6: Lake St. & Dwy. 4

Movement	EB	SB	SB
Directions Served	R	T	TR
Maximum Queue (ft)	133	290	228
Average Queue (ft)	72	118	104
95th Queue (ft)	122	224	218
Link Distance (ft)	81	394	394
Upstream Blk Time (%)	27		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: Lake St. & Mountain St.

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	TR
Maximum Queue (ft)	98	219	45	41	249	410	27	96	203	180
Average Queue (ft)	88	147	10	17	201	182	4	36	151	149
95th Queue (ft)	115	221	33	38	272	386	20	76	184	177
Link Distance (ft)		98		435		1317	1317		141	141
Upstream Blk Time (%)	16	25							27	26
Queuing Penalty (veh)	0	87							147	138
Storage Bay Dist (ft)	75		85		170			145		
Storage Blk Time (%)	40	10			24	1			27	
Queuing Penalty (veh)	22	31			72	4			9	

Zone Summary

Zone wide Queuing Penalty: 513

EAP Conditions

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Queuing and Blocking Report
EAP (2021) Conditions - AM Peak Hour

01/16/2020

Intersection: 1: Ginger Root Wy./Dwy. 1 & Mountain St.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	52	27	31	144
Average Queue (ft)	11	2	12	53
95th Queue (ft)	37	11	35	97
Link Distance (ft)	724	130	160	176
Upstream Blk Time (%)				
Queuing Penalty (veh)				
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Mountain St. & Dwy. 2

Movement	EB	SB
Directions Served	T	R
Maximum Queue (ft)	158	31
Average Queue (ft)	49	11
95th Queue (ft)	141	35
Link Distance (ft)	130	167
Upstream Blk Time (%)	2	
Queuing Penalty (veh)	7	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Lake St. & Dwy. 3

Movement	EB
Directions Served	R
Maximum Queue (ft)	93
Average Queue (ft)	29
95th Queue (ft)	56
Link Distance (ft)	180
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Queuing and Blocking Report
EAP (2021) Conditions - AM Peak Hour

01/16/2020

Intersection: 6: Lake St. & Dwy. 4

Movement	EB	SB	SB
Directions Served	R	T	TR
Maximum Queue (ft)	113	74	74
Average Queue (ft)	36	16	10
95th Queue (ft)	72	65	44
Link Distance (ft)	81	394	394
Upstream Blk Time (%)	1		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: Lake St. & Mountain St.

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	TR
Maximum Queue (ft)	98	171	62	83	250	584	31	31	181	169
Average Queue (ft)	90	150	21	32	170	262	11	9	107	125
95th Queue (ft)	109	209	48	70	261	481	32	29	168	174
Link Distance (ft)		98		435		1317	1317		141	141
Upstream Blk Time (%)	16	25							5	5
Queuing Penalty (veh)	0	108							15	16
Storage Bay Dist (ft)	75		85		170			145		
Storage Blk Time (%)	40	8		0	8	16			5	
Queuing Penalty (veh)	45	24		0	58	38			0	

Zone Summary

Zone wide Queuing Penalty: 311

Queuing and Blocking Report
EAP (2021) Conditions - PM Peak Hour

01/16/2020

Intersection: 1: Ginger Root Wy./Dwy. 1 & Mountain St.

Movement	EB	WB	NB	SB
Directions Served	LTR	LTR	LTR	LTR
Maximum Queue (ft)	52	24	30	159
Average Queue (ft)	10	1	3	79
95th Queue (ft)	38	9	19	138
Link Distance (ft)	724	130	160	176
Upstream Blk Time (%)				0
Queuing Penalty (veh)				0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Mountain St. & Dwy. 2

Movement	EB	SB
Directions Served	T	R
Maximum Queue (ft)	174	42
Average Queue (ft)	67	14
95th Queue (ft)	167	40
Link Distance (ft)	130	167
Upstream Blk Time (%)	4	
Queuing Penalty (veh)	15	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Lake St. & Dwy. 3

Movement	EB	SB
Directions Served	R	TR
Maximum Queue (ft)	88	8
Average Queue (ft)	30	0
95th Queue (ft)	63	5
Link Distance (ft)	180	1691
Upstream Blk Time (%)		
Queuing Penalty (veh)		
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Queuing and Blocking Report
EAP (2021) Conditions - PM Peak Hour

01/16/2020

Intersection: 6: Lake St. & Dwy. 4

Movement	EB	SB	SB
Directions Served	R	T	TR
Maximum Queue (ft)	110	244	258
Average Queue (ft)	58	129	120
95th Queue (ft)	105	224	226
Link Distance (ft)	81	394	394
Upstream Blk Time (%)	11		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: Lake St. & Mountain St.

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	TR
Maximum Queue (ft)	98	195	57	46	250	494	42	140	188	189
Average Queue (ft)	94	161	16	11	207	204	6	36	152	152
95th Queue (ft)	107	204	46	33	280	429	26	93	176	178
Link Distance (ft)		98		435		1317	1317		141	141
Upstream Blk Time (%)	26	34						0	29	27
Queuing Penalty (veh)	0	120						0	162	149
Storage Bay Dist (ft)	75		85		170			145		
Storage Blk Time (%)	53	10			26	2		0	29	
Queuing Penalty (veh)	29	29			85	6		0	10	

Zone Summary

Zone wide Queuing Penalty: 605

EAPC Conditions

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Intersection: 1: Ginger Root Wy./Dwy. 1 & Mountain St.

Movement	EB	WB	NB	SB
Directions Served	LT	LTR	LTR	LTR
Maximum Queue (ft)	135	41	31	153
Average Queue (ft)	24	3	8	64
95th Queue (ft)	95	21	30	127
Link Distance (ft)	724	130	160	176
Upstream Blk Time (%)				3
Queuing Penalty (veh)				0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Mountain St. & Dwy. 2

Movement	EB	SB
Directions Served	T	R
Maximum Queue (ft)	186	31
Average Queue (ft)	72	12
95th Queue (ft)	176	37
Link Distance (ft)	130	167
Upstream Blk Time (%)	8	
Queuing Penalty (veh)	36	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Lake St. & Dwy. 3

Movement	EB
Directions Served	R
Maximum Queue (ft)	57
Average Queue (ft)	25
95th Queue (ft)	48
Link Distance (ft)	180
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Lake St. & Dwy. 4

Movement	EB	SB	SB
Directions Served	R	T	TR
Maximum Queue (ft)	75	92	91
Average Queue (ft)	31	9	11
95th Queue (ft)	61	47	51
Link Distance (ft)	82	394	394
Upstream Blk Time (%)	0		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: Lake St. & Mountain St.

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	TR
Maximum Queue (ft)	105	193	96	109	250	535	38	64	161	160
Average Queue (ft)	97	162	28	37	174	251	13	12	113	118
95th Queue (ft)	116	219	70	79	262	431	35	47	163	174
Link Distance (ft)		105		440		1367	1367		142	142
Upstream Blk Time (%)	21	35						0	3	5
Queuing Penalty (veh)	0	151						0	11	16
Storage Bay Dist (ft)	75		85		170			145		
Storage Blk Time (%)	59	7	2	1	11	11		0	3	
Queuing Penalty (veh)	65	22	2	1	82	28		0	0	

Network Summary

Network wide Queuing Penalty: 413

Intersection: 1: Ginger Root Wy./Dwy. 1 & Mountain St.

Movement	EB	WB	NB	SB
Directions Served	LT	LTR	LTR	LTR
Maximum Queue (ft)	60	31	30	146
Average Queue (ft)	9	1	2	70
95th Queue (ft)	36	13	15	116
Link Distance (ft)	724	130	160	176
Upstream Blk Time (%)				0
Queuing Penalty (veh)				0
Storage Bay Dist (ft)				
Storage Blk Time (%)				
Queuing Penalty (veh)				

Intersection: 2: Mountain St. & Dwy. 2

Movement	EB	SB
Directions Served	T	R
Maximum Queue (ft)	160	36
Average Queue (ft)	46	12
95th Queue (ft)	135	37
Link Distance (ft)	130	167
Upstream Blk Time (%)	2	
Queuing Penalty (veh)	6	
Storage Bay Dist (ft)		
Storage Blk Time (%)		
Queuing Penalty (veh)		

Intersection: 5: Lake St. & Dwy. 3

Movement	EB
Directions Served	R
Maximum Queue (ft)	69
Average Queue (ft)	28
95th Queue (ft)	55
Link Distance (ft)	180
Upstream Blk Time (%)	
Queuing Penalty (veh)	
Storage Bay Dist (ft)	
Storage Blk Time (%)	
Queuing Penalty (veh)	

Intersection: 6: Lake St. & Dwy. 4

Movement	EB	SB	SB
Directions Served	R	T	TR
Maximum Queue (ft)	106	284	294
Average Queue (ft)	63	140	148
95th Queue (ft)	112	265	271
Link Distance (ft)	82	394	394
Upstream Blk Time (%)	22		
Queuing Penalty (veh)	0		
Storage Bay Dist (ft)			
Storage Blk Time (%)			
Queuing Penalty (veh)			

Intersection: 7: Lake St. & Mountain St.

Movement	EB	EB	WB	WB	NB	NB	NB	SB	SB	SB
Directions Served	L	TR	L	TR	L	T	R	L	T	TR
Maximum Queue (ft)	105	200	62	46	250	608	28	142	184	175
Average Queue (ft)	99	154	18	14	212	244	4	37	152	151
95th Queue (ft)	114	227	48	39	282	485	20	96	172	167
Link Distance (ft)		105		440		1392	1392		142	142
Upstream Blk Time (%)	19	26						0	28	30
Queuing Penalty (veh)	0	94						0	162	176
Storage Bay Dist (ft)	75		85		170			145		
Storage Blk Time (%)	52	4	0		30	2		0	28	
Queuing Penalty (veh)	29	13	0		111	7		0	10	

Network Summary

Network wide Queuing Penalty: 608

APPENDIX 3.1:

EXISTING TRAFFIC COUNTS – SEPTEMBER 2019

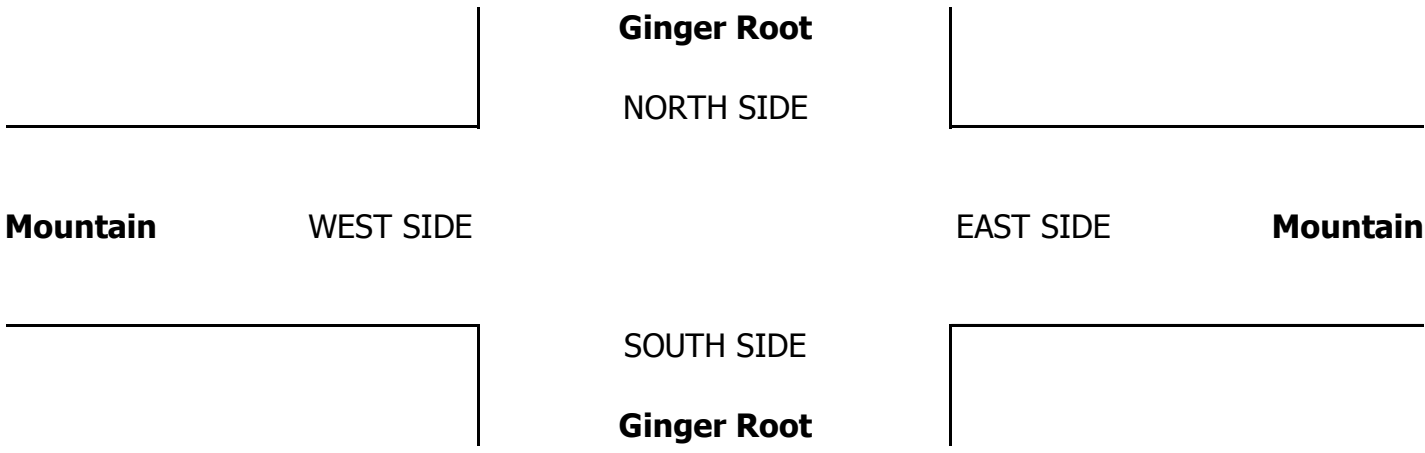
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INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Thu, Sep 19, 19	LOCATION: NORTH & SOUTH: EAST & WEST:	Lake Elsinore Ginger Root Mountain	PROJECT #: LOCATION #: CONTROL:	SC2352 1 STOP N												
NOTES:			AM PM MD OTHER OTHER	<table border="1"> <tr> <td></td> <td>▲</td> <td></td> </tr> <tr> <td>◀ W</td> <td>N</td> <td>E ▶</td> </tr> <tr> <td></td> <td>S</td> <td></td> </tr> <tr> <td></td> <td>▼</td> <td></td> </tr> </table>		▲		◀ W	N	E ▶		S			▼	
	▲															
◀ W	N	E ▶														
	S															
	▼															

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	Ginger Root			Ginger Root			Mountain			Mountain			
LANES:	NL 0	NT X	NR 0	SL X	ST X	SR X	EL X	ET 1	ER 0	WL 0	WT 1	WR X	TOTAL
7:00 AM	0	0	3	0	0	0	0	59	0	0	19	0	81
7:15 AM	0	0	2	0	0	0	0	61	0	0	38	0	101
7:30 AM	0	0	7	0	0	0	0	64	0	1	39	0	111
7:45 AM	0	0	0	0	0	0	0	66	0	2	16	0	84
8:00 AM	0	0	0	0	0	0	0	31	0	1	13	0	45
8:15 AM	0	0	2	0	0	0	0	34	0	0	9	0	45
8:30 AM	0	0	7	0	0	0	0	31	0	0	14	0	52
8:45 AM	0	0	0	0	0	0	0	21	0	0	10	0	31
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	0	0	21	0	0	0	0	367	0	4	158	0	550
APPROACH %	0%	0%	100%	0%	0%	0%	0%	100%	0%	2%	98%	0%	
APP/DEPART	21	/	0	0	/	4	367	/	388	162	/	158	0
BEGIN PEAK HR	7:00 AM												
VOLUMES	0	0	12	0	0	0	0	250	0	3	112	0	377
APPROACH %	0%	0%	100%	0%	0%	0%	0%	100%	0%	3%	97%	0%	
PEAK HR FACTOR	0.429			0.000			0.947			0.719			0.849
APP/DEPART	12	/	0	0	/	3	250	/	262	115	/	112	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	0	0	0	0	0	0	0	23	0	2	20	0	45
4:15 PM	0	0	4	0	0	0	0	22	0	0	29	0	55
4:30 PM	0	0	4	0	0	0	0	27	0	0	33	0	64
4:45 PM	0	0	1	0	0	0	0	27	0	3	33	0	64
5:00 PM	0	0	1	0	0	0	0	21	0	3	32	0	57
5:15 PM	0	0	1	0	0	0	0	24	0	0	34	0	59
5:30 PM	0	0	1	0	0	0	0	21	0	1	36	0	59
5:45 PM	0	0	0	0	0	0	0	29	0	1	44	0	74
VOLUMES	0	0	12	0	0	0	0	194	0	10	261	0	477
APPROACH %	0%	0%	100%	0%	0%	0%	0%	100%	0%	4%	96%	0%	
APP/DEPART	12	/	0	0	/	9	194	/	207	271	/	261	0
BEGIN PEAK HR	5:00 PM												
VOLUMES	0	0	3	0	0	0	0	95	0	5	146	0	249
APPROACH %	0%	0%	100%	0%	0%	0%	0%	100%	0%	3%	97%	0%	
PEAK HR FACTOR	0.750			0.000			0.819			0.839			0.841
APP/DEPART	3	/	0	0	/	5	95	/	98	151	/	146	0

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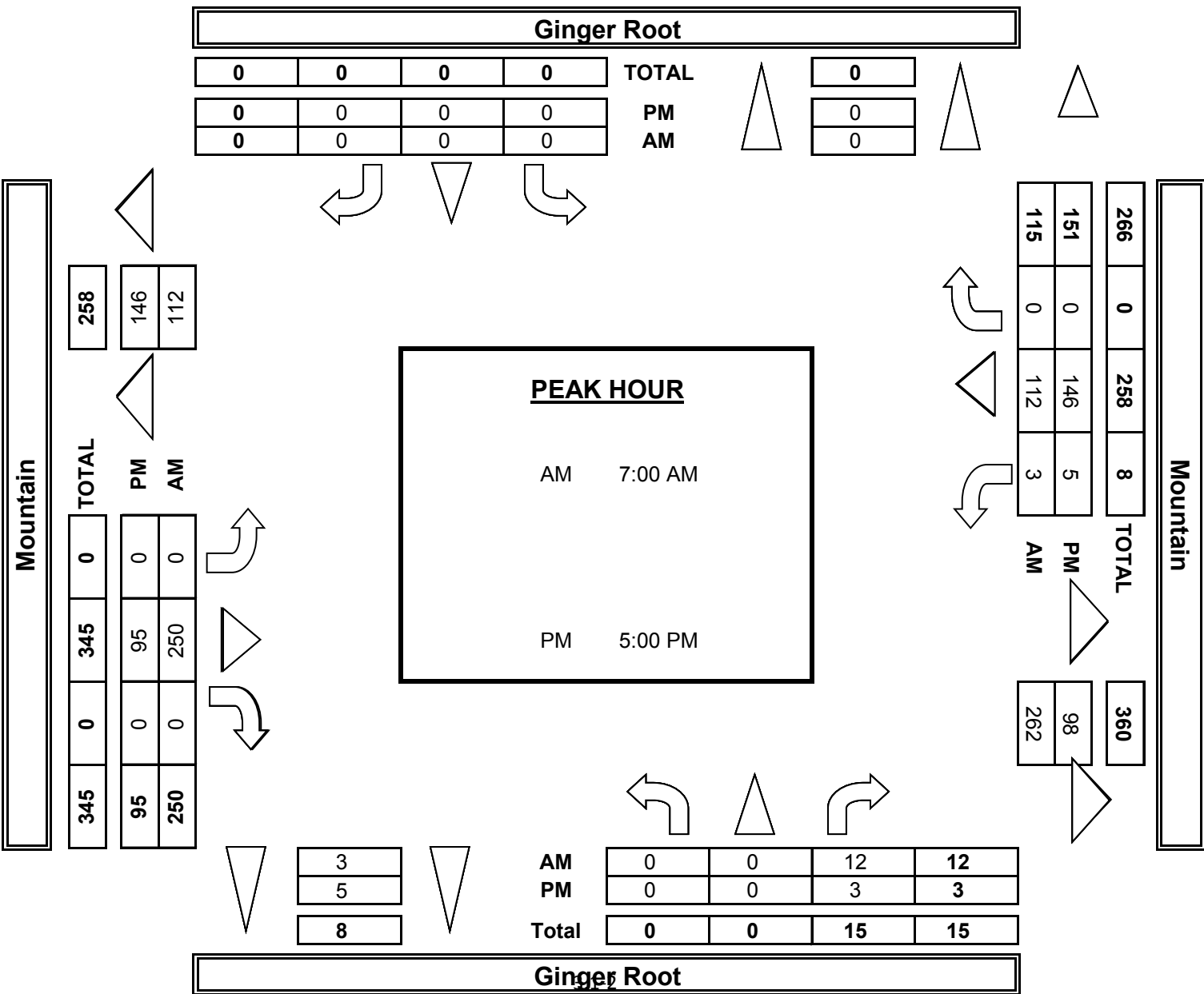
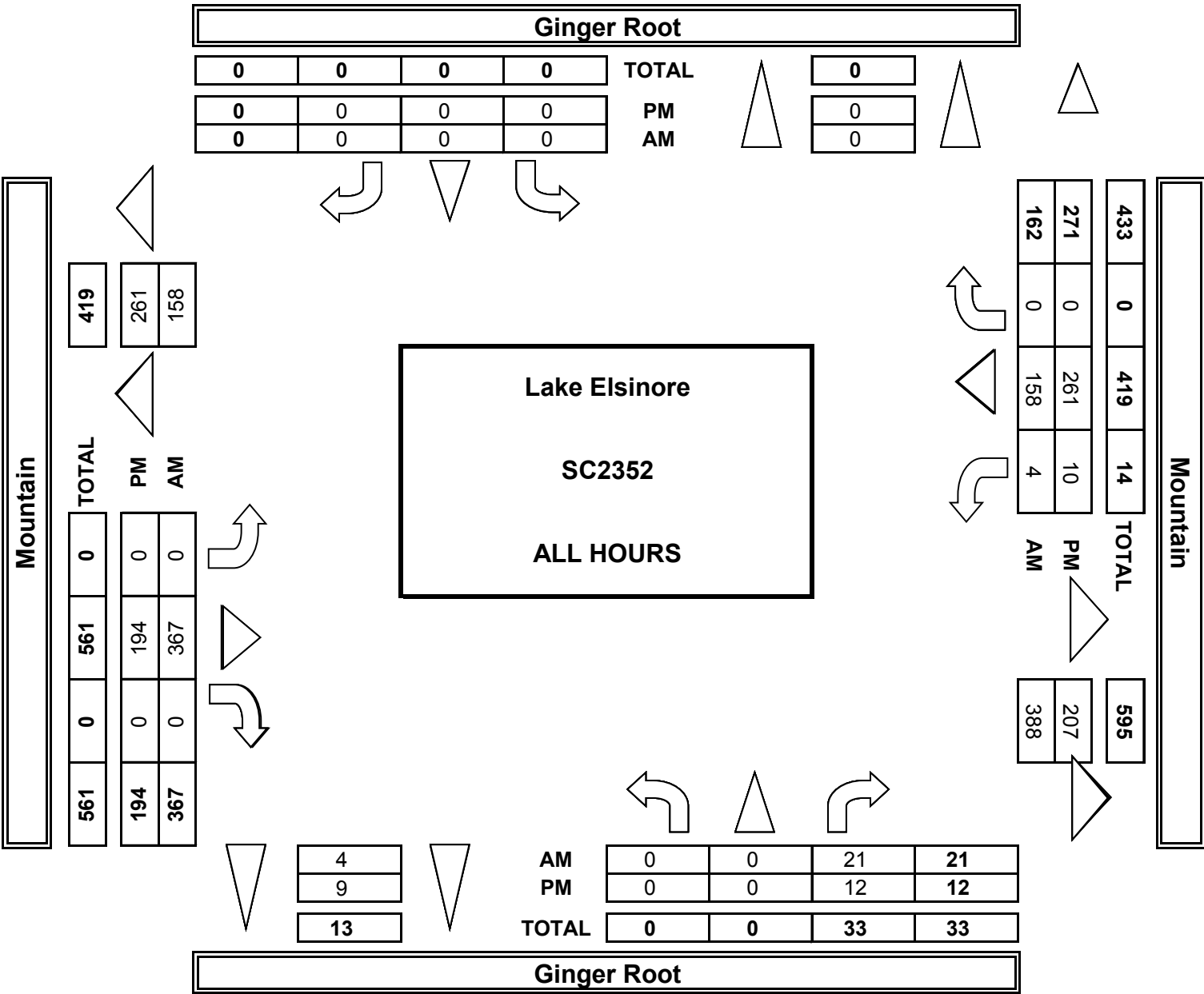
AM		7:00 AM
		7:15 AM
		7:30 AM
		7:45 AM
		8:00 AM
		8:15 AM
		8:30 AM
		8:45 AM
		9:00 AM
		9:15 AM
		9:30 AM
	9:45 AM	
		TOTAL
PM		3:00 PM
		3:15 PM
		3:30 PM
		3:45 PM
		4:00 PM
		4:15 PM
		4:30 PM
		4:45 PM
		5:00 PM
		5:15 PM
		5:30 PM
	5:45 PM	
		TOTAL

ALL PED AND BIKE				
E SIDE	W SIDE	S SIDE	N SIDE	TOTAL
0	0	0	0	0
0	0	2	0	2
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
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0	0	0	0	0
0	0	0	0	0
0	0	1	0	1
0	0	1	0	1

[illegible]

BICYCLE CROSSINGS				
ES	WS	SS	NS	TOTAL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
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0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	1	0	1
0	0	1	0	1

AimTD LLC
TURNING MOVEMENT COUNTS



Lake Elsinore
Lake
Nichols

☒ Add U-Turns to Left Turns

RTOR			
NRR X	SRR 0	ERR 0	WRR 0

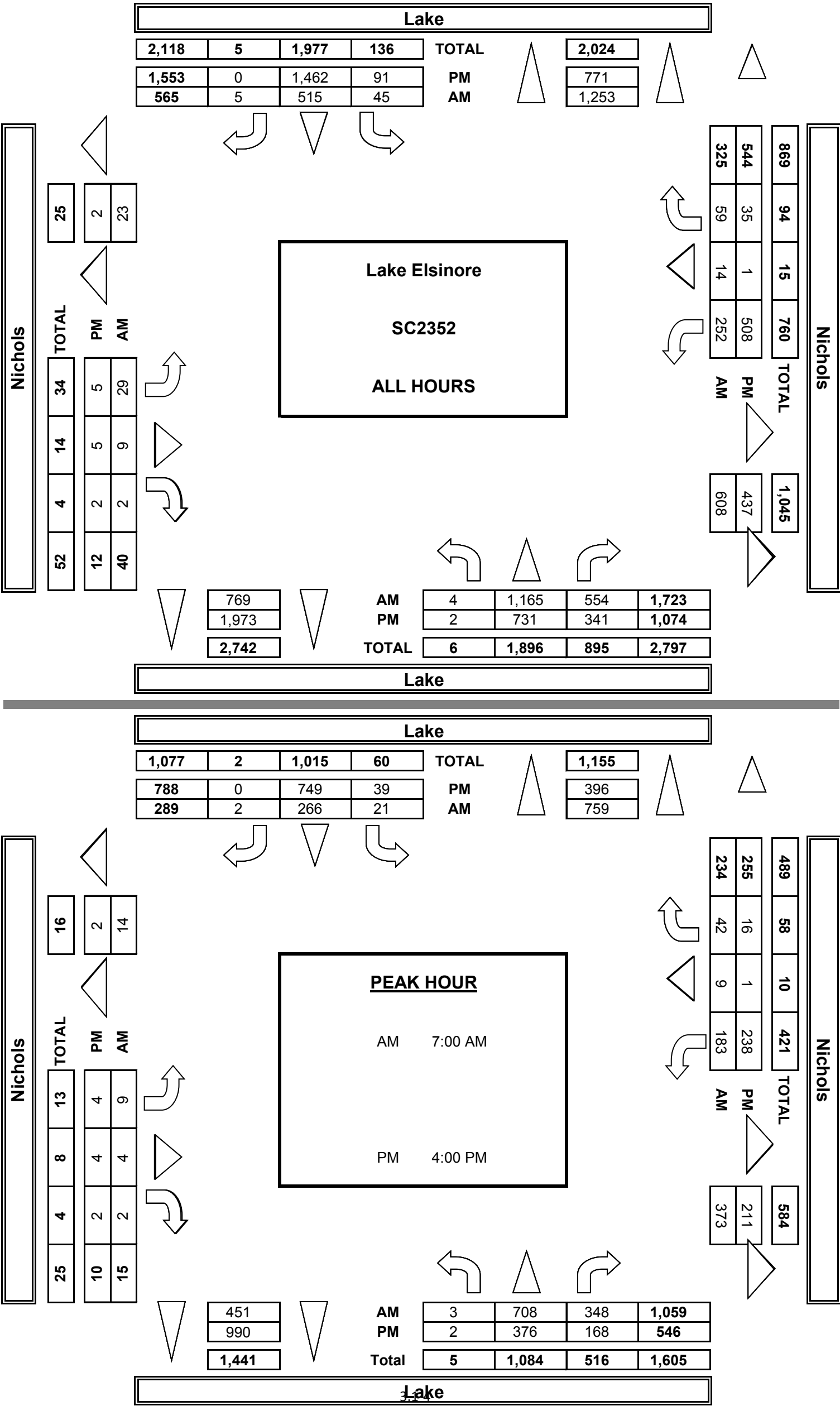
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0	0	0	1
0	0	0	1
0	0	0	3
0	0	0	0
0	0	0	1
0	0	1	12

	Lake	
	NORTH SIDE	
Nichols	WEST SIDE	EAST SIDE
	Lake	
	SOUTH SIDE	

[illegible]

AimTD LLC
TURNING MOVEMENT COUNTS



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Thu, Sep 19, 19	LOCATION: NORTH & SOUTH: EAST & WEST:	Lake Elsinore Lake Aberhill Ranch	PROJECT #: LOCATION #: CONTROL:	SC2352 4 SIGNAL
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NOTES:	AM		▲	
	PM		N	
	MD	◀ W		E ▶
	OTHER		S	
	OTHER		▼	

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	Lake			Lake			Aberhill Ranch			Aberhill Ranch			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	X	1	1	1	1	X	X	X	X	1	X	1	

U-TURNS				
NB	SB	EB	WB	TTL

RTOR			
NRR	SRR	ERR	WRR

AM	7:00 AM	0	253	8	5	122	0	0	0	0	22	0	11	421
	7:15 AM	0	223	8	3	135	0	0	0	0	23	0	19	411
	7:30 AM	0	262	11	5	90	0	0	0	0	15	0	12	395
	7:45 AM	0	264	11	5	80	0	0	0	0	7	0	15	382
	8:00 AM	0	199	6	8	65	0	0	0	0	6	0	11	295
	8:15 AM	0	176	6	8	72	0	0	0	0	6	0	8	276
	8:30 AM	0	138	1	2	64	0	0	0	0	3	0	5	213
	8:45 AM	0	130	3	3	72	0	0	0	0	2	0	8	218
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
	VOLUMES	0	1,645	54	39	700	0	0	0	0	84	0	89	2,611
APPROACH %	0%	97%	3%	5%	95%	0%	0%	0%	0%	49%	0%	51%		
APP/DEPART	1,699	/	1,734	739	/	784	0	/	93	173	/	0	0	
BEGIN PEAK HR	7:00 AM													
VOLUMES	0	1,002	38	18	427	0	0	0	0	67	0	57	1,609	
APPROACH %	0%	96%	4%	4%	96%	0%	0%	0%	0%	54%	0%	46%		
PEAK HR FACTOR	0.945													
APP/DEPART	1,040	/	1,059	445	/	494	0	/	56	124	/	0	0	
PM	03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	112	4	8	192	0	0	0	0	5	0	3	324
	4:15 PM	0	130	13	8	227	0	0	0	0	1	0	1	380
	4:30 PM	0	135	3	12	248	0	0	0	0	6	0	6	410
	4:45 PM	0	135	6	9	270	0	0	0	0	11	0	7	438
	5:00 PM	0	117	7	8	198	0	0	0	0	7	0	2	339
	5:15 PM	0	133	12	8	238	0	0	0	0	5	0	4	400
	5:30 PM	0	141	6	7	260	0	0	0	0	5	0	3	422
	5:45 PM	0	155	9	9	243	0	0	0	0	7	0	4	427
	VOLUMES	0	1,058	60	69	1,876	0	0	0	0	47	0	30	3,140
APPROACH %	0%	95%	5%	4%	96%	0%	0%	0%	0%	61%	0%	39%		
APP/DEPART	1,118	/	1,088	1,945	/	1,923	0	/	129	77	/	0	0	
BEGIN PEAK HR	4:45 PM													
VOLUMES	0	526	31	32	966	0	0	0	0	28	0	16	1,599	
APPROACH %	0%	94%	6%	3%	97%	0%	0%	0%	0%	64%	0%	36%		
PEAK HR FACTOR	0.947													
APP/DEPART	557	/	542	998	/	994	0	/	63	44	/	0	0	

[illegible]

5	0	0	3
1	0	0	4
4	0	0	4
3	0	0	2
1	0	0	3
2	0	0	1
0	0	0	1
0	0	0	4
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
16	0	0	22

13	0	0	13
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[illegible]

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0	0	0	0
0	0	0	0
0	0	0	0
1	0	0	0
0	0	0	0
0	0	0	5
1	0	0	4
0	0	0	1
0	0	0	2
2	0	0	1
0	0	0	3
4	0	0	16

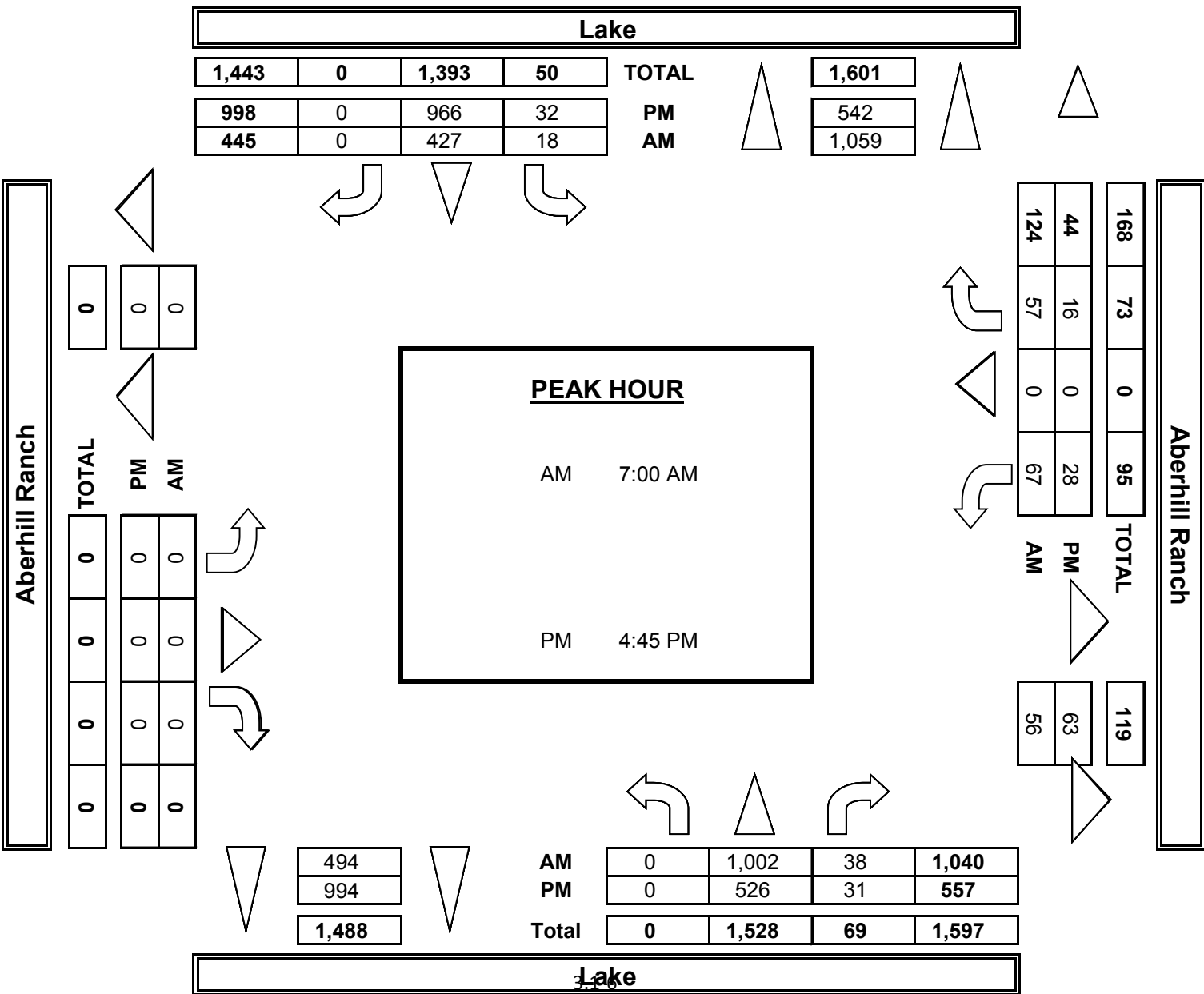
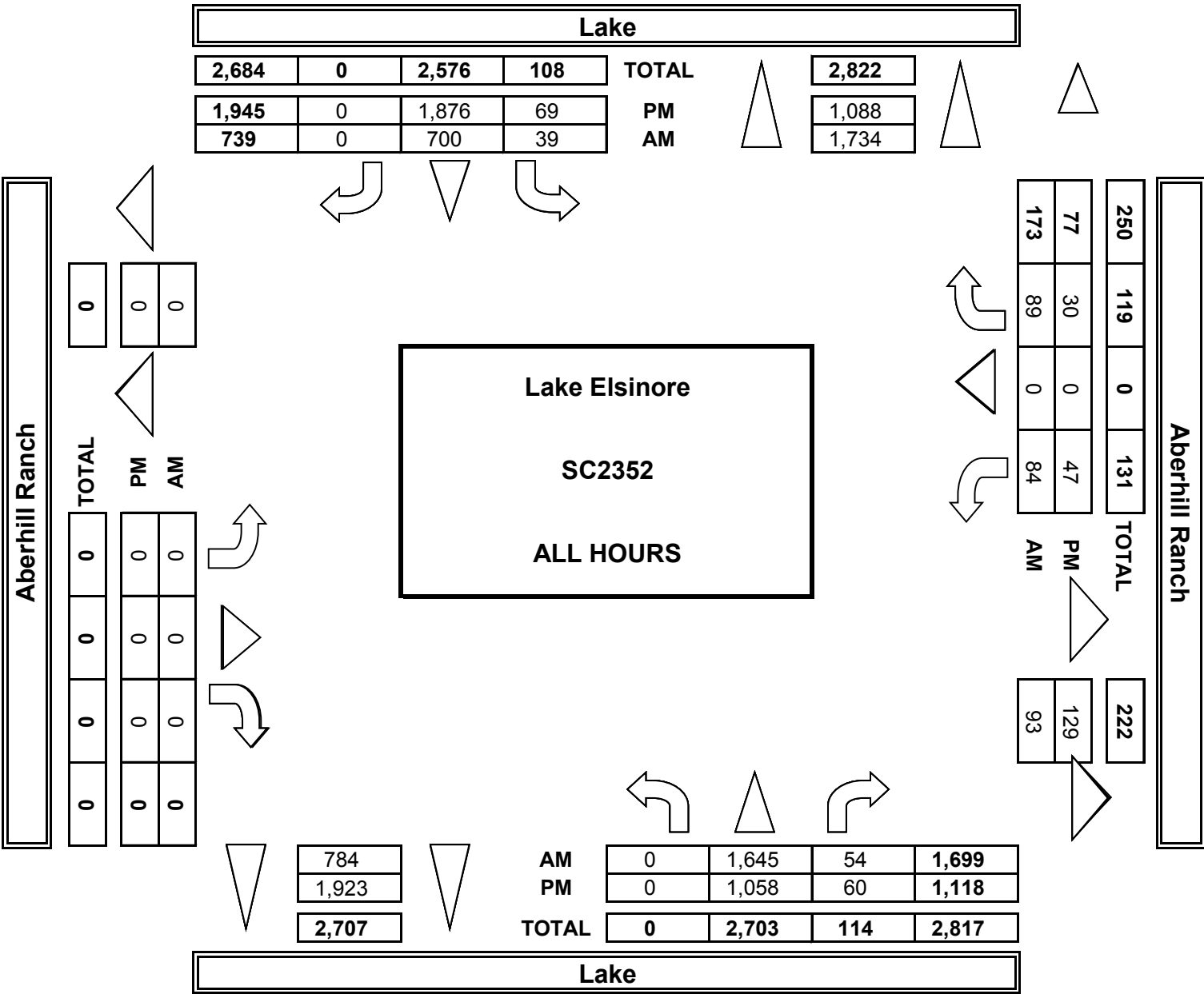
3	0	0	8
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AM		7:00 AM
		7:15 AM
		7:30 AM
		7:45 AM
		8:00 AM
		8:15 AM
		8:30 AM
		8:45 AM
		9:00 AM
		9:15 AM
		9:30 AM
	9:45 AM	
		TOTAL
PM		3:00 PM
		3:15 PM
		3:30 PM
		3:45 PM
		4:00 PM
		4:15 PM
		4:30 PM
		4:45 PM
		5:00 PM
		5:15 PM
		5:30 PM
	5:45 PM	
		TOTAL

[illegible][illegible][illegible]

AimTD LLC
TURNING MOVEMENT COUNTS



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:
Thu, Sep 19, 19

LOCATION:
NORTH & SOUTH:
EAST & WEST:

Lake Elsinore
Lake
Mountain

PROJECT #:
LOCATION #:
CONTROL:

SC2352
7
SIGNAL

NOTES:

AM
PM
MD
OTHER
OTHER

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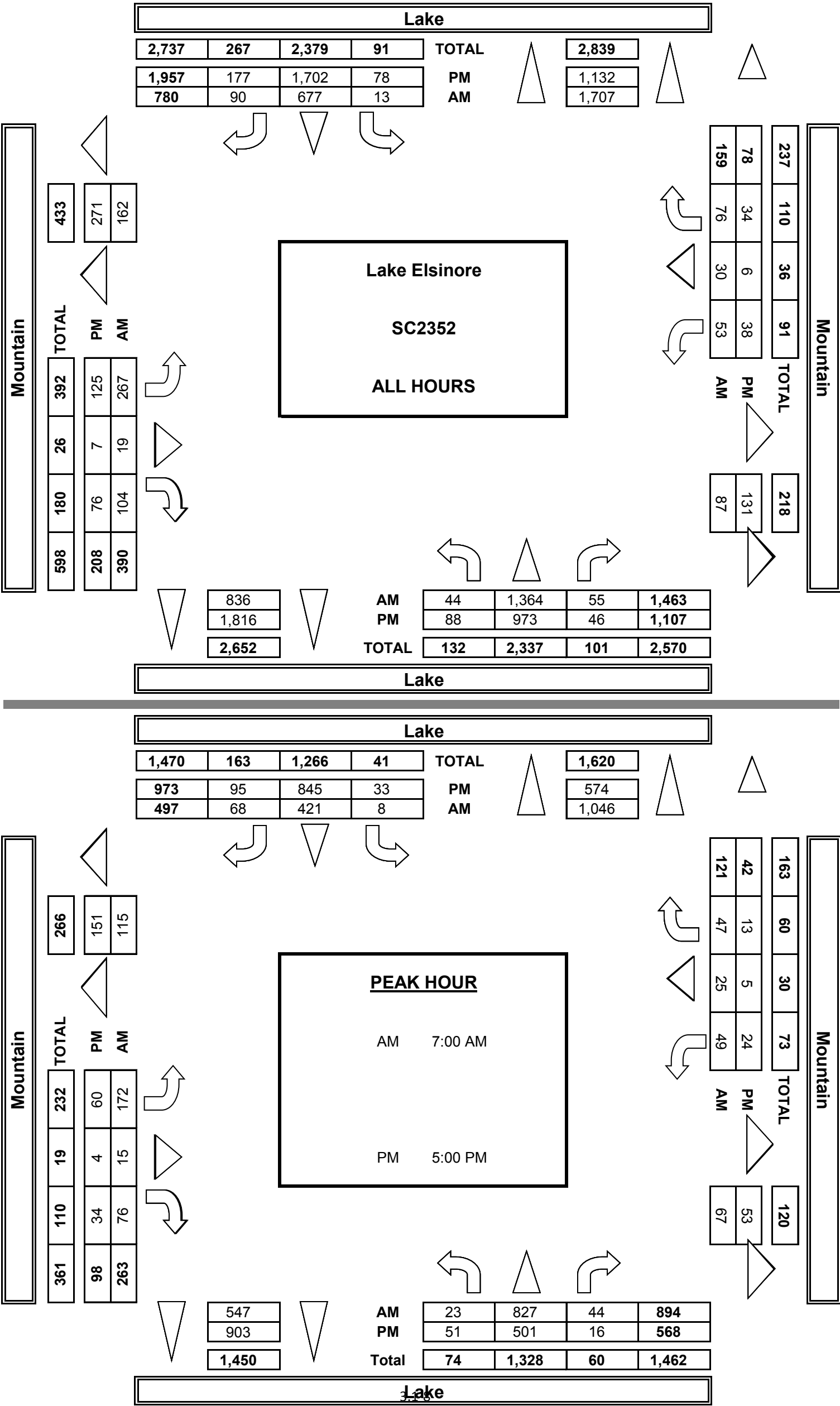
☒ Add U-Turns to Left Turns

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	Lake			Lake			Mountain			Mountain			
LANES:	NL 1	NT 1	NR 1	SL 1	ST 2	SR 0	EL 1	ET 1	ER 0	WL 1	WT 1	WR 0	TOTAL
7:00 AM	3	205	2	3	131	11	38	3	24	12	4	13	449
7:15 AM	6	193	11	3	125	28	33	0	26	19	6	13	463
7:30 AM	11	210	22	2	89	18	53	5	12	13	11	10	456
7:45 AM	3	219	9	0	76	11	48	7	14	5	4	11	407
8:00 AM	9	155	6	1	64	5	25	1	5	0	0	12	283
8:15 AM	3	159	1	2	73	5	23	2	11	2	2	5	288
8:30 AM	5	106	2	1	60	5	29	1	6	2	3	4	224
8:45 AM	4	117	2	1	59	7	18	0	6	0	0	8	222
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	44	1,364	55	13	677	90	267	19	104	53	30	76	2,792
APPROACH %	3%	93%	4%	2%	87%	12%	68%	5%	27%	33%	19%	48%	
APP/DEPART	1,463	/	1,707	780	/	836	390	/	87	159	/	162	0
BEGIN PEAK HR	7:00 AM												
VOLUMES	23	827	44	8	421	68	172	15	76	49	25	47	1,775
APPROACH %	3%	93%	5%	2%	85%	14%	65%	6%	29%	40%	21%	39%	
PEAK HR FACTOR	0.920			0.796			0.939			0.796			0.958
APP/DEPART	894	/	1,046	497	/	547	263	/	67	121	/	115	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	7	114	7	5	211	15	13	1	10	5	0	2	390
4:15 PM	9	119	12	11	194	20	15	0	11	4	0	7	402
4:30 PM	11	113	5	17	215	22	23	0	9	5	0	6	426
4:45 PM	10	126	6	12	237	25	14	2	12	0	1	6	451
5:00 PM	7	111	3	4	187	25	10	1	10	8	3	3	372
5:15 PM	15	121	2	9	215	18	16	3	8	4	1	2	414
5:30 PM	14	130	5	9	227	23	13	0	7	6	0	5	439
5:45 PM	15	139	6	11	216	29	21	0	9	6	1	3	456
VOLUMES	88	973	46	78	1,702	177	125	7	76	38	6	34	3,350
APPROACH %	8%	88%	4%	4%	87%	9%	60%	3%	37%	49%	8%	44%	
APP/DEPART	1,107	/	1,132	1,957	/	1,816	208	/	131	78	/	271	0
BEGIN PEAK HR	5:00 PM												
VOLUMES	51	501	16	33	845	95	60	4	34	24	5	13	1,681
APPROACH %	9%	88%	3%	3%	87%	10%	61%	4%	35%	57%	12%	31%	
PEAK HR FACTOR	0.888			0.939			0.817			0.750			0.922
APP/DEPART	568	/	574	973	/	903	98	/	53	42	/	151	0



		ALL PED AND BIKE					PEDESTRIAN CROSSINGS					BICYCLE CROSSINGS				
		E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	E SIDE	W SIDE	S SIDE	N SIDE	TOTAL	ES	WS	SS	NS	TOTAL
AM	7:00 AM	4	0	4	0	8	4	0	4	0	8	0	0	0	0	0
	7:15 AM	3	0	8	0	11	3	0	8	0	11	0	0	0	0	0
	7:30 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	7:45 AM	2	0	0	0	2	2	0	0	0	2	0	0	0	0	0
	8:00 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	8:15 AM	2	2	2	0	6	2	2	2	0	6	0	0	0	0	0
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:45 AM	0	0	1	0	1	0	0	1	0	1	0	0	0	0	0
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
PM	3:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	5:00 PM	1	0	0	0	1	1	0	0	0	1	0	0	0	0	0
	5:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL	TOTAL	11	2	17	0	30	11	2	17	0	30	0	0	0	0	0

AimTD LLC
TURNING MOVEMENT COUNTS



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE:
Thu, Sep 19, 19

LOCATION:
NORTH & SOUTH:
EAST & WEST:

Lake Elsinore
Grand
Lakeshore

PROJECT #:
LOCATION #:
CONTROL:

SC2352
8
SIGNAL

NOTES:

Queue WB AM 7:00-7:30

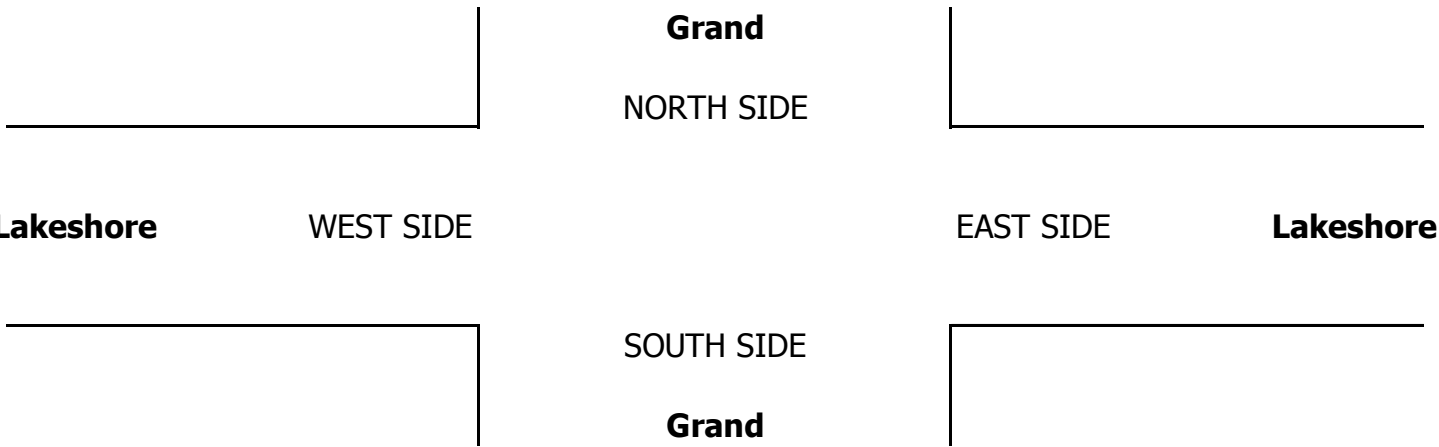
AM
PM
MD
OTHER
OTHER

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☒ Add U-Turns to Left Turns

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	Grand			Grand			Lakeshore			Lakeshore			
LANES:	NL 1	NT 2	NR 1	SL 2	ST 2	SR 0	EL 0.5	ET 1	ER 0.5	WL 1	WT 1	WR 2	TOTAL
7:00 AM	37	161	22	41	116	41	16	30	22	36	41	43	606
7:15 AM	26	159	72	36	119	64	25	44	45	84	44	79	797
7:30 AM	28	201	79	41	84	31	17	41	48	57	28	80	735
7:45 AM	3	145	39	42	55	1	2	2	3	13	1	65	371
8:00 AM	1	128	28	28	53	0	0	1	1	13	2	58	313
8:15 AM	1	116	13	26	58	1	1	2	2	14	2	47	283
8:30 AM	0	70	20	30	44	2	1	1	2	10	1	43	224
8:45 AM	0	74	11	27	40	0	1	0	2	4	0	41	200
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	96	1,054	284	271	569	140	63	121	125	231	119	456	3,529
APPROACH %	7%	74%	20%	28%	58%	14%	20%	39%	40%	29%	15%	57%	
APP/DEPART	1,434	/	1,574	980	/	928	309	/	675	806	/	352	0
BEGIN PEAK HR	7:00 AM												
VOLUMES	94	666	212	160	374	137	60	117	118	190	114	267	2,509
APPROACH %	10%	69%	22%	24%	56%	20%	20%	40%	40%	33%	20%	47%	
PEAK HR FACTOR		0.789			0.766			0.647			0.690		0.787
APP/DEPART	972	/	994	671	/	685	295	/	488	571	/	342	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	6	76	9	63	143	4	4	7	12	26	8	56	414
4:15 PM	4	102	17	71	138	1	1	7	6	28	6	42	423
4:30 PM	2	96	24	79	148	2	0	7	4	26	4	55	447
4:45 PM	1	87	22	78	154	5	1	5	6	30	4	51	444
5:00 PM	1	84	22	60	135	3	2	1	5	29	5	49	396
5:15 PM	7	93	28	74	147	2	2	5	5	30	2	43	438
5:30 PM	5	92	19	56	168	5	1	9	2	40	3	63	463
5:45 PM	2	119	26	65	162	3	5	5	8	36	0	44	475
VOLUMES	28	749	167	546	1,195	25	16	46	48	245	32	403	3,500
APPROACH %	3%	79%	18%	31%	68%	1%	15%	42%	44%	36%	5%	59%	
APP/DEPART	944	/	1,168	1,766	/	1,488	110	/	759	680	/	85	0
BEGIN PEAK HR	5:00 PM												
VOLUMES	15	388	95	255	612	13	10	20	20	135	10	199	1,772
APPROACH %	3%	78%	19%	29%	70%	1%	20%	40%	40%	39%	3%	58%	
PEAK HR FACTOR		0.847			0.957			0.694			0.811		0.933
APP/DEPART	498	/	597	880	/	767	50	/	370	344	/	38	0



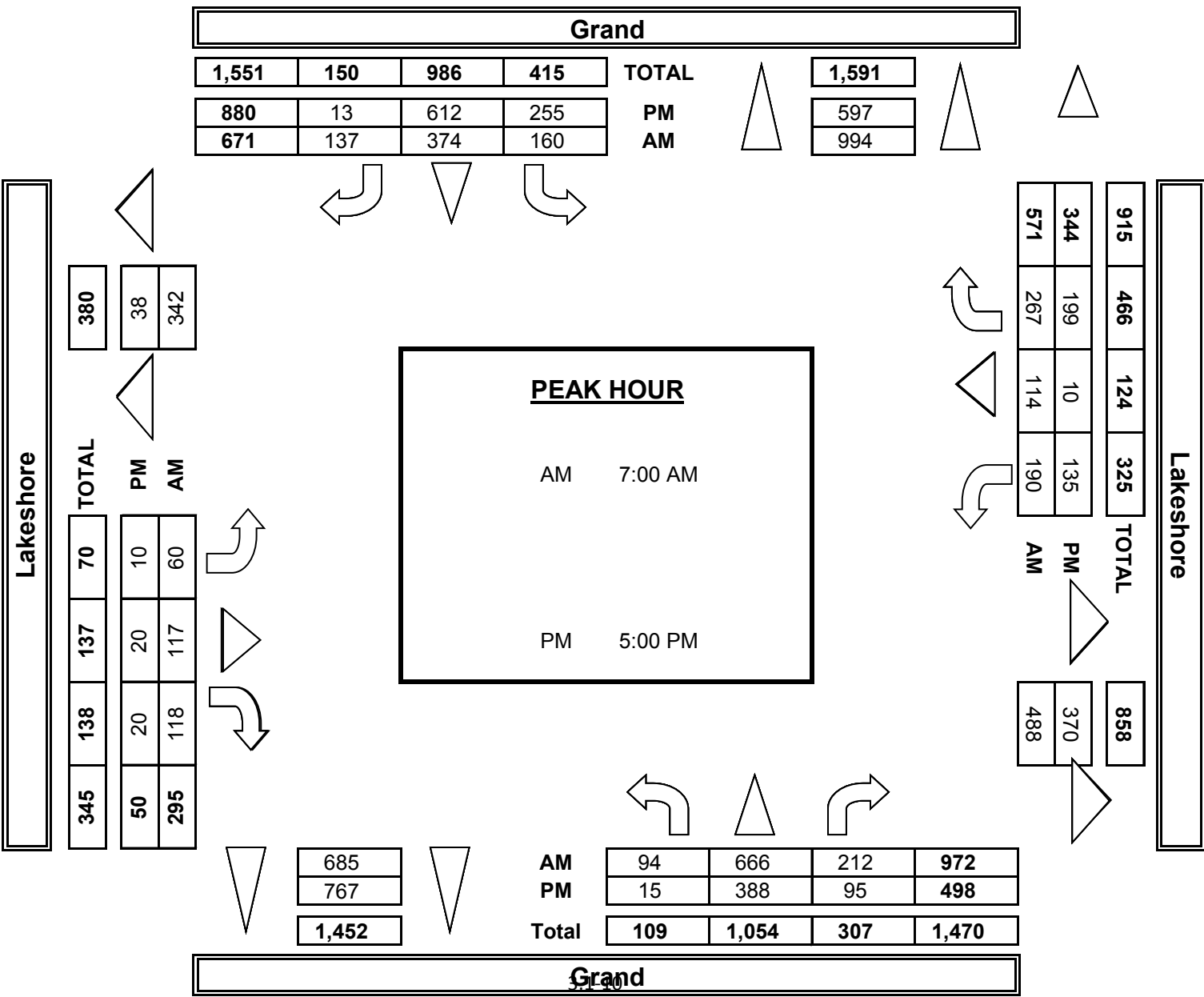
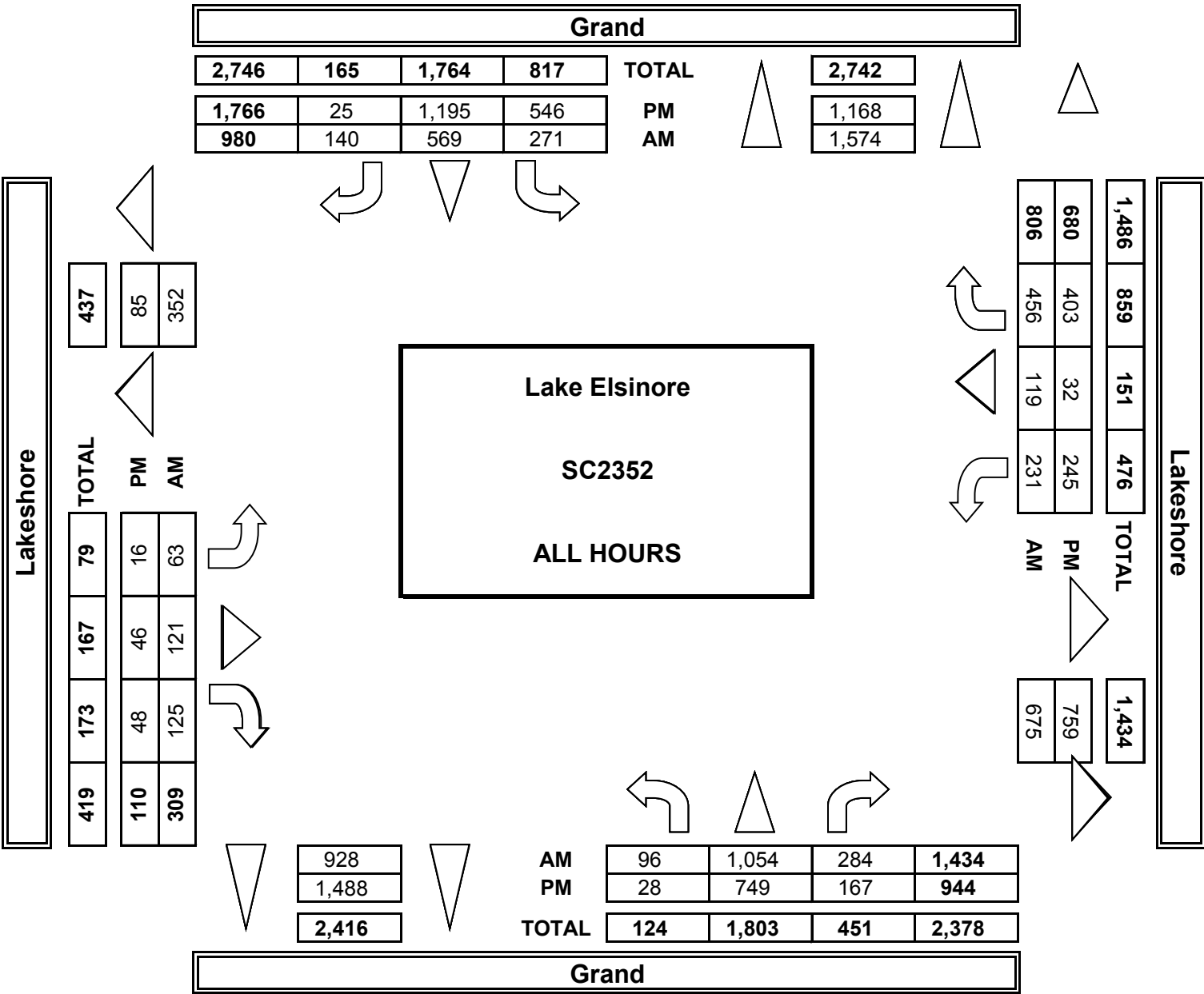
AM	7:00 AM
	7:15 AM
	7:30 AM
	7:45 AM
	8:00 AM
	8:15 AM
	8:30 AM
	8:45 AM
	9:00 AM
	9:15 AM
PM	3:00 PM
	3:15 PM
	3:30 PM
	3:45 PM
	4:00 PM
	4:15 PM
	4:30 PM
	4:45 PM
	5:00 PM
	5:15 PM
TOTAL	5:30 PM
	5:45 PM
	TOTAL

ALL PED AND BIKE				
E SIDE	W SIDE	S SIDE	N SIDE	TOTAL
1	1	17	0	19
8	1	62	0	71
7	2	49	0	58
0	1	0	0	1
3	0	2	0	5
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	0	1	0	2
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	2	1	0	3
1	5	2	0	8

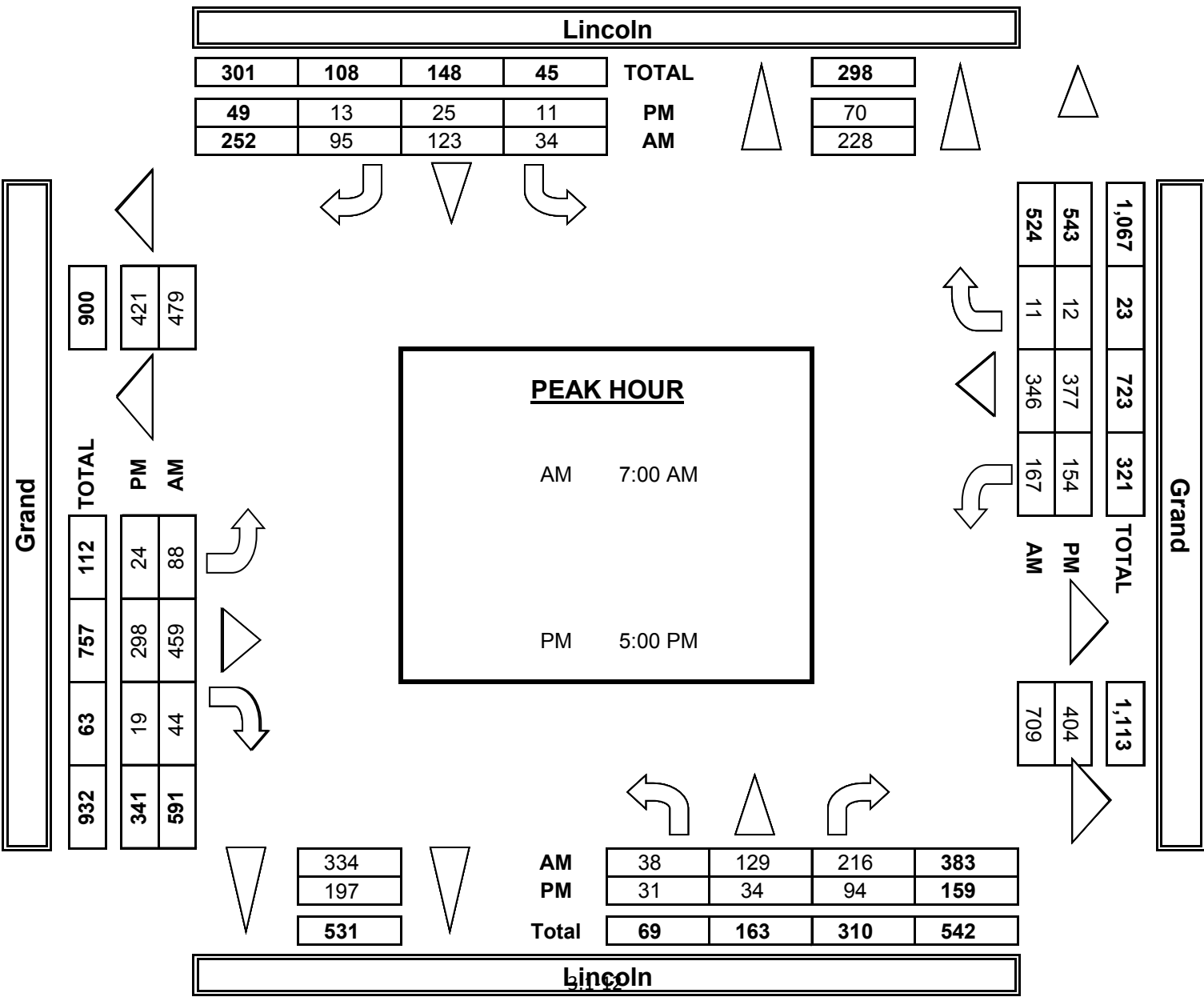
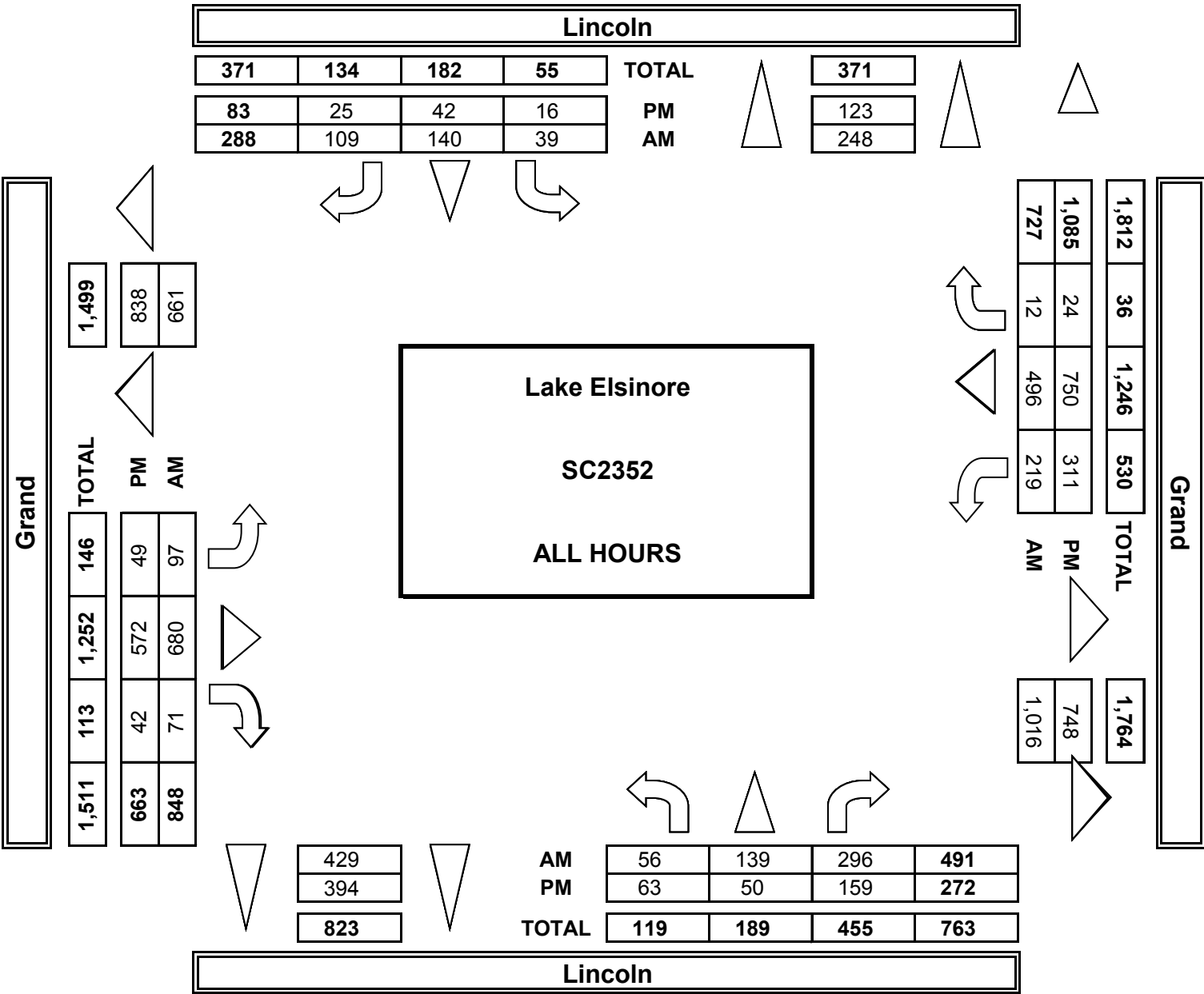
PEDESTRIAN CROSSINGS				
E SIDE	W SIDE	S SIDE	N SIDE	TOTAL
1	1	17	0	19
8	1	62	0	71
7	2	49	0	58
0	1	0	0	1
3	0	2	0	5
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
1	0	1	0	2
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	1	0	2
1	4	2	0	7

BICYCLE CROSSINGS				
ES	WS	SS	NS	TOTAL
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
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0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	1	0	0	1
0	1	0	0	1

AimTD LLC
TURNING MOVEMENT COUNTS



AimTD LLC
TURNING MOVEMENT COUNTS



INTERSECTION TURNING MOVEMENT COUNTS

PREPARED BY: AimTD LLC. tel: 714 253 7888 cs@aimtd.com

DATE: Thu, Sep 19, 19	LOCATION: Lake Elsinore	PROJECT #: SC2352																				
	NORTH & SOUTH: Terra Cotta	LOCATION #: 10																				
	EAST & WEST: Lakeshore	CONTROL: SIGNAL																				
NOTES:		<table border="1"> <tr> <td>AM</td> <td></td> <td>▲</td> <td></td> </tr> <tr> <td>PM</td> <td></td> <td>N</td> <td></td> </tr> <tr> <td>MD</td> <td>◀ W</td> <td></td> <td>E ▶</td> </tr> <tr> <td>OTHER</td> <td></td> <td>S</td> <td></td> </tr> <tr> <td>OTHER</td> <td></td> <td>▼</td> <td></td> </tr> </table>	AM		▲		PM		N		MD	◀ W		E ▶	OTHER		S		OTHER		▼	
AM		▲																				
PM		N																				
MD	◀ W		E ▶																			
OTHER		S																				
OTHER		▼																				

	NORTHBOUND			SOUTHBOUND			EASTBOUND			WESTBOUND			
	Terra Cotta			Terra Cotta			Lakeshore			Lakeshore			
LANES:	NL	NT	NR	SL	ST	SR	EL	ET	ER	WL	WT	WR	TOTAL
	0	1	0	0	1	0	1	1	1	1	1	1	0
7:00 AM	8	0	12	0	0	1	1	115	1	2	150	3	293
7:15 AM	10	0	16	1	0	2	1	167	3	2	222	4	428
7:30 AM	7	0	10	5	0	0	2	164	6	5	97	4	300
7:45 AM	6	0	7	1	0	0	0	96	1	3	90	1	205
8:00 AM	5	0	9	2	0	0	0	68	1	7	68	2	162
8:15 AM	5	0	5	1	1	0	0	58	2	8	73	2	155
8:30 AM	2	0	7	0	0	0	0	48	4	4	52	1	118
8:45 AM	2	1	8	1	0	0	0	51	0	1	46	2	112
9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:15 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0
VOLUMES	45	1	74	11	1	3	4	767	18	32	798	19	1,773
APPROACH %	38%	1%	62%	73%	7%	20%	1%	97%	2%	4%	94%	2%	
APP/DEPART	120	/	24	15	/	51	789	/	852	849	/	846	0
BEGIN PEAK HR	7:00 AM												
VOLUMES	31	0	45	7	0	3	4	542	11	12	559	12	1,226
APPROACH %	41%	0%	59%	70%	0%	30%	1%	97%	2%	2%	96%	2%	
PEAK HR FACTOR	0.731			0.500			0.810			0.639			0.716
APP/DEPART	76	/	16	10	/	23	557	/	594	583	/	593	0
03:00 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
3:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0
4:00 PM	1	0	8	1	1	0	0	84	4	9	98	3	209
4:15 PM	2	1	8	1	0	0	0	106	6	13	113	4	254
4:30 PM	1	0	6	3	0	1	0	115	3	8	98	2	237
4:45 PM	2	0	14	3	0	2	0	126	8	9	104	2	270
5:00 PM	0	0	10	4	2	0	0	94	4	14	114	7	249
5:15 PM	1	0	7	1	1	0	0	107	7	8	111	1	244
5:30 PM	2	0	14	2	0	0	0	92	9	10	120	4	253
5:45 PM	2	1	8	1	0	0	0	94	0	12	109	3	230
VOLUMES	11	2	75	16	4	3	0	818	41	83	867	26	1,946
APPROACH %	13%	2%	85%	70%	17%	13%	0%	95%	5%	9%	89%	3%	
APP/DEPART	88	/	28	23	/	128	859	/	909	976	/	881	0
BEGIN PEAK HR	4:45 PM												
VOLUMES	5	0	45	10	3	2	0	419	28	41	449	14	1,016
APPROACH %	10%	0%	90%	67%	20%	13%	0%	94%	6%	8%	89%	3%	
PEAK HR FACTOR	0.781			0.625			0.834			0.933			0.941
APP/DEPART	50	/	14	15	/	72	447	/	474	504	/	456	0

[illegible]

RTOR			
NRR 0	SRR X	ERR 0	WRR X
0	0	0	0
1	0	1	0
0	0	1	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
1	0	2	0

1	0	2	0
---	---	---	---

[illegible]

0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
0	0	0	0
2	0	1	0
1	0	0	0
1	0	2	0
1	0	1	0
0	0	2	0
1	0	1	0
2	0	0	0
8	0	7	0

3	0	6	0
---	---	---	---



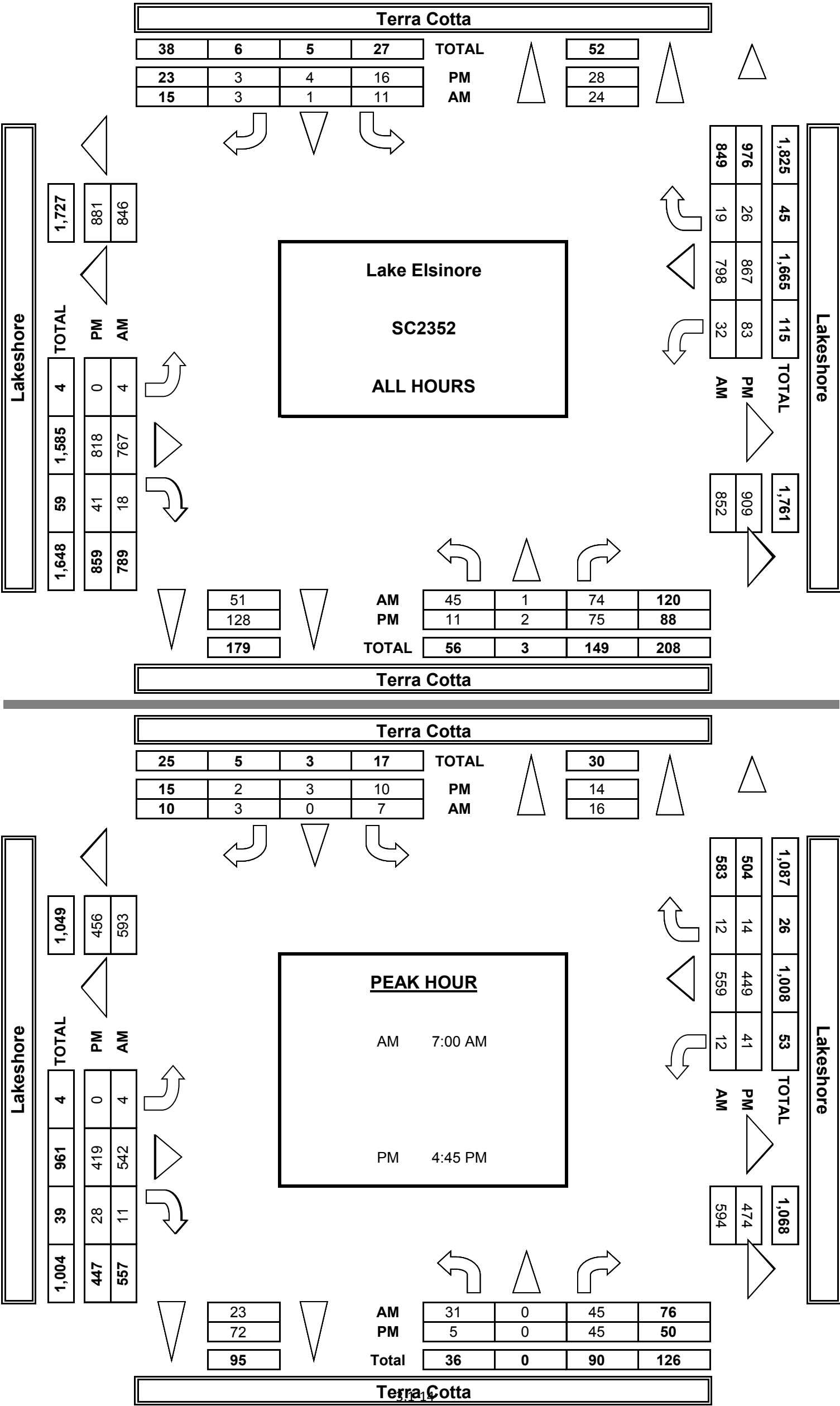
AM		7:00 AM
		7:15 AM
		7:30 AM
		7:45 AM
		8:00 AM
		8:15 AM
		8:30 AM
		8:45 AM
		9:00 AM
		9:15 AM
		9:30 AM
	9:45 AM	
		TOTAL
PM		3:00 PM
		3:15 PM
		3:30 PM
		3:45 PM
		4:00 PM
		4:15 PM
		4:30 PM
		4:45 PM
		5:00 PM
		5:15 PM
		5:30 PM
	5:45 PM	
		TOTAL

ALL PED AND BIKE				
E SIDE	W SIDE	S SIDE	N SIDE	TOTAL
0	0	6	0	6
0	0	3	0	3
0	0	0	0	0
0	0	3	0	3
0	0	3	0	3
0	0	1	0	1
0	1	1	0	2
0	1	1	0	2
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	2	18	0	20
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	2	0	2
0	0	0	0	0
0	0	0	0	0
0	0	3	0	3
0	0	1	0	1
0	0	0	0	0
0	0	1	0	1
0	0	0	0	0
0	0	0	0	0
0	0	7	0	7

PEDESTRIAN CROSSINGS				
E SIDE	W SIDE	S SIDE	N SIDE	TOTAL
0	0	6	0	6
0	0	2	0	2
0	0	0	0	0
0	0	2	0	2
0	0	3	0	3
0	0	1	0	1
0	1	1	0	2
0	1	1	0	2
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	2	16	0	18
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	0	0	0
0	0	2	0	2
0	0	0	0	0
0	0	0	0	0
0	0	3	0	3
0	0	1	0	1
0	0	0	0	0
0	0	1	0	1
0	0	0	0	0
0	0	0	0	0
0	0	7	0	7

[illegible]

AimTD LLC
TURNING MOVEMENT COUNTS



Thursday, September 19, 2019					Location:			Lake Elsinore			PROJECT: SC2352					
ADT2 Mountain west of Lake.										Prepared by AimTD tel. 714 253 7888						
AM Period	NB	SB		EB		WB		PM Period	NB	SB		EB		WB		
0:00				3		4		12:00				19		14		
0:15				2		3		12:15				29		12		
0:30				3		4		12:30				17		17		
0:45				0	8	5	16	24	12:45			23	88	23	66 154	
1:00				0		3		13:00				23		31		
1:15				0		0		13:15				20		26		
1:30				0		3		13:30				17		24		
1:45				2	2	0	6	8	13:45			29	89	32	113 202	
2:00				4		2		14:00				51		40		
2:15				0		0		14:15				35		29		
2:30				5		2		14:30				25		31		
2:45				3	12	4	8	20	14:45			28	139	37	137 276	
3:00				4		0		15:00				40		45		
3:15				8		4		15:15				32		32		
3:30				15		3		15:30				26		23		
3:45				16	43	3	10	53	15:45			30	128	42	142 270	
4:00				15		0		16:00				25		21		
4:15				17		0		16:15				28		30		
4:30				20		0		16:30				32		34		
4:45				29	81	2	2	83	16:45			27	112	35	120 232	
5:00				22		4		17:00				21		35		
5:15				41		2		17:15				28		33		
5:30				26		3		17:30				19		38		
5:45				29	118	0	9	127	17:45			28	96	44	150 246	
6:00				27		3		18:00				26		45		
6:15				36		6		18:15				31		29		
6:30				49		9		18:30				22		34		
6:45				60	172	12	30	202	18:45			17	96	19	127 223	
7:00				63		17		19:00				23		24		
7:15				63		38		19:15				14		26		
7:30				69		41		19:30				21		22		
7:45				66	261	18	114	375	19:45			18	76	31	103 179	
8:00				29		15		20:00				14		29		
8:15				35		9		20:15				18		25		
8:30				42		15		20:30				16		23		
8:45				22	128	10	49	177	20:45			14	62	19	96 158	
9:00				29		6		21:00				9		22		
9:15				31		7		21:15				13		21		
9:30				24		19		21:30				9		13		
9:45				23	107	12	44	151	21:45			6	37	20	76 113	
10:00				22		18		22:00				4		21		
10:15				28		16		22:15				3		11		
10:30				18		10		22:30				8		13		
10:45				19	87	17	61	148	22:45			2	17	4	49 66	
11:00				24		10		23:00				4		6		
11:15				23		16		23:15				4		8		
11:30				29		17		23:30				3		6		
11:45				19	95	12	55	150	23:45			0	11	5	25 36	
Total Vol.				1114		404		1518					951		1204 2155	
												Daily Totals				
										NB SB		EB		WB Combined		
												2065		1608 3673		
AM										PM						
Split %				73.4%		26.6%		41.3%					44.1%		55.9% 58.7%	
Peak Hour				7:00		7:00		7:00					13:45		17:15 14:00	
Volume				261		114		375					140		160 276	
P.H.F.				0.95		0.70		0.85					0.69		0.89 0.76	
cs@aimtd.com Tell. 714 253 7888																

Thursday, September 19, 2019

Location: Lake Elsinore

PROJECT: SC2352

ADT3 Lake north of Mountain.

Prepared by AimTD tel. 714 253 7888

AM Period	NB	SB	EB	WB	PM Period	NB	SB	EB	WB
0:00	15	37			12:00	126	94		
0:15	18	35			12:15	122	82		
0:30	8	42			12:30	104	99		
0:45	15	56	44	158	12:45	117	469	109	384
1:00	10	38			13:00	129	134		
1:15	14	21			13:15	131	143		
1:30	15	27			13:30	118	138		
1:45	20	59	19	105	13:45	142	520	172	587
2:00	16	16			14:00	177	168		
2:15	16	16			14:15	173	167		
2:30	24	18			14:30	141	180		
2:45	31	87	18	68	14:45	163	654	216	731
3:00	51	8			15:00	157	170		
3:15	72	12			15:15	124	208		
3:30	92	13			15:30	147	179		
3:45	148	363	13	46	15:45	146	574	246	803
4:00	183	18			16:00	131	232		
4:15	174	23			16:15	142	224		
4:30	211	22			16:30	139	258		
4:45	196	764	24	87	16:45	139	551	271	985
5:00	220	25			17:00	130	218		
5:15	220	35			17:15	140	238		
5:30	201	50			17:30	147	260		
5:45	208	849	46	156	17:45	160	577	257	973
6:00	208	53			18:00	128	265		
6:15	246	58			18:15	140	265		
6:30	253	73			18:30	116	222		
6:45	252	959	84	268	18:45	102	486	252	1004
7:00	256	142			19:00	102	196		
7:15	231	156			19:15	95	192		
7:30	274	111			19:30	79	188		
7:45	271	1032	86	495	19:45	87	363	191	767
8:00	202	69			20:00	60	170		
8:15	186	79			20:15	66	155		
8:30	151	70			20:30	85	171		
8:45	134	673	68	286	20:45	59	270	132	628
9:00	157	83			21:00	54	148		
9:15	162	72			21:15	52	146		
9:30	118	85			21:30	45	107		
9:45	116	553	89	329	21:45	33	184	147	548
10:00	127	93			22:00	27	116		
10:15	155	87			22:15	34	93		
10:30	121	78			22:30	25	98		
10:45	111	514	77	335	22:45	17	103	75	382
11:00	103	90			23:00	24	63		
11:15	98	86			23:15	16	67		
11:30	118	111			23:30	23	51		
11:45	87	406	82	369	23:45	18	81	47	228
Total Vol.	6315	2702			9017	4832	8020		12852

Daily Totals

NB	SB	EB	WB	Combined
11147	10722			21869

AM

PM

Split %	70.0%	30.0%	41.2%	37.6%	62.4%	58.8%
Peak Hour	7:00	7:00	7:00	14:00	17:30	17:30
Volume	1032	495	1527	654	1047	1622
P.H.F.	0.94	0.79	0.96	0.89	0.99	0.97

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Tell. 714 253 7888

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APPENDIX 3.2:

EXISTING (2019) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Intersection												
Int Delay, s/veh	0.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	251	0	3	113	0	0	0	12	0	0	0
Future Vol, veh/h	0	251	0	3	113	0	0	0	12	0	0	0
Conflicting Peds, #/hr	0	0	2	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	295	0	4	133	0	0	0	14	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	133	0	-	295	0	0	436	436	295	443	436	133
Stage 1	-	-	-	-	-	-	295	295	-	141	141	-
Stage 2	-	-	-	-	-	-	141	141	-	302	295	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1452	-	0	1266	-	-	531	514	744	525	514	916
Stage 1	-	-	0	-	-	-	713	669	-	862	780	-
Stage 2	-	-	0	-	-	-	862	780	-	707	669	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1452	-	-	1266	-	-	530	512	744	514	512	916
Mov Cap-2 Maneuver	-	-	-	-	-	-	530	512	-	514	512	-
Stage 1	-	-	-	-	-	-	713	669	-	862	778	-
Stage 2	-	-	-	-	-	-	859	778	-	694	669	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	9.9	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	744	1452	-	1266	-	-	-
HCM Lane V/C Ratio	0.019	-	-	0.003	-	-	-
HCM Control Delay (s)	9.9	0	-	7.9	-	-	0
HCM Lane LOS	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0.1	0	-	0	-	-	-

Timings
3: Lake St. & Nichols Rd.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	9	4	183	9	3	708	348	21	266
Future Volume (vph)	9	4	183	9	3	708	348	21	266
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	15.8	15.8	9.6	16.2	16.2	9.6	16.2
Total Split (s)	38.0	38.0	38.0	38.0	9.6	70.2	70.2	11.8	72.4
Total Split (%)	31.7%	31.7%	31.7%	31.7%	8.0%	58.5%	58.5%	9.8%	60.3%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		5.8	4.6	6.2	6.2	4.6	6.2
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)		23.8		22.6	5.1	66.1	66.1	5.9	68.6
Actuated g/C Ratio		0.23		0.22	0.05	0.63	0.63	0.06	0.65
v/c Ratio		0.04		0.79	0.04	0.62	0.34	0.22	0.23
Control Delay		29.1		56.5	54.3	17.6	6.5	56.8	9.6
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		29.1		56.5	54.3	17.6	6.5	56.8	9.6
LOS		C		E	D	B	A	E	A
Approach Delay		29.1		56.5		14.0			13.1
Approach LOS		C		E		B			B

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 105

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 20.2

Intersection LOS: C

Intersection Capacity Utilization 64.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Lake St. & Nichols Rd.

		
Ø1	Ø2	Ø4
11.8 s	70.2 s	38 s
		
Ø5	Ø6	Ø8
9.6 s	72.4 s	38 s

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 3: Lake St. & Nichols Rd. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	4	2	183	9	42	3	708	348	21	266	0
Future Volume (veh/h)	9	4	2	183	9	42	3	708	348	21	266	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	9	4	2	189	9	30	3	730	0	22	274	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	0
Cap, veh/h	221	94	40	283	10	35	7	1185		41	1220	0
Arrive On Green	0.18	0.18	0.18	0.18	0.18	0.18	0.00	0.63	0.00	0.02	0.65	0.00
Sat Flow, veh/h	911	520	220	1209	58	192	1781	1870	1585	1781	1870	0
Grp Volume(v), veh/h	15	0	0	228	0	0	3	730	0	22	274	0
Grp Sat Flow(s),veh/h/ln	1651	0	0	1458	0	0	1781	1870	1585	1781	1870	0
Q Serve(g_s), s	0.0	0.0	0.0	14.7	0.0	0.0	0.2	23.8	0.0	1.2	6.1	0.0
Cycle Q Clear(g_c), s	0.7	0.0	0.0	15.4	0.0	0.0	0.2	23.8	0.0	1.2	6.1	0.0
Prop In Lane	0.60		0.13	0.83		0.13	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	355	0	0	328	0	0	7	1185		41	1220	0
V/C Ratio(X)	0.04	0.00	0.00	0.70	0.00	0.00	0.42	0.62		0.54	0.22	0.00
Avail Cap(c_a), veh/h	578	0	0	526	0	0	88	1185		126	1220	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)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.4	0.0	0.0	40.3	0.0	0.0	50.4	11.2	0.0	49.1	7.2	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.7	0.0	0.0	14.0	2.4	0.0	4.1	0.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	5.5	0.0	0.0	0.1	8.6	0.0	0.6	2.1	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.4	0.0	0.0	43.0	0.0	0.0	64.5	13.6	0.0	53.2	7.6	0.0
LnGrp LOS	C	A	A	D	A	A	E	B		D	A	A
Approach Vol, veh/h		15			228			733	A		296	
Approach Delay, s/veh		34.4			43.0			13.8			11.0	
Approach LOS		C			D			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.9	70.5		24.1	5.0	72.4		24.1				
Change Period (Y+Rc), s	4.6	6.2		* 5.8	4.6	6.2		5.8				
Max Green Setting (Gmax), s	7.2	64.0		* 33	5.0	66.2		32.2				
Max Q Clear Time (g_c+I1), s	3.2	25.8		2.7	2.2	8.1		17.4				
Green Ext Time (p_c), s	0.0	5.1		0.0	0.0	1.5		0.9				

Intersection Summary

HCM 6th Ctrl Delay	18.6
HCM 6th LOS	B

Notes

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

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

Timings
4: Lake St. & Alberhill Ranch Rd.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	67	57	1008	38	18	430
Future Volume (vph)	67	57	1008	38	18	430
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.7	14.7	16.2	16.2	9.6	16.2
Total Split (s)	15.3	15.3	94.6	94.6	10.1	104.7
Total Split (%)	12.8%	12.8%	78.8%	78.8%	8.4%	87.3%
Yellow Time (s)	3.7	3.7	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	4.7	6.2	6.2	4.6	6.2
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Max	Max	None	Max
Act Effect Green (s)	10.2	10.2	98.7	98.7	5.3	102.7
Actuated g/C Ratio	0.09	0.09	0.82	0.82	0.04	0.86
v/c Ratio	0.47	0.44	0.69	0.03	0.24	0.28
Control Delay	62.9	63.0	9.8	1.4	63.0	2.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	62.9	63.0	9.8	1.4	63.0	2.7
LOS	E	E	A	A	E	A
Approach Delay	62.9		9.5			5.1
Approach LOS	E		A			A

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 119.7

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.69

Intersection Signal Delay: 12.4

Intersection LOS: B

Intersection Capacity Utilization 70.5%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: Lake St. & Alberhill Ranch Rd.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 4: Lake St. & Alberhill Ranch Rd. 09/26/2019

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	67	57	1008	38	18	430
Future Volume (veh/h)	67	57	1008	38	18	430
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	71	60	1061	26	19	453
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	147	131	1436	1217	35	1545
Arrive On Green	0.08	0.08	0.77	0.77	0.02	0.83
Sat Flow, veh/h	1781	1585	1870	1585	1781	1870
Grp Volume(v), veh/h	71	60	1061	26	19	453
Grp Sat Flow(s), veh/h/ln	1781	1585	1870	1585	1781	1870
Q Serve(g_s), s	4.5	4.3	36.3	0.5	1.3	6.6
Cycle Q Clear(g_c), s	4.5	4.3	36.3	0.5	1.3	6.6
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	147	131	1436	1217	35	1545
V/C Ratio(X)	0.48	0.46	0.74	0.02	0.54	0.29
Avail Cap(c_a), veh/h	158	141	1436	1217	82	1545
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.3	52.1	7.4	3.3	57.9	2.4
Incr Delay (d2), s/veh	0.9	0.9	3.4	0.0	4.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.1	1.7	11.0	0.1	0.6	1.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	53.2	53.1	10.9	3.3	62.8	2.9
LnGrp LOS	D	D	B	A	E	A
Approach Vol, veh/h	131		1087			472
Approach Delay, s/veh	53.1		10.7			5.3
Approach LOS	D		B			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	6.9	97.8			104.7	14.6
Change Period (Y+Rc), s	4.6	6.2			6.2	4.7
Max Green Setting (Gmax), s	5.5	88.4			98.5	10.6
Max Q Clear Time (g_c+I1), s	3.3	38.3			8.6	6.5
Green Ext Time (p_c), s	0.0	10.5			2.7	0.1
Intersection Summary						
HCM 6th Ctrl Delay			12.5			
HCM 6th LOS			B			

Timings
7: Lake St. & Mountain St.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	172	15	49	25	23	827	44	8	421
Future Volume (vph)	172	15	49	25	23	827	44	8	421
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	34.7	34.7	21.7	21.7	9.6	26.8	26.8	9.6	23.2
Total Split (s)	34.7	34.7	34.7	34.7	10.5	75.7	75.7	9.6	74.8
Total Split (%)	28.9%	28.9%	28.9%	28.9%	8.8%	63.1%	63.1%	8.0%	62.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.6	4.8	4.8	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	4.7	4.7	4.7	4.6	5.8	5.8	4.6	6.2
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)	19.8	19.8	19.8	19.8	5.5	75.5	75.5	5.0	70.9
Actuated g/C Ratio	0.18	0.18	0.18	0.18	0.05	0.70	0.70	0.05	0.66
v/c Ratio	0.74	0.27	0.22	0.22	0.26	0.66	0.04	0.10	0.22
Control Delay	60.0	13.1	39.2	17.7	60.0	14.2	2.0	56.4	8.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.0	13.1	39.2	17.7	60.0	14.2	2.0	56.4	8.7
LOS	E	B	D	B	E	B	A	E	A
Approach Delay		43.7		26.4		14.8			9.5
Approach LOS		D		C		B			A

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 107.6

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 18.4

Intersection LOS: B

Intersection Capacity Utilization 71.6%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 7: Lake St. & Mountain St.

		
9.6 s	75.7 s	34.7 s
		
10.5 s	74.8 s	34.7 s

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)

7: Lake St. & Mountain St.

09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	172	15	76	49	25	47	23	827	44	8	421	68
Future Volume (veh/h)	172	15	76	49	25	47	23	827	44	8	421	68
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	0.98		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	179	16	43	51	26	37	24	861	34	8	439	61
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	293	88	238	291	140	199	42	1210	1018	18	1985	274
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.02	0.65	0.65	0.01	0.63	0.63
Sat Flow, veh/h	1339	442	1187	1322	698	993	1781	1870	1574	1781	3136	433
Grp Volume(v), veh/h	179	0	59	51	0	63	24	861	34	8	248	252
Grp Sat Flow(s),veh/h/ln	1339	0	1629	1322	0	1692	1781	1870	1574	1781	1777	1792
Q Serve(g_s), s	13.9	0.0	3.3	3.6	0.0	3.4	1.4	32.6	0.8	0.5	6.4	6.5
Cycle Q Clear(g_c), s	17.2	0.0	3.3	6.9	0.0	3.4	1.4	32.6	0.8	0.5	6.4	6.5
Prop In Lane	1.00		0.73	1.00		0.59	1.00		1.00	1.00		0.24
Lane Grp Cap(c), veh/h	293	0	326	291	0	339	42	1210	1018	18	1125	1135
V/C Ratio(X)	0.61	0.00	0.18	0.18	0.00	0.19	0.57	0.71	0.03	0.45	0.22	0.22
Avail Cap(c_a), veh/h	396	0	451	393	0	468	97	1210	1018	82	1125	1135
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.2	0.0	36.0	38.8	0.0	36.0	52.3	12.5	6.9	53.4	8.5	8.5
Incr Delay (d2), s/veh	2.1	0.0	0.3	0.3	0.0	0.3	4.4	3.6	0.1	6.7	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	4.7	0.0	1.3	1.2	0.0	1.4	0.7	12.5	0.3	0.2	2.2	2.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.2	0.0	36.2	39.1	0.0	36.3	56.7	16.1	7.0	60.0	8.9	8.9
LnGrp LOS	D	A	D	D	A	D	E	B	A	E	A	A
Approach Vol, veh/h	238			114			919			508		
Approach Delay, s/veh	43.0			37.5			16.8			9.7		
Approach LOS	D			D			B			A		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	5.7	76.3		26.4	7.2	74.8		26.4				
Change Period (Y+Rc), s	4.6	* 6.2		* 4.7	4.6	6.2		* 4.7				
Max Green Setting (Gmax), s	5.0	* 70		* 30	5.9	68.6		* 30				
Max Q Clear Time (g_c+I1), s	2.5	34.6		19.2	3.4	8.5		8.9				
Green Ext Time (p_c), s	0.0	7.0		0.6	0.0	2.8		0.4				

Intersection Summary

HCM 6th Ctrl Delay 19.6

HCM 6th LOS B

Notes

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

Timings

Lake and Mountain Shopping Center TIA (JN:12768)

8: Lake St. & Lakeshore Dr.

09/26/2019

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	60	117	190	114	267	94	666	212	160	374	137
Future Volume (vph)	60	117	190	114	267	94	666	212	160	374	137
Turn Type	Perm	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	8	8	1	5	2		1	6	
Permitted Phases	4				8			2			6
Detector Phase	4	4	8	8	1	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	35.6	35.6	15.8	15.8	9.6	9.6	33.8	33.8	9.6	22.8	22.8
Total Split (s)	36.0	36.0	28.0	28.0	15.0	20.2	41.0	41.0	15.0	35.8	35.8
Total Split (%)	30.0%	30.0%	23.3%	23.3%	12.5%	16.8%	34.2%	34.2%	12.5%	29.8%	29.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)		21.6	18.5	18.5	29.2	11.2	35.7	35.7	9.5	33.9	33.9
Actuated g/C Ratio		0.20	0.17	0.17	0.27	0.11	0.34	0.34	0.09	0.32	0.32
v/c Ratio		0.82	0.79	0.44	0.37	0.64	0.71	0.43	0.67	0.42	0.36
Control Delay		41.2	61.7	45.5	4.3	63.4	36.9	6.2	60.2	32.7	10.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		41.2	61.7	45.5	4.3	63.4	36.9	6.2	60.2	32.7	10.2
LOS		D	E	D	A	E	D	A	E	C	B
Approach Delay		41.2		31.7			32.8			34.7	
Approach LOS		D		C			C			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 106.4

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 34.0

Intersection LOS: C

Intersection Capacity Utilization 77.0%

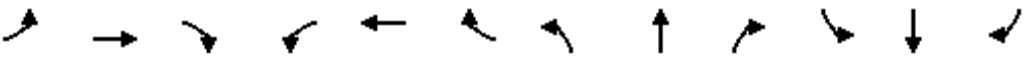
ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 8: Lake St. & Lakeshore Dr.

			
Ø1	Ø2	Ø4	Ø8
15 s	41 s	36 s	28 s
			
Ø5	Ø6		
20.2 s	35.8 s		

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 8: Lake St. & Lakeshore Dr. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔↔		↔	↑	↔↔	↔	↔↔	↔	↔↔	↔↔	↔
Traffic Volume (veh/h)	60	117	118	190	114	267	94	666	212	160	374	137
Future Volume (veh/h)	60	117	118	190	114	267	94	666	212	160	374	137
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.81	1.00		0.71	1.00		0.88	1.00		0.89
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	76	148	102	241	144	218	119	843	125	203	473	95
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	154	299	204	296	310	548	148	1236	487	269	1218	481
Arrive On Green	0.20	0.20	0.20	0.17	0.17	0.17	0.08	0.35	0.35	0.08	0.34	0.34
Sat Flow, veh/h	759	1473	1006	1781	1870	1991	1781	3554	1401	3456	3554	1405
Grp Volume(v), veh/h	183	0	143	241	144	218	119	843	125	203	473	95
Grp Sat Flow(s), veh/h/ln	1832	0	1405	1781	1870	996	1781	1777	1401	1728	1777	1405
Q Serve(g_s), s	9.0	0.0	9.1	13.2	7.0	9.4	6.6	20.5	6.5	5.8	10.2	4.8
Cycle Q Clear(g_c), s	9.0	0.0	9.1	13.2	7.0	9.4	6.6	20.5	6.5	5.8	10.2	4.8
Prop In Lane	0.41		0.72	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	372	0	285	296	310	548	148	1236	487	269	1218	481
V/C Ratio(X)	0.49	0.00	0.50	0.82	0.46	0.40	0.80	0.68	0.26	0.75	0.39	0.20
Avail Cap(c_a), veh/h	569	0	436	391	410	654	275	1236	487	355	1218	481
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.7	0.0	35.8	40.7	38.1	32.5	45.6	28.2	23.6	45.7	25.2	23.4
Incr Delay (d2), s/veh	1.0	0.0	1.4	9.6	1.1	0.5	3.8	3.1	1.3	4.2	0.9	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.1	0.0	3.2	6.3	3.2	2.2	3.0	8.7	2.2	2.6	4.2	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.8	0.0	37.1	50.3	39.2	33.0	49.4	31.3	24.9	49.9	26.2	24.4
LnGrp LOS	D	A	D	D	D	C	D	C	C	D	C	C
Approach Vol, veh/h		326			603			1087			771	
Approach Delay, s/veh		36.9			41.4			32.5			32.2	
Approach LOS		D			D			C			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.5	41.0		25.1	13.0	40.5		22.6				
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8				
Max Green Setting (Gmax), s	10.4	35.2		31.4	15.6	30.0		22.2				
Max Q Clear Time (g_c+I1), s	7.8	22.5		11.1	8.6	12.2		15.2				
Green Ext Time (p_c), s	0.1	4.7		2.1	0.1	3.0		1.6				
Intersection Summary												
HCM 6th Ctrl Delay			34.9									
HCM 6th LOS			C									

Timings

Lake and Mountain Shopping Center TIA (JN:12768)

9: Lincoln St. & Grand Av./Lake St.

09/26/2019

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	88	459	44	167	346	11	38	129	34	123
Future Volume (vph)	88	459	44	167	346	11	38	129	34	123
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases			4			8				
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	9.6	32.8	32.8	9.6	31.8	31.8	9.6	34.4	9.6	34.4
Total Split (s)	21.0	37.0	37.0	31.0	47.0	47.0	14.0	38.0	14.0	38.0
Total Split (%)	17.5%	30.8%	30.8%	25.8%	39.2%	39.2%	11.7%	31.7%	11.7%	31.7%
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	4.8	3.6	4.4	3.6	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	5.8	4.6	5.4	4.6	5.4
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None
Act Effect Green (s)	10.5	37.0	37.0	15.9	42.4	42.4	7.1	14.0	6.9	13.9
Actuated g/C Ratio	0.12	0.41	0.41	0.18	0.47	0.47	0.08	0.16	0.08	0.15
v/c Ratio	0.57	0.42	0.08	0.71	0.28	0.02	0.37	0.63	0.33	0.47
Control Delay	51.5	23.8	0.2	49.7	18.0	0.0	51.7	17.5	51.0	22.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	51.5	23.8	0.2	49.7	18.0	0.0	51.7	17.5	51.0	22.4
LOS	D	C	A	D	B	A	D	B	D	C
Approach Delay		26.1			27.7			21.0		26.2
Approach LOS		C			C			C		C

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 89.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 25.5

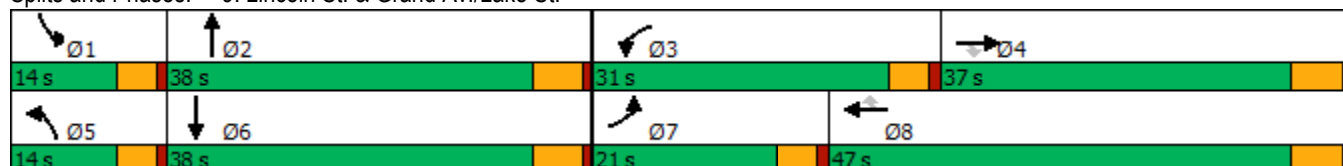
Intersection LOS: C

Intersection Capacity Utilization 69.1%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 9: Lincoln St. & Grand Av./Lake St.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 9: Lincoln St. & Grand Av./Lake St. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	459	44	167	346	11	38	129	216	34	123	95
Future Volume (veh/h)	88	459	44	167	346	11	38	129	216	34	123	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	117	612	40	223	461	11	51	172	216	45	164	95
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	147	1384	607	260	1610	707	71	360	314	67	442	243
Arrive On Green	0.08	0.39	0.39	0.15	0.45	0.45	0.04	0.20	0.20	0.04	0.20	0.20
Sat Flow, veh/h	1781	3554	1559	1781	3554	1561	1781	1777	1552	1781	2209	1213
Grp Volume(v), veh/h	117	612	40	223	461	11	51	172	216	45	130	129
Grp Sat Flow(s),veh/h/ln	1781	1777	1559	1781	1777	1561	1781	1777	1552	1781	1777	1646
Q Serve(g_s), s	5.9	11.5	1.5	11.1	7.4	0.4	2.6	7.8	11.7	2.3	5.7	6.2
Cycle Q Clear(g_c), s	5.9	11.5	1.5	11.1	7.4	0.4	2.6	7.8	11.7	2.3	5.7	6.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.74
Lane Grp Cap(c), veh/h	147	1384	607	260	1610	707	71	360	314	67	355	329
V/C Ratio(X)	0.79	0.44	0.07	0.86	0.29	0.02	0.72	0.48	0.69	0.68	0.37	0.39
Avail Cap(c_a), veh/h	321	1384	607	517	1610	707	184	637	556	184	637	590
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.9	20.5	17.4	37.9	15.6	13.7	43.2	32.0	33.6	43.2	31.4	31.6
Incr Delay (d2), s/veh	3.6	1.0	0.2	3.1	0.4	0.0	5.0	1.0	2.7	4.4	0.6	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	4.6	0.5	4.8	2.8	0.1	1.2	3.3	4.4	1.0	2.4	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.6	21.5	17.6	41.0	16.1	13.7	48.2	33.0	36.3	47.6	32.0	32.3
LnGrp LOS	D	C	B	D	B	B	D	C	D	D	C	C
Approach Vol, veh/h	769			695			439			304		
Approach Delay, s/veh	24.8			24.0			36.4			34.5		
Approach LOS	C			C			D			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.0	23.8	17.9	41.2	8.2	23.6	12.1	47.0				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.8	4.6	5.4	4.6	5.8				
Max Green Setting (Gmax), s	9.4	32.6	26.4	31.2	9.4	32.6	16.4	41.2				
Max Q Clear Time (g_c+I1), s	4.3	13.7	13.1	13.5	4.6	8.2	7.9	9.4				
Green Ext Time (p_c), s	0.0	2.1	0.2	3.6	0.0	1.4	0.1	3.0				
Intersection Summary												
HCM 6th Ctrl Delay	28.2											
HCM 6th LOS	C											

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	542	578	12	7	3
Future Vol, veh/h	4	542	578	12	7	3
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	100
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	72	72	72	72	72	72
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	6	753	803	17	10	4
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	820	0	-	0	1201	812
Stage 1	-	-	-	-	812	-
Stage 2	-	-	-	-	389	-
Critical Hdwy	4.13	-	-	-	6.63	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.83	-
Follow-up Hdwy	2.219	-	-	-	3.519	3.319
Pot Cap-1 Maneuver	807	-	-	-	190	378
Stage 1	-	-	-	-	436	-
Stage 2	-	-	-	-	655	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	807	-	-	-	189	378
Mov Cap-2 Maneuver	-	-	-	-	319	-
Stage 1	-	-	-	-	433	-
Stage 2	-	-	-	-	655	-
Approach	EB	WB		SB		
HCM Control Delay, s	0.1	0		16		
HCM LOS	C					
Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	807	-	-	-	319	378
HCM Lane V/C Ratio	0.007	-	-	-	0.03	0.011
HCM Control Delay (s)	9.5	-	-	-	16.6	14.6
HCM Lane LOS	A	-	-	-	C	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0

Timings
11: Terra Cota Rd. (S) & Lakeshore Dr.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑	↑	↘	↑	↘
Traffic Volume (vph)	538	11	12	559	31
Future Volume (vph)	538	11	12	559	31
Turn Type	NA	Perm	Prot	NA	Prot
Protected Phases	4		3	8	2
Permitted Phases		4			
Detector Phase	4	4	3	8	2
Switch Phase					
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	22.6	22.6	9.6	15.8	14.6
Total Split (s)	83.0	83.0	12.0	95.0	25.0
Total Split (%)	69.2%	69.2%	10.0%	79.2%	20.8%
Yellow Time (s)	3.6	3.6	3.6	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	5.8	4.6
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	Max	Max	None	Max	None
Act Effect Green (s)	86.0	86.0	5.8	89.2	12.9
Actuated g/C Ratio	0.76	0.76	0.05	0.79	0.11
v/c Ratio	0.52	0.01	0.19	0.53	0.55
Control Delay	8.3	2.8	56.5	6.0	58.3
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	8.3	2.8	56.5	6.0	58.3
LOS	A	A	E	A	E
Approach Delay	8.2			7.0	58.3
Approach LOS	A			A	E

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 112.5

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.55

Intersection Signal Delay: 10.8

Intersection LOS: B

Intersection Capacity Utilization 46.4%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 11: Terra Cota Rd. (S) & Lakeshore Dr.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 11: Terra Cota Rd. (S) & Lakeshore Dr. 09/26/2019

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	538	11	12	559	31	45
Future Volume (veh/h)	538	11	12	559	31	45
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	747	12	17	776	43	62
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	1415	1166	33	1528	59	85
Arrive On Green	0.76	0.76	0.02	0.82	0.09	0.09
Sat Flow, veh/h	1870	1542	1781	1870	674	972
Grp Volume(v), veh/h	747	12	17	776	106	0
Grp Sat Flow(s),veh/h/ln	1870	1542	1781	1870	1662	0
Q Serve(g_s), s	17.7	0.2	1.0	14.2	6.8	0.0
Cycle Q Clear(g_c), s	17.7	0.2	1.0	14.2	6.8	0.0
Prop In Lane		1.00	1.00		0.41	0.58
Lane Grp Cap(c), veh/h	1415	1166	33	1528	146	0
V/C Ratio(X)	0.53	0.01	0.52	0.51	0.73	0.00
Avail Cap(c_a), veh/h	1415	1166	121	1528	310	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	5.4	3.3	53.1	3.1	48.5	0.0
Incr Delay (d2), s/veh	1.4	0.0	4.6	1.2	6.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.3	0.1	0.5	3.2	3.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	6.8	3.3	57.7	4.3	55.2	0.0
LnGrp LOS	A	A	E	A	E	A
Approach Vol, veh/h	759			793	106	
Approach Delay, s/veh	6.8			5.5	55.2	
Approach LOS	A			A	E	
Timer - Assigned Phs	2		3	4	8	
Phs Duration (G+Y+Rc), s	14.2		6.6	88.4	95.0	
Change Period (Y+Rc), s	4.6		4.6	* 5.8	5.8	
Max Green Setting (Gmax), s	20.4		7.4	* 78	89.2	
Max Q Clear Time (g_c+I1), s	8.8		3.0	19.7	16.2	
Green Ext Time (p_c), s	0.2		0.0	5.7	6.0	
Intersection Summary						
HCM 6th Ctrl Delay			9.2			
HCM 6th LOS			A			
Notes						
User approved volume balancing among the lanes for turning movement.						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						

Intersection												
Int Delay, s/veh	0.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	0	95	0	5	148	0	0	0	3	0	0	0
Future Vol, veh/h	0	95	0	5	148	0	0	0	3	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	0	113	0	6	176	0	0	0	4	0	0	0

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	176	0	-	113	0	0	301	301	113	303	301	176
Stage 1	-	-	-	-	-	-	113	113	-	188	188	-
Stage 2	-	-	-	-	-	-	188	188	-	115	113	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1400	-	0	1476	-	-	651	612	940	649	612	867
Stage 1	-	-	0	-	-	-	892	802	-	814	745	-
Stage 2	-	-	0	-	-	-	814	745	-	890	802	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1400	-	-	1476	-	-	648	609	940	644	609	867
Mov Cap-2 Maneuver	-	-	-	-	-	-	648	609	-	644	609	-
Stage 1	-	-	-	-	-	-	892	802	-	814	741	-
Stage 2	-	-	-	-	-	-	810	741	-	887	802	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	0.2	8.8	0
HCM LOS			A	A

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	940	1400	-	1476	-	-	-
HCM Lane V/C Ratio	0.004	-	-	0.004	-	-	-
HCM Control Delay (s)	8.8	0	-	7.4	-	-	0
HCM Lane LOS	A	A	-	A	-	-	A
HCM 95th %tile Q(veh)	0	0	-	0	-	-	-

Timings
3: Lake St. & Nichols Rd.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	4	4	238	1	2	376	168	39	749
Future Volume (vph)	4	4	238	1	2	376	168	39	749
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	15.8	15.8	9.6	16.2	16.2	9.6	16.2
Total Split (s)	38.0	38.0	38.0	38.0	9.6	70.2	70.2	11.8	72.4
Total Split (%)	31.7%	31.7%	31.7%	31.7%	8.0%	58.5%	58.5%	9.8%	60.3%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		5.8	4.6	6.2	6.2	4.6	6.2
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)		27.8		26.6	5.0	65.6	65.6	6.5	70.4
Actuated g/C Ratio		0.25		0.24	0.05	0.59	0.59	0.06	0.63
v/c Ratio		0.02		0.85	0.03	0.37	0.18	0.41	0.69
Control Delay		28.8		63.8	55.5	15.1	2.9	65.5	18.8
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		28.8		63.8	55.5	15.1	2.9	65.5	18.8
LOS		C		E	E	B	A	E	B
Approach Delay		28.8		63.8		11.5			21.1
Approach LOS		C		E		B			C

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 110.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.85

Intersection Signal Delay: 24.7

Intersection LOS: C

Intersection Capacity Utilization 70.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Lake St. & Nichols Rd.

		
Ø1	Ø2	Ø4
11.8 s	70.2 s	38 s
		
Ø5	Ø6	Ø8
9.6 s	72.4 s	38 s

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 3: Lake St. & Nichols Rd. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	4	2	238	1	16	2	376	168	39	749	0
Future Volume (veh/h)	4	4	2	238	1	16	2	376	168	39	749	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	4	4	1	259	1	9	2	409	0	42	814	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	0
Cap, veh/h	199	188	42	356	1	10	5	1122		59	1179	0
Arrive On Green	0.21	0.21	0.21	0.21	0.21	0.21	0.00	0.60	0.00	0.03	0.63	0.00
Sat Flow, veh/h	710	890	200	1371	5	48	1781	1870	1585	1781	1870	0
Grp Volume(v), veh/h	9	0	0	269	0	0	2	409	0	42	814	0
Grp Sat Flow(s),veh/h/ln	1800	0	0	1424	0	0	1781	1870	1585	1781	1870	0
Q Serve(g_s), s	0.0	0.0	0.0	19.2	0.0	0.0	0.1	11.9	0.0	2.5	30.4	0.0
Cycle Q Clear(g_c), s	0.4	0.0	0.0	19.6	0.0	0.0	0.1	11.9	0.0	2.5	30.4	0.0
Prop In Lane	0.44		0.11	0.96		0.03	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	429	0	0	367	0	0	5	1122		59	1179	0
V/C Ratio(X)	0.02	0.00	0.00	0.73	0.00	0.00	0.42	0.36		0.71	0.69	0.00
Avail Cap(c_a), veh/h	592	0	0	495	0	0	83	1122		120	1179	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)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.4	0.0	0.0	40.9	0.0	0.0	53.1	10.9	0.0	51.1	12.9	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	3.7	0.0	0.0	19.9	0.9	0.0	5.6	3.3	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	0.2	0.0	0.0	6.9	0.0	0.0	0.1	4.5	0.0	1.2	11.4	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.4	0.0	0.0	44.6	0.0	0.0	73.0	11.9	0.0	56.7	16.2	0.0
LnGrp LOS	C	A	A	D	A	A	E	B		E	B	A
Approach Vol, veh/h		9			269			411	A		856	
Approach Delay, s/veh		33.4			44.6			12.1			18.2	
Approach LOS		C			D			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.2	70.2		28.3	4.9	73.5		28.3				
Change Period (Y+Rc), s	4.6	6.2		* 5.8	4.6	6.2		5.8				
Max Green Setting (Gmax), s	7.2	64.0		* 33	5.0	66.2		32.2				
Max Q Clear Time (g_c+I1), s	4.5	13.9		2.4	2.1	32.4		21.6				
Green Ext Time (p_c), s	0.0	2.3		0.0	0.0	5.9		1.0				

Intersection Summary

HCM 6th Ctrl Delay	21.3
HCM 6th LOS	C

Notes

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

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

Timings
4: Lake St. & Alberhill Ranch Rd.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	28	16	543	31	32	966
Future Volume (vph)	28	16	543	31	32	966
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.7	14.7	16.2	16.2	9.6	16.2
Total Split (s)	15.3	15.3	94.6	94.6	10.1	104.7
Total Split (%)	12.8%	12.8%	78.8%	78.8%	8.4%	87.3%
Yellow Time (s)	3.7	3.7	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	4.7	6.2	6.2	4.6	6.2
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Max	Max	None	Max
Act Effect Green (s)	10.0	10.0	98.4	98.4	5.4	104.3
Actuated g/C Ratio	0.09	0.09	0.84	0.84	0.05	0.90
v/c Ratio	0.20	0.13	0.38	0.03	0.43	0.64
Control Delay	54.0	52.9	5.0	1.4	71.0	5.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	52.9	5.0	1.4	71.0	5.2
LOS	D	D	A	A	E	A
Approach Delay	53.6		4.9			7.3
Approach LOS	D		A			A

Intersection Summary

Cycle Length: 120
 Actuated Cycle Length: 116.5
 Natural Cycle: 60
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 0.64
 Intersection Signal Delay: 7.7
 Intersection LOS: A
 Intersection Capacity Utilization 68.3%
 ICU Level of Service C
 Analysis Period (min) 15

Splits and Phases: 4: Lake St. & Alberhill Ranch Rd.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 4: Lake St. & Alberhill Ranch Rd. 09/26/2019

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	28	16	543	31	32	966
Future Volume (veh/h)	28	16	543	31	32	966
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	31	18	597	31	35	1062
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	121	108	1442	1222	52	1570
Arrive On Green	0.07	0.07	0.77	0.77	0.03	0.84
Sat Flow, veh/h	1781	1585	1870	1585	1781	1870
Grp Volume(v), veh/h	31	18	597	31	35	1062
Grp Sat Flow(s), veh/h/ln	1781	1585	1870	1585	1781	1870
Q Serve(g_s), s	1.9	1.3	12.6	0.5	2.3	24.8
Cycle Q Clear(g_c), s	1.9	1.3	12.6	0.5	2.3	24.8
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	121	108	1442	1222	52	1570
V/C Ratio(X)	0.26	0.17	0.41	0.03	0.68	0.68
Avail Cap(c_a), veh/h	161	143	1442	1222	83	1570
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.9	51.6	4.5	3.1	56.4	3.5
Incr Delay (d2), s/veh	0.4	0.3	0.9	0.0	5.7	2.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.9	0.5	3.6	0.1	1.1	4.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	52.3	51.8	5.4	3.2	62.1	5.9
LnGrp LOS	D	D	A	A	E	A
Approach Vol, veh/h	49		628			1097
Approach Delay, s/veh	52.1		5.3			7.7
Approach LOS	D		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	8.0	96.7			104.7	12.7
Change Period (Y+Rc), s	4.6	6.2			6.2	4.7
Max Green Setting (Gmax), s	5.5	88.4			98.5	10.6
Max Q Clear Time (g_c+I1), s	4.3	14.6			26.8	3.9
Green Ext Time (p_c), s	0.0	3.9			10.7	0.0
Intersection Summary						
HCM 6th Ctrl Delay			8.1			
HCM 6th LOS			A			

Timings
7: Lake St. & Mountain St.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	60	4	24	5	51	501	16	34	863
Future Volume (vph)	60	4	24	5	51	501	16	34	863
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	34.7	34.7	21.7	21.7	9.6	26.8	26.8	9.6	23.2
Total Split (s)	34.7	34.7	34.7	34.7	10.5	75.7	75.7	9.6	74.8
Total Split (%)	28.9%	28.9%	28.9%	28.9%	8.8%	63.1%	63.1%	8.0%	62.3%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.6	4.8	4.8	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	4.7	4.7	4.7	4.6	5.8	5.8	4.6	6.2
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)	13.8	13.8	13.8	13.8	5.7	77.2	77.2	5.0	74.2
Actuated g/C Ratio	0.13	0.13	0.13	0.13	0.06	0.75	0.75	0.05	0.72
v/c Ratio	0.35	0.16	0.14	0.08	0.56	0.39	0.01	0.43	0.41
Control Delay	45.3	15.0	40.2	21.4	71.5	8.7	0.0	66.0	9.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.3	15.0	40.2	21.4	71.5	8.7	0.0	66.0	9.0
LOS	D	B	D	C	E	A	A	E	A
Approach Delay		33.6		32.2		14.1			10.9
Approach LOS		C		C		B			B

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 102.5

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.56

Intersection Signal Delay: 13.8

Intersection LOS: B

Intersection Capacity Utilization 54.0%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 7: Lake St. & Mountain St.

		
9.6 s	75.7 s	34.7 s
		
10.5 s	74.8 s	34.7 s

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	4	34	24	5	13	51	501	16	34	863	97
Future Volume (veh/h)	60	4	34	24	5	13	51	501	16	34	863	97
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	65	4	15	26	5	5	55	545	14	37	938	98
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	204	34	127	195	84	84	71	1331	1127	58	2288	239
Arrive On Green	0.10	0.10	0.10	0.10	0.10	0.10	0.04	0.71	0.71	0.03	0.70	0.70
Sat Flow, veh/h	1405	345	1293	1393	858	858	1781	1870	1584	1781	3247	339
Grp Volume(v), veh/h	65	0	19	26	0	10	55	545	14	37	513	523
Grp Sat Flow(s),veh/h/ln	1405	0	1638	1393	0	1716	1781	1870	1584	1781	1777	1809
Q Serve(g_s), s	4.3	0.0	1.0	1.7	0.0	0.5	3.0	11.6	0.3	2.0	11.8	11.8
Cycle Q Clear(g_c), s	4.8	0.0	1.0	2.7	0.0	0.5	3.0	11.6	0.3	2.0	11.8	11.8
Prop In Lane	1.00		0.79	1.00		0.50	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	204	0	160	195	0	168	71	1331	1127	58	1252	1275
V/C Ratio(X)	0.32	0.00	0.12	0.13	0.00	0.06	0.78	0.41	0.01	0.64	0.41	0.41
Avail Cap(c_a), veh/h	495	0	500	484	0	524	107	1331	1127	91	1252	1275
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.4	0.0	40.4	41.7	0.0	40.2	46.7	5.8	4.1	46.9	6.0	6.0
Incr Delay (d2), s/veh	0.9	0.0	0.3	0.3	0.0	0.1	8.8	0.9	0.0	4.4	1.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	0.4	0.6	0.0	0.2	1.5	3.6	0.1	0.9	3.4	3.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	43.3	0.0	40.7	42.0	0.0	40.3	55.5	6.7	4.1	51.3	7.0	7.0
LnGrp LOS	D	A	D	D	A	D	E	A	A	D	A	A
Approach Vol, veh/h	84		36				614				1073	
Approach Delay, s/veh	42.7		41.5				11.0				8.5	
Approach LOS	D		D				B				A	
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	7.8	76.1	14.3		8.5	75.4	14.3					
Change Period (Y+Rc), s	4.6	* 6.2	* 4.7		4.6	6.2	* 4.7					
Max Green Setting (Gmax), s	5.0	* 70	* 30		5.9	68.6	* 30					
Max Q Clear Time (g_c+I1), s	4.0	13.6	6.8		5.0	13.8	4.7					
Green Ext Time (p_c), s	0.0	3.6	0.2		0.0	7.1	0.1					
Intersection Summary												
HCM 6th Ctrl Delay	11.6											
HCM 6th LOS	B											
Notes												

Timings
8: Lake St. & Lakeshore Dr.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	10	20	135	10	199	15	388	95	255	612	13
Future Volume (vph)	10	20	135	10	199	15	388	95	255	612	13
Turn Type	Perm	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	8	8	1	5	2		1	6	
Permitted Phases	4				8			2			6
Detector Phase	4	4	8	8	1	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	35.6	35.6	15.8	15.8	9.6	9.6	33.8	33.8	9.6	22.8	22.8
Total Split (s)	36.0	36.0	28.0	28.0	15.0	20.2	41.0	41.0	15.0	35.8	35.8
Total Split (%)	30.0%	30.0%	23.3%	23.3%	12.5%	16.8%	34.2%	34.2%	12.5%	29.8%	29.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)		13.5	13.4	13.4	29.8	5.7	36.2	36.2	10.4	49.4	49.4
Actuated g/C Ratio		0.15	0.15	0.15	0.33	0.06	0.40	0.40	0.11	0.54	0.54
v/c Ratio		0.18	0.56	0.04	0.20	0.14	0.30	0.15	0.70	0.34	0.02
Control Delay		24.9	47.1	37.2	4.3	49.1	22.4	5.4	52.0	16.5	0.0
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		24.9	47.1	37.2	4.3	49.1	22.4	5.4	52.0	16.5	0.0
LOS		C	D	D	A	D	C	A	D	B	A
Approach Delay		24.9		22.1			20.0			26.5	
Approach LOS		C		C			B			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 91.1

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.70

Intersection Signal Delay: 23.8

Intersection LOS: C

Intersection Capacity Utilization 58.3%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 8: Lake St. & Lakeshore Dr.

			
Ø1	Ø2	Ø4	Ø8
15 s	41 s	36 s	28 s
			
Ø5	Ø6		
20.2 s	35.8 s		

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)

8: Lake St. & Lakeshore Dr.

09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	20	20	135	10	199	15	388	95	255	612	13
Future Volume (veh/h)	10	20	20	135	10	199	15	388	95	255	612	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	22	0	145	11	205	16	417	99	274	658	8
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	73	160	0	224	235	640	33	1575	702	358	1877	837
Arrive On Green	0.07	0.07	0.00	0.13	0.13	0.13	0.02	0.44	0.44	0.10	0.53	0.53
Sat Flow, veh/h	1128	2556	0	1781	1870	2790	1781	3554	1584	3456	3554	1585
Grp Volume(v), veh/h	18	15	0	145	11	205	16	417	99	274	658	8
Grp Sat Flow(s),veh/h/ln	1814	1777	0	1781	1870	1395	1781	1777	1584	1728	1777	1585
Q Serve(g_s), s	0.7	0.6	0.0	6.2	0.4	4.9	0.7	5.9	2.9	6.1	8.5	0.2
Cycle Q Clear(g_c), s	0.7	0.6	0.0	6.2	0.4	4.9	0.7	5.9	2.9	6.1	8.5	0.2
Prop In Lane	0.62		0.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	118	116	0	224	235	640	33	1575	702	358	1877	837
V/C Ratio(X)	0.15	0.13	0.00	0.65	0.05	0.32	0.48	0.26	0.14	0.76	0.35	0.01
Avail Cap(c_a), veh/h	717	703	0	498	523	1069	350	1575	702	453	1877	837
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	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.0	35.0	0.0	33.0	30.5	25.4	38.6	13.9	13.1	34.6	10.8	8.9
Incr Delay (d2), s/veh	0.6	0.5	0.0	3.1	0.1	0.3	3.9	0.4	0.4	4.3	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.3	0.0	2.7	0.2	1.5	0.3	2.1	1.0	2.6	2.9	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.6	35.5	0.0	36.1	30.6	25.7	42.5	14.3	13.5	38.9	11.4	8.9
LnGrp LOS	D	D	A	D	C	C	D	B	B	D	B	A
Approach Vol, veh/h	33			361			532			940		
Approach Delay, s/veh	35.6			30.0			15.0			19.4		
Approach LOS	D			C			B			B		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	12.8	41.0		9.8	6.1	47.7		15.8				
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8				
Max Green Setting (Gmax), s	10.4	35.2		31.4	15.6	30.0		22.2				
Max Q Clear Time (g_c+I1), s	8.1	7.9		2.7	2.7	10.5		8.2				
Green Ext Time (p_c), s	0.1	2.9		0.1	0.0	4.0		1.0				
Intersection Summary												
HCM 6th Ctrl Delay	20.5											
HCM 6th LOS	C											

Timings

Lake and Mountain Shopping Center TIA (JN:12768)

9: Lincoln St. & Grand Av./Lake St.

09/26/2019

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	
Lane Configurations											
Traffic Volume (vph)	24	298	19	154	377	12	31	34	11	25	
Future Volume (vph)	24	298	19	154	377	12	31	34	11	25	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA	
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases			4			8					
Detector Phase	7	4	4	3	8	8	5	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	
Minimum Split (s)	9.6	32.8	32.8	9.6	31.8	31.8	9.6	34.4	9.6	34.4	
Total Split (s)	21.0	37.0	37.0	31.0	47.0	47.0	14.0	38.0	14.0	38.0	
Total Split (%)	17.5%	30.8%	30.8%	25.8%	39.2%	39.2%	11.7%	31.7%	11.7%	31.7%	
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	4.8	3.6	4.4	3.6	4.4	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	5.8	4.6	5.4	4.6	5.4	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	
Act Effct Green (s)	6.0	33.5	33.5	11.7	46.0	46.0	6.2	17.8	5.5	13.2	
Actuated g/C Ratio	0.07	0.41	0.41	0.14	0.57	0.57	0.08	0.22	0.07	0.16	
v/c Ratio	0.19	0.21	0.03	0.62	0.19	0.01	0.24	0.17	0.09	0.07	
Control Delay	44.6	19.3	0.1	45.7	12.4	0.0	44.8	10.0	44.5	23.2	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	44.6	19.3	0.1	45.7	12.4	0.0	44.8	10.0	44.5	23.2	
LOS	D	B	A	D	B	A	D	B	D	C	
Approach Delay		20.0			21.6			16.8		27.9	
Approach LOS		C			C			B		C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 81.1

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.62

Intersection Signal Delay: 20.7

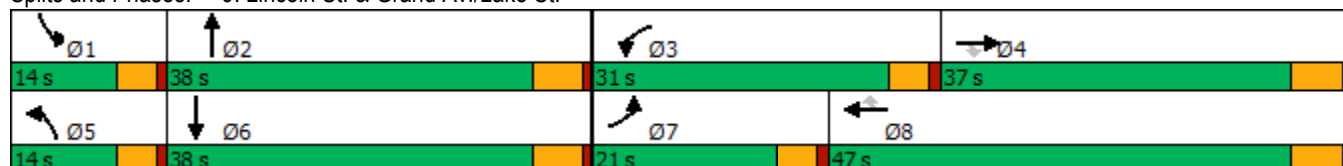
Intersection LOS: C

Intersection Capacity Utilization 55.6%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 9: Lincoln St. & Grand Av./Lake St.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 9: Lincoln St. & Grand Av./Lake St. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	298	19	154	377	12	31	34	94	11	25	13
Future Volume (veh/h)	24	298	19	154	377	12	31	34	94	11	25	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	25	307	18	159	389	9	32	35	58	11	26	3
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	48	1611	718	199	1912	852	57	275	246	24	438	50
Arrive On Green	0.03	0.45	0.45	0.11	0.54	0.54	0.03	0.16	0.16	0.01	0.14	0.14
Sat Flow, veh/h	1781	3554	1584	1781	3554	1583	1781	1777	1585	1781	3213	364
Grp Volume(v), veh/h	25	307	18	159	389	9	32	35	58	11	14	15
Grp Sat Flow(s),veh/h/ln	1781	1777	1584	1781	1777	1583	1781	1777	1585	1781	1777	1800
Q Serve(g_s), s	1.1	4.0	0.5	6.7	4.3	0.2	1.4	1.3	2.5	0.5	0.5	0.6
Cycle Q Clear(g_c), s	1.1	4.0	0.5	6.7	4.3	0.2	1.4	1.3	2.5	0.5	0.5	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	48	1611	718	199	1912	852	57	275	246	24	242	246
V/C Ratio(X)	0.52	0.19	0.03	0.80	0.20	0.01	0.56	0.13	0.24	0.45	0.06	0.06
Avail Cap(c_a), veh/h	382	1611	718	614	1912	852	219	756	675	219	756	766
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.8	12.5	11.6	33.2	9.2	8.2	36.5	27.9	28.4	37.5	28.8	28.8
Incr Delay (d2), s/veh	3.2	0.3	0.1	2.8	0.2	0.0	3.1	0.2	0.5	4.8	0.1	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	0.5	1.4	0.2	2.8	1.4	0.1	0.6	0.5	0.9	0.2	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.0	12.8	11.6	36.0	9.4	8.2	39.6	28.1	28.9	42.3	28.9	28.9
LnGrp LOS	D	B	B	D	A	A	D	C	C	D	C	C
Approach Vol, veh/h	350			557			125			40		
Approach Delay, s/veh	14.7			17.0			31.4			32.6		
Approach LOS	B			B			C			C		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	5.6	17.3	13.1	40.5	7.1	15.8	6.7	47.0				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.8	4.6	5.4	4.6	5.8				
Max Green Setting (Gmax), s	9.4	32.6	26.4	31.2	9.4	32.6	16.4	41.2				
Max Q Clear Time (g_c+I1), s	2.5	4.5	8.7	6.0	3.4	2.6	3.1	6.3				
Green Ext Time (p_c), s	0.0	0.4	0.2	1.8	0.0	0.1	0.0	2.5				
Intersection Summary												
HCM 6th Ctrl Delay	18.5											
HCM 6th LOS	B											

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	419	440	14	10	2
Future Vol, veh/h	0	419	440	14	10	2
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	100
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	446	468	15	11	2

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	483	0	0 699 476
Stage 1	-	-	- 476 -
Stage 2	-	-	- 223 -
Critical Hdwy	4.13	-	- 6.63 6.23
Critical Hdwy Stg 1	-	-	- 5.43 -
Critical Hdwy Stg 2	-	-	- 5.83 -
Follow-up Hdwy	2.219	-	- 3.519 3.319
Pot Cap-1 Maneuver	1078	-	- 390 588
Stage 1	-	-	- 624 -
Stage 2	-	-	- 793 -
Platoon blocked, %		-	-
Mov Cap-1 Maneuver	1078	-	- 390 588
Mov Cap-2 Maneuver	-	-	- 491 -
Stage 1	-	-	- 624 -
Stage 2	-	-	- 793 -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1078	-	-	-	491	588
HCM Lane V/C Ratio	-	-	-	-	0.022	0.004
HCM Control Delay (s)	0	-	-	-	12.5	11.1
HCM Lane LOS	A	-	-	-	B	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0

Timings
11: Terra Cota Rd. (S) & Lakeshore Dr.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑	↑	↘	↑	↘
Traffic Volume (vph)	401	28	41	449	5
Future Volume (vph)	401	28	41	449	5
Turn Type	NA	Perm	Prot	NA	Prot
Protected Phases	4		3	8	2
Permitted Phases		4			
Detector Phase	4	4	3	8	2
Switch Phase					
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	22.6	22.6	9.6	15.8	14.6
Total Split (s)	83.0	83.0	12.0	95.0	25.0
Total Split (%)	69.2%	69.2%	10.0%	79.2%	20.8%
Yellow Time (s)	3.6	3.6	3.6	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	5.8	4.6
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	Max	Max	None	Max	None
Act Effect Green (s)	85.1	85.1	6.6	93.4	10.5
Actuated g/C Ratio	0.77	0.77	0.06	0.85	0.10
v/c Ratio	0.30	0.03	0.42	0.30	0.34
Control Delay	5.9	1.8	62.1	3.0	53.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	5.9	1.8	62.1	3.0	53.0
LOS	A	A	E	A	D
Approach Delay	5.6			8.0	53.0
Approach LOS	A			A	D

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 110.2

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 9.2

Intersection LOS: A

Intersection Capacity Utilization 45.1%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 11: Terra Cota Rd. (S) & Lakeshore Dr.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 11: Terra Cota Rd. (S) & Lakeshore Dr. 09/26/2019

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	401	28	41	449	5	45
Future Volume (veh/h)	401	28	41	449	5	45
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	427	24	44	478	5	48
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	1407	1188	61	1550	11	106
Arrive On Green	0.75	0.75	0.03	0.83	0.07	0.07
Sat Flow, veh/h	1870	1580	1781	1870	149	1428
Grp Volume(v), veh/h	427	24	44	478	54	0
Grp Sat Flow(s), veh/h/ln	1870	1580	1781	1870	1606	0
Q Serve(g_s), s	7.9	0.4	2.6	6.3	3.5	0.0
Cycle Q Clear(g_c), s	7.9	0.4	2.6	6.3	3.5	0.0
Prop In Lane		1.00	1.00		0.09	0.89
Lane Grp Cap(c), veh/h	1407	1188	61	1550	120	0
V/C Ratio(X)	0.30	0.02	0.73	0.31	0.45	0.00
Avail Cap(c_a), veh/h	1407	1188	122	1550	304	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.3	3.4	51.5	2.1	47.7	0.0
Incr Delay (d2), s/veh	0.6	0.0	6.0	0.5	2.7	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.3	0.1	1.2	1.2	1.5	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	4.8	3.4	57.5	2.6	50.3	0.0
LnGrp LOS	A	A	E	A	D	A
Approach Vol, veh/h	451			522	54	
Approach Delay, s/veh	4.8			7.3	50.3	
Approach LOS	A			A	D	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		12.6	8.3	86.7		95.0
Change Period (Y+Rc), s		4.6	4.6	* 5.8		5.8
Max Green Setting (Gmax), s		20.4	7.4	* 78		89.2
Max Q Clear Time (g_c+I1), s		5.5	4.6	9.9		8.3
Green Ext Time (p_c), s		0.1	0.0	2.7		3.0
Intersection Summary						
HCM 6th Ctrl Delay			8.4			
HCM 6th LOS			A			
Notes						
User approved volume balancing among the lanes for turning movement.						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						

APPENDIX 3.3:

EXISTING (2019) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing (2019) Conditions - Weekday AM Peak Hour**

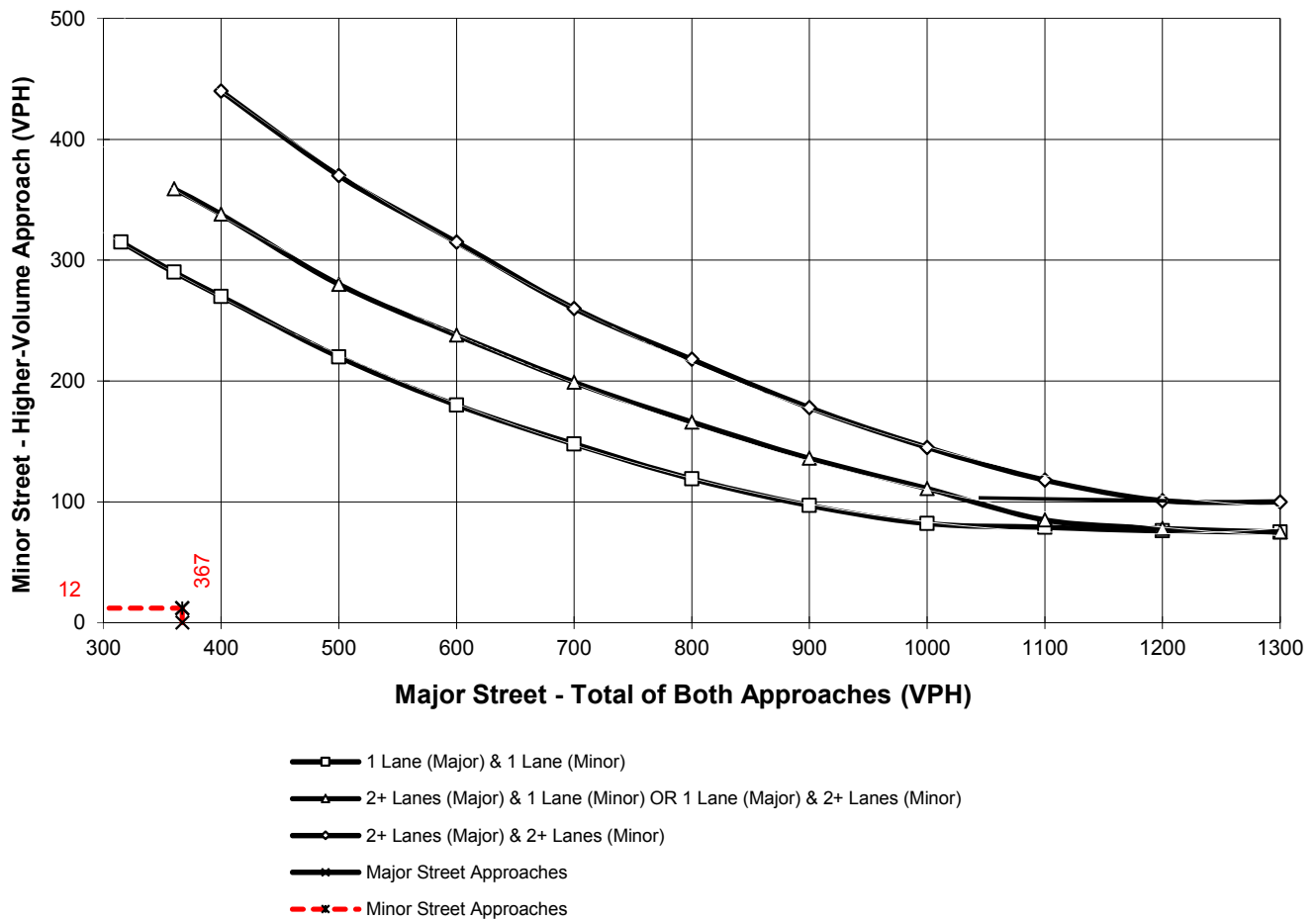
Major Street Name = **Mountain St.**

Total of Both Approaches (VPH) = **367**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Ginger Root Wy.**

High Volume Approach (VPH) = **12**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes
and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **Existing (2019) Conditions - Weekday PM Peak Hour**

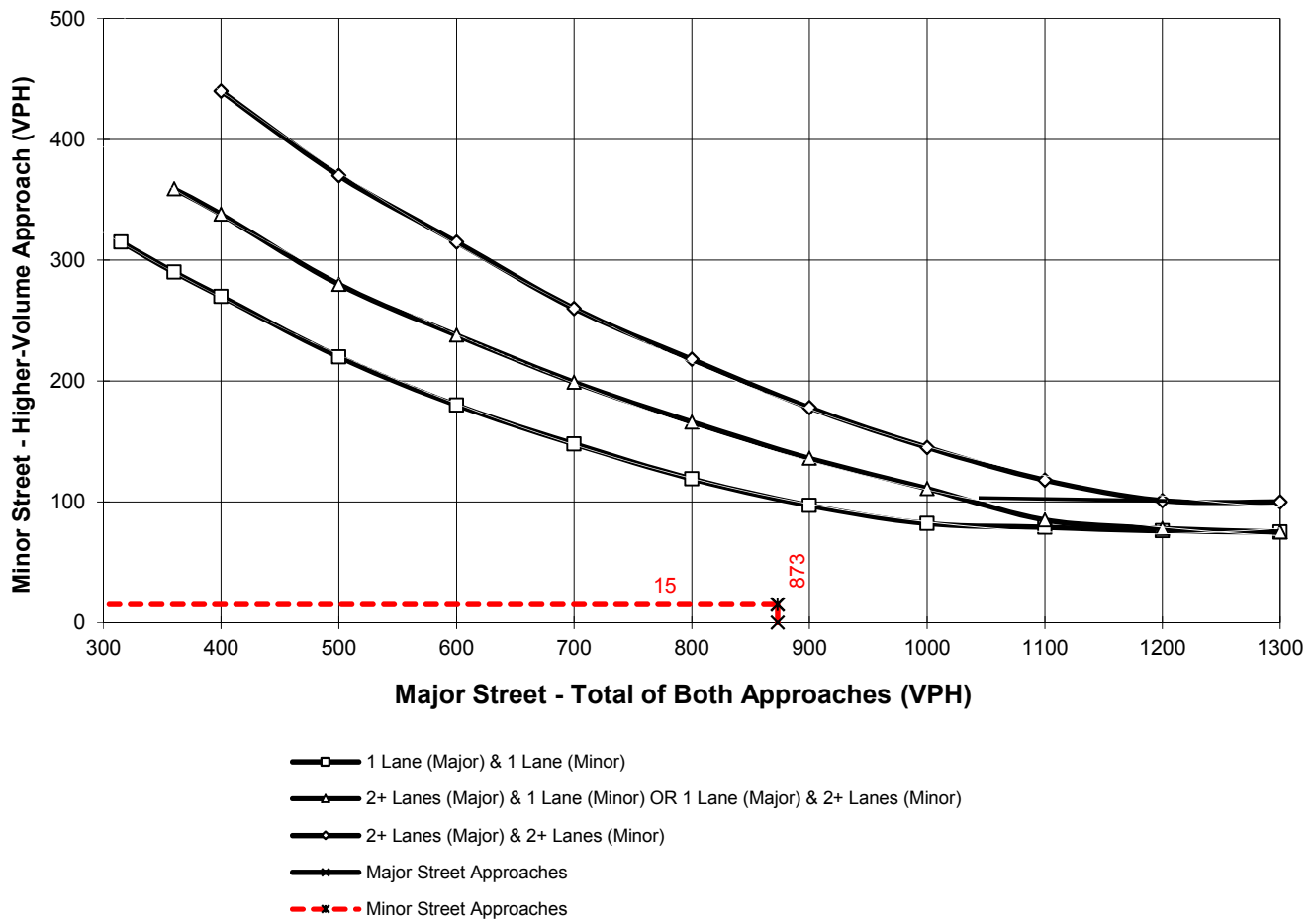
Major Street Name = **Lakeshore Dr.**

Total of Both Approaches (VPH) = **873**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Terra Cotta Rd. (N)**

High Volume Approach (VPH) = **15**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes
and 75 vph applies as the lower threshold for a minor-street approach with one lane

APPENDIX 4.1:

CUMULATIVE DEVELOPMENT TRIP GENERATION

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Appendix 4.1

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Cumulative Projects Trip Generation Rates

Land Use		ITE LU	AM Peak Hour			PM Peak Hour			Daily
	Units ¹	Code	In	Out	Total	In	Out	Total	
Trip Generation Rates									
Single Family Detached Residential	DU	210	0.19	0.56	0.74	0.62	0.37	0.99	9.44
Shopping Center	TSF	820	0.58	0.36	0.94	1.83	1.98	3.81	37.75
Multifamily Housing (low)	TSF	220	0.11	0.35	0.46	0.35	0.21	0.56	7.32
Warehouse (Truck)	TSF	150	0.03	0.01	0.04	0.01	0.03	0.04	0.35
Warehouse (Passenger Car)	TSF	150	0.10	0.03	0.14	0.04	0.11	0.15	1.39
Hotel	RM	310	0.28	0.19	0.47	0.31	0.29	0.60	8.36
Recreation Community Center	TSF	495	1.16	0.60	1.76	1.09	1.22	2.31	28.82
Senior Adult Housing Attached	DU	252	0.07	0.13	0.20	0.14	0.12	0.26	3.70
Mini Warehouse (Storage)	TSF	151	0.06	0.04	0.10	0.08	0.09	0.17	1.51
Automobile Sales	TSF	840	1.37	0.50	1.87	0.97	1.46	2.43	27.84
High Turnover Sit-Down Restaurant	TSF	932	5.47	4.47	9.94	6.06	3.71	9.77	112.18
Resort Hotel	RM	330	0.23	0.09	0.32	0.18	0.23	0.41	8.36
General Office	TSF	710	1.00	0.16	1.16	0.18	0.97	1.15	9.74
University	TSF	550	0.84	0.25	1.09	0.37	0.80	1.17	26.04
Recycling	TSF	897	4.89	4.89	9.78	5.25	4.85	10.10	101.00

¹ DU = Dwelling Units; TSF = thousand square feet; RM = Rooms

Cumulative Projects Trip Generation Summary

No.	Project Name	Land Use	Quantity	Units ¹	AM Peak Hour			PM Peak Hour			Daily
					In	Out	Total	In	Out	Total	
City of Lake Elsinore											
LE1	Greenwald ²	Shopping Center	104.450	TSF	61	37	98	143	155	298	2,957
LE2	Ramsgate	Single Family Residential	1,306	DU	242	725	966	815	478	1,293	12,329
		Condo/Townhomes	120	DU	13	43	55	42	25	67	878
LE3	Trieste Residential (Tract 36624)	Single Family Residential	75	DU	14	42	56	47	27	74	708
LE4	Fairway Business Park	Warehouse	279.445	TSF	29	9	38	11	31	42	389
LE5	Ness Industrial Garage	Warehouse	12.000	TSF	1	0	2	0	1	2	17
LE6	Spyglass Ranch ³	Single Family Residential	523	DU	97	290	387	326	192	518	4,937
		Condo/Townhomes	171	DU	18	61	79	60	35	96	1,252
		Shopping Center	145.00	TSF	85	52	136	265	287	552	5,474
LE7	South Shore I (Tract 31593)	Single Family Residential	521	DU	96	289	386	325	191	516	4,918
	South Shore II (Tract 36567)	Single Family Residential	147	DU	27	82	109	92	54	146	1,388
LE8	La Strada (Tract 32077)	Single Family Residential	134	DU	25	74	99	84	49	133	1,265
LE9	Tuscany West (Tract 25473)	Single Family Residential	164	DU	30	91	121	102	60	162	1,548
LE10	Marina Village Condos (Tract 33820) ⁶	Condo/Townhomes	94	DU	10	33	43	33	19	53	688
LE11	La Quinta Inn	Hotel	64	RM	18	12	30	20	19	38	535
LE12	LE Sports Complex	Recreational Community Center	525.000	TSF	610	314	924	570	643	1,213	924
LE13	TAG Property ⁴	New Car Sales	50.000	TSF	68	25	94	49	73	122	1,392
LE14	City Center Condos	Condo/Townhomes	144	DU	15	51	66	51	30	81	1,054
LE15	Central & Collier	Shopping Center	75.000	TSF	44	27	71	137	149	286	2,831
LE16	Diamond Specific Plan ⁵	Condo/Townhomes	600	DU	63	213	276	212	124	336	4,392
		Hotel	150	RM	42	29	71	46	44	90	1,254
		General Office	425.000	TSF	424	69	493	78	411	489	4,140
		Shopping Center	472.000	TSF	275	169	444	863	935	1,798	17,818
LE17	The Colony	Apartments	211	DU	22	75	97	74	44	118	1,545
	Back Basin Specific Plan & East Lake Specific Plan	Single Family Residential	2,407	DU	445	1,336	1,781	1,501	882	2,383	22,722
		Condo/Townhomes	324	DU	34	115	149	114	67	181	2,372
	John Laing Homes (Phase 2)	Single Family Residential	506	DU	94	281	374	316	185	501	4,777
		Condo/Townhomes	1,141	DU	121	404	525	403	236	639	8,352
		Apartments	308	DU	33	109	142	109	64	172	2,255
LE18	Canyon Hills Estates (Tract 34249)	Shopping Center	117.000	TSF	68	42	110	214	232	446	4,417
		Single Family Residential	302	DU	56	168	223	188	111	299	2,851
		Single Family Residential	2,700	DU	500	1,499	1,998	1,684	989	2,673	25,488
	Canyon Hills (Multiple Tracts)	Apartments	1,575	DU	167	558	725	556	326	882	11,529
		Audie Murphy (Tract 36484)	Single Family Residential	109	DU	20	60	81	68	40	108
	Audie Murphy (Tract 36485)	Single Family Residential	1,003	DU	186	557	742	626	367	993	9,468
LE19	Artisan Alley	Shopping Center	95.100	TSF	55	34	89	174	188	362	3,590
LE20	Quikrete Plant	Warehouse	163.900	TSF	17	5	22	7	18	25	228

Appendix 4.1

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Cumulative Projects Trip Generation Summary

No.	Project Name	Land Use	Quantity	Units ¹	AM Peak Hour			PM Peak Hour			Daily
					In	Out	Total	In	Out	Total	
LE21	Alberhill Ridge (Tract 35001)	Single Family Residential	1,056	DU	195	586	781	659	387	1,045	9,969
		Apartments	345	DU	37	122	159	122	71	193	2,525
		Shopping Center	679,000	TSF	396	243	638	1,242	1,345	2,587	25,632
		General Office	679,000	TSF	677	110	788	125	656	781	6,613
LE22	Alberhill Ranch	Single Family Residential	1,986	DU	367	1,102	1,470	1,239	727	1,966	18,748
LE23	Lake Elsinore Walmart ⁶	Free-Standing Discount Superstore	154,487	TSF	148	112	260	296	310	606	7,056
		Specialty Retail	4,600	TSF	3	2	5	4	6	10	184
		Fast Food w/Drive Thru	6,800	TSF	157	151	308	115	107	222	3,374
		Fast Food w/o Drive Thru	4,600	TSF	113	73	186	55	53	108	2,965
LE24	Circle K	Gas Station	4,500	TSF	46	46	91	50	50	101	892
LE25	Alberhill Villages	Single Family Residential	8,244	DU	1,525	4,575	6,101	5,142	3,020	8,162	77,823
		University	6,000	TSF	5	2	7	2	5	7	156
LE26	Terracina	Single Family Residential	365	DU	68	203	270	228	134	361	3,446
LE27	Lakeshore Senior Apartments	Senior Adult Housing Attached	121	DU	8	16	24	17	14	31	448
LE28	North Peak Plaza	Condo/Townhomes	92	DU	10	33	42	32	19	52	673
		Shopping Center	92,000	TSF	54	33	86	168	182	351	3,473
LE29	Running Deer (TR 31957)	Single Family Residential	101	DU	19	56	75	63	37	100	953
LE30	Wake Rider Beach Resort	Beach Resort	50	RM	12	5	16	9	12	21	418
LE31	Lakeshore Town Center	Town Center	237,400	TSF	138	85	223	434	470	904	8,962
LE32	Ortega	Single Family Residential	105	DU	19	58	78	65	38	104	991
LE33	Summerly	Single Family Residential	142	DU	26	79	105	89	52	141	1,340
LE34	Beazer, KB Homes, McMillin Homes, Richmond	Single Family Residential	395	DU	73	219	292	246	145	391	3,729
LE35	Village at Lake Elsinore SPA #1	Single Family Residential	163	DU	30	90	121	102	60	161	1,539
LE36	Lakeview Manor	Condo/Townhomes	104	DU	11	37	48	37	22	58	761
LE37	Golden Corral Restaurant	Restaurant	7,798	TSF	43	35	78	47	29	76	875
LE38	Tige Watersports	Shopping Center	34,500	TSF	20	12	32	63	68	131	1,302
LE39	Kassab Travel Center	Restaurant	17,200	TSF	94	77	171	104	64	168	1,929
LE40	Honda	Automobile Sales	53,400	TSF	73	27	100	52	78	130	1,487
County of Riverside											
RC1	Lennar (Tract 31792)	Single Family Residential	191	DU	35	106	141	119	70	189	1,803
RC2	PM33840	Single Family Residential	4	DU	1	2	3	2	1	3	38
RC3	PP20158R1	Storage Facility	103,727	TSF	6	4	10	8	9	18	157
RC4	CUP03651	Recycling Facility	0.504	TSF	2	2	4	3	2	5	51
Total:					8,535	16,279	24,814	21,343	16,026	37,370	364,022

¹ DU = Dwelling Units; TSF = thousand square feet; RM = Rooms

² Source: Greenwald Avenue Commercial Center TIA, Urban Crossroads, Inc., May 2008.

³ Source: Spyglass Ranch TIA (Revised), Kunzman Associates, February 2007.

⁴ Source: Lake Elsinore TAG Property TIA (Revised), Urban Crossroads, Inc., August 2008.

⁵ Source: The Diamond Specific Plan TIA, Urban Crossroads, Inc., April 2009.

⁶ Source: Lake Elsinore Walmart TIA, Urban Crossroads, Inc., April 2015.

APPENDIX 5.1:

E+P CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Intersection

Int Delay, s/veh 5.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔			↔			↔	
Traffic Vol, veh/h	32	251	0	3	130	89	0	0	12	159	0	8
Future Vol, veh/h	32	251	0	3	130	89	0	0	12	159	0	8
Conflicting Peds, #/hr	0	0	2	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	295	0	4	153	105	0	0	14	187	0	9

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	258	0	-	295	0	0	589	637	295	592	585	206
Stage 1	-	-	-	-	-	-	371	371	-	214	214	-
Stage 2	-	-	-	-	-	-	218	266	-	378	371	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1307	-	0	1266	-	-	420	395	744	418	423	835
Stage 1	-	-	0	-	-	-	649	620	-	788	725	-
Stage 2	-	-	0	-	-	-	784	689	-	644	620	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1307	-	-	1266	-	-	403	380	744	398	407	835
Mov Cap-2 Maneuver	-	-	-	-	-	-	403	380	-	398	407	-
Stage 1	-	-	-	-	-	-	626	598	-	760	722	-
Stage 2	-	-	-	-	-	-	772	686	-	610	598	-

Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.9			0.1			9.9			21.8		
HCM LOS							A			C		

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	744	1307	-	1266	-	-	408
HCM Lane V/C Ratio	0.019	0.029	-	0.003	-	-	0.482
HCM Control Delay (s)	9.9	7.8	0	7.9	-	-	21.8
HCM Lane LOS	A	A	A	A	-	-	C
HCM 95th %tile Q(veh)	0.1	0.1	-	0	-	-	2.5

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↗
Traffic Vol, veh/h	0	422	205	138	0	17
Future Vol, veh/h	0	422	205	138	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	459	223	150	0	18
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	298
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	-	0	741
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	741
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		10		
HCM LOS				B		
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	741		
HCM Lane V/C Ratio	-	-	-	0.025		
HCM Control Delay (s)	-	-	-	10		
HCM Lane LOS	-	-	-	B		
HCM 95th %tile Q(veh)	-	-	-	0.1		

Timings
3: Lake St. & Nichols Rd.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	9	4	196	9	3	730	358	21	294
Future Volume (vph)	9	4	196	9	3	730	358	21	294
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	15.8	15.8	9.6	16.2	16.2	9.6	16.2
Total Split (s)	38.0	38.0	38.0	38.0	9.6	70.2	70.2	11.8	72.4
Total Split (%)	31.7%	31.7%	31.7%	31.7%	8.0%	58.5%	58.5%	9.8%	60.3%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		5.8	4.6	6.2	6.2	4.6	6.2
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)		24.8		23.6	5.1	66.1	66.1	5.9	68.6
Actuated g/C Ratio		0.23		0.22	0.05	0.62	0.62	0.06	0.65
v/c Ratio		0.04		0.81	0.04	0.65	0.35	0.22	0.25
Control Delay		28.9		58.1	54.7	18.7	6.9	57.3	10.1
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		28.9		58.1	54.7	18.7	6.9	57.3	10.1
LOS		C		E	D	B	A	E	B
Approach Delay		28.9		58.1		14.9			13.3
Approach LOS		C		E		B			B

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 106

Natural Cycle: 75

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.81

Intersection Signal Delay: 21.1

Intersection LOS: C

Intersection Capacity Utilization 67.1%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Lake St. & Nichols Rd.

 Ø1	 Ø2	 Ø4
11.8 s	70.2 s	38 s
 Ø5	 Ø6	 Ø8
9.6 s	72.4 s	38 s

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768) 3: Lake St. & Nichols Rd. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	4	2	196	9	42	3	730	358	21	294	0
Future Volume (veh/h)	9	4	2	196	9	42	3	730	358	21	294	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	9	4	2	202	9	30	3	753	0	22	303	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	0
Cap, veh/h	231	98	42	296	10	34	7	1171		40	1206	0
Arrive On Green	0.19	0.19	0.19	0.19	0.19	0.19	0.00	0.63	0.00	0.02	0.64	0.00
Sat Flow, veh/h	921	518	221	1220	54	181	1781	1870	1585	1781	1870	0
Grp Volume(v), veh/h	15	0	0	241	0	0	3	753	0	22	303	0
Grp Sat Flow(s),veh/h/ln	1661	0	0	1455	0	0	1781	1870	1585	1781	1870	0
Q Serve(g_s), s	0.0	0.0	0.0	15.8	0.0	0.0	0.2	25.9	0.0	1.3	7.0	0.0
Cycle Q Clear(g_c), s	0.7	0.0	0.0	16.5	0.0	0.0	0.2	25.9	0.0	1.3	7.0	0.0
Prop In Lane	0.60		0.13	0.84		0.12	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	371	0	0	340	0	0	7	1171		40	1206	0
V/C Ratio(X)	0.04	0.00	0.00	0.71	0.00	0.00	0.42	0.64		0.54	0.25	0.00
Avail Cap(c_a), veh/h	575	0	0	519	0	0	87	1171		125	1206	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)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	34.0	0.0	0.0	40.3	0.0	0.0	51.0	12.0	0.0	49.6	7.7	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.7	0.0	0.0	14.0	2.7	0.0	4.2	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	5.9	0.0	0.0	0.1	9.5	0.0	0.6	2.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	34.0	0.0	0.0	43.0	0.0	0.0	65.1	14.7	0.0	53.8	8.2	0.0
LnGrp LOS	C	A	A	D	A	A	E	B		D	A	A
Approach Vol, veh/h		15			241			756	A		325	
Approach Delay, s/veh		34.0			43.0			14.9			11.3	
Approach LOS		C			D			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	6.9	70.5		25.2	5.0	72.4		25.2				
Change Period (Y+Rc), s	4.6	6.2		* 5.8	4.6	6.2		5.8				
Max Green Setting (Gmax), s	7.2	64.0		* 33	5.0	66.2		32.2				
Max Q Clear Time (g_c+I1), s	3.3	27.9		2.7	2.2	9.0		18.5				
Green Ext Time (p_c), s	0.0	5.3		0.0	0.0	1.7		1.0				

Intersection Summary

HCM 6th Ctrl Delay	19.3
HCM 6th LOS	B

Notes

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

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

Timings
4: Lake St. & Alberhill Ranch Rd.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	80	57	1040	48	18	470
Future Volume (vph)	80	57	1040	48	18	470
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.7	14.7	16.2	16.2	9.6	16.2
Total Split (s)	15.3	15.3	94.6	94.6	10.1	104.7
Total Split (%)	12.8%	12.8%	78.8%	78.8%	8.4%	87.3%
Yellow Time (s)	3.7	3.7	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	4.7	6.2	6.2	4.6	6.2
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Max	Max	None	Max
Act Effect Green (s)	10.2	10.2	94.4	94.4	5.3	98.5
Actuated g/C Ratio	0.09	0.09	0.79	0.79	0.04	0.82
v/c Ratio	0.56	0.44	0.74	0.04	0.24	0.32
Control Delay	67.1	63.0	11.6	1.4	62.9	3.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	67.1	63.0	11.6	1.4	62.9	3.2
LOS	E	E	B	A	E	A
Approach Delay	65.4		11.2			5.4
Approach LOS	E		B			A

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 119.6

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.74

Intersection Signal Delay: 13.8

Intersection LOS: B

Intersection Capacity Utilization 72.2%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: Lake St. & Alberhill Ranch Rd.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 4: Lake St. & Alberhill Ranch Rd. 09/26/2019

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	80	57	1040	48	18	470
Future Volume (veh/h)	80	57	1040	48	18	470
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	84	60	1095	37	19	495
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	148	132	1435	1216	35	1544
Arrive On Green	0.08	0.08	0.77	0.77	0.02	0.83
Sat Flow, veh/h	1781	1585	1870	1585	1781	1870
Grp Volume(v), veh/h	84	60	1095	37	19	495
Grp Sat Flow(s), veh/h/ln	1781	1585	1870	1585	1781	1870
Q Serve(g_s), s	5.4	4.3	39.2	0.7	1.3	7.5
Cycle Q Clear(g_c), s	5.4	4.3	39.2	0.7	1.3	7.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	148	132	1435	1216	35	1544
V/C Ratio(X)	0.57	0.46	0.76	0.03	0.54	0.32
Avail Cap(c_a), veh/h	158	141	1435	1216	82	1544
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.6	52.1	7.8	3.3	58.0	2.5
Incr Delay (d2), s/veh	2.2	0.9	3.9	0.0	4.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.5	1.7	11.9	0.2	0.6	1.6
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	54.8	53.0	11.7	3.4	62.8	3.0
LnGrp LOS	D	D	B	A	E	A
Approach Vol, veh/h	144		1132			514
Approach Delay, s/veh	54.1		11.4			5.2
Approach LOS	D		B			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	6.9	97.8			104.7	14.6
Change Period (Y+Rc), s	4.6	6.2			6.2	4.7
Max Green Setting (Gmax), s	5.5	88.4			98.5	10.6
Max Q Clear Time (g_c+I1), s	3.3	41.2			9.5	7.4
Green Ext Time (p_c), s	0.0	11.3			3.0	0.1
Intersection Summary						
HCM 6th Ctrl Delay			13.1			
HCM 6th LOS			B			

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	55	0	1088	516	34
Future Vol, veh/h	0	55	0	1088	516	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	60	0	1183	561	37

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 580	- 0	- 0
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -
Critical Hdwy	- 6.22	- -	- -
Critical Hdwy Stg 1	- -	- -	- -
Critical Hdwy Stg 2	- -	- -	- -
Follow-up Hdwy	- 3.318	- -	- -
Pot Cap-1 Maneuver	0 514	0 -	- -
Stage 1	0 -	0 -	- -
Stage 2	0 -	0 -	- -
Platoon blocked, %		- -	- -
Mov Cap-1 Maneuver	- 514	- -	- -
Mov Cap-2 Maneuver	- -	- -	- -
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -

Approach	EB	NB	SB
HCM Control Delay, s	12.9	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 514	- -	- -
HCM Lane V/C Ratio	- 0.116	- -	- -
HCM Control Delay (s)	- 12.9	- -	- -
HCM Lane LOS	- B	- -	- -
HCM 95th %tile Q(veh)	- 0.4	- -	- -

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↑↑	
Traffic Vol, veh/h	0	62	0	1088	519	52
Future Vol, veh/h	0	62	0	1088	519	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	67	0	1183	564	57

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 311	- 0	- 0
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -
Critical Hdwy	- 6.93	- -	- -
Critical Hdwy Stg 1	- -	- -	- -
Critical Hdwy Stg 2	- -	- -	- -
Follow-up Hdwy	- 3.319	- -	- -
Pot Cap-1 Maneuver	0 686	0 -	- -
Stage 1	0 -	0 -	- -
Stage 2	0 -	0 -	- -
Platoon blocked, %		- -	- -
Mov Cap-1 Maneuver	- 686	- -	- -
Mov Cap-2 Maneuver	- -	- -	- -
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -

Approach	EB	NB	SB
HCM Control Delay, s	10.8	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 686	- -	- -
HCM Lane V/C Ratio	- 0.098	- -	- -
HCM Control Delay (s)	- 10.8	- -	- -
HCM Lane LOS	- B	- -	- -
HCM 95th %tile Q(veh)	- 0.3	- -	- -

Timings
7: Lake St. & Mountain St.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	314	23	49	36	240	727	44	8	505
Future Volume (vph)	314	23	49	36	240	727	44	8	505
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	34.7	34.7	21.7	21.7	9.6	26.8	26.8	9.6	23.2
Total Split (s)	37.0	37.0	37.0	37.0	33.0	71.6	71.6	11.4	50.0
Total Split (%)	30.8%	30.8%	30.8%	30.8%	27.5%	59.7%	59.7%	9.5%	41.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.6	4.8	4.8	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	4.7	4.7	4.7	4.6	5.8	5.8	4.6	6.2
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)	30.9	30.9	30.9	30.9	19.9	67.9	67.9	5.4	45.0
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.18	0.61	0.61	0.05	0.40
v/c Ratio	0.90	0.22	0.15	0.17	0.79	0.67	0.05	0.10	0.42
Control Delay	68.3	11.4	32.9	16.8	61.7	19.0	2.4	55.6	25.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.3	11.4	32.9	16.8	61.7	19.0	2.4	55.6	25.6
LOS	E	B	C	B	E	B	A	E	C
Approach Delay		53.8		22.7		28.4			26.0
Approach LOS		D		C		C			C

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 111.4

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 32.4

Intersection LOS: C

Intersection Capacity Utilization 79.4%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 7: Lake St. & Mountain St.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)

7: Lake St. & Mountain St.

09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	314	23	84	49	36	47	240	727	44	8	505	68
Future Volume (veh/h)	314	23	84	49	36	47	240	727	44	8	505	68
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	327	24	52	51	38	37	250	757	34	8	526	61
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	392	147	318	386	245	239	280	1073	902	17	1368	158
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.16	0.57	0.57	0.01	0.43	0.43
Sat Flow, veh/h	1325	521	1128	1308	870	847	1781	1870	1573	1781	3209	371
Grp Volume(v), veh/h	327	0	76	51	0	75	250	757	34	8	290	297
Grp Sat Flow(s),veh/h/ln	1325	0	1649	1308	0	1718	1781	1870	1573	1781	1777	1804
Q Serve(g_s), s	28.3	0.0	4.0	3.5	0.0	3.8	15.8	33.3	1.1	0.5	12.9	13.0
Cycle Q Clear(g_c), s	32.0	0.0	4.0	7.5	0.0	3.8	15.8	33.3	1.1	0.5	12.9	13.0
Prop In Lane	1.00		0.68	1.00		0.49	1.00		1.00	1.00		0.21
Lane Grp Cap(c), veh/h	392	0	464	386	0	484	280	1073	902	17	757	769
V/C Ratio(X)	0.83	0.00	0.16	0.13	0.00	0.16	0.89	0.71	0.04	0.46	0.38	0.39
Avail Cap(c_a), veh/h	392	0	464	386	0	484	441	1073	902	106	757	769
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.0	0.0	31.0	33.9	0.0	31.0	47.4	17.5	10.7	56.5	22.6	22.6
Incr Delay (d2), s/veh	14.3	0.0	0.2	0.2	0.0	0.1	9.2	3.9	0.1	6.8	1.5	1.5
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	10.7	0.0	1.6	1.1	0.0	1.6	7.5	13.9	0.4	0.3	5.3	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.3	0.0	31.2	34.0	0.0	31.1	56.6	21.4	10.7	63.3	24.0	24.1
LnGrp LOS	E	A	C	C	A	C	E	C	B	E	C	C
Approach Vol, veh/h	403				126				1041			
Approach Delay, s/veh	52.4				32.3				29.5			
Approach LOS	D				C				C			
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	5.7	72.0	37.0		22.6	55.1	37.0					
Change Period (Y+Rc), s	4.6	* 6.2	* 4.7		4.6	6.2	* 4.7					
Max Green Setting (Gmax), s	6.8	* 66	* 32		28.4	43.8	* 32					
Max Q Clear Time (g_c+I1), s	2.5	35.3	34.0		17.8	15.0	9.5					
Green Ext Time (p_c), s	0.0	5.5	0.0		0.2	3.2	0.5					

Intersection Summary

HCM 6th Ctrl Delay 32.6

HCM 6th LOS C

Notes

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

Timings
8: Lake St. & Lakeshore Dr.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	60	117	190	114	320	94	730	212	202	424	137
Future Volume (vph)	60	117	190	114	320	94	730	212	202	424	137
Turn Type	Perm	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	8	8	1	5	2		1	6	
Permitted Phases	4				8			2			6
Detector Phase	4	4	8	8	1	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	35.6	35.6	15.8	15.8	9.6	9.6	33.8	33.8	9.6	22.8	22.8
Total Split (s)	36.0	36.0	28.0	28.0	15.0	20.2	41.0	41.0	15.0	35.8	35.8
Total Split (%)	30.0%	30.0%	23.3%	23.3%	12.5%	16.8%	34.2%	34.2%	12.5%	29.8%	29.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)		21.7	18.6	18.6	30.0	11.3	35.6	35.6	10.2	34.5	34.5
Actuated g/C Ratio		0.20	0.17	0.17	0.28	0.11	0.33	0.33	0.10	0.32	0.32
v/c Ratio		0.82	0.79	0.45	0.42	0.64	0.79	0.44	0.78	0.47	0.35
Control Delay		41.5	62.2	45.7	4.2	63.7	39.9	6.7	66.6	33.5	10.1
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		41.5	62.2	45.7	4.2	63.7	39.9	6.7	66.6	33.5	10.1
LOS		D	E	D	A	E	D	A	E	C	B
Approach Delay		41.5		29.5			35.2			38.1	
Approach LOS		D		C			D			D	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 107.1

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 35.4

Intersection LOS: D

Intersection Capacity Utilization 78.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 8: Lake St. & Lakeshore Dr.

 Ø1	 Ø2	 Ø4	 Ø8
15 s	41 s	36 s	28 s
 Ø5	 Ø6		
20.2 s	35.8 s		

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 8: Lake St. & Lakeshore Dr. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	60	117	118	190	114	320	94	730	212	202	424	137
Future Volume (veh/h)	60	117	118	190	114	320	94	730	212	202	424	137
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.81	1.00		0.72	1.00		0.88	1.00		0.89
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	76	148	102	241	144	285	119	924	125	256	537	95
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	152	295	202	297	312	590	148	1207	474	319	1240	491
Arrive On Green	0.20	0.20	0.20	0.17	0.17	0.17	0.08	0.34	0.34	0.09	0.35	0.35
Sat Flow, veh/h	759	1472	1004	1781	1870	1995	1781	3554	1397	3456	3554	1408
Grp Volume(v), veh/h	184	0	142	241	144	285	119	924	125	256	537	95
Grp Sat Flow(s),veh/h/ln	1832	0	1403	1781	1870	998	1781	1777	1397	1728	1777	1408
Q Serve(g_s), s	9.2	0.0	9.4	13.5	7.2	12.8	6.8	24.1	6.7	7.5	12.0	4.9
Cycle Q Clear(g_c), s	9.2	0.0	9.4	13.5	7.2	12.8	6.8	24.1	6.7	7.5	12.0	4.9
Prop In Lane	0.41		0.72	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	368	0	281	297	312	590	148	1207	474	319	1240	491
V/C Ratio(X)	0.50	0.00	0.51	0.81	0.46	0.48	0.81	0.77	0.26	0.80	0.43	0.19
Avail Cap(c_a), veh/h	555	0	425	382	401	685	268	1207	474	347	1240	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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.8	0.0	36.9	41.6	39.0	33.2	46.7	30.5	24.8	46.1	25.9	23.5
Incr Delay (d2), s/veh	1.0	0.0	1.4	9.9	1.1	0.6	3.9	4.7	1.4	10.6	1.1	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.3	0.0	3.3	6.5	3.3	3.0	3.1	10.4	2.3	3.6	5.0	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.8	0.0	38.3	51.5	40.0	33.8	50.6	35.2	26.2	56.7	27.0	24.4
LnGrp LOS	D	A	D	D	D	C	D	D	C	E	C	C
Approach Vol, veh/h		326			670			1168			888	
Approach Delay, s/veh		38.0			41.5			35.8			35.3	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.2	41.0		25.4	13.2	42.0		23.1				
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8				
Max Green Setting (Gmax), s	10.4	35.2		31.4	15.6	30.0		22.2				
Max Q Clear Time (g_c+I1), s	9.5	26.1		11.4	8.8	14.0		15.5				
Green Ext Time (p_c), s	0.0	4.2		2.1	0.1	3.2		1.8				
Intersection Summary												
HCM 6th Ctrl Delay				37.1								
HCM 6th LOS				D								

Timings

Lake and Mountain Shopping Center TIA (JN:12768)

9: Lincoln St. & Grand Av./Lake St.

09/26/2019

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	88	487	44	177	368	21	38	129	47	123
Future Volume (vph)	88	487	44	177	368	21	38	129	47	123
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases			4			8				
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	9.6	32.8	32.8	9.6	31.8	31.8	9.6	34.4	9.6	34.4
Total Split (s)	21.0	37.0	37.0	31.0	47.0	47.0	14.0	38.0	14.0	38.0
Total Split (%)	17.5%	30.8%	30.8%	25.8%	39.2%	39.2%	11.7%	31.7%	11.7%	31.7%
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	4.8	3.6	4.4	3.6	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	5.8	4.6	5.4	4.6	5.4
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None
Act Effect Green (s)	10.5	36.1	36.1	16.6	42.2	42.2	7.1	14.3	7.5	16.9
Actuated g/C Ratio	0.11	0.39	0.39	0.18	0.45	0.45	0.08	0.15	0.08	0.18
v/c Ratio	0.58	0.47	0.09	0.75	0.31	0.04	0.38	0.64	0.44	0.41
Control Delay	53.7	26.2	0.2	52.5	19.4	0.1	53.3	17.7	55.0	21.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	53.7	26.2	0.2	52.5	19.4	0.1	53.3	17.7	55.0	21.1
LOS	D	C	A	D	B	A	D	B	D	C
Approach Delay		28.3			29.1			21.1		27.2
Approach LOS		C			C			C		C

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 92.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.75

Intersection Signal Delay: 26.8

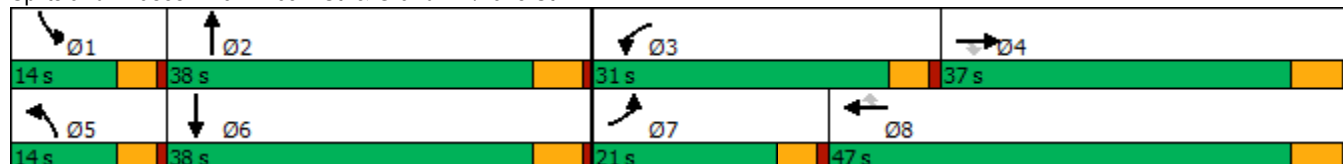
Intersection LOS: C

Intersection Capacity Utilization 69.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 9: Lincoln St. & Grand Av./Lake St.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 9: Lincoln St. & Grand Av./Lake St. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	88	487	44	177	368	21	38	129	229	47	123	95
Future Volume (veh/h)	88	487	44	177	368	21	38	129	229	47	123	95
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	117	649	40	236	491	24	51	172	233	63	164	95
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	147	1323	580	273	1574	691	70	373	326	81	477	262
Arrive On Green	0.08	0.37	0.37	0.15	0.44	0.44	0.04	0.21	0.21	0.05	0.22	0.22
Sat Flow, veh/h	1781	3554	1559	1781	3554	1561	1781	1777	1553	1781	2209	1213
Grp Volume(v), veh/h	117	649	40	236	491	24	51	172	233	63	130	129
Grp Sat Flow(s),veh/h/ln	1781	1777	1559	1781	1777	1561	1781	1777	1553	1781	1777	1646
Q Serve(g_s), s	6.0	13.1	1.5	12.0	8.3	0.8	2.6	7.9	13.0	3.3	5.8	6.2
Cycle Q Clear(g_c), s	6.0	13.1	1.5	12.0	8.3	0.8	2.6	7.9	13.0	3.3	5.8	6.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.74
Lane Grp Cap(c), veh/h	147	1323	580	273	1574	691	70	373	326	81	384	356
V/C Ratio(X)	0.80	0.49	0.07	0.87	0.31	0.03	0.73	0.46	0.71	0.78	0.34	0.36
Avail Cap(c_a), veh/h	314	1323	580	505	1574	691	180	623	544	180	623	577
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.9	22.4	18.8	38.5	16.8	14.7	44.2	32.2	34.2	43.9	30.9	31.0
Incr Delay (d2), s/veh	3.7	1.3	0.2	3.2	0.5	0.1	5.3	0.9	2.9	5.8	0.5	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.7	5.3	0.6	5.2	3.2	0.3	1.2	3.3	4.9	1.5	2.4	2.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.6	23.7	19.0	41.7	17.3	14.8	49.5	33.1	37.1	49.8	31.4	31.6
LnGrp LOS	D	C	B	D	B	B	D	C	D	D	C	C
Approach Vol, veh/h		806			751			456			322	
Approach Delay, s/veh		26.7			24.9			37.0			35.1	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	8.8	24.9	18.8	40.4	8.3	25.5	12.3	47.0				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.8	4.6	5.4	4.6	5.8				
Max Green Setting (Gmax), s	9.4	32.6	26.4	31.2	9.4	32.6	16.4	41.2				
Max Q Clear Time (g_c+I1), s	5.3	15.0	14.0	15.1	4.6	8.2	8.0	10.3				
Green Ext Time (p_c), s	0.0	2.2	0.2	3.7	0.0	1.4	0.1	3.2				
Intersection Summary												
HCM 6th Ctrl Delay			29.3									
HCM 6th LOS			C									

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	576	620	12	7	14
Future Vol, veh/h	12	576	620	12	7	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	100
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	72	72	72	72	72	72
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	800	861	17	10	19

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	878	0	0 1304 870
Stage 1	-	-	- 870 -
Stage 2	-	-	- 434 -
Critical Hdwy	4.13	-	- 6.63 6.23
Critical Hdwy Stg 1	-	-	- 5.43 -
Critical Hdwy Stg 2	-	-	- 5.83 -
Follow-up Hdwy	2.219	-	- 3.519 3.319
Pot Cap-1 Maneuver	767	-	- 164 350
Stage 1	-	-	- 409 -
Stage 2	-	-	- 622 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	767	-	- 160 350
Mov Cap-2 Maneuver	-	-	- 290 -
Stage 1	-	-	- 400 -
Stage 2	-	-	- 622 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	16.5
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	767	-	-	-	290	350
HCM Lane V/C Ratio	0.022	-	-	-	0.034	0.056
HCM Control Delay (s)	9.8	-	-	-	17.8	15.9
HCM Lane LOS	A	-	-	-	C	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0.2

Timings
11: Terra Cota Rd. (S) & Lakeshore Dr.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑	↑	↘	↑	↘
Traffic Volume (vph)	555	28	12	580	52
Future Volume (vph)	555	28	12	580	52
Turn Type	NA	Perm	Prot	NA	Prot
Protected Phases	4		3	8	2
Permitted Phases		4			
Detector Phase	4	4	3	8	2
Switch Phase					
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	22.6	22.6	9.6	15.8	14.6
Total Split (s)	83.0	83.0	12.0	95.0	25.0
Total Split (%)	69.2%	69.2%	10.0%	79.2%	20.8%
Yellow Time (s)	3.6	3.6	3.6	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	5.8	4.6
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	Max	Max	None	Max	None
Act Effect Green (s)	86.1	86.1	5.8	89.3	14.6
Actuated g/C Ratio	0.75	0.75	0.05	0.78	0.13
v/c Ratio	0.55	0.03	0.19	0.55	0.62
Control Delay	9.4	2.2	57.9	7.0	60.1
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.4	2.2	57.9	7.0	60.1
LOS	A	A	E	A	E
Approach Delay	9.1			8.1	60.1
Approach LOS	A			A	E

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 114.3

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 12.5

Intersection LOS: B

Intersection Capacity Utilization 47.5%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 11: Terra Cota Rd. (S) & Lakeshore Dr.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 11: Terra Cota Rd. (S) & Lakeshore Dr. 09/26/2019

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↙	↑	↘	
Traffic Volume (veh/h)	555	28	12	580	52	45
Future Volume (veh/h)	555	28	12	580	52	45
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	771	36	17	806	72	62
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	1400	1154	33	1512	87	75
Arrive On Green	0.75	0.75	0.02	0.81	0.10	0.10
Sat Flow, veh/h	1870	1541	1781	1870	899	774
Grp Volume(v), veh/h	771	36	17	806	135	0
Grp Sat Flow(s),veh/h/ln	1870	1541	1781	1870	1686	0
Q Serve(g_s), s	19.5	0.7	1.0	16.0	8.7	0.0
Cycle Q Clear(g_c), s	19.5	0.7	1.0	16.0	8.7	0.0
Prop In Lane		1.00	1.00		0.53	0.46
Lane Grp Cap(c), veh/h	1400	1154	33	1512	164	0
V/C Ratio(X)	0.55	0.03	0.52	0.53	0.82	0.00
Avail Cap(c_a), veh/h	1400	1154	119	1512	312	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	5.9	3.6	53.7	3.6	48.9	0.0
Incr Delay (d2), s/veh	1.6	0.1	4.6	1.4	9.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.0	0.2	0.5	3.8	4.1	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	7.5	3.6	58.3	4.9	58.7	0.0
LnGrp LOS	A	A	E	A	E	A
Approach Vol, veh/h	807			823	135	
Approach Delay, s/veh	7.3			6.0	58.7	
Approach LOS	A			A	E	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		15.3	6.6	88.4		95.0
Change Period (Y+Rc), s		4.6	4.6	* 5.8		5.8
Max Green Setting (Gmax), s		20.4	7.4	* 78		89.2
Max Q Clear Time (g_c+I1), s		10.7	3.0	21.5		18.0
Green Ext Time (p_c), s		0.2	0.0	6.1		6.4
Intersection Summary						
HCM 6th Ctrl Delay			10.6			
HCM 6th LOS			B			
Notes						
User approved volume balancing among the lanes for turning movement.						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						

Intersection												
Int Delay, s/veh	9.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	24	95	0	5	164	125	0	0	3	255	0	8
Future Vol, veh/h	24	95	0	5	164	125	0	0	3	255	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	113	0	6	195	149	0	0	4	304	0	10
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	344	0	-	113	0	0	458	527	113	455	453	270
Stage 1	-	-	-	-	-	-	171	171	-	282	282	-
Stage 2	-	-	-	-	-	-	287	356	-	173	171	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1215	-	0	1476	-	-	513	456	940	515	503	769
Stage 1	-	-	0	-	-	-	831	757	-	725	678	-
Stage 2	-	-	0	-	-	-	720	629	-	829	757	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	1215	-	-	1476	-	-	495	442	940	501	488	769
Mov Cap-2 Maneuver	-	-	-	-	-	-	495	442	-	501	488	-
Stage 1	-	-	-	-	-	-	810	738	-	707	675	-
Stage 2	-	-	-	-	-	-	708	626	-	805	738	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.6			0.1			8.8			23		
HCM LOS							A			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1					
Capacity (veh/h)	940	1215	-	1476	-	-	506					
HCM Lane V/C Ratio	0.004	0.024	-	0.004	-	-	0.619					
HCM Control Delay (s)	8.8	8	0	7.4	-	-	23					
HCM Lane LOS	A	A	A	A	-	-	C					
HCM 95th %tile Q(veh)	0	0.1	-	0	-	-	4.2					

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	353	278	171	0	16
Future Vol, veh/h	0	353	278	171	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
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	384	302	186	0	17
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	395
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	-	0	654
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	654
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		10.7		
HCM LOS	B					
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	654		
HCM Lane V/C Ratio	-	-	-	0.027		
HCM Control Delay (s)	-	-	-	10.7		
HCM Lane LOS	-	-	-	B		
HCM 95th %tile Q(veh)	-	-	-	0.1		

Timings
3: Lake St. & Nichols Rd.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	4	4	248	1	2	396	177	39	770
Future Volume (vph)	4	4	248	1	2	396	177	39	770
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	15.8	15.8	9.6	16.2	16.2	9.6	16.2
Total Split (s)	38.0	38.0	38.0	38.0	9.6	70.2	70.2	11.8	72.4
Total Split (%)	31.7%	31.7%	31.7%	31.7%	8.0%	58.5%	58.5%	9.8%	60.3%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		5.8	4.6	6.2	6.2	4.6	6.2
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)		28.6		27.4	5.0	65.6	65.6	6.5	70.4
Actuated g/C Ratio		0.26		0.25	0.04	0.59	0.59	0.06	0.63
v/c Ratio		0.02		0.86	0.03	0.39	0.19	0.41	0.71
Control Delay		28.8		65.1	56.0	15.7	3.3	65.9	20.0
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		28.8		65.1	56.0	15.7	3.3	65.9	20.0
LOS		C		E	E	B	A	E	B
Approach Delay		28.8		65.1		12.0			22.2
Approach LOS		C		E		B			C

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 111.7

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.86

Intersection Signal Delay: 25.5

Intersection LOS: C

Intersection Capacity Utilization 72.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Lake St. & Nichols Rd.

		
Ø1	Ø2	Ø4
11.8 s	70.2 s	38 s
		
Ø5	Ø6	Ø8
9.6 s	72.4 s	38 s

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768) 3: Lake St. & Nichols Rd. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	4	2	248	1	16	2	396	177	39	770	0
Future Volume (veh/h)	4	4	2	248	1	16	2	396	177	39	770	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	4	4	1	270	1	9	2	430	0	42	837	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	0
Cap, veh/h	204	194	44	366	1	10	5	1111		59	1168	0
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.00	0.59	0.00	0.03	0.62	0.00
Sat Flow, veh/h	714	887	200	1373	5	46	1781	1870	1585	1781	1870	0
Grp Volume(v), veh/h	9	0	0	280	0	0	2	430	0	42	837	0
Grp Sat Flow(s),veh/h/ln	1802	0	0	1424	0	0	1781	1870	1585	1781	1870	0
Q Serve(g_s), s	0.0	0.0	0.0	20.2	0.0	0.0	0.1	13.1	0.0	2.5	32.7	0.0
Cycle Q Clear(g_c), s	0.4	0.0	0.0	20.6	0.0	0.0	0.1	13.1	0.0	2.5	32.7	0.0
Prop In Lane	0.44		0.11	0.96		0.03	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	442	0	0	377	0	0	5	1111		59	1168	0
V/C Ratio(X)	0.02	0.00	0.00	0.74	0.00	0.00	0.42	0.39		0.71	0.72	0.00
Avail Cap(c_a), veh/h	589	0	0	491	0	0	83	1111		119	1168	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)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.1	0.0	0.0	40.9	0.0	0.0	53.6	11.5	0.0	51.6	13.7	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	4.3	0.0	0.0	19.9	1.0	0.0	5.7	3.8	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	0.2	0.0	0.0	7.4	0.0	0.0	0.1	5.0	0.0	1.2	12.5	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.1	0.0	0.0	45.2	0.0	0.0	73.6	12.5	0.0	57.3	17.5	0.0
LnGrp LOS	C	A	A	D	A	A	E	B		E	B	A
Approach Vol, veh/h	9				280			432		A		879
Approach Delay, s/veh	33.1				45.2			12.8				19.4
Approach LOS	C				D			B				B
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.2	70.2		29.3	4.9	73.5		29.3				
Change Period (Y+Rc), s	4.6	6.2		* 5.8	4.6	6.2		5.8				
Max Green Setting (Gmax), s	7.2	64.0		* 33	5.0	66.2		32.2				
Max Q Clear Time (g_c+I1), s	4.5	15.1		2.4	2.1	34.7		22.6				
Green Ext Time (p_c), s	0.0	2.5		0.0	0.0	6.1		1.0				
Intersection Summary												
HCM 6th Ctrl Delay	22.2											
HCM 6th LOS	C											
Notes												
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.												
Unsignalized Delay for [NBR] is excluded from calculations of the approach delay and intersection delay.												

Timings
4: Lake St. & Alberhill Ranch Rd.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	38	16	573	40	32	997
Future Volume (vph)	38	16	573	40	32	997
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.7	14.7	16.2	16.2	9.6	16.2
Total Split (s)	15.3	15.3	94.6	94.6	10.1	104.7
Total Split (%)	12.8%	12.8%	78.8%	78.8%	8.4%	87.3%
Yellow Time (s)	3.7	3.7	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	4.7	6.2	6.2	4.6	6.2
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Max	Max	None	Max
Act Effect Green (s)	10.1	10.1	96.7	96.7	5.4	102.7
Actuated g/C Ratio	0.08	0.08	0.81	0.81	0.05	0.86
v/c Ratio	0.28	0.14	0.42	0.03	0.44	0.68
Control Delay	56.7	53.3	5.8	1.3	72.9	6.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.7	53.3	5.8	1.3	72.9	6.7
LOS	E	D	A	A	E	A
Approach Delay	55.7		5.5			8.7
Approach LOS	E		A			A

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 119.5

Natural Cycle: 65

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.68

Intersection Signal Delay: 9.1

Intersection LOS: A

Intersection Capacity Utilization 69.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: Lake St. & Alberhill Ranch Rd.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 4: Lake St. & Alberhill Ranch Rd. 09/26/2019

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	38	16	573	40	32	997
Future Volume (veh/h)	38	16	573	40	32	997
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	42	18	630	41	35	1096
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	130	116	1434	1215	52	1561
Arrive On Green	0.07	0.07	0.77	0.77	0.03	0.83
Sat Flow, veh/h	1781	1585	1870	1585	1781	1870
Grp Volume(v), veh/h	42	18	630	41	35	1096
Grp Sat Flow(s), veh/h/ln	1781	1585	1870	1585	1781	1870
Q Serve(g_s), s	2.6	1.3	14.0	0.7	2.3	27.6
Cycle Q Clear(g_c), s	2.6	1.3	14.0	0.7	2.3	27.6
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	130	116	1434	1215	52	1561
V/C Ratio(X)	0.32	0.16	0.44	0.03	0.68	0.70
Avail Cap(c_a), veh/h	160	142	1434	1215	83	1561
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.9	51.3	4.8	3.3	56.8	3.9
Incr Delay (d2), s/veh	0.5	0.2	1.0	0.1	5.7	2.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.5	4.1	0.2	1.1	5.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	52.5	51.5	5.8	3.3	62.5	6.6
LnGrp LOS	D	D	A	A	E	A
Approach Vol, veh/h	60		671			1131
Approach Delay, s/veh	52.2		5.7			8.3
Approach LOS	D		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	8.0	96.7			104.7	13.3
Change Period (Y+Rc), s	4.6	6.2			6.2	4.7
Max Green Setting (Gmax), s	5.5	88.4			98.5	10.6
Max Q Clear Time (g_c+I1), s	4.3	16.0			29.6	4.6
Green Ext Time (p_c), s	0.0	4.3			11.6	0.0
Intersection Summary						
HCM 6th Ctrl Delay			8.8			
HCM 6th LOS			A			

Intersection						
Int Delay, s/veh	0.9					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↘	
Traffic Vol, veh/h	0	66	0	613	991	43
Future Vol, veh/h	0	66	0	613	991	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	72	0	666	1077	47
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	1101	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	258	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	258	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	24.2	0	0			
HCM LOS	C					
Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	-	258	-	-		
HCM Lane V/C Ratio	-	0.278	-	-		
HCM Control Delay (s)	-	24.2	-	-		
HCM Lane LOS	-	C	-	-		
HCM 95th %tile Q(veh)	-	1.1	-	-		

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↑↑	
Traffic Vol, veh/h	0	79	0	613	993	64
Future Vol, veh/h	0	79	0	613	993	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	86	0	666	1079	70

Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	575	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.93	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.319	-	-	-	-
Pot Cap-1 Maneuver	0	462	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	462	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	14.6	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 462	-	-
HCM Lane V/C Ratio	- 0.186	-	-
HCM Control Delay (s)	- 14.6	-	-
HCM Lane LOS	- B	-	-
HCM 95th %tile Q(veh)	- 0.7	-	-

Timings
7: Lake St. & Mountain St.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	299	12	24	13	340	301	16	34	942
Future Volume (vph)	299	12	24	13	340	301	16	34	942
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	34.7	34.7	21.7	21.7	9.6	26.8	26.8	9.6	23.2
Total Split (s)	37.0	37.0	37.0	37.0	33.0	71.6	71.6	11.4	50.0
Total Split (%)	30.8%	30.8%	30.8%	30.8%	27.5%	59.7%	59.7%	9.5%	41.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.6	4.8	4.8	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	4.7	4.7	4.7	4.6	5.8	5.8	4.6	6.2
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)	29.9	29.9	29.9	29.9	26.4	68.8	68.8	6.2	44.0
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.23	0.59	0.59	0.05	0.38
v/c Ratio	0.92	0.13	0.08	0.06	0.92	0.30	0.02	0.39	0.85
Control Delay	73.3	13.7	33.5	20.9	73.2	13.9	0.1	66.8	40.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.3	13.7	33.5	20.9	73.2	13.9	0.1	66.8	40.7
LOS	E	B	C	C	E	B	A	E	D
Approach Delay		64.1		27.0		44.3			41.6
Approach LOS		E		C		D			D

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 115.8

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 45.8

Intersection LOS: D

Intersection Capacity Utilization 84.1%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 7: Lake St. & Mountain St.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)

7: Lake St. & Mountain St.

09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	299	12	42	24	13	13	340	301	16	34	942	97
Future Volume (veh/h)	299	12	42	24	13	13	340	301	16	34	942	97
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	325	13	24	26	14	5	370	327	14	37	1024	98
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	411	152	280	393	339	121	397	1078	913	54	1258	120
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.22	0.58	0.58	0.03	0.38	0.38
Sat Flow, veh/h	1393	588	1086	1371	1316	470	1781	1870	1584	1781	3277	314
Grp Volume(v), veh/h	325	0	37	26	0	19	370	327	14	37	555	567
Grp Sat Flow(s),veh/h/ln	1393	0	1675	1371	0	1786	1781	1870	1584	1781	1777	1814
Q Serve(g_s), s	26.1	0.0	1.9	1.7	0.0	0.9	23.3	10.2	0.4	2.3	32.0	32.0
Cycle Q Clear(g_c), s	27.0	0.0	1.9	3.6	0.0	0.9	23.3	10.2	0.4	2.3	32.0	32.0
Prop In Lane	1.00		0.65	1.00		0.26	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	411	0	431	393	0	460	397	1078	913	54	682	696
V/C Ratio(X)	0.79	0.00	0.09	0.07	0.00	0.04	0.93	0.30	0.02	0.69	0.81	0.81
Avail Cap(c_a), veh/h	446	0	474	428	0	505	443	1078	913	106	682	696
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	41.9	0.0	32.2	33.5	0.0	31.8	43.5	12.4	10.3	54.8	31.5	31.5
Incr Delay (d2), s/veh	8.7	0.0	0.1	0.1	0.0	0.0	24.1	0.7	0.0	5.6	10.3	10.1
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	9.9	0.0	0.8	0.6	0.0	0.4	12.5	4.1	0.1	1.1	14.7	15.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	50.7	0.0	32.3	33.6	0.0	31.8	67.6	13.1	10.4	60.5	41.8	41.7
LnGrp LOS	D	A	C	C	A	C	E	B	B	E	D	D
Approach Vol, veh/h	362				45				711			
Approach Delay, s/veh	48.8				32.9				41.4			
Approach LOS	D				C				D			
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	8.1	72.0	34.1		30.1	50.0	34.1					
Change Period (Y+Rc), s	4.6	* 6.2	* 4.7		4.6	6.2	* 4.7					
Max Green Setting (Gmax), s	6.8	* 66	* 32		28.4	43.8	* 32					
Max Q Clear Time (g_c+I1), s	4.3	12.2	29.0		25.3	34.0	5.6					
Green Ext Time (p_c), s	0.0	1.9	0.4		0.2	4.5	0.1					

Intersection Summary

HCM 6th Ctrl Delay 42.9

HCM 6th LOS D

Notes

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

Timings
8: Lake St. & Lakeshore Dr.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	10	20	135	10	240	15	437	95	294	659	13
Future Volume (vph)	10	20	135	10	240	15	437	95	294	659	13
Turn Type	Perm	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	8	8	1	5	2		1	6	
Permitted Phases	4				8			2			6
Detector Phase	4	4	8	8	1	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	35.6	35.6	15.8	15.8	9.6	9.6	33.8	33.8	9.6	22.8	22.8
Total Split (s)	36.0	36.0	28.0	28.0	15.0	20.2	41.0	41.0	15.0	35.8	35.8
Total Split (%)	30.0%	30.0%	23.3%	23.3%	12.5%	16.8%	34.2%	34.2%	12.5%	29.8%	29.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)		13.5	13.4	13.4	30.0	5.7	36.1	36.1	10.7	49.6	49.6
Actuated g/C Ratio		0.15	0.15	0.15	0.33	0.06	0.40	0.40	0.12	0.54	0.54
v/c Ratio		0.18	0.56	0.04	0.24	0.14	0.34	0.15	0.79	0.37	0.02
Control Delay		25.0	47.2	37.2	4.0	49.1	22.9	5.4	56.8	16.8	0.0
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		25.0	47.2	37.2	4.0	49.1	22.9	5.4	56.8	16.8	0.0
LOS		C	D	D	A	D	C	A	E	B	A
Approach Delay		25.0		20.0			20.6			28.7	
Approach LOS		C		C			C			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 91.3

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.79

Intersection Signal Delay: 24.6

Intersection LOS: C

Intersection Capacity Utilization 59.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 8: Lake St. & Lakeshore Dr.

 Ø1	 Ø2	 Ø4	 Ø8
15 s	41 s	36 s	28 s
 Ø5	 Ø6		
20.2 s	35.8 s		

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 8: Lake St. & Lakeshore Dr. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	20	20	135	10	240	15	437	95	294	659	13
Future Volume (veh/h)	10	20	20	135	10	240	15	437	95	294	659	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	22	0	145	11	249	16	470	99	316	709	8
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	73	160	0	221	232	667	33	1555	693	397	1897	846
Arrive On Green	0.06	0.06	0.00	0.12	0.12	0.12	0.02	0.44	0.44	0.11	0.53	0.53
Sat Flow, veh/h	1128	2556	0	1781	1870	2790	1781	3554	1584	3456	3554	1585
Grp Volume(v), veh/h	18	15	0	145	11	249	16	470	99	316	709	8
Grp Sat Flow(s),veh/h/ln	1814	1777	0	1781	1870	1395	1781	1777	1584	1728	1777	1585
Q Serve(g_s), s	0.7	0.7	0.0	6.2	0.4	6.0	0.7	6.9	3.0	7.2	9.4	0.2
Cycle Q Clear(g_c), s	0.7	0.7	0.0	6.2	0.4	6.0	0.7	6.9	3.0	7.2	9.4	0.2
Prop In Lane	0.62		0.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	118	115	0	221	232	667	33	1555	693	397	1897	846
V/C Ratio(X)	0.15	0.13	0.00	0.66	0.05	0.37	0.48	0.30	0.14	0.80	0.37	0.01
Avail Cap(c_a), veh/h	708	693	0	491	516	1090	345	1555	693	447	1897	846
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(l)	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.5	35.5	0.0	33.6	31.0	25.6	39.1	14.7	13.6	34.7	10.9	8.8
Incr Delay (d2), s/veh	0.6	0.5	0.0	3.3	0.1	0.3	4.0	0.5	0.4	7.5	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.3	0.0	2.7	0.2	1.9	0.3	2.5	1.0	3.2	3.2	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.1	36.0	0.0	36.9	31.1	25.9	43.0	15.2	14.0	42.2	11.5	8.8
LnGrp LOS	D	D	A	D	C	C	D	B	B	D	B	A
Approach Vol, veh/h		33			405			585			1033	
Approach Delay, s/veh		36.1			30.0			15.7			20.9	
Approach LOS		D			C			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	13.8	41.0		9.8	6.1	48.7		15.8				
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8				
Max Green Setting (Gmax), s	10.4	35.2		31.4	15.6	30.0		22.2				
Max Q Clear Time (g_c+l1), s	9.2	8.9		2.7	2.7	11.4		8.2				
Green Ext Time (p_c), s	0.1	3.2		0.1	0.0	4.3		1.2				
Intersection Summary												
HCM 6th Ctrl Delay			21.4									
HCM 6th LOS			C									

Timings

Lake and Mountain Shopping Center TIA (JN:12768)

9: Lincoln St. & Grand Av./Lake St.

09/26/2019

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	24	319	19	163	397	21	31	34	21	25
Future Volume (vph)	24	319	19	163	397	21	31	34	21	25
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases			4			8				
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	9.6	32.8	32.8	9.6	31.8	31.8	9.6	34.4	9.6	34.4
Total Split (s)	21.0	37.0	37.0	31.0	47.0	47.0	14.0	38.0	14.0	38.0
Total Split (%)	17.5%	30.8%	30.8%	25.8%	39.2%	39.2%	11.7%	31.7%	11.7%	31.7%
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	4.8	3.6	4.4	3.6	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	5.8	4.6	5.4	4.6	5.4
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None
Act Effect Green (s)	6.0	32.9	32.9	12.1	45.9	45.9	6.3	15.6	5.9	13.2
Actuated g/C Ratio	0.07	0.41	0.41	0.15	0.57	0.57	0.08	0.19	0.07	0.16
v/c Ratio	0.19	0.23	0.03	0.63	0.20	0.02	0.23	0.21	0.17	0.07
Control Delay	44.9	19.8	0.1	45.8	12.5	0.0	45.0	11.0	44.8	23.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.9	19.8	0.1	45.8	12.5	0.0	45.0	11.0	44.8	23.3
LOS	D	B	A	D	B	A	D	B	D	C
Approach Delay		20.4			21.4			17.2		31.1
Approach LOS		C			C			B		C

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 80.9

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.63

Intersection Signal Delay: 21.0

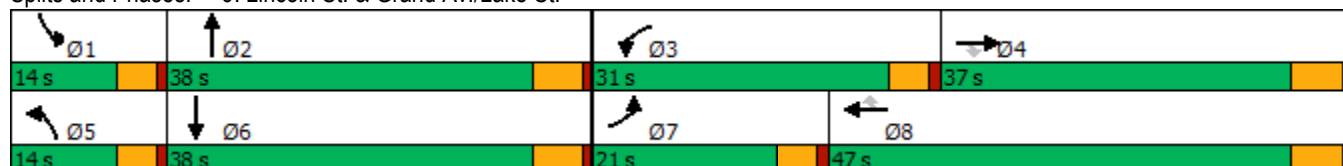
Intersection LOS: C

Intersection Capacity Utilization 63.2%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 9: Lincoln St. & Grand Av./Lake St.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 9: Lincoln St. & Grand Av./Lake St. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	319	19	163	397	21	31	34	104	21	25	13
Future Volume (veh/h)	24	319	19	163	397	21	31	34	104	21	25	13
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	25	329	18	168	409	19	32	35	68	22	26	3
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	48	1586	707	208	1907	849	57	260	232	43	446	50
Arrive On Green	0.03	0.45	0.45	0.12	0.54	0.54	0.03	0.15	0.15	0.02	0.14	0.14
Sat Flow, veh/h	1781	3554	1584	1781	3554	1583	1781	1777	1585	1781	3214	364
Grp Volume(v), veh/h	25	329	18	168	409	19	32	35	68	22	14	15
Grp Sat Flow(s),veh/h/ln	1781	1777	1584	1781	1777	1583	1781	1777	1585	1781	1777	1800
Q Serve(g_s), s	1.1	4.3	0.5	7.1	4.6	0.4	1.4	1.3	2.9	0.9	0.5	0.6
Cycle Q Clear(g_c), s	1.1	4.3	0.5	7.1	4.6	0.4	1.4	1.3	2.9	0.9	0.5	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	48	1586	707	208	1907	849	57	260	232	43	246	250
V/C Ratio(X)	0.52	0.21	0.03	0.81	0.21	0.02	0.56	0.13	0.29	0.51	0.06	0.06
Avail Cap(c_a), veh/h	380	1586	707	612	1907	849	218	754	673	218	754	764
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.9	13.0	11.9	33.1	9.3	8.3	36.6	28.5	29.2	37.0	28.7	28.7
Incr Delay (d2), s/veh	3.2	0.3	0.1	2.8	0.3	0.0	3.1	0.2	0.7	3.4	0.1	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	0.5	1.6	0.2	3.0	1.5	0.1	0.6	0.5	1.1	0.4	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.1	13.3	12.0	35.8	9.6	8.4	39.7	28.8	29.9	40.4	28.8	28.8
LnGrp LOS	D	B	B	D	A	A	D	C	C	D	C	C
Approach Vol, veh/h		372			596			135			51	
Approach Delay, s/veh		15.0			16.9			31.9			33.8	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.5	16.7	13.6	40.1	7.1	16.1	6.7	47.0				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.8	4.6	5.4	4.6	5.8				
Max Green Setting (Gmax), s	9.4	32.6	26.4	31.2	9.4	32.6	16.4	41.2				
Max Q Clear Time (g_c+I1), s	2.9	4.9	9.1	6.3	3.4	2.6	3.1	6.6				
Green Ext Time (p_c), s	0.0	0.5	0.2	2.0	0.0	0.1	0.0	2.6				
Intersection Summary												
HCM 6th Ctrl Delay			18.8									
HCM 6th LOS			B									

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	451	472	14	10	10
Future Vol, veh/h	8	451	472	14	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	100
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	480	502	15	11	11

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	517	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.13	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.219	-	-
Pot Cap-1 Maneuver	1047	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1047	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.3
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1047	-	-	-	461	562
HCM Lane V/C Ratio	0.008	-	-	-	0.023	0.019
HCM Control Delay (s)	8.5	-	-	-	13	11.5
HCM Lane LOS	A	-	-	-	B	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0.1

Timings
11: Terra Cota Rd. (S) & Lakeshore Dr.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑	↑	↘	↑	↘
Traffic Volume (vph)	417	44	41	465	21
Future Volume (vph)	417	44	41	465	21
Turn Type	NA	Perm	Prot	NA	Prot
Protected Phases	4		3	8	2
Permitted Phases		4			
Detector Phase	4	4	3	8	2
Switch Phase					
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	22.6	22.6	9.6	15.8	14.6
Total Split (s)	83.0	83.0	12.0	95.0	25.0
Total Split (%)	69.2%	69.2%	10.0%	79.2%	20.8%
Yellow Time (s)	3.6	3.6	3.6	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	5.8	4.6
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	Max	Max	None	Max	None
Act Effect Green (s)	85.1	85.1	6.6	93.4	11.1
Actuated g/C Ratio	0.77	0.77	0.06	0.84	0.10
v/c Ratio	0.31	0.04	0.42	0.32	0.42
Control Delay	6.3	1.6	62.8	3.2	54.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.3	1.6	62.8	3.2	54.8
LOS	A	A	E	A	D
Approach Delay	5.8			8.1	54.8
Approach LOS	A			A	D

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 110.8

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.42

Intersection Signal Delay: 10.1

Intersection LOS: B

Intersection Capacity Utilization 45.9%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 11: Terra Cota Rd. (S) & Lakeshore Dr.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 11: Terra Cota Rd. (S) & Lakeshore Dr. 09/26/2019

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	417	44	41	465	21	45
Future Volume (veh/h)	417	44	41	465	21	45
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	444	41	44	495	22	48
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	1396	1179	60	1539	41	90
Arrive On Green	0.75	0.75	0.03	0.82	0.08	0.08
Sat Flow, veh/h	1870	1580	1781	1870	510	1112
Grp Volume(v), veh/h	444	41	44	495	71	0
Grp Sat Flow(s),veh/h/ln	1870	1580	1781	1870	1645	0
Q Serve(g_s), s	8.6	0.7	2.7	6.9	4.5	0.0
Cycle Q Clear(g_c), s	8.6	0.7	2.7	6.9	4.5	0.0
Prop In Lane		1.00	1.00		0.31	0.68
Lane Grp Cap(c), veh/h	1396	1179	60	1539	134	0
V/C Ratio(X)	0.32	0.03	0.73	0.32	0.53	0.00
Avail Cap(c_a), veh/h	1396	1179	122	1539	309	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.6	3.6	51.9	2.3	47.8	0.0
Incr Delay (d2), s/veh	0.6	0.1	6.1	0.6	3.2	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.2	1.3	1.4	2.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.2	3.6	58.0	2.9	51.0	0.0
LnGrp LOS	A	A	E	A	D	A
Approach Vol, veh/h	485			539	71	
Approach Delay, s/veh	5.0			7.4	51.0	
Approach LOS	A			A	D	
Timer - Assigned Phs	2		3	4	8	
Phs Duration (G+Y+Rc), s	13.4		8.3	86.7	95.0	
Change Period (Y+Rc), s	4.6		4.6	* 5.8	5.8	
Max Green Setting (Gmax), s	20.4		7.4	* 78	89.2	
Max Q Clear Time (g_c+I1), s	6.5		4.7	10.6	8.9	
Green Ext Time (p_c), s	0.1		0.0	2.8	3.1	
Intersection Summary						
HCM 6th Ctrl Delay			9.2			
HCM 6th LOS			A			
Notes						
User approved volume balancing among the lanes for turning movement.						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						

APPENDIX 5.2:

E+P CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

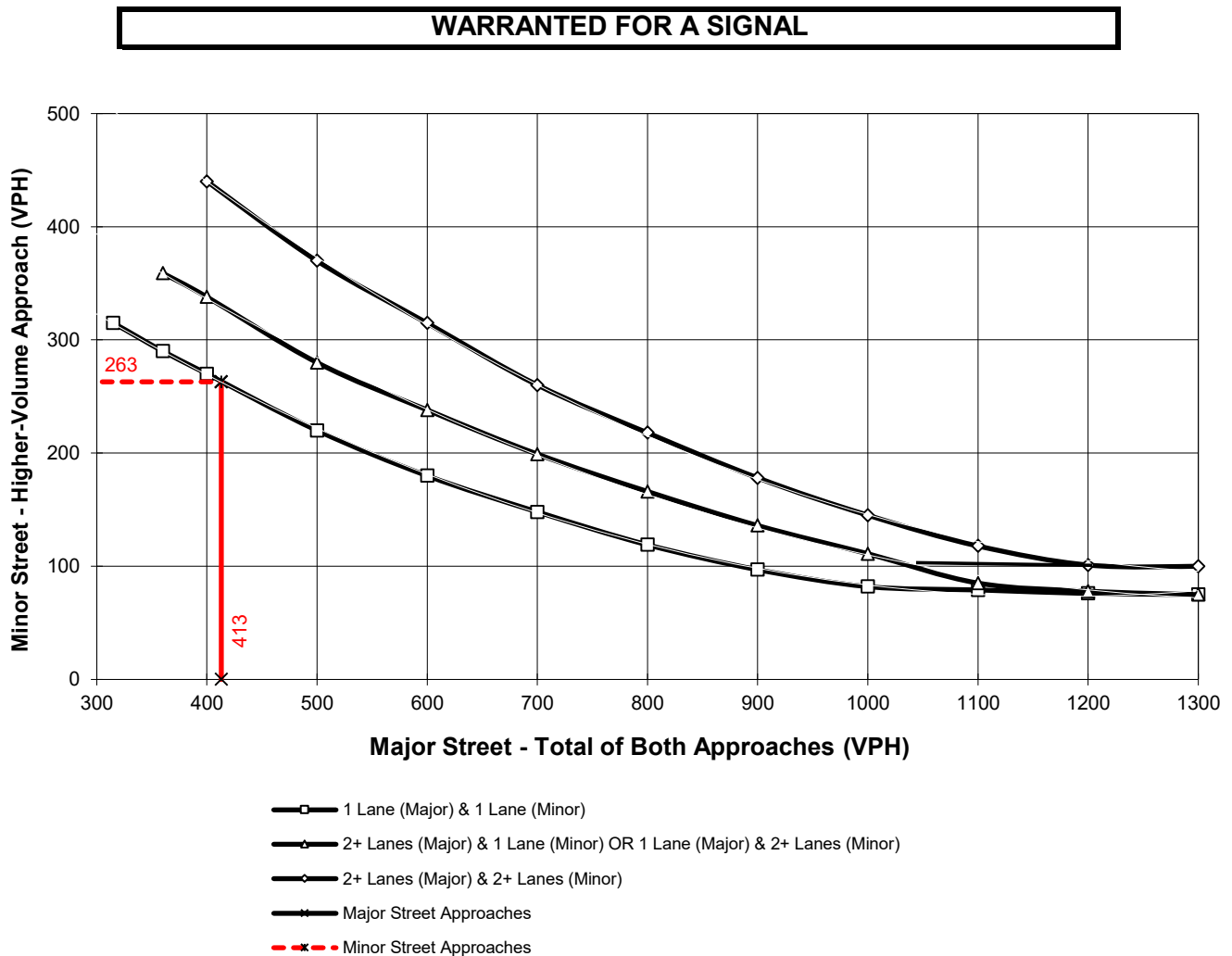
Traffic Conditions = **E+P Conditions - Weekday AM Peak Hour**

Major Street Name = **Mountain St.**

Total of Both Approaches (VPH) = **413**
Number of Approach Lanes Major Street = **1**

Minor Street Name = **Ginger Root Wy./Driveway 1**

High Volume Approach (VPH) = **263**
Number of Approach Lanes Minor Street = **1**



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes
and 75 vph applies as the lower threshold for a minor-street approach with one lane

Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **E+P Conditions - Weekday PM Peak Hour**

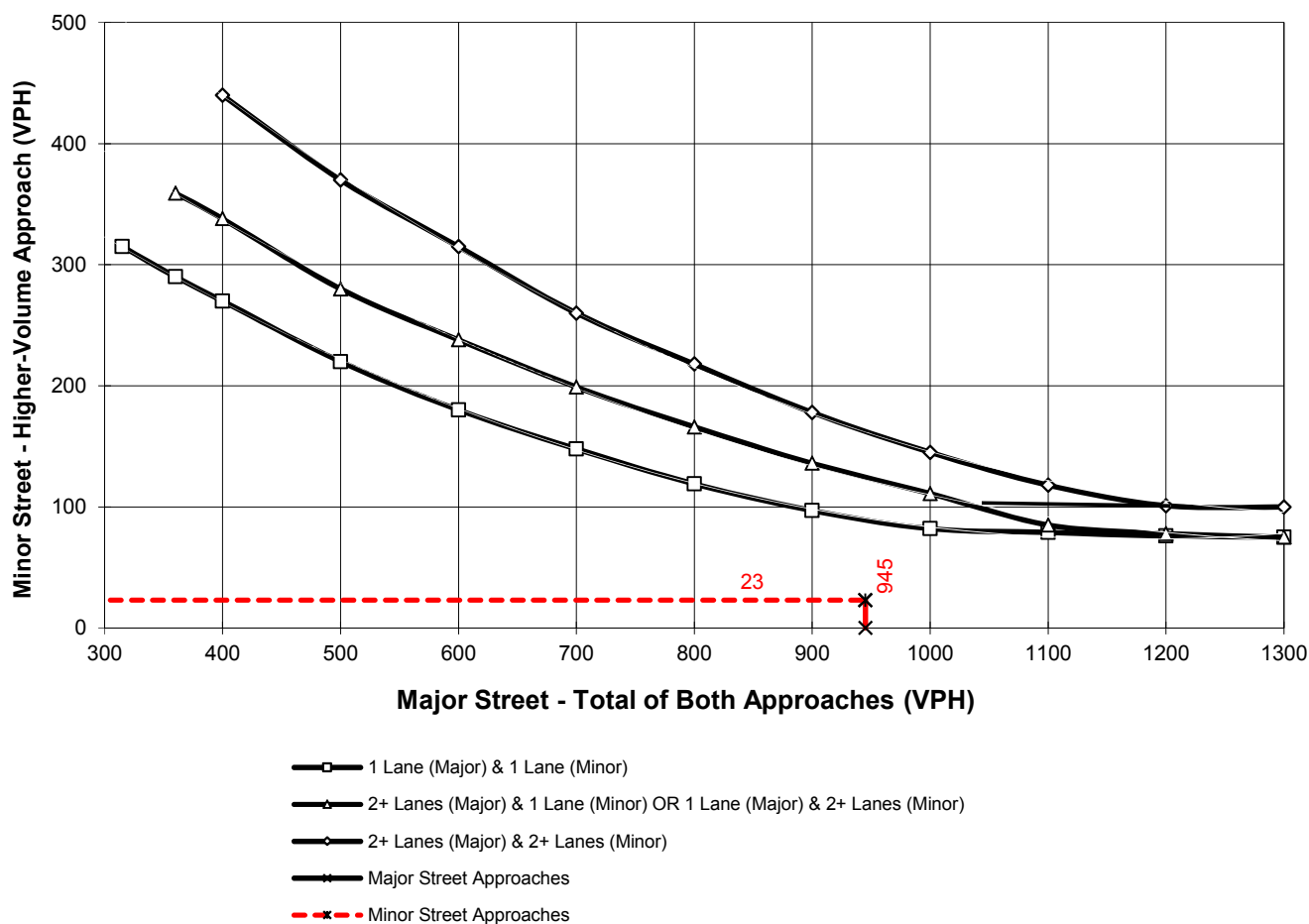
Major Street Name = **Lakeshore Dr.**

Total of Both Approaches (VPH) = **945**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Terra Cotta Rd. (N)**

High Volume Approach (VPH) = **23**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

APPENDIX 6.1:

EAP (2021) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Intersection												
Int Delay, s/veh	6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	32	261	0	3	135	89	0	0	12	159	0	8
Future Vol, veh/h	32	261	0	3	135	89	0	0	12	159	0	8
Conflicting Peds, #/hr	0	0	2	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	307	0	4	159	105	0	0	14	187	0	9
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	264	0	-	307	0	0	607	655	307	610	603	212
Stage 1	-	-	-	-	-	-	383	383	-	220	220	-
Stage 2	-	-	-	-	-	-	224	272	-	390	383	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1300	-	0	1254	-	-	408	386	733	407	413	828
Stage 1	-	-	0	-	-	-	640	612	-	782	721	-
Stage 2	-	-	0	-	-	-	779	685	-	634	612	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	1300	-	-	1254	-	-	391	371	733	387	397	828
Mov Cap-2 Maneuver	-	-	-	-	-	-	391	371	-	387	397	-
Stage 1	-	-	-	-	-	-	618	591	-	755	718	-
Stage 2	-	-	-	-	-	-	767	682	-	600	591	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	0.9			0.1			10			22.6		
HCM LOS							B			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1					
Capacity (veh/h)	733	1300	-	1254	-	-	397					
HCM Lane V/C Ratio	0.019	0.029	-	0.003	-	-	0.495					
HCM Control Delay (s)	10	7.9	0	7.9	-	-	22.6					
HCM Lane LOS	B	A	A	A	-	-	C					
HCM 95th %tile Q(veh)	0.1	0.1	-	0	-	-	2.7					

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	433	210	138	0	17
Future Vol, veh/h	0	433	210	138	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	471	228	150	0	18
Major/Minor	Major1	Major2	Minor2			
Conflicting Flow All	-	0	-	0	-	303
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	-	0	737
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	737
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		10		
HCM LOS	B					
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	737		
HCM Lane V/C Ratio	-	-	-	0.025		
HCM Control Delay (s)	-	-	-	10		
HCM Lane LOS	-	-	-	B		
HCM 95th %tile Q(veh)	-	-	-	0.1		

Timings
3: Lake St. & Nichols Rd.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	9	4	203	9	3	759	372	22	305
Future Volume (vph)	9	4	203	9	3	759	372	22	305
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	15.8	15.8	9.6	16.2	16.2	9.6	16.2
Total Split (s)	38.0	38.0	38.0	38.0	9.6	70.2	70.2	11.8	72.4
Total Split (%)	31.7%	31.7%	31.7%	31.7%	8.0%	58.5%	58.5%	9.8%	60.3%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		5.8	4.6	6.2	6.2	4.6	6.2
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)		25.5		24.3	5.1	66.1	66.1	6.0	68.6
Actuated g/C Ratio		0.24		0.23	0.05	0.62	0.62	0.06	0.64
v/c Ratio		0.04		0.82	0.04	0.68	0.37	0.23	0.26
Control Delay		28.7		59.1	55.0	20.0	7.3	57.7	10.4
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		28.7		59.1	55.0	20.0	7.3	57.7	10.4
LOS		C		E	D	B	A	E	B
Approach Delay		28.7		59.1		15.9			13.6
Approach LOS		C		E		B			B

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 106.7

Natural Cycle: 80

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 22.0

Intersection LOS: C

Intersection Capacity Utilization 69.3%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Lake St. & Nichols Rd.

		
Ø1	Ø2	Ø4
11.8 s	70.2 s	38 s
		
Ø5	Ø6	Ø8
9.6 s	72.4 s	38 s

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)

3: Lake St. & Nichols Rd.

09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	4	2	203	9	44	3	759	372	22	305	0
Future Volume (veh/h)	9	4	2	203	9	44	3	759	372	22	305	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	9	4	2	209	9	32	3	782	0	23	314	0
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	0
Cap, veh/h	236	101	43	302	10	36	7	1161		42	1197	0
Arrive On Green	0.20	0.20	0.20	0.20	0.20	0.20	0.00	0.62	0.00	0.02	0.64	0.00
Sat Flow, veh/h	923	515	221	1216	52	186	1781	1870	1585	1781	1870	0
Grp Volume(v), veh/h	15	0	0	250	0	0	3	782	0	23	314	0
Grp Sat Flow(s),veh/h/ln	1658	0	0	1455	0	0	1781	1870	1585	1781	1870	0
Q Serve(g_s), s	0.0	0.0	0.0	16.5	0.0	0.0	0.2	28.2	0.0	1.3	7.5	0.0
Cycle Q Clear(g_c), s	0.7	0.0	0.0	17.2	0.0	0.0	0.2	28.2	0.0	1.3	7.5	0.0
Prop In Lane	0.60		0.13	0.84		0.13	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	380	0	0	348	0	0	7	1161		42	1197	0
V/C Ratio(X)	0.04	0.00	0.00	0.72	0.00	0.00	0.42	0.67		0.55	0.26	0.00
Avail Cap(c_a), veh/h	571	0	0	516	0	0	86	1161		124	1197	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)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	33.8	0.0	0.0	40.3	0.0	0.0	51.4	12.8	0.0	50.0	8.1	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	2.8	0.0	0.0	14.1	3.1	0.0	4.2	0.5	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.3	0.0	0.0	6.2	0.0	0.0	0.1	10.6	0.0	0.6	2.6	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.8	0.0	0.0	43.1	0.0	0.0	65.4	15.9	0.0	54.2	8.6	0.0
LnGrp LOS	C	A	A	D	A	A	E	B		D	A	A
Approach Vol, veh/h	15				250				785			
Approach Delay, s/veh	33.8				43.1				16.1			
Approach LOS	C				D				B			
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.0	70.4		26.0	5.0	72.4		26.0				
Change Period (Y+Rc), s	4.6	6.2		* 5.8	4.6	6.2		5.8				
Max Green Setting (Gmax), s	7.2	64.0		* 33	5.0	66.2		32.2				
Max Q Clear Time (g_c+I1), s	3.3	30.2		2.7	2.2	9.5		19.2				
Green Ext Time (p_c), s	0.0	5.6		0.0	0.0	1.7		1.0				

Intersection Summary

HCM 6th Ctrl Delay	20.1
HCM 6th LOS	C

Notes

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

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

Timings
4: Lake St. & Alberhill Ranch Rd.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	83	59	1081	50	19	487
Future Volume (vph)	83	59	1081	50	19	487
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.7	14.7	16.2	16.2	9.6	16.2
Total Split (s)	15.3	15.3	94.6	94.6	10.1	104.7
Total Split (%)	12.8%	12.8%	78.8%	78.8%	8.4%	87.3%
Yellow Time (s)	3.7	3.7	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	4.7	6.2	6.2	4.6	6.2
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Max	Max	None	Max
Act Effect Green (s)	10.3	10.3	94.5	94.5	5.3	98.5
Actuated g/C Ratio	0.09	0.09	0.79	0.79	0.04	0.82
v/c Ratio	0.57	0.46	0.77	0.04	0.26	0.33
Control Delay	68.1	63.5	12.8	1.5	63.5	3.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	68.1	63.5	12.8	1.5	63.5	3.3
LOS	E	E	B	A	E	A
Approach Delay	66.2		12.3			5.5
Approach LOS	E		B			A

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 119.7

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 14.7

Intersection LOS: B

Intersection Capacity Utilization 74.3%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: Lake St. & Alberhill Ranch Rd.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 4: Lake St. & Alberhill Ranch Rd. 09/26/2019

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	83	59	1081	50	19	487
Future Volume (veh/h)	83	59	1081	50	19	487
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	87	62	1138	39	20	513
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	148	132	1434	1215	36	1544
Arrive On Green	0.08	0.08	0.77	0.77	0.02	0.83
Sat Flow, veh/h	1781	1585	1870	1585	1781	1870
Grp Volume(v), veh/h	87	62	1138	39	20	513
Grp Sat Flow(s), veh/h/ln	1781	1585	1870	1585	1781	1870
Q Serve(g_s), s	5.6	4.5	43.3	0.7	1.3	7.9
Cycle Q Clear(g_c), s	5.6	4.5	43.3	0.7	1.3	7.9
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	148	132	1434	1215	36	1544
V/C Ratio(X)	0.59	0.47	0.79	0.03	0.55	0.33
Avail Cap(c_a), veh/h	158	141	1434	1215	82	1544
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.7	52.2	8.3	3.3	57.9	2.5
Incr Delay (d2), s/veh	2.9	1.0	4.6	0.0	4.8	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	1.8	13.3	0.2	0.6	1.7
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	55.6	53.2	12.9	3.4	62.7	3.1
LnGrp LOS	E	D	B	A	E	A
Approach Vol, veh/h	149		1177			533
Approach Delay, s/veh	54.6		12.6			5.3
Approach LOS	D		B			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	7.0	97.7			104.7	14.6
Change Period (Y+Rc), s	4.6	6.2			6.2	4.7
Max Green Setting (Gmax), s	5.5	88.4			98.5	10.6
Max Q Clear Time (g_c+I1), s	3.3	45.3			9.9	7.6
Green Ext Time (p_c), s	0.0	12.1			3.1	0.1
Intersection Summary						
HCM 6th Ctrl Delay			13.9			
HCM 6th LOS			B			

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↘	
Traffic Vol, veh/h	0	55	0	1130	536	34
Future Vol, veh/h	0	55	0	1130	536	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	60	0	1228	583	37
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	602	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	500	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	500	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	13.2	0	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	-	500	-	-		
HCM Lane V/C Ratio	-	0.12	-	-		
HCM Control Delay (s)	-	13.2	-	-		
HCM Lane LOS	-	B	-	-		
HCM 95th %tile Q(veh)	-	0.4	-	-		

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↑↑	
Traffic Vol, veh/h	0	62	0	1130	539	52
Future Vol, veh/h	0	62	0	1130	539	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	67	0	1228	586	57
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	322	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.93	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.319	-	-	-	-
Pot Cap-1 Maneuver	0	674	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	674	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.9	0		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBT EBLn1		SBT	SBR		
Capacity (veh/h)	- 674		-	-		
HCM Lane V/C Ratio	- 0.1		-	-		
HCM Control Delay (s)	- 10.9		-	-		
HCM Lane LOS	- B		-	-		
HCM 95th %tile Q(veh)	- 0.3		-	-		

Timings
7: Lake St. & Mountain St.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	321	24	51	37	241	760	46	8	522
Future Volume (vph)	321	24	51	37	241	760	46	8	522
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	34.7	34.7	21.7	21.7	9.6	26.8	26.8	9.6	23.2
Total Split (s)	37.0	37.0	37.0	37.0	33.0	71.6	71.6	11.4	50.0
Total Split (%)	30.8%	30.8%	30.8%	30.8%	27.5%	59.7%	59.7%	9.5%	41.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.6	4.8	4.8	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	4.7	4.7	4.7	4.6	5.8	5.8	4.6	6.2
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)	31.3	31.3	31.3	31.3	20.0	67.9	67.9	5.4	44.9
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.18	0.61	0.61	0.05	0.40
v/c Ratio	0.92	0.22	0.15	0.18	0.79	0.70	0.05	0.10	0.44
Control Delay	70.6	11.4	33.0	16.7	61.9	20.2	2.5	55.8	26.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.6	11.4	33.0	16.7	61.9	20.2	2.5	55.8	26.0
LOS	E	B	C	B	E	C	A	E	C
Approach Delay		55.3		22.8		29.0			26.4
Approach LOS		E		C		C			C

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 111.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 33.0

Intersection LOS: C

Intersection Capacity Utilization 81.4%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 7: Lake St. & Mountain St.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 7: Lake St. & Mountain St. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	321	24	87	51	37	49	241	760	46	8	522	71
Future Volume (veh/h)	321	24	87	51	37	49	241	760	46	8	522	71
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	334	25	55	53	39	39	251	792	36	8	544	64
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	389	145	319	382	242	242	281	1073	902	17	1364	160
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.16	0.57	0.57	0.01	0.43	0.43
Sat Flow, veh/h	1321	515	1133	1304	858	858	1781	1870	1573	1781	3204	376
Grp Volume(v), veh/h	334	0	80	53	0	78	251	792	36	8	301	307
Grp Sat Flow(s),veh/h/ln	1321	0	1648	1304	0	1716	1781	1870	1573	1781	1777	1803
Q Serve(g_s), s	28.4	0.0	4.2	3.7	0.0	3.9	15.8	35.9	1.1	0.5	13.4	13.5
Cycle Q Clear(g_c), s	32.3	0.0	4.2	7.9	0.0	3.9	15.8	35.9	1.1	0.5	13.4	13.5
Prop In Lane	1.00		0.69	1.00		0.50	1.00		1.00	1.00		0.21
Lane Grp Cap(c), veh/h	389	0	464	382	0	483	281	1073	902	17	756	767
V/C Ratio(X)	0.86	0.00	0.17	0.14	0.00	0.16	0.89	0.74	0.04	0.46	0.40	0.40
Avail Cap(c_a), veh/h	389	0	464	382	0	483	441	1073	902	106	756	767
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.5	0.0	31.1	34.1	0.0	31.0	47.4	18.1	10.7	56.5	22.8	22.8
Incr Delay (d2), s/veh	17.1	0.0	0.2	0.2	0.0	0.2	9.3	4.6	0.1	6.8	1.6	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.3	0.0	1.7	1.2	0.0	1.7	7.5	15.1	0.4	0.3	5.6	5.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	60.6	0.0	31.3	34.3	0.0	31.2	56.7	22.7	10.8	63.3	24.3	24.4
LnGrp LOS	E	A	C	C	A	C	E	C	B	E	C	C
Approach Vol, veh/h	414		131			1079			616			
Approach Delay, s/veh	54.9		32.4			30.2			24.9			
Approach LOS	D		C			C			C			
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	5.7	72.0	37.0		22.7	55.0	37.0					
Change Period (Y+Rc), s	4.6	* 6.2	* 4.7		4.6	6.2	* 4.7					
Max Green Setting (Gmax), s	6.8	* 66	* 32		28.4	43.8	* 32					
Max Q Clear Time (g_c+I1), s	2.5	37.9	34.3		17.8	15.5	9.9					
Green Ext Time (p_c), s	0.0	5.8	0.0		0.2	3.3	0.5					
Intersection Summary												
HCM 6th Ctrl Delay			33.4									
HCM 6th LOS			C									
Notes												

Timings
8: Lake St. & Lakeshore Dr.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	62	122	198	119	331	98	757	221	208	439	143
Future Volume (vph)	62	122	198	119	331	98	757	221	208	439	143
Turn Type	Perm	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	8	8	1	5	2		1	6	
Permitted Phases	4				8			2			6
Detector Phase	4	4	8	8	1	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	35.6	35.6	15.8	15.8	9.6	9.6	33.8	33.8	9.6	22.8	22.8
Total Split (s)	36.0	36.0	28.0	28.0	15.0	20.2	41.0	41.0	15.0	35.8	35.8
Total Split (%)	30.0%	30.0%	23.3%	23.3%	12.5%	16.8%	34.2%	34.2%	12.5%	29.8%	29.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)		22.7	19.1	19.1	30.6	11.6	35.6	35.6	10.3	34.3	34.3
Actuated g/C Ratio		0.21	0.18	0.18	0.28	0.11	0.33	0.33	0.09	0.32	0.32
v/c Ratio		0.83	0.81	0.46	0.42	0.66	0.83	0.46	0.81	0.50	0.38
Control Delay		43.0	64.4	46.4	4.2	65.0	42.7	7.5	69.7	34.9	11.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		43.0	64.4	46.4	4.2	65.0	42.7	7.5	69.7	34.9	11.2
LOS		D	E	D	A	E	D	A	E	C	B
Approach Delay		43.0		30.4			37.5			39.8	
Approach LOS		D		C			D			D	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 108.7

Natural Cycle: 105

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.83

Intersection Signal Delay: 37.1

Intersection LOS: D

Intersection Capacity Utilization 78.9%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 8: Lake St. & Lakeshore Dr.

 Ø1	 Ø2	 Ø4	 Ø8
15 s	41 s	36 s	28 s
 Ø5	 Ø6		
20.2 s	35.8 s		

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 8: Lake St. & Lakeshore Dr. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	122	123	198	119	331	98	757	221	208	439	143
Future Volume (veh/h)	62	122	123	198	119	331	98	757	221	208	439	143
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.81	1.00		0.72	1.00		0.88	1.00		0.89
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	78	154	109	251	151	299	124	958	137	263	556	103
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	150	296	208	305	320	607	153	1190	467	325	1219	482
Arrive On Green	0.20	0.20	0.20	0.17	0.17	0.17	0.09	0.33	0.33	0.09	0.34	0.34
Sat Flow, veh/h	742	1461	1026	1781	1870	2016	1781	3554	1395	3456	3554	1405
Grp Volume(v), veh/h	193	0	148	251	151	299	124	958	137	263	556	103
Grp Sat Flow(s),veh/h/ln	1833	0	1395	1781	1870	1008	1781	1777	1395	1728	1777	1405
Q Serve(g_s), s	9.9	0.0	10.0	14.3	7.7	13.5	7.2	25.8	7.6	7.8	12.8	5.5
Cycle Q Clear(g_c), s	9.9	0.0	10.0	14.3	7.7	13.5	7.2	25.8	7.6	7.8	12.8	5.5
Prop In Lane	0.40		0.74	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	371	0	282	305	320	607	153	1190	467	325	1219	482
V/C Ratio(X)	0.52	0.00	0.53	0.82	0.47	0.49	0.81	0.81	0.29	0.81	0.46	0.21
Avail Cap(c_a), veh/h	547	0	417	376	395	687	264	1190	467	342	1219	482
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.4	0.0	37.4	42.0	39.3	33.3	47.2	31.9	25.8	46.7	26.9	24.5
Incr Delay (d2), s/veh	1.1	0.0	1.5	11.5	1.1	0.6	3.9	5.9	1.6	12.0	1.2	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.6	0.0	3.5	7.0	3.5	3.2	3.2	11.4	2.6	3.8	5.4	1.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.5	0.0	38.9	53.5	40.4	34.0	51.1	37.7	27.4	58.7	28.1	25.5
LnGrp LOS	D	A	D	D	D	C	D	D	C	E	C	C
Approach Vol, veh/h		341			701			1219			922	
Approach Delay, s/veh		38.7			42.4			37.9			36.6	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.5	41.0		25.9	13.6	41.9		23.8				
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8				
Max Green Setting (Gmax), s	10.4	35.2		31.4	15.6	30.0		22.2				
Max Q Clear Time (g_c+I1), s	9.8	27.8		12.0	9.2	14.8		16.3				
Green Ext Time (p_c), s	0.0	3.8		2.2	0.1	3.3		1.7				
Intersection Summary												
HCM 6th Ctrl Delay			38.6									
HCM 6th LOS			D									

Timings

Lake and Mountain Shopping Center TIA (JN:12768)

9: Lincoln St. & Grand Av./Lake St.

09/26/2019

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	92	506	46	184	382	21	40	134	48	128
Future Volume (vph)	92	506	46	184	382	21	40	134	48	128
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases			4			8				
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	9.6	32.8	32.8	9.6	31.8	31.8	9.6	34.4	9.6	34.4
Total Split (s)	21.0	37.0	37.0	31.0	47.0	47.0	14.0	38.0	14.0	38.0
Total Split (%)	17.5%	30.8%	30.8%	25.8%	39.2%	39.2%	11.7%	31.7%	11.7%	31.7%
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	4.8	3.6	4.4	3.6	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	5.8	4.6	5.4	4.6	5.4
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None
Act Effect Green (s)	10.8	36.0	36.0	17.0	42.2	42.2	7.1	14.4	7.5	14.8
Actuated g/C Ratio	0.12	0.39	0.39	0.18	0.45	0.45	0.08	0.15	0.08	0.16
v/c Ratio	0.60	0.49	0.09	0.76	0.32	0.04	0.39	0.66	0.45	0.48
Control Delay	54.4	26.9	0.3	53.2	19.8	0.1	53.9	17.9	55.4	22.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.4	26.9	0.3	53.2	19.8	0.1	53.9	17.9	55.4	22.7
LOS	D	C	A	D	B	A	D	B	E	C
Approach Delay		28.9			29.5			21.4		28.4
Approach LOS		C			C			C		C

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 93.3

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.76

Intersection Signal Delay: 27.4

Intersection LOS: C

Intersection Capacity Utilization 70.6%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 9: Lincoln St. & Grand Av./Lake St.

			
Ø1	Ø2	Ø3	Ø4
14 s	38 s	31 s	37 s
			
Ø5	Ø6	Ø7	Ø8
14 s	38 s	21 s	47 s

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 9: Lincoln St. & Grand Av./Lake St. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	506	46	184	382	21	40	134	238	48	128	99
Future Volume (veh/h)	92	506	46	184	382	21	40	134	238	48	128	99
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	123	675	42	245	509	24	53	179	245	64	171	100
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	154	1296	568	281	1550	681	71	382	334	82	488	271
Arrive On Green	0.09	0.36	0.36	0.16	0.44	0.44	0.04	0.22	0.22	0.05	0.22	0.22
Sat Flow, veh/h	1781	3554	1559	1781	3554	1561	1781	1777	1554	1781	2200	1221
Grp Volume(v), veh/h	123	675	42	245	509	24	53	179	245	64	136	135
Grp Sat Flow(s),veh/h/ln	1781	1777	1559	1781	1777	1561	1781	1777	1554	1781	1777	1645
Q Serve(g_s), s	6.4	14.1	1.7	12.7	8.9	0.8	2.8	8.3	13.9	3.4	6.1	6.6
Cycle Q Clear(g_c), s	6.4	14.1	1.7	12.7	8.9	0.8	2.8	8.3	13.9	3.4	6.1	6.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.74
Lane Grp Cap(c), veh/h	154	1296	568	281	1550	681	71	382	334	82	394	365
V/C Ratio(X)	0.80	0.52	0.07	0.87	0.33	0.04	0.75	0.47	0.73	0.78	0.35	0.37
Avail Cap(c_a), veh/h	309	1296	568	498	1550	681	177	613	536	177	613	568
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.4	23.5	19.6	38.8	17.5	15.2	44.9	32.3	34.5	44.6	31.0	31.2
Incr Delay (d2), s/veh	3.6	1.5	0.3	3.3	0.6	0.1	5.8	0.9	3.1	5.7	0.5	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	5.7	0.6	5.5	3.5	0.3	1.3	3.5	5.3	1.6	2.6	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.0	25.0	19.8	42.1	18.1	15.3	50.6	33.2	37.6	50.3	31.5	31.8
LnGrp LOS	D	C	B	D	B	B	D	C	D	D	C	C
Approach Vol, veh/h	840			778			477			335		
Approach Delay, s/veh	27.8			25.6			37.4			35.2		
Approach LOS	C			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.0	25.7	19.5	40.2	8.4	26.3	12.7	47.0				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.8	4.6	5.4	4.6	5.8				
Max Green Setting (Gmax), s	9.4	32.6	26.4	31.2	9.4	32.6	16.4	41.2				
Max Q Clear Time (g_c+I1), s	5.4	15.9	14.7	16.1	4.8	8.6	8.4	10.9				
Green Ext Time (p_c), s	0.0	2.2	0.3	3.8	0.0	1.4	0.1	3.3				
Intersection Summary												
HCM 6th Ctrl Delay			30.0									
HCM 6th LOS			C									

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	598	643	12	7	14
Future Vol, veh/h	12	598	643	12	7	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	100
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	72	72	72	72	72	72
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	831	893	17	10	19

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	910	0	0 1352 902
Stage 1	-	-	- 902 -
Stage 2	-	-	- 450 -
Critical Hdwy	4.13	-	- 6.63 6.23
Critical Hdwy Stg 1	-	-	- 5.43 -
Critical Hdwy Stg 2	-	-	- 5.83 -
Follow-up Hdwy	2.219	-	- 3.519 3.319
Pot Cap-1 Maneuver	746	-	- 153 335
Stage 1	-	-	- 395 -
Stage 2	-	-	- 610 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	746	-	- 149 335
Mov Cap-2 Maneuver	-	-	- 279 -
Stage 1	-	-	- 386 -
Stage 2	-	-	- 610 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	17.1
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	746	-	-	-	279	335
HCM Lane V/C Ratio	0.022	-	-	-	0.035	0.058
HCM Control Delay (s)	9.9	-	-	-	18.4	16.4
HCM Lane LOS	A	-	-	-	C	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0.2

Timings
11: Terra Cota Rd. (S) & Lakeshore Dr.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑	↑	↘	↑	↘
Traffic Volume (vph)	577	28	12	603	53
Future Volume (vph)	577	28	12	603	53
Turn Type	NA	Perm	Prot	NA	Prot
Protected Phases	4		3	8	2
Permitted Phases		4			
Detector Phase	4	4	3	8	2
Switch Phase					
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	22.6	22.6	9.6	15.8	14.6
Total Split (s)	83.0	83.0	12.0	95.0	25.0
Total Split (%)	69.2%	69.2%	10.0%	79.2%	20.8%
Yellow Time (s)	3.6	3.6	3.6	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	5.8	4.6
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	Max	Max	None	Max	None
Act Effect Green (s)	86.0	86.0	5.8	89.3	14.7
Actuated g/C Ratio	0.75	0.75	0.05	0.78	0.13
v/c Ratio	0.57	0.03	0.19	0.58	0.64
Control Delay	9.9	2.2	58.0	7.4	60.7
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	9.9	2.2	58.0	7.4	60.7
LOS	A	A	E	A	E
Approach Delay	9.5			8.4	60.7
Approach LOS	A			A	E

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 114.4

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 12.9

Intersection LOS: B

Intersection Capacity Utilization 48.7%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 11: Terra Cota Rd. (S) & Lakeshore Dr.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 11: Terra Cota Rd. (S) & Lakeshore Dr. 09/26/2019

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	577	28	12	603	53	47
Future Volume (veh/h)	577	28	12	603	53	47
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	801	36	17	838	74	65
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	1395	1149	33	1507	89	79
Arrive On Green	0.75	0.75	0.02	0.81	0.10	0.10
Sat Flow, veh/h	1870	1541	1781	1870	891	782
Grp Volume(v), veh/h	801	36	17	838	140	0
Grp Sat Flow(s),veh/h/ln	1870	1541	1781	1870	1685	0
Q Serve(g_s), s	21.1	0.7	1.0	17.5	9.0	0.0
Cycle Q Clear(g_c), s	21.1	0.7	1.0	17.5	9.0	0.0
Prop In Lane		1.00	1.00		0.53	0.46
Lane Grp Cap(c), veh/h	1395	1149	33	1507	169	0
V/C Ratio(X)	0.57	0.03	0.52	0.56	0.83	0.00
Avail Cap(c_a), veh/h	1395	1149	119	1507	310	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	6.3	3.7	53.9	3.8	48.9	0.0
Incr Delay (d2), s/veh	1.7	0.1	4.7	1.5	9.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	6.6	0.2	0.5	4.3	4.3	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.0	3.7	58.5	5.3	58.7	0.0
LnGrp LOS	A	A	E	A	E	A
Approach Vol, veh/h	837			855	140	
Approach Delay, s/veh	7.8			6.3	58.7	
Approach LOS	A			A	E	
Timer - Assigned Phs	2		3	4	8	
Phs Duration (G+Y+Rc), s	15.7		6.6	88.4	95.0	
Change Period (Y+Rc), s	4.6		4.6	* 5.8	5.8	
Max Green Setting (Gmax), s	20.4		7.4	* 78	89.2	
Max Q Clear Time (g_c+I1), s	11.0		3.0	23.1	19.5	
Green Ext Time (p_c), s	0.2		0.0	6.5	6.9	
Intersection Summary						
HCM 6th Ctrl Delay			11.0			
HCM 6th LOS			B			
Notes						
User approved volume balancing among the lanes for turning movement.						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						

Intersection												
Int Delay, s/veh	9.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	24	99	0	5	170	125	0	0	3	255	0	8
Future Vol, veh/h	24	99	0	5	170	125	0	0	3	255	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	118	0	6	202	149	0	0	4	304	0	10
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	351	0	-	118	0	0	470	539	118	467	465	277
Stage 1	-	-	-	-	-	-	176	176	-	289	289	-
Stage 2	-	-	-	-	-	-	294	363	-	178	176	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1208	-	0	1470	-	-	504	449	934	506	495	762
Stage 1	-	-	0	-	-	-	826	753	-	719	673	-
Stage 2	-	-	0	-	-	-	714	625	-	824	753	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	1208	-	-	1470	-	-	486	435	934	492	480	762
Mov Cap-2 Maneuver	-	-	-	-	-	-	486	435	-	492	480	-
Stage 1	-	-	-	-	-	-	805	733	-	700	670	-
Stage 2	-	-	-	-	-	-	702	622	-	800	733	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.6			0.1			8.9			23.8		
HCM LOS							A			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1					
Capacity (veh/h)	934	1208	-	1470	-	-	497					
HCM Lane V/C Ratio	0.004	0.024	-	0.004	-	-	0.63					
HCM Control Delay (s)	8.9	8.1	0	7.5	-	-	23.8					
HCM Lane LOS	A	A	A	A	-	-	C					
HCM 95th %tile Q(veh)	0	0.1	-	0	-	-	4.3					

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	357	284	171	0	16
Future Vol, veh/h	0	357	284	171	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
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	388	309	186	0	17
Major/Minor	Major1	Major2		Minor2		
Conflicting Flow All	-	0	-	0	-	402
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	-	-	-	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	-	-	-	-	3.318
Pot Cap-1 Maneuver	0	-	-	-	0	648
Stage 1	0	-	-	-	0	-
Stage 2	0	-	-	-	0	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	-	-	-	-	-	648
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	WB		SB		
HCM Control Delay, s	0	0		10.7		
HCM LOS	B					
Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1		
Capacity (veh/h)	-	-	-	648		
HCM Lane V/C Ratio	-	-	-	0.027		
HCM Control Delay (s)	-	-	-	10.7		
HCM Lane LOS	-	-	-	B		
HCM 95th %tile Q(veh)	-	-	-	0.1		

Timings
3: Lake St. & Nichols Rd.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	4	4	258	1	2	411	184	41	800
Future Volume (vph)	4	4	258	1	2	411	184	41	800
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	15.8	15.8	9.6	16.2	16.2	9.6	16.2
Total Split (s)	38.0	38.0	38.0	38.0	9.6	70.2	70.2	11.8	72.4
Total Split (%)	31.7%	31.7%	31.7%	31.7%	8.0%	58.5%	58.5%	9.8%	60.3%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		5.8	4.6	6.2	6.2	4.6	6.2
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)		29.4		28.2	5.0	64.9	64.9	6.5	72.0
Actuated g/C Ratio		0.26		0.25	0.04	0.57	0.57	0.06	0.63
v/c Ratio		0.02		0.89	0.03	0.42	0.21	0.45	0.74
Control Delay		28.2		69.4	56.0	17.1	3.6	68.5	21.2
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		28.2		69.4	56.0	17.1	3.6	68.5	21.2
LOS		C		E	E	B	A	E	C
Approach Delay		28.2		69.4		13.0			23.5
Approach LOS		C		E		B			C

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 114.1

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.89

Intersection Signal Delay: 27.3

Intersection LOS: C

Intersection Capacity Utilization 74.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 3: Lake St. & Nichols Rd.

		
Ø1	Ø2	Ø4
11.8 s	70.2 s	38 s
		
Ø5	Ø6	Ø8
9.6 s	72.4 s	38 s

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 3: Lake St. & Nichols Rd. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	4	2	258	1	17	2	411	184	41	800	0
Future Volume (veh/h)	4	4	2	258	1	17	2	411	184	41	800	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	0
Adj Flow Rate, veh/h	4	4	1	280	1	10	2	447	0	45	870	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	0
Cap, veh/h	210	200	45	374	1	11	5	1099		61	1158	0
Arrive On Green	0.23	0.23	0.23	0.23	0.23	0.23	0.00	0.59	0.00	0.03	0.62	0.00
Sat Flow, veh/h	718	884	200	1370	5	49	1781	1870	1585	1781	1870	0
Grp Volume(v), veh/h	9	0	0	291	0	0	2	447	0	45	870	0
Grp Sat Flow(s),veh/h/ln	1803	0	0	1424	0	0	1781	1870	1585	1781	1870	0
Q Serve(g_s), s	0.0	0.0	0.0	21.2	0.0	0.0	0.1	14.1	0.0	2.7	36.1	0.0
Cycle Q Clear(g_c), s	0.4	0.0	0.0	21.6	0.0	0.0	0.1	14.1	0.0	2.7	36.1	0.0
Prop In Lane	0.44		0.11	0.96		0.03	1.00		1.00	1.00		0.00
Lane Grp Cap(c), veh/h	455	0	0	386	0	0	5	1099		61	1158	0
V/C Ratio(X)	0.02	0.00	0.00	0.75	0.00	0.00	0.42	0.41		0.74	0.75	0.00
Avail Cap(c_a), veh/h	584	0	0	485	0	0	82	1099		118	1158	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)	1.00	0.00	0.00	1.00	0.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	32.8	0.0	0.0	41.0	0.0	0.0	54.2	12.2	0.0	52.1	14.8	0.0
Incr Delay (d2), s/veh	0.0	0.0	0.0	5.1	0.0	0.0	20.0	1.1	0.0	6.4	4.5	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	0.2	0.0	0.0	7.8	0.0	0.0	0.1	5.4	0.0	1.3	14.0	0.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	32.8	0.0	0.0	46.0	0.0	0.0	74.2	13.3	0.0	58.5	19.3	0.0
LnGrp LOS	C	A	A	D	A	A	E	B		E	B	A
Approach Vol, veh/h		9			291			449	A		915	
Approach Delay, s/veh		32.8			46.0			13.5			21.2	
Approach LOS		C			D			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.3	70.2		30.4	4.9	73.6		30.4				
Change Period (Y+Rc), s	4.6	6.2		* 5.8	4.6	6.2		5.8				
Max Green Setting (Gmax), s	7.2	64.0		* 33	5.0	66.2		32.2				
Max Q Clear Time (g_c+I1), s	4.7	16.1		2.4	2.1	38.1		23.6				
Green Ext Time (p_c), s	0.0	2.6		0.0	0.0	6.4		0.9				

Intersection Summary

HCM 6th Ctrl Delay	23.5
HCM 6th LOS	C

Notes

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

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

Timings
4: Lake St. & Alberhill Ranch Rd.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	39	17	595	41	33	1036
Future Volume (vph)	39	17	595	41	33	1036
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.7	14.7	16.2	16.2	9.6	16.2
Total Split (s)	15.3	15.3	94.6	94.6	10.1	104.7
Total Split (%)	12.8%	12.8%	78.8%	78.8%	8.4%	87.3%
Yellow Time (s)	3.7	3.7	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	4.7	6.2	6.2	4.6	6.2
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Max	Max	None	Max
Act Effect Green (s)	10.1	10.1	96.6	96.6	5.4	102.7
Actuated g/C Ratio	0.08	0.08	0.81	0.81	0.05	0.86
v/c Ratio	0.29	0.14	0.43	0.03	0.46	0.71
Control Delay	56.8	53.5	6.0	1.3	73.8	7.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	56.8	53.5	6.0	1.3	73.8	7.3
LOS	E	D	A	A	E	A
Approach Delay	55.8		5.7			9.4
Approach LOS	E		A			A

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 119.5

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.71

Intersection Signal Delay: 9.5

Intersection LOS: A

Intersection Capacity Utilization 71.9%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 4: Lake St. & Alberhill Ranch Rd.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 4: Lake St. & Alberhill Ranch Rd. 09/26/2019

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	39	17	595	41	33	1036
Future Volume (veh/h)	39	17	595	41	33	1036
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	43	19	654	42	36	1138
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	131	117	1432	1214	52	1560
Arrive On Green	0.07	0.07	0.77	0.77	0.03	0.83
Sat Flow, veh/h	1781	1585	1870	1585	1781	1870
Grp Volume(v), veh/h	43	19	654	42	36	1138
Grp Sat Flow(s),veh/h/ln	1781	1585	1870	1585	1781	1870
Q Serve(g_s), s	2.7	1.3	14.9	0.8	2.4	30.4
Cycle Q Clear(g_c), s	2.7	1.3	14.9	0.8	2.4	30.4
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	131	117	1432	1214	52	1560
V/C Ratio(X)	0.33	0.16	0.46	0.03	0.69	0.73
Avail Cap(c_a), veh/h	160	142	1432	1214	83	1560
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	51.9	51.3	5.0	3.3	56.8	4.2
Incr Delay (d2), s/veh	0.5	0.2	1.1	0.1	5.9	3.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	0.5	4.3	0.2	1.1	6.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	52.5	51.5	6.0	3.4	62.6	7.2
LnGrp LOS	D	D	A	A	E	A
Approach Vol, veh/h	62		696			1174
Approach Delay, s/veh	52.2		5.9			8.9
Approach LOS	D		A			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	8.1	96.6			104.7	13.4
Change Period (Y+Rc), s	4.6	6.2			6.2	4.7
Max Green Setting (Gmax), s	5.5	88.4			98.5	10.6
Max Q Clear Time (g_c+l1), s	4.4	16.9			32.4	4.7
Green Ext Time (p_c), s	0.0	4.5			12.7	0.0
Intersection Summary						
HCM 6th Ctrl Delay			9.2			
HCM 6th LOS			A			

Intersection

Int Delay, s/veh 1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↘	
Traffic Vol, veh/h	0	66	0	636	1031	43
Future Vol, veh/h	0	66	0	636	1031	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	72	0	691	1121	47

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 1145	-	0 - 0
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	- 6.22	-	- - -
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	- 3.318	-	- - -
Pot Cap-1 Maneuver	0 243	0	- - -
Stage 1	0	0	- - -
Stage 2	0	0	- - -
Platoon blocked, %			- - -
Mov Cap-1 Maneuver	- 243	-	- - -
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	NB	SB
HCM Control Delay, s	25.9	0	0
HCM LOS	D		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 243	-	-
HCM Lane V/C Ratio	- 0.295	-	-
HCM Control Delay (s)	- 25.9	-	-
HCM Lane LOS	- D	-	-
HCM 95th %tile Q(veh)	- 1.2	-	-

Intersection

Int Delay, s/veh 0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↑↑	
Traffic Vol, veh/h	0	79	0	636	1033	64
Future Vol, veh/h	0	79	0	636	1033	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	86	0	691	1123	70

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 597	- 0	- 0
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -
Critical Hdwy	- 6.93	- -	- -
Critical Hdwy Stg 1	- -	- -	- -
Critical Hdwy Stg 2	- -	- -	- -
Follow-up Hdwy	- 3.319	- -	- -
Pot Cap-1 Maneuver	0 447	0 -	- -
Stage 1	0 -	0 -	- -
Stage 2	0 -	0 -	- -
Platoon blocked, %		- -	- -
Mov Cap-1 Maneuver	- 447	- -	- -
Mov Cap-2 Maneuver	- -	- -	- -
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -

Approach	EB	NB	SB
HCM Control Delay, s	15	0	0
HCM LOS	C		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 447	- -	- -
HCM Lane V/C Ratio	- 0.192	- -	- -
HCM Control Delay (s)	- 15	- -	- -
HCM Lane LOS	- C	- -	- -
HCM 95th %tile Q(veh)	- 0.7	- -	- -

Timings
7: Lake St. & Mountain St.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	301	12	25	13	342	321	17	35	977
Future Volume (vph)	301	12	25	13	342	321	17	35	977
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	34.7	34.7	21.7	21.7	9.6	26.8	26.8	9.6	23.2
Total Split (s)	37.0	37.0	37.0	37.0	33.0	71.6	71.6	11.4	50.0
Total Split (%)	30.8%	30.8%	30.8%	30.8%	27.5%	59.7%	59.7%	9.5%	41.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.6	4.8	4.8	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	4.7	4.7	4.7	4.6	5.8	5.8	4.6	6.2
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)	30.1	30.1	30.1	30.1	26.5	68.9	68.9	6.2	44.0
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.23	0.59	0.59	0.05	0.38
v/c Ratio	0.92	0.13	0.08	0.06	0.92	0.32	0.02	0.40	0.88
Control Delay	73.8	13.5	33.6	20.6	73.6	14.2	0.1	67.4	43.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	73.8	13.5	33.6	20.6	73.6	14.2	0.1	67.4	43.4
LOS	E	B	C	C	E	B	A	E	D
Approach Delay		64.5		26.9		43.8			44.2
Approach LOS		E		C		D			D

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 116.1

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 46.9

Intersection LOS: D

Intersection Capacity Utilization 85.4%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 7: Lake St. & Mountain St.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)

7: Lake St. & Mountain St.

09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	301	12	43	25	13	14	342	321	17	35	977	101
Future Volume (veh/h)	301	12	43	25	13	14	342	321	17	35	977	101
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	327	13	25	27	14	6	372	349	15	38	1062	103
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	412	148	285	394	322	138	399	1076	911	55	1249	121
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.22	0.58	0.58	0.03	0.38	0.38
Sat Flow, veh/h	1392	572	1100	1370	1242	532	1781	1870	1584	1781	3273	317
Grp Volume(v), veh/h	327	0	38	27	0	20	372	349	15	38	576	589
Grp Sat Flow(s),veh/h/ln	1392	0	1672	1370	0	1775	1781	1870	1584	1781	1777	1813
Q Serve(g_s), s	26.4	0.0	2.0	1.7	0.0	1.0	23.5	11.2	0.5	2.4	34.0	34.1
Cycle Q Clear(g_c), s	27.4	0.0	2.0	3.7	0.0	1.0	23.5	11.2	0.5	2.4	34.0	34.1
Prop In Lane	1.00		0.66	1.00		0.30	1.00		1.00	1.00		0.17
Lane Grp Cap(c), veh/h	412	0	433	394	0	460	399	1076	911	55	678	692
V/C Ratio(X)	0.79	0.00	0.09	0.07	0.00	0.04	0.93	0.32	0.02	0.70	0.85	0.85
Avail Cap(c_a), veh/h	443	0	471	425	0	500	441	1076	911	106	678	692
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.1	0.0	32.2	33.6	0.0	31.8	43.7	12.7	10.5	55.1	32.5	32.5
Incr Delay (d2), s/veh	9.0	0.0	0.1	0.1	0.0	0.0	24.6	0.8	0.0	5.9	12.6	12.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	10.0	0.0	0.8	0.6	0.0	0.4	12.7	4.5	0.2	1.1	16.0	16.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	51.1	0.0	32.3	33.7	0.0	31.9	68.2	13.5	10.5	60.9	45.1	45.0
LnGrp LOS	D	A	C	C	A	C	E	B	B	E	D	D
Approach Vol, veh/h	365			47			736			1203		
Approach Delay, s/veh	49.2			32.9			41.1			45.5		
Approach LOS	D			C			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.1	72.2		34.4	30.3	50.0		34.4				
Change Period (Y+Rc), s	4.6	* 6.2		* 4.7	4.6	6.2		* 4.7				
Max Green Setting (Gmax), s	6.8	* 66		* 32	28.4	43.8		* 32				
Max Q Clear Time (g_c+I1), s	4.4	13.2		29.4	25.5	36.1		5.7				
Green Ext Time (p_c), s	0.0	2.1		0.4	0.2	4.0		0.1				
Intersection Summary												
HCM 6th Ctrl Delay	44.5											
HCM 6th LOS	D											
Notes												

Timings
8: Lake St. & Lakeshore Dr.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	10	21	140	10	248	16	453	99	304	684	14
Future Volume (vph)	10	21	140	10	248	16	453	99	304	684	14
Turn Type	Perm	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	8	8	1	5	2		1	6	
Permitted Phases	4				8			2			6
Detector Phase	4	4	8	8	1	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	35.6	35.6	15.8	15.8	9.6	9.6	33.8	33.8	9.6	22.8	22.8
Total Split (s)	36.0	36.0	28.0	28.0	15.0	20.2	41.0	41.0	15.0	35.8	35.8
Total Split (%)	30.0%	30.0%	23.3%	23.3%	12.5%	16.8%	34.2%	34.2%	12.5%	29.8%	29.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)		13.5	13.7	13.7	30.3	5.8	36.1	36.1	10.7	47.5	47.5
Actuated g/C Ratio		0.15	0.15	0.15	0.33	0.06	0.39	0.39	0.12	0.52	0.52
v/c Ratio		0.18	0.57	0.04	0.24	0.15	0.35	0.16	0.82	0.40	0.02
Control Delay		25.0	47.5	37.0	4.0	49.3	23.2	5.8	59.3	18.8	0.0
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		25.0	47.5	37.0	4.0	49.3	23.2	5.8	59.3	18.8	0.0
LOS		C	D	D	A	D	C	A	E	B	A
Approach Delay		25.0		20.1			20.9			30.8	
Approach LOS		C		C			C			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 91.6

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.82

Intersection Signal Delay: 25.8

Intersection LOS: C

Intersection Capacity Utilization 59.9%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 8: Lake St. & Lakeshore Dr.

 Ø1	 Ø2	 Ø4	 Ø8
15 s	41 s	36 s	28 s
 Ø5	 Ø6		
20.2 s	35.8 s		

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)

8: Lake St. & Lakeshore Dr.

09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕↕		↕	↕	↕↕	↕	↕↕	↕	↕↕	↕↕	↕
Traffic Volume (veh/h)	10	21	21	140	10	248	16	453	99	304	684	14
Future Volume (veh/h)	10	21	21	140	10	248	16	453	99	304	684	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	11	23	1	151	11	258	17	487	103	327	735	9
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	73	166	7	220	231	673	35	1545	688	407	1893	844
Arrive On Green	0.07	0.07	0.07	0.12	0.12	0.12	0.02	0.43	0.43	0.12	0.53	0.53
Sat Flow, veh/h	1091	2465	111	1781	1870	2790	1781	3554	1584	3456	3554	1585
Grp Volume(v), veh/h	18	0	17	151	11	258	17	487	103	327	735	9
Grp Sat Flow(s), veh/h/ln	1816	0	1850	1781	1870	1395	1781	1777	1584	1728	1777	1585
Q Serve(g_s), s	0.8	0.0	0.7	6.6	0.4	6.3	0.8	7.3	3.2	7.5	9.9	0.2
Cycle Q Clear(g_c), s	0.8	0.0	0.7	6.6	0.4	6.3	0.8	7.3	3.2	7.5	9.9	0.2
Prop In Lane	0.60		0.06	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	122	0	125	220	231	673	35	1545	688	407	1893	844
V/C Ratio(X)	0.15	0.00	0.13	0.69	0.05	0.38	0.49	0.32	0.15	0.80	0.39	0.01
Avail Cap(c_a), veh/h	704	0	717	488	513	1093	343	1545	688	444	1893	844
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.6	0.0	35.5	34.0	31.3	25.7	39.3	15.0	13.8	34.8	11.1	8.9
Incr Delay (d2), s/veh	0.6	0.0	0.5	3.8	0.1	0.4	3.8	0.5	0.5	8.5	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.4	0.0	0.3	2.9	0.2	2.0	0.4	2.7	1.1	3.4	3.4	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.1	0.0	36.0	37.8	31.4	26.0	43.1	15.5	14.3	43.3	11.7	8.9
LnGrp LOS	D	A	D	D	C	C	D	B	B	D	B	A
Approach Vol, veh/h		35			420			607			1071	
Approach Delay, s/veh		36.1			30.4			16.1			21.4	
Approach LOS		D			C			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.1	41.0		10.0	6.2	48.9		15.8				
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8				
Max Green Setting (Gmax), s	10.4	35.2		31.4	15.6	30.0		22.2				
Max Q Clear Time (g_c+I1), s	9.5	9.3		2.8	2.8	11.9		8.6				
Green Ext Time (p_c), s	0.1	3.3		0.1	0.0	4.4		1.2				
Intersection Summary												
HCM 6th Ctrl Delay			21.9									
HCM 6th LOS			C									

Timings

Lake and Mountain Shopping Center TIA (JN:12768)

9: Lincoln St. & Grand Av./Lake St.

09/26/2019

											
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	
Lane Configurations											
Traffic Volume (vph)	25	331	20	169	412	21	32	35	21	26	
Future Volume (vph)	25	331	20	169	412	21	32	35	21	26	
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA	
Protected Phases	7	4		3	8		5	2	1	6	
Permitted Phases			4			8					
Detector Phase	7	4	4	3	8	8	5	2	1	6	
Switch Phase											
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0	
Minimum Split (s)	9.6	32.8	32.8	9.6	31.8	31.8	9.6	34.4	9.6	34.4	
Total Split (s)	21.0	37.0	37.0	31.0	47.0	47.0	14.0	38.0	14.0	38.0	
Total Split (%)	17.5%	30.8%	30.8%	25.8%	39.2%	39.2%	11.7%	31.7%	11.7%	31.7%	
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	4.8	3.6	4.4	3.6	4.4	
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	5.8	4.6	5.4	4.6	5.4	
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag	
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None	
Act Effct Green (s)	6.1	32.8	32.8	12.4	46.1	46.1	6.3	15.6	5.9	13.2	
Actuated g/C Ratio	0.08	0.40	0.40	0.15	0.57	0.57	0.08	0.19	0.07	0.16	
v/c Ratio	0.20	0.24	0.03	0.64	0.21	0.02	0.24	0.21	0.17	0.07	
Control Delay	45.0	20.0	0.1	45.9	12.5	0.0	45.2	10.9	45.0	23.3	
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Delay	45.0	20.0	0.1	45.9	12.5	0.0	45.2	10.9	45.0	23.3	
LOS	D	C	A	D	B	A	D	B	D	C	
Approach Delay		20.6			21.4			17.2		30.9	
Approach LOS		C			C			B		C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 81.2

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.64

Intersection Signal Delay: 21.1

Intersection LOS: C

Intersection Capacity Utilization 63.5%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 9: Lincoln St. & Grand Av./Lake St.

			
Ø1	Ø2	Ø3	Ø4
14 s	38 s	31 s	37 s
			
Ø5	Ø6	Ø7	Ø8
14 s	38 s	21 s	47 s

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 9: Lincoln St. & Grand Av./Lake St. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	331	20	169	412	21	32	35	108	21	26	14
Future Volume (veh/h)	25	331	20	169	412	21	32	35	108	21	26	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	341	19	174	425	19	33	36	72	22	27	4
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	49	1572	701	215	1902	848	59	262	234	43	433	63
Arrive On Green	0.03	0.44	0.44	0.12	0.54	0.54	0.03	0.15	0.15	0.02	0.14	0.14
Sat Flow, veh/h	1781	3554	1584	1781	3554	1583	1781	1777	1585	1781	3111	449
Grp Volume(v), veh/h	26	341	19	174	425	19	33	36	72	22	15	16
Grp Sat Flow(s),veh/h/ln	1781	1777	1584	1781	1777	1583	1781	1777	1585	1781	1777	1784
Q Serve(g_s), s	1.1	4.6	0.5	7.3	4.9	0.4	1.4	1.4	3.1	0.9	0.6	0.6
Cycle Q Clear(g_c), s	1.1	4.6	0.5	7.3	4.9	0.4	1.4	1.4	3.1	0.9	0.6	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	49	1572	701	215	1902	848	59	262	234	43	247	248
V/C Ratio(X)	0.53	0.22	0.03	0.81	0.22	0.02	0.56	0.14	0.31	0.51	0.06	0.06
Avail Cap(c_a), veh/h	380	1572	701	611	1902	848	218	753	671	218	753	755
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.9	13.2	12.1	33.0	9.4	8.4	36.7	28.5	29.3	37.1	28.8	28.8
Incr Delay (d2), s/veh	3.2	0.3	0.1	2.8	0.3	0.0	3.1	0.2	0.7	3.4	0.1	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	0.5	1.6	0.2	3.1	1.6	0.1	0.6	0.6	1.2	0.4	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.1	13.6	12.2	35.8	9.7	8.5	39.8	28.8	30.0	40.5	28.9	28.9
LnGrp LOS	D	B	B	D	A	A	D	C	C	D	C	C
Approach Vol, veh/h		386			618			141			53	
Approach Delay, s/veh		15.3			17.0			32.0			33.7	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.5	16.8	13.9	39.8	7.1	16.1	6.7	47.0				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.8	4.6	5.4	4.6	5.8				
Max Green Setting (Gmax), s	9.4	32.6	26.4	31.2	9.4	32.6	16.4	41.2				
Max Q Clear Time (g_c+I1), s	2.9	5.1	9.3	6.6	3.4	2.6	3.1	6.9				
Green Ext Time (p_c), s	0.0	0.5	0.2	2.0	0.0	0.1	0.0	2.8				
Intersection Summary												
HCM 6th Ctrl Delay			19.0									
HCM 6th LOS			B									

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	468	490	15	10	10
Future Vol, veh/h	8	468	490	15	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	100
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	498	521	16	11	11

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	537	0	0
Stage 1	-	-	-
Stage 2	-	-	-
Critical Hdwy	4.13	-	-
Critical Hdwy Stg 1	-	-	-
Critical Hdwy Stg 2	-	-	-
Follow-up Hdwy	2.219	-	-
Pot Cap-1 Maneuver	1029	-	-
Stage 1	-	-	-
Stage 2	-	-	-
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1029	-	-
Mov Cap-2 Maneuver	-	-	-
Stage 1	-	-	-
Stage 2	-	-	-

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.4
HCM LOS	B		

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1029	-	-	-	450	549
HCM Lane V/C Ratio	0.008	-	-	-	0.024	0.019
HCM Control Delay (s)	8.5	-	-	-	13.2	11.7
HCM Lane LOS	A	-	-	-	B	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0.1

Timings
11: Terra Cota Rd. (S) & Lakeshore Dr.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑	↑	↘	↑	↘
Traffic Volume (vph)	433	45	43	483	21
Future Volume (vph)	433	45	43	483	21
Turn Type	NA	Perm	Prot	NA	Prot
Protected Phases	4		3	8	2
Permitted Phases		4			
Detector Phase	4	4	3	8	2
Switch Phase					
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	22.6	22.6	9.6	15.8	14.6
Total Split (s)	83.0	83.0	12.0	95.0	25.0
Total Split (%)	69.2%	69.2%	10.0%	79.2%	20.8%
Yellow Time (s)	3.6	3.6	3.6	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	5.8	4.6
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	Max	Max	None	Max	None
Act Effect Green (s)	85.1	85.1	6.6	93.4	11.2
Actuated g/C Ratio	0.77	0.77	0.06	0.84	0.10
v/c Ratio	0.32	0.04	0.44	0.33	0.43
Control Delay	6.4	1.7	63.8	3.3	55.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.4	1.7	63.8	3.3	55.0
LOS	A	A	E	A	E
Approach Delay	6.0			8.3	55.0
Approach LOS	A			A	E

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 110.9

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.44

Intersection Signal Delay: 10.2

Intersection LOS: B

Intersection Capacity Utilization 46.8%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 11: Terra Cota Rd. (S) & Lakeshore Dr.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 11: Terra Cota Rd. (S) & Lakeshore Dr. 09/26/2019

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	433	45	43	483	21	47
Future Volume (veh/h)	433	45	43	483	21	47
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	461	42	46	514	22	50
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	1394	1177	62	1538	41	92
Arrive On Green	0.75	0.75	0.03	0.82	0.08	0.08
Sat Flow, veh/h	1870	1580	1781	1870	495	1125
Grp Volume(v), veh/h	461	42	46	514	73	0
Grp Sat Flow(s),veh/h/ln	1870	1580	1781	1870	1643	0
Q Serve(g_s), s	9.0	0.8	2.8	7.3	4.6	0.0
Cycle Q Clear(g_c), s	9.0	0.8	2.8	7.3	4.6	0.0
Prop In Lane		1.00	1.00		0.30	0.68
Lane Grp Cap(c), veh/h	1394	1177	62	1538	135	0
V/C Ratio(X)	0.33	0.04	0.75	0.33	0.54	0.00
Avail Cap(c_a), veh/h	1394	1177	121	1538	309	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.7	3.6	51.9	2.4	47.8	0.0
Incr Delay (d2), s/veh	0.6	0.1	6.6	0.6	3.4	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.2	1.3	1.5	2.0	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.3	3.7	58.5	3.0	51.2	0.0
LnGrp LOS	A	A	E	A	D	A
Approach Vol, veh/h	503			560	73	
Approach Delay, s/veh	5.2			7.5	51.2	
Approach LOS	A			A	D	
Timer - Assigned Phs	2		3	4	8	
Phs Duration (G+Y+Rc), s	13.5		8.3	86.7	95.0	
Change Period (Y+Rc), s	4.6		4.6	* 5.8	5.8	
Max Green Setting (Gmax), s	20.4		7.4	* 78	89.2	
Max Q Clear Time (g_c+I1), s	6.6		4.8	11.0	9.3	
Green Ext Time (p_c), s	0.1		0.0	3.0	3.3	
Intersection Summary						
HCM 6th Ctrl Delay			9.3			
HCM 6th LOS			A			
Notes						
User approved volume balancing among the lanes for turning movement.						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						

APPENDIX 6.2:

EAP (2021) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **EAP (2021) Conditions - Weekday PM Peak Hour**

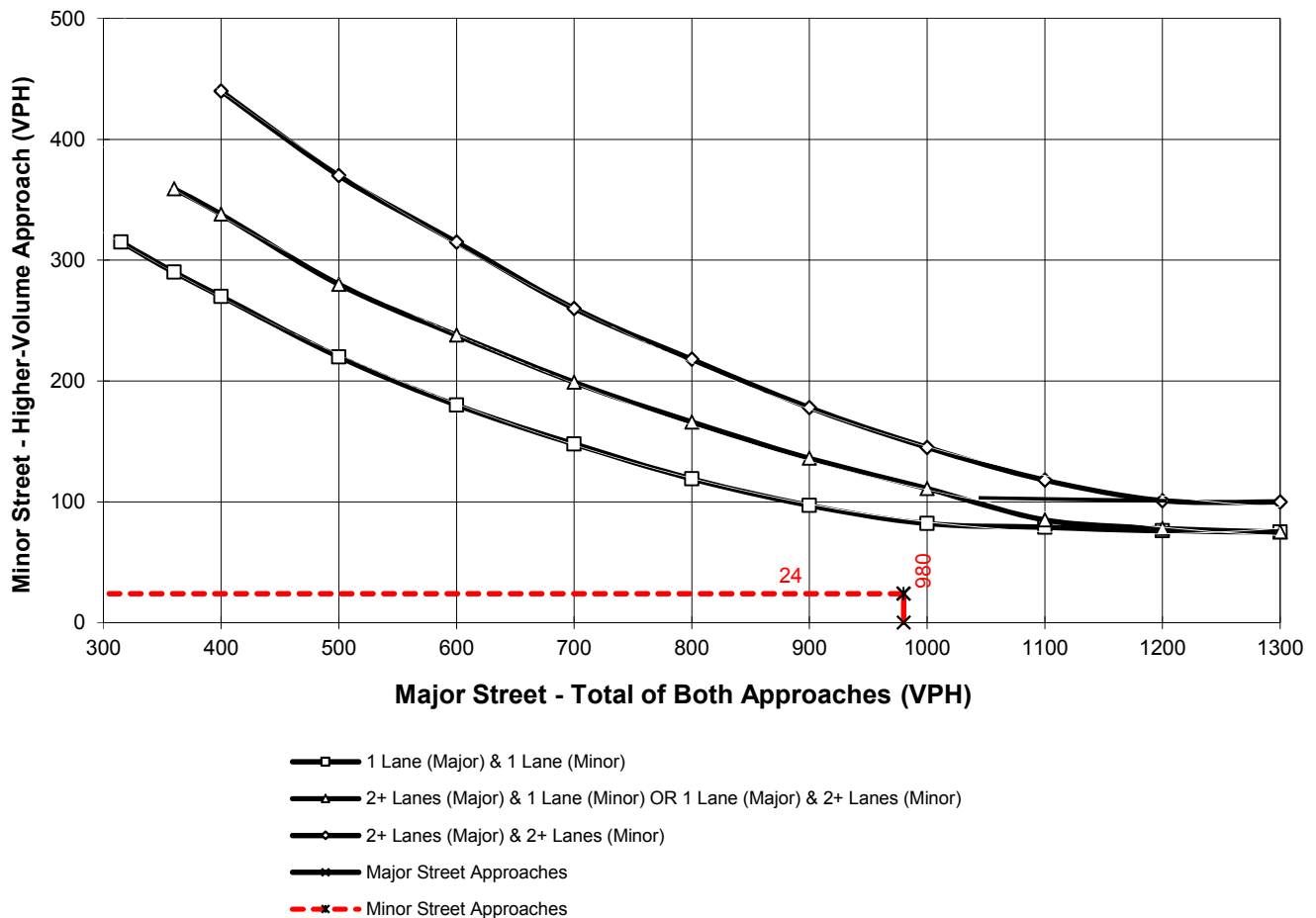
Major Street Name = **Lakeshore Dr.**

Total of Both Approaches (VPH) = **980**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Terra Cotta Rd. (N)**

High Volume Approach (VPH) = **24**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes
and 75 vph applies as the lower threshold for a minor-street approach with one lane

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APPENDIX 7.1:

EAPC (2021) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS

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Intersection												
Int Delay, s/veh	6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	32	264	0	3	135	89	0	0	12	159	0	8
Future Vol, veh/h	32	264	0	3	135	89	0	0	12	159	0	8
Conflicting Peds, #/hr	0	0	2	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	38	311	0	4	159	105	0	0	14	187	0	9
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	264	0	-	311	0	0	611	659	311	614	607	212
Stage 1	-	-	-	-	-	-	387	387	-	220	220	-
Stage 2	-	-	-	-	-	-	224	272	-	394	387	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1300	-	0	1249	-	-	406	384	729	404	411	828
Stage 1	-	-	0	-	-	-	637	610	-	782	721	-
Stage 2	-	-	0	-	-	-	779	685	-	631	610	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	1300	-	-	1249	-	-	389	369	729	385	395	828
Mov Cap-2 Maneuver	-	-	-	-	-	-	389	369	-	385	395	-
Stage 1	-	-	-	-	-	-	615	589	-	755	718	-
Stage 2	-	-	-	-	-	-	767	682	-	597	589	-
Approach	EB		WB				NB		SB			
HCM Control Delay, s	0.8		0.1				10		22.8			
HCM LOS							B		C			
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1					
Capacity (veh/h)	729	1300	-	1249	-	-	395					
HCM Lane V/C Ratio	0.019	0.029	-	0.003	-	-	0.497					
HCM Control Delay (s)	10	7.9	0	7.9	-	-	22.8					
HCM Lane LOS	B	A	A	A	-	-	C					
HCM 95th %tile Q(veh)	0.1	0.1	-	0	-	-	2.7					

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	435	211	138	0	17
Future Vol, veh/h	0	435	211	138	0	17
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	473	229	150	0	18

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0 - 304
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.22
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.318
Pot Cap-1 Maneuver	0	-	- - 0 736
Stage 1	0	-	- - 0 -
Stage 2	0	-	- - 0 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	- - 736
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	736
HCM Lane V/C Ratio	-	-	-	0.025
HCM Control Delay (s)	-	-	-	10
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Timings
3: Lake St. & Nichols Rd.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	51	45	206	23	10	767	380	27	308
Future Volume (vph)	51	45	206	23	10	767	380	27	308
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	15.8	15.8	9.6	16.2	16.2	9.6	16.2
Total Split (s)	38.0	38.0	38.0	38.0	9.6	70.2	70.2	11.8	72.4
Total Split (%)	31.7%	31.7%	31.7%	31.7%	8.0%	58.5%	58.5%	9.8%	60.3%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		5.8	4.6	6.2	6.2	4.6	6.2
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)		29.2		28.0	5.0	65.5	65.5	6.1	70.1
Actuated g/C Ratio		0.26		0.25	0.04	0.58	0.58	0.05	0.63
v/c Ratio		0.31		0.90	0.13	0.73	0.39	0.29	0.29
Control Delay		33.3		70.4	59.0	24.1	8.5	61.4	11.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		33.3		70.4	59.0	24.1	8.5	61.4	11.5
LOS		C		E	E	C	A	E	B
Approach Delay		33.3		70.4		19.3			15.4
Approach LOS		C		E		B			B

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 112

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.90

Intersection Signal Delay: 26.8

Intersection LOS: C

Intersection Capacity Utilization 72.5%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 3: Lake St. & Nichols Rd.

		
Ø1	Ø2	Ø4
11.8 s	70.2 s	38 s
		
Ø5	Ø6	Ø8
9.6 s	72.4 s	38 s

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768) 3: Lake St. & Nichols Rd. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	51	45	23	206	23	46	10	767	380	27	308	14
Future Volume (veh/h)	51	45	23	206	23	46	10	767	380	27	308	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	53	46	24	212	24	34	10	791	0	28	318	14
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	186	155	71	296	27	38	21	1126		47	1096	48
Arrive On Green	0.22	0.22	0.22	0.22	0.22	0.22	0.01	0.60	0.00	0.03	0.62	0.62
Sat Flow, veh/h	633	714	327	1088	123	174	1781	1870	1585	1781	1778	78
Grp Volume(v), veh/h	123	0	0	270	0	0	10	791	0	28	0	332
Grp Sat Flow(s),veh/h/ln	1673	0	0	1386	0	0	1781	1870	1585	1781	0	1856
Q Serve(g_s), s	0.0	0.0	0.0	13.9	0.0	0.0	0.6	31.4	0.0	1.7	0.0	9.0
Cycle Q Clear(g_c), s	6.4	0.0	0.0	20.4	0.0	0.0	0.6	31.4	0.0	1.7	0.0	9.0
Prop In Lane	0.43		0.20	0.79		0.13	1.00		1.00	1.00		0.04
Lane Grp Cap(c), veh/h	412	0	0	361	0	0	21	1126		47	0	1144
V/C Ratio(X)	0.30	0.00	0.00	0.75	0.00	0.00	0.47	0.70		0.60	0.00	0.29
Avail Cap(c_a), veh/h	557	0	0	476	0	0	83	1126		119	0	1144
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	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	35.4	0.0	0.0	40.9	0.0	0.0	52.7	14.8	0.0	51.7	0.0	9.6
Incr Delay (d2), s/veh	0.4	0.0	0.0	4.6	0.0	0.0	5.8	3.7	0.0	4.4	0.0	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	0.0	7.1	0.0	0.0	0.3	12.2	0.0	0.8	0.0	3.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.8	0.0	0.0	45.5	0.0	0.0	58.5	18.4	0.0	56.2	0.0	10.3
LnGrp LOS	D	A	A	D	A	A	E	B		E	A	B
Approach Vol, veh/h		123			270			801	A		360	
Approach Delay, s/veh		35.8			45.5			18.9			13.9	
Approach LOS		D			D			B			B	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	7.4	70.9		29.2	5.9	72.4		29.2				
Change Period (Y+Rc), s	4.6	6.2		* 5.8	4.6	6.2		5.8				
Max Green Setting (Gmax), s	7.2	64.0		* 33	5.0	66.2		32.2				
Max Q Clear Time (g_c+I1), s	3.7	33.4		8.4	2.6	11.0		22.4				
Green Ext Time (p_c), s	0.0	5.6		0.7	0.0	1.8		1.0				

Intersection Summary

HCM 6th Ctrl Delay	23.7
HCM 6th LOS	C

Notes

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

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

Timings
4: Lake St. & Alberhill Ranch Rd.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	99	66	1098	55	21	513
Future Volume (vph)	99	66	1098	55	21	513
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.7	14.7	16.2	16.2	9.6	16.2
Total Split (s)	15.3	15.3	94.6	94.6	10.1	104.7
Total Split (%)	12.8%	12.8%	78.8%	78.8%	8.4%	87.3%
Yellow Time (s)	3.7	3.7	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	4.7	6.2	6.2	4.6	6.2
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Max	Max	None	Max
Act Effect Green (s)	10.4	10.4	92.5	92.5	5.3	98.5
Actuated g/C Ratio	0.09	0.09	0.77	0.77	0.04	0.82
v/c Ratio	0.68	0.51	0.80	0.05	0.28	0.35
Control Delay	75.6	65.8	15.1	1.5	64.7	3.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.6	65.8	15.1	1.5	64.7	3.4
LOS	E	E	B	A	E	A
Approach Delay	71.7		14.5			5.8
Approach LOS	E		B			A

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 119.8

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 17.1

Intersection LOS: B

Intersection Capacity Utilization 75.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: Lake St. & Alberhill Ranch Rd.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 4: Lake St. & Alberhill Ranch Rd. 09/26/2019

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	99	66	1098	55	21	513
Future Volume (veh/h)	99	66	1098	55	21	513
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	104	69	1156	44	22	540
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	149	132	1431	1212	39	1543
Arrive On Green	0.08	0.08	0.76	0.76	0.02	0.83
Sat Flow, veh/h	1781	1585	1870	1585	1781	1870
Grp Volume(v), veh/h	104	69	1156	44	22	540
Grp Sat Flow(s), veh/h/ln	1781	1585	1870	1585	1781	1870
Q Serve(g_s), s	6.8	5.0	45.4	0.8	1.5	8.5
Cycle Q Clear(g_c), s	6.8	5.0	45.4	0.8	1.5	8.5
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	149	132	1431	1212	39	1543
V/C Ratio(X)	0.70	0.52	0.81	0.04	0.57	0.35
Avail Cap(c_a), veh/h	158	141	1431	1212	82	1543
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.2	52.4	8.6	3.4	57.8	2.6
Incr Delay (d2), s/veh	9.7	1.2	5.0	0.1	4.8	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	3.4	2.0	14.1	0.2	0.7	1.8
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	62.9	53.6	13.6	3.4	62.7	3.2
LnGrp LOS	E	D	B	A	E	A
Approach Vol, veh/h	173		1200			562
Approach Delay, s/veh	59.2		13.3			5.5
Approach LOS	E		B			A
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	7.2	97.5			104.7	14.7
Change Period (Y+Rc), s	4.6	6.2			6.2	4.7
Max Green Setting (Gmax), s	5.5	88.4			98.5	10.6
Max Q Clear Time (g_c+I1), s	3.5	47.4			10.5	8.8
Green Ext Time (p_c), s	0.0	12.5			3.4	0.0
Intersection Summary						
HCM 6th Ctrl Delay			15.1			
HCM 6th LOS			B			

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↘	
Traffic Vol, veh/h	0	55	0	1153	577	34
Future Vol, veh/h	0	55	0	1153	577	34
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	60	0	1253	627	37

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 646	- 0	- 0
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -
Critical Hdwy	- 6.22	- -	- -
Critical Hdwy Stg 1	- -	- -	- -
Critical Hdwy Stg 2	- -	- -	- -
Follow-up Hdwy	- 3.318	- -	- -
Pot Cap-1 Maneuver	0 472	0 -	- -
Stage 1	0 -	0 -	- -
Stage 2	0 -	0 -	- -
Platoon blocked, %		- -	- -
Mov Cap-1 Maneuver	- 472	- -	- -
Mov Cap-2 Maneuver	- -	- -	- -
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -

Approach	EB	NB	SB
HCM Control Delay, s	13.7	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 472	- -	- -
HCM Lane V/C Ratio	- 0.127	- -	- -
HCM Control Delay (s)	- 13.7	- -	- -
HCM Lane LOS	- B	- -	- -
HCM 95th %tile Q(veh)	- 0.4	- -	- -

Intersection

Int Delay, s/veh 0.4

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↑↑	
Traffic Vol, veh/h	0	62	0	1153	580	52
Future Vol, veh/h	0	62	0	1153	580	52
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	67	0	1253	630	57

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 344	- 0	- 0
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -
Critical Hdwy	- 6.93	- -	- -
Critical Hdwy Stg 1	- -	- -	- -
Critical Hdwy Stg 2	- -	- -	- -
Follow-up Hdwy	- 3.319	- -	- -
Pot Cap-1 Maneuver	0 653	0 -	- -
Stage 1	0 -	0 -	- -
Stage 2	0 -	0 -	- -
Platoon blocked, %		- -	- -
Mov Cap-1 Maneuver	- 653	- -	- -
Mov Cap-2 Maneuver	- -	- -	- -
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -

Approach	EB	NB	SB
HCM Control Delay, s	11.1	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 653	- -	- -
HCM Lane V/C Ratio	- 0.103	- -	- -
HCM Control Delay (s)	- 11.1	- -	- -
HCM Lane LOS	- B	- -	- -
HCM 95th %tile Q(veh)	- 0.3	- -	- -

Timings
7: Lake St. & Mountain St.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	324	24	51	37	241	781	46	8	562
Future Volume (vph)	324	24	51	37	241	781	46	8	562
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	34.7	34.7	21.7	21.7	9.6	26.8	26.8	9.6	23.2
Total Split (s)	37.0	37.0	37.0	37.0	33.0	71.6	71.6	11.4	50.0
Total Split (%)	30.8%	30.8%	30.8%	30.8%	27.5%	59.7%	59.7%	9.5%	41.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.6	4.8	4.8	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	4.7	4.7	4.7	4.6	5.8	5.8	4.6	6.2
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)	31.8	31.8	31.8	31.8	20.1	67.9	67.9	5.4	44.8
Actuated g/C Ratio	0.28	0.28	0.28	0.28	0.18	0.61	0.61	0.05	0.40
v/c Ratio	0.92	0.22	0.15	0.17	0.79	0.72	0.05	0.10	0.47
Control Delay	70.8	11.3	33.0	16.7	62.0	21.1	2.5	55.8	26.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.8	11.3	33.0	16.7	62.0	21.1	2.5	55.8	26.7
LOS	E	B	C	B	E	C	A	E	C
Approach Delay		55.6		22.7		29.5			27.1
Approach LOS		E		C		C			C

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 112.2

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 33.4

Intersection LOS: C

Intersection Capacity Utilization 82.6%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 7: Lake St. & Mountain St.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)

7: Lake St. & Mountain St.

09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	324	24	87	51	37	49	241	781	46	8	562	72
Future Volume (veh/h)	324	24	87	51	37	49	241	781	46	8	562	72
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	0.99		1.00	1.00		0.99	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	338	25	55	53	39	39	251	814	36	8	585	65
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	389	145	319	382	242	242	281	1073	902	17	1373	152
Arrive On Green	0.28	0.28	0.28	0.28	0.28	0.28	0.16	0.57	0.57	0.01	0.43	0.43
Sat Flow, veh/h	1321	515	1133	1304	858	858	1781	1870	1573	1781	3225	358
Grp Volume(v), veh/h	338	0	80	53	0	78	251	814	36	8	322	328
Grp Sat Flow(s),veh/h/ln	1321	0	1648	1304	0	1716	1781	1870	1573	1781	1777	1806
Q Serve(g_s), s	28.4	0.0	4.2	3.7	0.0	3.9	15.8	37.7	1.1	0.5	14.6	14.6
Cycle Q Clear(g_c), s	32.3	0.0	4.2	7.9	0.0	3.9	15.8	37.7	1.1	0.5	14.6	14.6
Prop In Lane	1.00		0.69	1.00		0.50	1.00		1.00	1.00		0.20
Lane Grp Cap(c), veh/h	389	0	464	382	0	483	281	1073	902	17	756	769
V/C Ratio(X)	0.87	0.00	0.17	0.14	0.00	0.16	0.89	0.76	0.04	0.46	0.43	0.43
Avail Cap(c_a), veh/h	389	0	464	382	0	483	441	1073	902	106	756	769
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	43.6	0.0	31.1	34.1	0.0	31.0	47.4	18.5	10.7	56.5	23.1	23.1
Incr Delay (d2), s/veh	18.4	0.0	0.2	0.2	0.0	0.2	9.3	5.0	0.1	6.8	1.8	1.7
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	11.6	0.0	1.7	1.2	0.0	1.7	7.5	16.0	0.4	0.3	6.1	6.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	62.0	0.0	31.3	34.3	0.0	31.2	56.7	23.5	10.8	63.3	24.9	24.9
LnGrp LOS	E	A	C	C	A	C	E	C	B	E	C	C
Approach Vol, veh/h	418		131				1101				658	
Approach Delay, s/veh	56.1		32.4				30.7				25.3	
Approach LOS	E		C				C				C	
Timer - Assigned Phs	1	2	4		5	6	8					
Phs Duration (G+Y+Rc), s	5.7	72.0	37.0		22.7	55.0	37.0					
Change Period (Y+Rc), s	4.6	* 6.2	* 4.7		4.6	6.2	* 4.7					
Max Green Setting (Gmax), s	6.8	* 66	* 32		28.4	43.8	* 32					
Max Q Clear Time (g_c+I1), s	2.5	39.7	34.3		17.8	16.6	9.9					
Green Ext Time (p_c), s	0.0	6.0	0.0		0.2	3.6	0.5					
Intersection Summary												
HCM 6th Ctrl Delay			33.9									
HCM 6th LOS			C									
Notes												

Timings
8: Lake St. & Lakeshore Dr.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	65	122	198	119	340	98	766	221	226	454	150
Future Volume (vph)	65	122	198	119	340	98	766	221	226	454	150
Turn Type	Perm	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	8	8	1	5	2		1	6	
Permitted Phases	4				8			2			6
Detector Phase	4	4	8	8	1	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	35.6	35.6	15.8	15.8	9.6	9.6	33.8	33.8	9.6	22.8	22.8
Total Split (s)	36.0	36.0	28.0	28.0	15.0	20.2	41.0	41.0	15.0	35.8	35.8
Total Split (%)	30.0%	30.0%	23.3%	23.3%	12.5%	16.8%	34.2%	34.2%	12.5%	29.8%	29.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)		23.2	19.2	19.2	30.9	11.6	35.5	35.5	10.5	34.4	34.4
Actuated g/C Ratio		0.21	0.18	0.18	0.28	0.11	0.32	0.32	0.10	0.31	0.31
v/c Ratio		0.84	0.81	0.46	0.43	0.66	0.84	0.46	0.87	0.52	0.39
Control Delay		44.1	64.8	46.7	4.2	65.3	44.0	7.8	76.3	35.4	12.2
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		44.1	64.8	46.7	4.2	65.3	44.0	7.8	76.3	35.4	12.2
LOS		D	E	D	A	E	D	A	E	D	B
Approach Delay		44.1		30.2			38.5			42.4	
Approach LOS		D		C			D			D	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 109.4

Natural Cycle: 105

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 38.3

Intersection LOS: D

Intersection Capacity Utilization 79.4%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 8: Lake St. & Lakeshore Dr.

 Ø1	 Ø2	 Ø4	 Ø8
15 s	41 s	36 s	28 s
 Ø5	 Ø6		
20.2 s	35.8 s		

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 8: Lake St. & Lakeshore Dr. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	65	122	123	198	119	340	98	766	221	226	454	150
Future Volume (veh/h)	65	122	123	198	119	340	98	766	221	226	454	150
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.81	1.00		0.72	1.00		0.88	1.00		0.89
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	82	154	109	251	151	310	124	970	137	286	575	112
Peak Hour Factor	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79	0.79
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	156	292	206	305	320	618	153	1181	463	339	1225	485
Arrive On Green	0.20	0.20	0.20	0.17	0.17	0.17	0.09	0.33	0.33	0.10	0.34	0.34
Sat Flow, veh/h	771	1444	1016	1781	1870	2015	1781	3554	1393	3456	3554	1406
Grp Volume(v), veh/h	195	0	150	251	151	310	124	970	137	286	575	112
Grp Sat Flow(s),veh/h/ln	1832	0	1400	1781	1870	1007	1781	1777	1393	1728	1777	1406
Q Serve(g_s), s	10.1	0.0	10.2	14.4	7.7	14.1	7.2	26.6	7.7	8.6	13.4	6.0
Cycle Q Clear(g_c), s	10.1	0.0	10.2	14.4	7.7	14.1	7.2	26.6	7.7	8.6	13.4	6.0
Prop In Lane	0.42		0.73	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	371	0	283	305	320	618	153	1181	463	339	1225	485
V/C Ratio(X)	0.53	0.00	0.53	0.82	0.47	0.50	0.81	0.82	0.30	0.84	0.47	0.23
Avail Cap(c_a), veh/h	543	0	415	373	392	696	262	1181	463	339	1225	485
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	37.7	0.0	37.8	42.4	39.6	33.4	47.6	32.5	26.2	47.0	27.1	24.7
Incr Delay (d2), s/veh	1.2	0.0	1.5	11.7	1.1	0.6	3.9	6.5	1.6	16.5	1.3	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	4.7	0.0	3.6	7.1	3.5	3.3	3.3	11.8	2.7	4.4	5.6	2.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	38.9	0.0	39.3	54.1	40.7	34.1	51.5	39.0	27.8	63.4	28.4	25.8
LnGrp LOS	D	A	D	D	D	C	D	D	C	E	C	C
Approach Vol, veh/h		345			712			1231			973	
Approach Delay, s/veh		39.1			42.5			39.0			38.4	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	15.0	41.0		26.0	13.7	42.3		23.9				
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8				
Max Green Setting (Gmax), s	10.4	35.2		31.4	15.6	30.0		22.2				
Max Q Clear Time (g_c+I1), s	10.6	28.6		12.2	9.2	15.4		16.4				
Green Ext Time (p_c), s	0.0	3.5		2.2	0.1	3.4		1.7				
Intersection Summary												
HCM 6th Ctrl Delay			39.6									
HCM 6th LOS			D									

Timings
9: Lincoln St. & Grand Av./Lake St.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	92	510	46	187	393	23	40	134	50	128
Future Volume (vph)	92	510	46	187	393	23	40	134	50	128
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases			4			8				
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	9.6	32.8	32.8	9.6	31.8	31.8	9.6	34.4	9.6	34.4
Total Split (s)	21.0	37.0	37.0	31.0	47.0	47.0	14.0	38.0	14.0	38.0
Total Split (%)	17.5%	30.8%	30.8%	25.8%	39.2%	39.2%	11.7%	31.7%	11.7%	31.7%
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	4.8	3.6	4.4	3.6	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	5.8	4.6	5.4	4.6	5.4
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None
Act Effect Green (s)	10.8	35.8	35.8	17.1	42.2	42.2	7.1	14.4	7.6	14.9
Actuated g/C Ratio	0.12	0.38	0.38	0.18	0.45	0.45	0.08	0.15	0.08	0.16
v/c Ratio	0.60	0.50	0.09	0.77	0.33	0.04	0.39	0.66	0.47	0.48
Control Delay	54.4	27.1	0.3	53.6	19.9	0.1	54.0	17.9	56.1	22.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	54.4	27.1	0.3	53.6	19.9	0.1	54.0	17.9	56.1	22.7
LOS	D	C	A	D	B	A	D	B	E	C
Approach Delay		29.1			29.6			21.4		28.7
Approach LOS		C			C			C		C

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 93.4

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.77

Intersection Signal Delay: 27.5

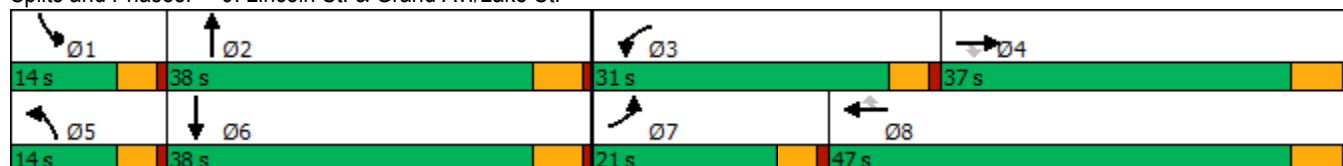
Intersection LOS: C

Intersection Capacity Utilization 70.8%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 9: Lincoln St. & Grand Av./Lake St.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 9: Lincoln St. & Grand Av./Lake St. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	92	510	46	187	393	23	40	134	240	50	128	99
Future Volume (veh/h)	92	510	46	187	393	23	40	134	240	50	128	99
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.98	1.00		0.98	1.00		0.98	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	123	680	42	249	524	27	53	179	248	67	171	100
Peak Hour Factor	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	154	1280	561	285	1542	678	71	384	336	86	495	275
Arrive On Green	0.09	0.36	0.36	0.16	0.43	0.43	0.04	0.22	0.22	0.05	0.23	0.23
Sat Flow, veh/h	1781	3554	1559	1781	3554	1561	1781	1777	1554	1781	2200	1221
Grp Volume(v), veh/h	123	680	42	249	524	27	53	179	248	67	136	135
Grp Sat Flow(s),veh/h/ln	1781	1777	1559	1781	1777	1561	1781	1777	1554	1781	1777	1645
Q Serve(g_s), s	6.4	14.4	1.7	13.0	9.3	0.9	2.8	8.3	14.1	3.5	6.1	6.6
Cycle Q Clear(g_c), s	6.4	14.4	1.7	13.0	9.3	0.9	2.8	8.3	14.1	3.5	6.1	6.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.74
Lane Grp Cap(c), veh/h	154	1280	561	285	1542	678	71	384	336	86	400	370
V/C Ratio(X)	0.80	0.53	0.07	0.87	0.34	0.04	0.75	0.47	0.74	0.78	0.34	0.36
Avail Cap(c_a), veh/h	308	1280	561	495	1542	678	176	610	534	176	610	565
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.6	24.0	20.0	38.9	17.8	15.5	45.1	32.4	34.7	44.7	30.9	31.0
Incr Delay (d2), s/veh	3.6	1.6	0.3	3.5	0.6	0.1	5.8	0.9	3.2	5.5	0.5	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	5.9	0.6	5.7	3.6	0.3	1.3	3.5	5.4	1.6	2.6	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	46.2	25.6	20.2	42.4	18.4	15.6	51.0	33.3	37.8	50.2	31.4	31.6
LnGrp LOS	D	C	C	D	B	B	D	C	D	D	C	C
Approach Vol, veh/h	845			800			480			338		
Approach Delay, s/veh	28.3			25.8			37.6			35.2		
Approach LOS	C			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	9.2	25.9	19.8	40.0	8.4	26.8	12.8	47.0				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.8	4.6	5.4	4.6	5.8				
Max Green Setting (Gmax), s	9.4	32.6	26.4	31.2	9.4	32.6	16.4	41.2				
Max Q Clear Time (g_c+I1), s	5.5	16.1	15.0	16.4	4.8	8.6	8.4	11.3				
Green Ext Time (p_c), s	0.0	2.2	0.3	3.8	0.0	1.4	0.1	3.4				
Intersection Summary												
HCM 6th Ctrl Delay				30.3								
HCM 6th LOS				C								

Intersection						
Int Delay, s/veh	0.4					
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	12	615	650	13	7	14
Future Vol, veh/h	12	615	650	13	7	14
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	100
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	72	72	72	72	72	72
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	17	854	903	18	10	19

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	921	0	0 1373 912
Stage 1	-	-	- 912 -
Stage 2	-	-	- 461 -
Critical Hdwy	4.13	-	- 6.63 6.23
Critical Hdwy Stg 1	-	-	- 5.43 -
Critical Hdwy Stg 2	-	-	- 5.83 -
Follow-up Hdwy	2.219	-	- 3.519 3.319
Pot Cap-1 Maneuver	739	-	- 148 331
Stage 1	-	-	- 391 -
Stage 2	-	-	- 602 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	739	-	- 145 331
Mov Cap-2 Maneuver	-	-	- 275 -
Stage 1	-	-	- 382 -
Stage 2	-	-	- 602 -

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	17.3
HCM LOS			C

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	739	-	-	-	275	331
HCM Lane V/C Ratio	0.023	-	-	-	0.035	0.059
HCM Control Delay (s)	10	-	-	-	18.6	16.6
HCM Lane LOS	A	-	-	-	C	C
HCM 95th %tile Q(veh)	0.1	-	-	-	0.1	0.2

Timings
11: Terra Cota Rd. (S) & Lakeshore Dr.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑	↑	↘	↑	↘
Traffic Volume (vph)	593	29	12	610	56
Future Volume (vph)	593	29	12	610	56
Turn Type	NA	Perm	Prot	NA	Prot
Protected Phases	4		3	8	2
Permitted Phases		4			
Detector Phase	4	4	3	8	2
Switch Phase					
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	22.6	22.6	9.6	15.8	14.6
Total Split (s)	83.0	83.0	12.0	95.0	25.0
Total Split (%)	69.2%	69.2%	10.0%	79.2%	20.8%
Yellow Time (s)	3.6	3.6	3.6	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	5.8	4.6
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	Max	Max	None	Max	None
Act Effect Green (s)	86.1	86.1	5.8	89.3	14.9
Actuated g/C Ratio	0.75	0.75	0.05	0.78	0.13
v/c Ratio	0.59	0.04	0.19	0.58	0.65
Control Delay	10.3	2.2	58.1	7.6	61.2
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	10.3	2.2	58.1	7.6	61.2
LOS	B	A	E	A	E
Approach Delay	9.9			8.6	61.2
Approach LOS	A			A	E

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 114.6

Natural Cycle: 60

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 13.2

Intersection LOS: B

Intersection Capacity Utilization 49.1%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 11: Terra Cota Rd. (S) & Lakeshore Dr.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 11: Terra Cota Rd. (S) & Lakeshore Dr. 09/26/2019

						
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations						
Traffic Volume (veh/h)	593	29	12	610	56	47
Future Volume (veh/h)	593	29	12	610	56	47
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		0.97	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	824	37	17	847	78	65
Peak Hour Factor	0.72	0.72	0.72	0.72	0.72	0.72
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	1391	1146	33	1503	94	78
Arrive On Green	0.74	0.74	0.02	0.80	0.10	0.10
Sat Flow, veh/h	1870	1541	1781	1870	914	762
Grp Volume(v), veh/h	824	37	17	847	144	0
Grp Sat Flow(s),veh/h/ln	1870	1541	1781	1870	1688	0
Q Serve(g_s), s	22.4	0.7	1.0	18.0	9.3	0.0
Cycle Q Clear(g_c), s	22.4	0.7	1.0	18.0	9.3	0.0
Prop In Lane		1.00	1.00		0.54	0.45
Lane Grp Cap(c), veh/h	1391	1146	33	1503	173	0
V/C Ratio(X)	0.59	0.03	0.52	0.56	0.83	0.00
Avail Cap(c_a), veh/h	1391	1146	119	1503	310	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	6.5	3.7	54.0	3.9	48.9	0.0
Incr Delay (d2), s/veh	1.9	0.1	4.7	1.5	9.8	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	7.1	0.2	0.5	4.5	4.4	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	8.4	3.8	58.7	5.4	58.6	0.0
LnGrp LOS	A	A	E	A	E	A
Approach Vol, veh/h	861			864	144	
Approach Delay, s/veh	8.2			6.5	58.6	
Approach LOS	A			A	E	
Timer - Assigned Phs	2		3	4	8	
Phs Duration (G+Y+Rc), s	16.0		6.6	88.4	95.0	
Change Period (Y+Rc), s	4.6		4.6	* 5.8	5.8	
Max Green Setting (Gmax), s	20.4		7.4	* 78	89.2	
Max Q Clear Time (g_c+I1), s	11.3		3.0	24.4	20.0	
Green Ext Time (p_c), s	0.2		0.0	6.8	7.0	
Intersection Summary						
HCM 6th Ctrl Delay			11.3			
HCM 6th LOS			B			
Notes						
User approved volume balancing among the lanes for turning movement.						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						

Intersection												
Int Delay, s/veh	9.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕			↕			↕	
Traffic Vol, veh/h	24	102	0	5	175	125	0	0	3	255	0	8
Future Vol, veh/h	24	102	0	5	175	125	0	0	3	255	0	8
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	84	84	84	84	84	84	84	84	84	84	84	84
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	29	121	0	6	208	149	0	0	4	304	0	10
Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	357	0	-	121	0	0	479	548	121	476	474	283
Stage 1	-	-	-	-	-	-	179	179	-	295	295	-
Stage 2	-	-	-	-	-	-	300	369	-	181	179	-
Critical Hdwy	4.12	-	-	4.12	-	-	7.12	6.52	6.22	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.12	5.52	-
Follow-up Hdwy	2.218	-	-	2.218	-	-	3.518	4.018	3.318	3.518	4.018	3.318
Pot Cap-1 Maneuver	1202	-	0	1467	-	-	497	444	930	499	489	756
Stage 1	-	-	0	-	-	-	823	751	-	713	669	-
Stage 2	-	-	0	-	-	-	709	621	-	821	751	-
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	1202	-	-	1467	-	-	479	430	930	486	474	756
Mov Cap-2 Maneuver	-	-	-	-	-	-	479	430	-	486	474	-
Stage 1	-	-	-	-	-	-	802	731	-	694	666	-
Stage 2	-	-	-	-	-	-	697	618	-	797	731	-
Approach	EB			WB			NB			SB		
HCM Control Delay, s	1.5			0.1			8.9			24.4		
HCM LOS							A			C		
Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBL	WBT	WBR	SBLn1					
Capacity (veh/h)	930	1202	-	1467	-	-	491					
HCM Lane V/C Ratio	0.004	0.024	-	0.004	-	-	0.638					
HCM Control Delay (s)	8.9	8.1	0	7.5	-	-	24.4					
HCM Lane LOS	A	A	A	A	-	-	C					
HCM 95th %tile Q(veh)	0	0.1	-	0	-	-	4.4					

Intersection

Int Delay, s/veh 0.2

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑			↑
Traffic Vol, veh/h	0	360	289	171	0	16
Future Vol, veh/h	0	360	289	171	0	16
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	-	0
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	391	314	186	0	17

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	-	0	- 0 - 407
Stage 1	-	-	- - -
Stage 2	-	-	- - -
Critical Hdwy	-	-	- - 6.22
Critical Hdwy Stg 1	-	-	- - -
Critical Hdwy Stg 2	-	-	- - -
Follow-up Hdwy	-	-	- - 3.318
Pot Cap-1 Maneuver	0	-	- - 0 644
Stage 1	0	-	- - 0 -
Stage 2	0	-	- - 0 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	-	-	- - 644
Mov Cap-2 Maneuver	-	-	- - -
Stage 1	-	-	- - -
Stage 2	-	-	- - -

Approach	EB	WB	SB
HCM Control Delay, s	0	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	-	-	-	644
HCM Lane V/C Ratio	-	-	-	0.027
HCM Control Delay (s)	-	-	-	10.7
HCM Lane LOS	-	-	-	B
HCM 95th %tile Q(veh)	-	-	-	0.1

Timings
3: Lake St. & Nichols Rd.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	31	31	272	47	25	421	194	44	814
Future Volume (vph)	31	31	272	47	25	421	194	44	814
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.6	14.6	15.8	15.8	9.6	16.2	16.2	9.6	16.2
Total Split (s)	38.0	38.0	38.0	38.0	9.6	70.2	70.2	11.8	72.4
Total Split (%)	31.7%	31.7%	31.7%	31.7%	8.0%	58.5%	58.5%	9.8%	60.3%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6		5.8	4.6	6.2	6.2	4.6	6.2
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)		33.4		32.2	5.0	64.5	64.5	6.6	68.0
Actuated g/C Ratio		0.28		0.27	0.04	0.55	0.55	0.06	0.58
v/c Ratio		0.19		1.02	0.36	0.45	0.22	0.49	0.88
Control Delay		30.4		95.4	69.6	18.4	3.8	71.6	33.5
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		30.4		95.4	69.6	18.4	3.8	71.6	33.5
LOS		C		F	E	B	A	E	C
Approach Delay		30.4		95.4		16.0			35.4
Approach LOS		C		F		B			D

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 117.9

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 1.02

Intersection Signal Delay: 39.3

Intersection LOS: D

Intersection Capacity Utilization 81.2%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 3: Lake St. & Nichols Rd.

		
Ø1	Ø2	Ø4
11.8 s	70.2 s	38 s
		
Ø5	Ø6	Ø8
9.6 s	72.4 s	38 s

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)

3: Lake St. & Nichols Rd.

09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	31	31	16	272	47	23	25	421	194	44	814	46
Future Volume (veh/h)	31	31	16	272	47	23	25	421	194	44	814	46
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	34	34	16	296	51	17	27	458	0	48	885	50
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	208	201	86	369	54	18	45	1044		62	996	56
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.03	0.56	0.00	0.03	0.57	0.57
Sat Flow, veh/h	622	762	326	1185	204	68	1781	1870	1585	1781	1753	99
Grp Volume(v), veh/h	84	0	0	364	0	0	27	458	0	48	0	935
Grp Sat Flow(s),veh/h/ln	1709	0	0	1457	0	0	1781	1870	1585	1781	0	1853
Q Serve(g_s), s	0.0	0.0	0.0	24.2	0.0	0.0	1.7	16.7	0.0	3.1	0.0	51.3
Cycle Q Clear(g_c), s	4.2	0.0	0.0	28.5	0.0	0.0	1.7	16.7	0.0	3.1	0.0	51.3
Prop In Lane	0.40		0.19	0.81		0.05	1.00		1.00	1.00		0.05
Lane Grp Cap(c), veh/h	495	0	0	441	0	0	45	1044		62	0	1052
V/C Ratio(X)	0.17	0.00	0.00	0.82	0.00	0.00	0.61	0.44		0.78	0.00	0.89
Avail Cap(c_a), veh/h	530	0	0	458	0	0	76	1044		110	0	1052
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	0.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	33.1	0.0	0.0	41.7	0.0	0.0	56.2	15.0	0.0	55.8	0.0	22.0
Incr Delay (d2), s/veh	0.2	0.0	0.0	11.4	0.0	0.0	4.9	1.3	0.0	7.6	0.0	11.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.9	0.0	0.0	11.2	0.0	0.0	0.8	6.7	0.0	1.5	0.0	22.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.2	0.0	0.0	53.0	0.0	0.0	61.1	16.4	0.0	63.4	0.0	33.1
LnGrp LOS	C	A	A	D	A	A	E	B		E	A	C
Approach Vol, veh/h		84			364			485	A		983	
Approach Delay, s/veh		33.2			53.0			18.9			34.6	
Approach LOS		C			D			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.6	71.3		36.6	7.5	72.4		36.6				
Change Period (Y+Rc), s	4.6	6.2		* 5.8	4.6	6.2		5.8				
Max Green Setting (Gmax), s	7.2	64.0		* 33	5.0	66.2		32.2				
Max Q Clear Time (g_c+I1), s	5.1	18.7		6.2	3.7	53.3		30.5				
Green Ext Time (p_c), s	0.0	2.7		0.4	0.0	5.2		0.4				

Intersection Summary

HCM 6th Ctrl Delay	34.1
HCM 6th LOS	C

Notes

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

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

Timings
4: Lake St. & Alberhill Ranch Rd.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

						
Lane Group	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	50	22	632	59	42	1069
Future Volume (vph)	50	22	632	59	42	1069
Turn Type	Prot	Perm	NA	Perm	Prot	NA
Protected Phases	8		2		1	6
Permitted Phases		8		2		
Detector Phase	8	8	2	2	1	6
Switch Phase						
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0
Minimum Split (s)	14.7	14.7	16.2	16.2	9.6	16.2
Total Split (s)	15.3	15.3	94.6	94.6	10.1	104.7
Total Split (%)	12.8%	12.8%	78.8%	78.8%	8.4%	87.3%
Yellow Time (s)	3.7	3.7	5.2	5.2	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	4.7	6.2	6.2	4.6	6.2
Lead/Lag			Lag	Lag	Lead	
Lead-Lag Optimize?			Yes	Yes	Yes	
Recall Mode	None	None	Max	Max	None	Max
Act Effect Green (s)	10.1	10.1	94.7	94.7	5.4	102.8
Actuated g/C Ratio	0.08	0.08	0.79	0.79	0.05	0.86
v/c Ratio	0.37	0.18	0.47	0.05	0.58	0.73
Control Delay	59.2	54.3	7.0	1.1	83.9	8.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	59.2	54.3	7.0	1.1	83.9	8.0
LOS	E	D	A	A	F	A
Approach Delay	57.7		6.5			10.9
Approach LOS	E		A			B

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 119.6

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.73

Intersection Signal Delay: 11.0

Intersection LOS: B

Intersection Capacity Utilization 73.7%

ICU Level of Service D

Analysis Period (min) 15

Splits and Phases: 4: Lake St. & Alberhill Ranch Rd.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 4: Lake St. & Alberhill Ranch Rd. 09/26/2019

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	50	22	632	59	42	1069
Future Volume (veh/h)	50	22	632	59	42	1069
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00	1.00		1.00	1.00	
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No		No			No
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	55	24	695	62	46	1175
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	2	2	2	2	2	2
Cap, veh/h	139	124	1418	1202	59	1553
Arrive On Green	0.08	0.08	0.76	0.76	0.03	0.83
Sat Flow, veh/h	1781	1585	1870	1585	1781	1870
Grp Volume(v), veh/h	55	24	695	62	46	1175
Grp Sat Flow(s), veh/h/ln	1781	1585	1870	1585	1781	1870
Q Serve(g_s), s	3.5	1.7	17.0	1.2	3.0	34.1
Cycle Q Clear(g_c), s	3.5	1.7	17.0	1.2	3.0	34.1
Prop In Lane	1.00	1.00		1.00	1.00	
Lane Grp Cap(c), veh/h	139	124	1418	1202	59	1553
V/C Ratio(X)	0.40	0.19	0.49	0.05	0.78	0.76
Avail Cap(c_a), veh/h	159	142	1418	1202	83	1553
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.0	51.2	5.5	3.6	56.9	4.6
Incr Delay (d2), s/veh	0.7	0.3	1.2	0.1	17.0	3.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.7	5.1	0.3	1.6	7.3
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	52.7	51.5	6.7	3.7	73.9	8.1
LnGrp LOS	D	D	A	A	E	A
Approach Vol, veh/h	79		757			1221
Approach Delay, s/veh	52.3		6.5			10.6
Approach LOS	D		A			B
Timer - Assigned Phs	1	2			6	8
Phs Duration (G+Y+Rc), s	8.5	96.2			104.7	14.0
Change Period (Y+Rc), s	4.6	6.2			6.2	4.7
Max Green Setting (Gmax), s	5.5	88.4			98.5	10.6
Max Q Clear Time (g_c+I1), s	5.0	19.0			36.1	5.5
Green Ext Time (p_c), s	0.0	5.0			13.8	0.0
Intersection Summary						
HCM 6th Ctrl Delay			10.7			
HCM 6th LOS			B			

Intersection						
Int Delay, s/veh	1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↘	
Traffic Vol, veh/h	0	66	0	691	1075	43
Future Vol, veh/h	0	66	0	691	1075	43
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	72	0	751	1168	47
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	1192	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	228	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	228	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	27.9	0	0			
HCM LOS	D					
Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	-	228	-	-		
HCM Lane V/C Ratio	-	0.315	-	-		
HCM Control Delay (s)	-	27.9	-	-		
HCM Lane LOS	-	D	-	-		
HCM 95th %tile Q(veh)	-	1.3	-	-		

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↑↑	
Traffic Vol, veh/h	0	79	0	691	1077	64
Future Vol, veh/h	0	79	0	691	1077	64
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	92	92	92	92	92	92
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	86	0	751	1171	70
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	621	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.93	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.319	-	-	-	-
Pot Cap-1 Maneuver	0	431	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	431	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	15.4	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBT EBLn1		SBT	SBR		
Capacity (veh/h)	- 431		-	-		
HCM Lane V/C Ratio	- 0.199		-	-		
HCM Control Delay (s)	- 15.4		-	-		
HCM Lane LOS	- C		-	-		
HCM 95th %tile Q(veh)	- 0.7		-	-		

Timings
7: Lake St. & Mountain St.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

									
Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	NBR	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	305	12	25	13	342	373	17	35	1016
Future Volume (vph)	305	12	25	13	342	373	17	35	1016
Turn Type	Perm	NA	Perm	NA	Prot	NA	Perm	Prot	NA
Protected Phases		4		8	5	2		1	6
Permitted Phases	4		8				2		
Detector Phase	4	4	8	8	5	2	2	1	6
Switch Phase									
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0
Minimum Split (s)	34.7	34.7	21.7	21.7	9.6	26.8	26.8	9.6	23.2
Total Split (s)	37.0	37.0	37.0	37.0	33.0	71.6	71.6	11.4	50.0
Total Split (%)	30.8%	30.8%	30.8%	30.8%	27.5%	59.7%	59.7%	9.5%	41.7%
Yellow Time (s)	3.7	3.7	3.7	3.7	3.6	4.8	4.8	3.6	5.2
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.7	4.7	4.7	4.7	4.6	5.8	5.8	4.6	6.2
Lead/Lag					Lead	Lag	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	Max	Max	None	Max
Act Effect Green (s)	30.4	30.4	30.4	30.4	26.6	68.9	68.9	6.2	44.0
Actuated g/C Ratio	0.26	0.26	0.26	0.26	0.23	0.59	0.59	0.05	0.38
v/c Ratio	0.92	0.13	0.08	0.06	0.92	0.37	0.02	0.40	0.92
Control Delay	74.9	13.5	33.6	20.6	73.9	14.9	0.1	67.6	47.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	74.9	13.5	33.6	20.6	73.9	14.9	0.1	67.6	47.4
LOS	E	B	C	C	E	B	A	E	D
Approach Delay		65.5		26.9		42.2			48.0
Approach LOS		E		C		D			D

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 116.5

Natural Cycle: 100

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.92

Intersection Signal Delay: 48.5

Intersection LOS: D

Intersection Capacity Utilization 86.9%

ICU Level of Service E

Analysis Period (min) 15

Splits and Phases: 7: Lake St. & Mountain St.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)

7: Lake St. & Mountain St.

09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	305	12	43	25	13	14	342	373	17	35	1016	106
Future Volume (veh/h)	305	12	43	25	13	14	342	373	17	35	1016	106
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	332	13	25	27	14	6	372	405	15	38	1104	108
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	416	150	289	398	326	140	399	1072	907	54	1241	121
Arrive On Green	0.26	0.26	0.26	0.26	0.26	0.26	0.22	0.57	0.57	0.03	0.38	0.38
Sat Flow, veh/h	1392	572	1100	1370	1242	532	1781	1870	1584	1781	3270	320
Grp Volume(v), veh/h	332	0	38	27	0	20	372	405	15	38	599	613
Grp Sat Flow(s), veh/h/ln	1392	0	1672	1370	0	1775	1781	1870	1584	1781	1777	1813
Q Serve(g_s), s	27.0	0.0	2.0	1.8	0.0	1.0	23.6	13.6	0.5	2.4	36.4	36.5
Cycle Q Clear(g_c), s	27.9	0.0	2.0	3.7	0.0	1.0	23.6	13.6	0.5	2.4	36.4	36.5
Prop In Lane	1.00		0.66	1.00		0.30	1.00		1.00	1.00		0.18
Lane Grp Cap(c), veh/h	416	0	439	398	0	465	399	1072	907	54	675	688
V/C Ratio(X)	0.80	0.00	0.09	0.07	0.00	0.04	0.93	0.38	0.02	0.70	0.89	0.89
Avail Cap(c_a), veh/h	440	0	468	422	0	497	438	1072	907	105	675	688
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	42.2	0.0	32.1	33.5	0.0	31.8	43.9	13.4	10.6	55.4	33.5	33.5
Incr Delay (d2), s/veh	9.5	0.0	0.1	0.1	0.0	0.0	24.9	1.0	0.0	5.9	16.1	16.0
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	10.3	0.0	0.8	0.6	0.0	0.4	12.8	5.5	0.2	1.1	17.6	18.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d), s/veh	51.7	0.0	32.2	33.6	0.0	31.8	68.8	14.4	10.7	61.3	49.6	49.5
LnGrp LOS	D	A	C	C	A	C	E	B	B	E	D	D
Approach Vol, veh/h	370			47			792			1250		
Approach Delay, s/veh	49.7			32.8			39.9			49.9		
Approach LOS	D			C			D			D		
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	8.1	72.3		35.0	30.4	50.0		35.0				
Change Period (Y+Rc), s	4.6	* 6.2		* 4.7	4.6	6.2		* 4.7				
Max Green Setting (Gmax), s	6.8	* 66		* 32	28.4	43.8		* 32				
Max Q Clear Time (g_c+I1), s	4.4	15.6		29.9	25.6	38.5		5.7				
Green Ext Time (p_c), s	0.0	2.5		0.3	0.2	3.1		0.1				

Intersection Summary

HCM 6th Ctrl Delay 46.3

HCM 6th LOS D

Notes

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

Timings
8: Lake St. & Lakeshore Dr.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

											
Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations											
Traffic Volume (vph)	19	21	140	11	271	16	473	99	322	700	18
Future Volume (vph)	19	21	140	11	271	16	473	99	322	700	18
Turn Type	Perm	NA	Split	NA	pm+ov	Prot	NA	Perm	Prot	NA	Perm
Protected Phases		4	8	8	1	5	2		1	6	
Permitted Phases	4				8			2			6
Detector Phase	4	4	8	8	1	5	2	2	1	6	6
Switch Phase											
Minimum Initial (s)	10.0	10.0	10.0	10.0	5.0	5.0	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	35.6	35.6	15.8	15.8	9.6	9.6	33.8	33.8	9.6	22.8	22.8
Total Split (s)	36.0	36.0	28.0	28.0	15.0	20.2	41.0	41.0	15.0	35.8	35.8
Total Split (%)	30.0%	30.0%	23.3%	23.3%	12.5%	16.8%	34.2%	34.2%	12.5%	29.8%	29.8%
Yellow Time (s)	3.6	3.6	4.8	4.8	3.6	3.6	4.8	4.8	3.6	4.8	4.8
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.6	5.8	5.8	4.6	4.6	5.8	5.8	4.6	5.8	5.8
Lead/Lag					Lead	Lead	Lag	Lag	Lead	Lag	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Max	Max	None	Max	Max
Act Effect Green (s)		13.5	13.7	13.7	30.3	5.8	36.1	36.1	10.7	47.5	47.5
Actuated g/C Ratio		0.15	0.15	0.15	0.33	0.06	0.39	0.39	0.12	0.52	0.52
v/c Ratio		0.20	0.57	0.04	0.26	0.15	0.36	0.16	0.87	0.41	0.02
Control Delay		26.6	47.5	37.1	3.9	49.3	23.4	5.8	64.3	18.9	0.1
Queue Delay		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		26.6	47.5	37.1	3.9	49.3	23.4	5.8	64.3	18.9	0.1
LOS		C	D	D	A	D	C	A	E	B	A
Approach Delay		26.6		19.3			21.1			32.6	
Approach LOS		C		B			C			C	

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 91.6

Natural Cycle: 95

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.87

Intersection Signal Delay: 26.6

Intersection LOS: C

Intersection Capacity Utilization 60.4%

ICU Level of Service B

Analysis Period (min) 15

Splits and Phases: 8: Lake St. & Lakeshore Dr.

			
Ø1	Ø2	Ø4	Ø8
15 s	41 s	36 s	28 s
			
Ø5	Ø6		
20.2 s	35.8 s		

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 8: Lake St. & Lakeshore Dr. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	21	21	140	11	271	16	473	99	322	700	18
Future Volume (veh/h)	19	21	21	140	11	271	16	473	99	322	700	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	20	23	1	151	12	282	17	509	103	346	753	13
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	120	154	7	222	233	688	35	1511	673	422	1875	836
Arrive On Green	0.08	0.08	0.08	0.12	0.12	0.12	0.02	0.43	0.43	0.12	0.53	0.53
Sat Flow, veh/h	1558	2000	88	1781	1870	2790	1781	3554	1584	3456	3554	1585
Grp Volume(v), veh/h	23	0	21	151	12	282	17	509	103	346	753	13
Grp Sat Flow(s),veh/h/ln	1792	0	1854	1781	1870	1395	1781	1777	1584	1728	1777	1585
Q Serve(g_s), s	1.0	0.0	0.9	6.7	0.5	7.0	0.8	8.0	3.3	8.1	10.5	0.3
Cycle Q Clear(g_c), s	1.0	0.0	0.9	6.7	0.5	7.0	0.8	8.0	3.3	8.1	10.5	0.3
Prop In Lane	0.87		0.05	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	138	0	143	222	233	688	35	1511	673	422	1875	836
V/C Ratio(X)	0.17	0.00	0.15	0.68	0.05	0.41	0.49	0.34	0.15	0.82	0.40	0.02
Avail Cap(c_a), veh/h	680	0	703	478	501	1089	336	1511	673	434	1875	836
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	35.7	0.0	35.7	34.7	31.9	26.1	40.2	16.0	14.6	35.5	11.7	9.3
Incr Delay (d2), s/veh	0.6	0.0	0.5	3.6	0.1	0.4	3.9	0.6	0.5	10.7	0.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	0.0	0.4	3.0	0.2	2.2	0.4	3.0	1.2	3.8	3.7	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	36.3	0.0	36.2	38.3	32.0	26.5	44.1	16.6	15.1	46.2	12.4	9.3
LnGrp LOS	D	A	D	D	C	C	D	B	B	D	B	A
Approach Vol, veh/h		44			445			629			1112	
Approach Delay, s/veh		36.2			30.7			17.1			22.9	
Approach LOS		D			C			B			C	
Timer - Assigned Phs	1	2		4	5	6		8				
Phs Duration (G+Y+Rc), s	14.7	41.0		11.0	6.2	49.5		16.1				
Change Period (Y+Rc), s	4.6	5.8		4.6	4.6	5.8		5.8				
Max Green Setting (Gmax), s	10.4	35.2		31.4	15.6	30.0		22.2				
Max Q Clear Time (g_c+I1), s	10.1	10.0		3.0	2.8	12.5		9.0				
Green Ext Time (p_c), s	0.0	3.5		0.2	0.0	4.5		1.3				
Intersection Summary												
HCM 6th Ctrl Delay			23.0									
HCM 6th LOS			C									

Timings

Lake and Mountain Shopping Center TIA (JN:12768)

9: Lincoln St. & Grand Av./Lake St.

09/26/2019

										
Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations										
Traffic Volume (vph)	25	344	20	173	421	25	32	35	24	26
Future Volume (vph)	25	344	20	173	421	25	32	35	24	26
Turn Type	Prot	NA	Perm	Prot	NA	Perm	Prot	NA	Prot	NA
Protected Phases	7	4		3	8		5	2	1	6
Permitted Phases			4			8				
Detector Phase	7	4	4	3	8	8	5	2	1	6
Switch Phase										
Minimum Initial (s)	5.0	10.0	10.0	5.0	10.0	10.0	5.0	10.0	5.0	10.0
Minimum Split (s)	9.6	32.8	32.8	9.6	31.8	31.8	9.6	34.4	9.6	34.4
Total Split (s)	21.0	37.0	37.0	31.0	47.0	47.0	14.0	38.0	14.0	38.0
Total Split (%)	17.5%	30.8%	30.8%	25.8%	39.2%	39.2%	11.7%	31.7%	11.7%	31.7%
Yellow Time (s)	3.6	4.8	4.8	3.6	4.8	4.8	3.6	4.4	3.6	4.4
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	5.8	5.8	4.6	5.8	5.8	4.6	5.4	4.6	5.4
Lead/Lag	Lead	Lag	Lag	Lead	Lag	Lag	Lead	Lag	Lead	Lag
Lead-Lag Optimize?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Recall Mode	None	Max	Max	None	Max	Max	None	None	None	None
Act Effect Green (s)	6.1	32.8	32.8	12.6	46.2	46.2	6.4	15.5	6.0	13.2
Actuated g/C Ratio	0.08	0.40	0.40	0.15	0.57	0.57	0.08	0.19	0.07	0.16
v/c Ratio	0.20	0.25	0.03	0.65	0.22	0.03	0.24	0.22	0.19	0.07
Control Delay	45.2	20.2	0.1	46.0	12.6	0.0	45.3	10.8	45.2	23.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	45.2	20.2	0.1	46.0	12.6	0.0	45.3	10.8	45.2	23.4
LOS	D	C	A	D	B	A	D	B	D	C
Approach Delay		20.8			21.4			17.0		31.6
Approach LOS		C			C			B		C

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 81.3

Natural Cycle: 90

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.65

Intersection Signal Delay: 21.1

Intersection LOS: C

Intersection Capacity Utilization 64.0%

ICU Level of Service C

Analysis Period (min) 15

Splits and Phases: 9: Lincoln St. & Grand Av./Lake St.

			
Ø1	Ø2	Ø3	Ø4
14 s	38 s	31 s	37 s
			
Ø5	Ø6	Ø7	Ø8
14 s	38 s	21 s	47 s

HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 9: Lincoln St. & Grand Av./Lake St. 09/26/2019

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	25	344	20	173	421	25	32	35	112	24	26	14
Future Volume (veh/h)	25	344	20	173	421	25	32	35	112	24	26	14
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.99
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	26	355	19	178	434	23	33	36	76	25	27	4
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	49	1562	696	219	1901	847	59	259	231	48	434	63
Arrive On Green	0.03	0.44	0.44	0.12	0.53	0.53	0.03	0.15	0.15	0.03	0.14	0.14
Sat Flow, veh/h	1781	3554	1584	1781	3554	1583	1781	1777	1585	1781	3111	449
Grp Volume(v), veh/h	26	355	19	178	434	23	33	36	76	25	15	16
Grp Sat Flow(s),veh/h/ln	1781	1777	1584	1781	1777	1583	1781	1777	1585	1781	1777	1784
Q Serve(g_s), s	1.1	4.8	0.5	7.5	5.0	0.5	1.4	1.4	3.3	1.1	0.6	0.6
Cycle Q Clear(g_c), s	1.1	4.8	0.5	7.5	5.0	0.5	1.4	1.4	3.3	1.1	0.6	0.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.25
Lane Grp Cap(c), veh/h	49	1562	696	219	1901	847	59	259	231	48	248	249
V/C Ratio(X)	0.53	0.23	0.03	0.81	0.23	0.03	0.56	0.14	0.33	0.52	0.06	0.06
Avail Cap(c_a), veh/h	379	1562	696	611	1901	847	217	752	671	217	752	755
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	36.9	13.4	12.2	32.9	9.5	8.4	36.7	28.7	29.5	37.0	28.8	28.8
Incr Delay (d2), s/veh	3.2	0.3	0.1	2.8	0.3	0.1	3.1	0.2	0.8	3.2	0.1	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	0.5	1.7	0.2	3.2	1.7	0.2	0.6	0.6	1.2	0.5	0.2	0.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.2	13.8	12.3	35.7	9.8	8.5	39.8	28.9	30.4	40.2	28.9	28.9
LnGrp LOS	D	B	B	D	A	A	D	C	C	D	C	C
Approach Vol, veh/h		400			635			145			56	
Approach Delay, s/veh		15.4			17.0			32.2			33.9	
Approach LOS		B			B			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	6.7	16.6	14.1	39.7	7.1	16.1	6.7	47.0				
Change Period (Y+Rc), s	4.6	5.4	4.6	5.8	4.6	5.4	4.6	5.8				
Max Green Setting (Gmax), s	9.4	32.6	26.4	31.2	9.4	32.6	16.4	41.2				
Max Q Clear Time (g_c+I1), s	3.1	5.3	9.5	6.8	3.4	2.6	3.1	7.0				
Green Ext Time (p_c), s	0.0	0.6	0.2	2.1	0.0	0.1	0.0	2.8				
Intersection Summary												
HCM 6th Ctrl Delay			19.0									
HCM 6th LOS			B									

Intersection

Int Delay, s/veh 0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	8	481	509	15	10	10
Future Vol, veh/h	8	481	509	15	10	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	50	-	-	-	0	100
Veh in Median Storage, #	-	0	0	-	1	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	94	94	94	94	94	94
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	9	512	541	16	11	11

Major/Minor	Major1	Major2	Minor2
Conflicting Flow All	557	0	0 823 549
Stage 1	-	-	- 549 -
Stage 2	-	-	- 274 -
Critical Hdwy	4.13	-	- 6.63 6.23
Critical Hdwy Stg 1	-	-	- 5.43 -
Critical Hdwy Stg 2	-	-	- 5.83 -
Follow-up Hdwy	2.219	-	- 3.519 3.319
Pot Cap-1 Maneuver	1012	-	- 327 535
Stage 1	-	-	- 578 -
Stage 2	-	-	- 748 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1012	-	- 324 535
Mov Cap-2 Maneuver	-	-	- 439 -
Stage 1	-	-	- 573 -
Stage 2	-	-	- 748 -

Approach	EB	WB	SB
HCM Control Delay, s	0.1	0	12.7
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1	SBLn2
Capacity (veh/h)	1012	-	-	-	439	535
HCM Lane V/C Ratio	0.008	-	-	-	0.024	0.02
HCM Control Delay (s)	8.6	-	-	-	13.4	11.9
HCM Lane LOS	A	-	-	-	B	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1	0.1

Timings
11: Terra Cota Rd. (S) & Lakeshore Dr.

Lake and Mountain Shopping Center TIA (JN:12768)

09/26/2019

	→	↘	↙	←	↖
Lane Group	EBT	EBR	WBL	WBT	NBL
Lane Configurations	↑	↑	↘	↑	↘
Traffic Volume (vph)	442	50	43	503	24
Future Volume (vph)	442	50	43	503	24
Turn Type	NA	Perm	Prot	NA	Prot
Protected Phases	4		3	8	2
Permitted Phases		4			
Detector Phase	4	4	3	8	2
Switch Phase					
Minimum Initial (s)	10.0	10.0	5.0	10.0	10.0
Minimum Split (s)	22.6	22.6	9.6	15.8	14.6
Total Split (s)	83.0	83.0	12.0	95.0	25.0
Total Split (%)	69.2%	69.2%	10.0%	79.2%	20.8%
Yellow Time (s)	3.6	3.6	3.6	4.8	3.6
All-Red Time (s)	1.0	1.0	1.0	1.0	1.0
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.6	4.6	4.6	5.8	4.6
Lead/Lag	Lag	Lag	Lead		
Lead-Lag Optimize?	Yes	Yes	Yes		
Recall Mode	Max	Max	None	Max	None
Act Effect Green (s)	85.1	85.1	6.6	93.5	11.4
Actuated g/C Ratio	0.77	0.77	0.06	0.84	0.10
v/c Ratio	0.33	0.04	0.44	0.34	0.45
Control Delay	6.5	1.6	63.9	3.5	55.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	6.5	1.6	63.9	3.5	55.4
LOS	A	A	E	A	E
Approach Delay	6.0			8.3	55.4
Approach LOS	A			A	E

Intersection Summary

Cycle Length: 120

Actuated Cycle Length: 111.1

Natural Cycle: 50

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.45

Intersection Signal Delay: 10.3

Intersection LOS: B

Intersection Capacity Utilization 47.3%

ICU Level of Service A

Analysis Period (min) 15

Splits and Phases: 11: Terra Cota Rd. (S) & Lakeshore Dr.



HCM 6th Signalized Intersection Summary Lake and Mountain Shopping Center TIA (JN:12768)
 11: Terra Cota Rd. (S) & Lakeshore Dr. 09/26/2019

	→	↘	↙	←	↖	↗
Movement	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↑	↑	↑	↑	↑
Traffic Volume (veh/h)	442	50	43	503	24	47
Future Volume (veh/h)	442	50	43	503	24	47
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)		1.00	1.00		1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach	No			No	No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1900	1900
Adj Flow Rate, veh/h	470	47	46	535	26	50
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94
Percent Heavy Veh, %	2	2	2	2	0	0
Cap, veh/h	1392	1176	62	1536	46	89
Arrive On Green	0.74	0.74	0.03	0.82	0.08	0.08
Sat Flow, veh/h	1870	1580	1781	1870	557	1071
Grp Volume(v), veh/h	470	47	46	535	77	0
Grp Sat Flow(s),veh/h/ln	1870	1580	1781	1870	1650	0
Q Serve(g_s), s	9.3	0.9	2.8	7.8	4.9	0.0
Cycle Q Clear(g_c), s	9.3	0.9	2.8	7.8	4.9	0.0
Prop In Lane		1.00	1.00		0.34	0.65
Lane Grp Cap(c), veh/h	1392	1176	62	1536	137	0
V/C Ratio(X)	0.34	0.04	0.75	0.35	0.56	0.00
Avail Cap(c_a), veh/h	1392	1176	121	1536	310	0
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	0.00
Uniform Delay (d), s/veh	4.7	3.7	52.0	2.4	47.9	0.0
Incr Delay (d2), s/veh	0.7	0.1	6.6	0.6	3.6	0.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.9	0.2	1.3	1.6	2.2	0.0
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	5.4	3.7	58.5	3.1	51.5	0.0
LnGrp LOS	A	A	E	A	D	A
Approach Vol, veh/h	517			581	77	
Approach Delay, s/veh	5.2			7.4	51.5	
Approach LOS	A			A	D	
Timer - Assigned Phs		2	3	4		8
Phs Duration (G+Y+Rc), s		13.6	8.4	86.6		95.0
Change Period (Y+Rc), s		4.6	4.6	* 5.8		5.8
Max Green Setting (Gmax), s		20.4	7.4	* 78		89.2
Max Q Clear Time (g_c+I1), s		6.9	4.8	11.3		9.8
Green Ext Time (p_c), s		0.1	0.0	3.1		3.5
Intersection Summary						
HCM 6th Ctrl Delay			9.4			
HCM 6th LOS			A			
Notes						
User approved volume balancing among the lanes for turning movement.						
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.						

APPENDIX 7.2:

EAPC (2021) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS

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Figure 4C-4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 64 km/h OR ABOVE 40 mph ON MAJOR STREET)

Traffic Conditions = **EAPC (2021) Conditions - Weekday PM Peak Hour**

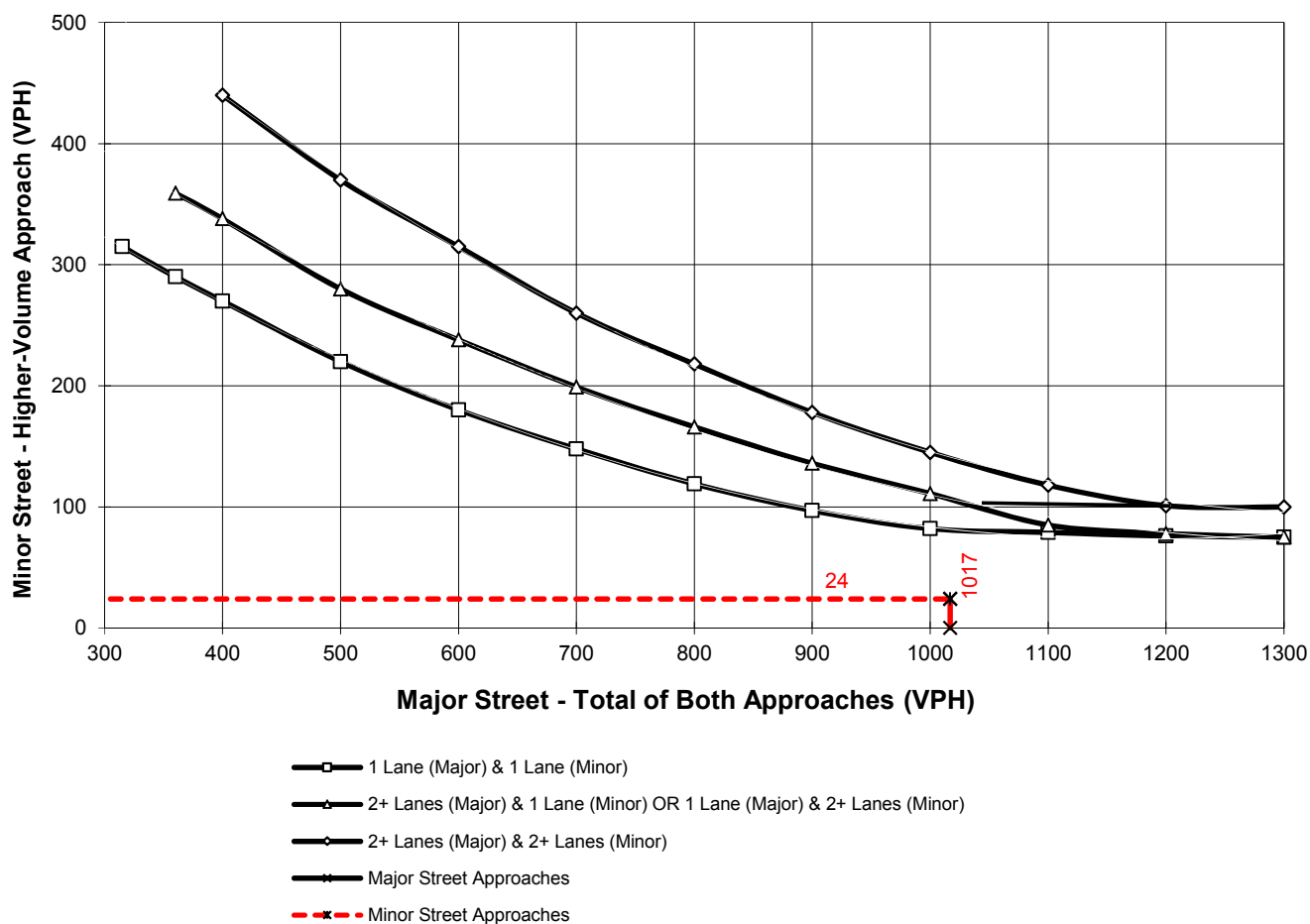
Major Street Name = **Lakeshore Dr.**

Total of Both Approaches (VPH) = **1017**
Number of Approach Lanes Major Street = **2**

Minor Street Name = **Terra Cotta Rd. (N)**

High Volume Approach (VPH) = **24**
Number of Approach Lanes Minor Street = **1**

SIGNAL WARRANT NOT SATISFIED



*Note: 100 vph applies as the lower threshold for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold for a minor-street approach with one lane

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