Appendix N

Traffic Impact Analysis, Urban Crossroads, September 10, 2018

URBAN CROSSROADS

Lake Street / I-15 Property

TRAFFIC IMPACT ANALYSIS

CITY OF LAKE ELSINORE

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
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
FHWA	Federal Highway Administration
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
MUTCD	Manual on Uniform Traffic Control Devices
NCHRP	National Cooperative Highway Research Program
NP	No Project (or Without Project)
PeMS	Caltrans Performance Measurement System
PHF	Peak Hour Factor
Project	Lake Street / I-15 Property
RivTAM	Riverside County Transportation Analysis Model
RTA	Riverside Transit Authority
RTP	Regional Transportation Plan
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SHS	State Highway System
TIA	Traffic Impact Analysis
TIF	Traffic Infrastructure Fee
TUMF	Transportation Uniform Mitigation Fee
WP	With Project
WRCOG	Western Riverside Council of Governments

1 INTRODUCTION

This report presents the results of the traffic impact analysis (TIA) for the proposed Lake Street / I-15 Property (referred to as "Project") located east of Lake Street and south of the I-15 Freeway in the City of Lake Elsinore as shown on Exhibit 1-1.

The purpose of this traffic impact analysis 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's *Traffic Impact Analysis Preparation Guide* (August 2008), the California Department of Transportation (Caltrans) *Guide for the Preparation of Traffic Impact Studies* (December 2002), and consultation with City of Lake Elsinore 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 PROJECT OVERVIEW

The Project is proposed to consist of a gas station, indoor and outdoor RV storage, and self-storage buildings (see Exhibit 1-2). The gas station includes 12 vehicle fueling positions. There is approximately 13.34 acres of RV storage and self storage.

As indicated in the signed scoping agreement, trip-generation statistics published in the Institute of Transportation Engineers (ITE) Trip Generation (9th Edition, 2012) manual for the proposed land use (ITE Land Use Code 151 – Mini Warehouse combined with ITE Land Use Code 945 – Gasoline/Service Station w/Convenience Market) are utilized in this traffic study. The project is anticipated to generate a net total of approximately 2,426 trip-ends per day with 156 AM peak hour and 210 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.

1.2 ANALYSIS SCENARIOS

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

- Existing (2017) Conditions (Baseline)
- Existing plus Project Conditions
- Existing plus Ambient Growth plus Project (EAP) (2018) Conditions
- Existing plus Ambient Growth plus Project plus Cumulative (EAPC) (2018) Conditions
- Horizon Year (2035), Without Project Conditions
- Horizon Year (2035), With Project Conditions

EXHIBIT 1-1: LOCATION MAP

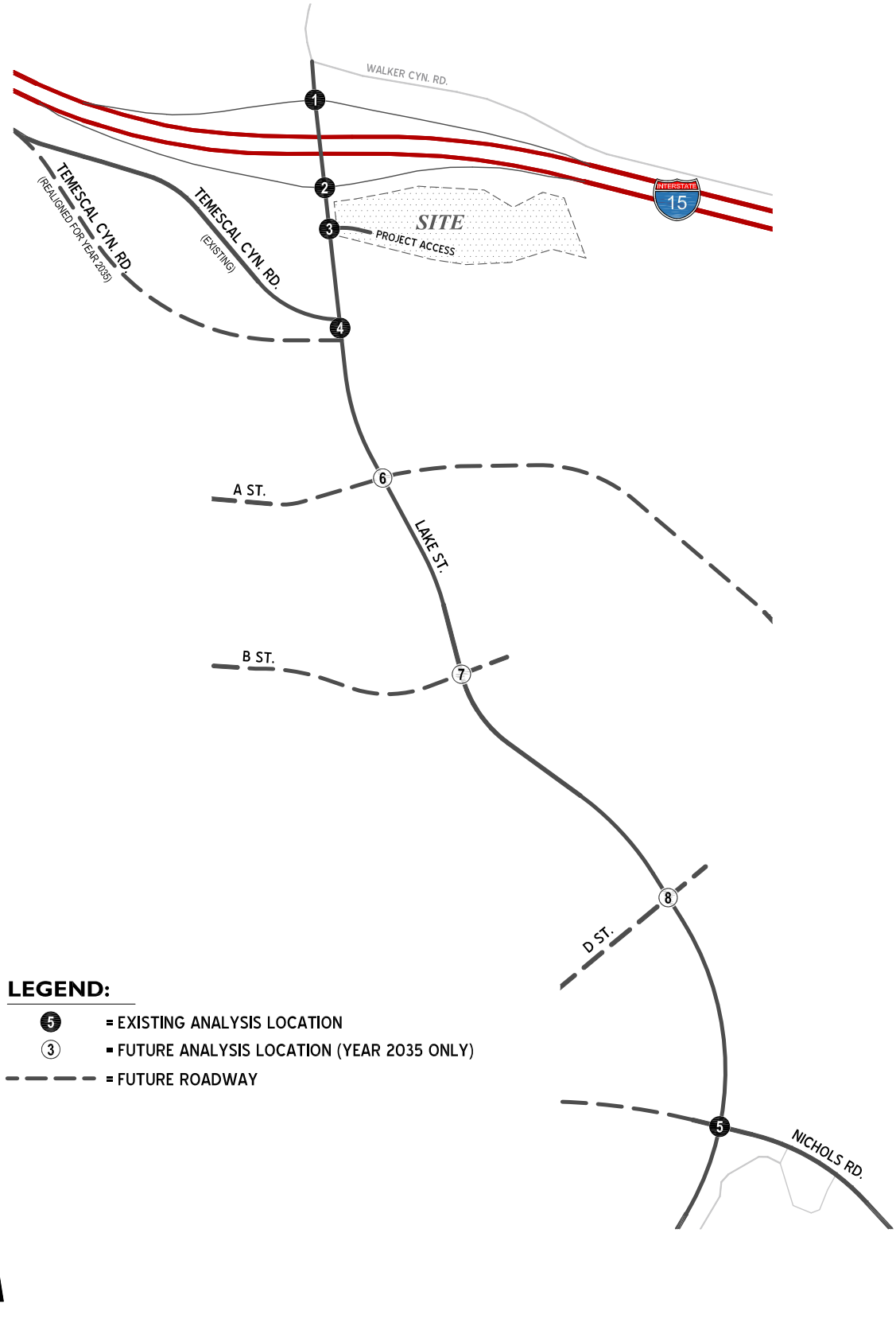
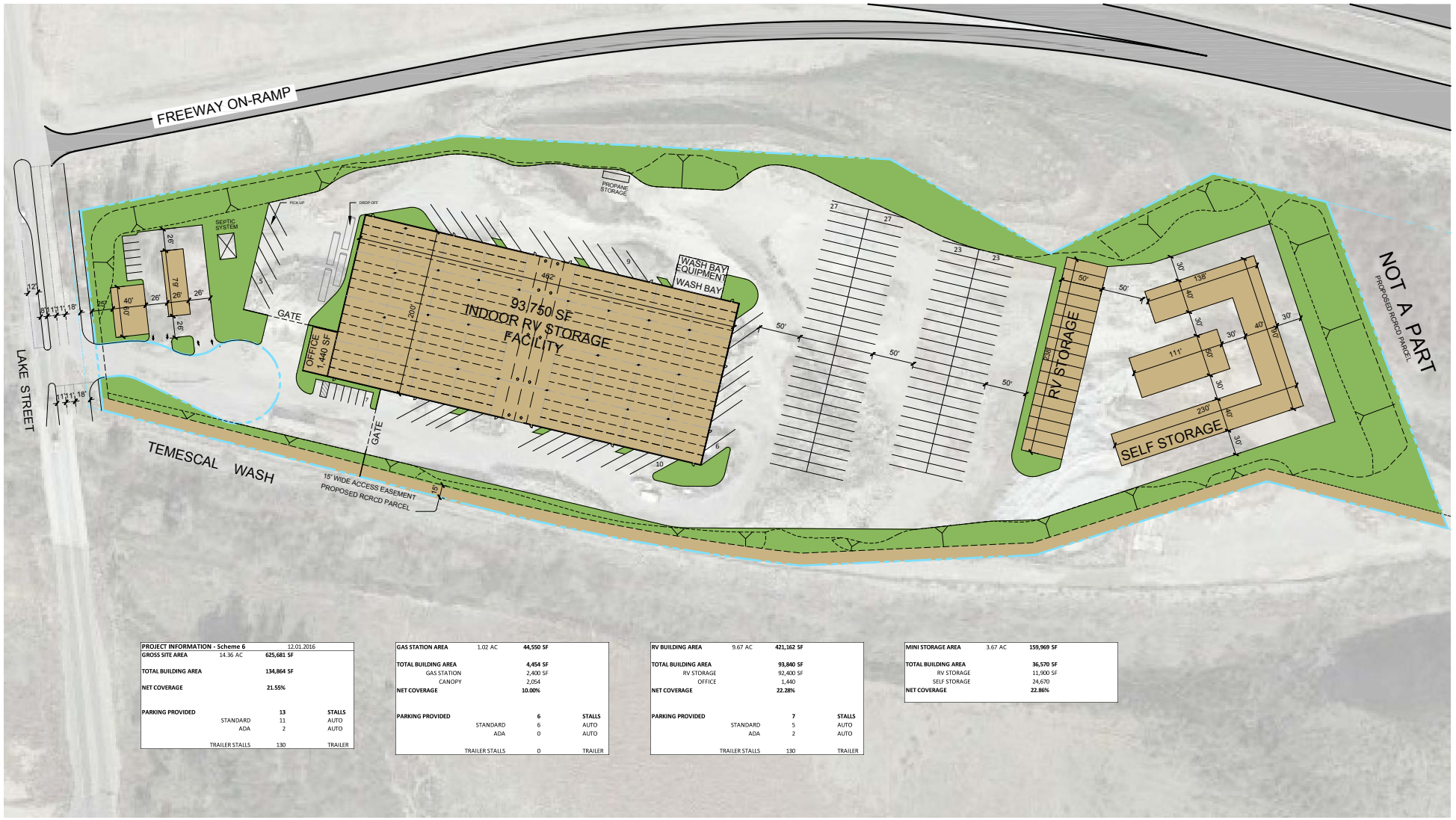


EXHIBIT 1-2: PRELIMINARY SITE PLAN



PROJECT INFORMATION - Scheme 6		12.01.2016	
GROSS SITE AREA	14.36 AC	625,681 SF	
TOTAL BUILDING AREA		134,864 SF	
NET COVERAGE		21.55%	
PARKING PROVIDED		13	STALLS
	STANDARD	11	AUTO
	ADA	2	AUTO
	TRAILER STALLS	130	TRAILER

GAS STATION AREA	1.02 AC	44,550 SF	
TOTAL BUILDING AREA		4,454 SF	
GAS STATION		2,400 SF	
CANOPY		2,054	
NET COVERAGE		10.00%	
PARKING PROVIDED		6	STALLS
	STANDARD	6	AUTO
	ADA	0	AUTO
	TRAILER STALLS	0	TRAILER

RV BUILDING AREA	9.67 AC	421,162 SF	
TOTAL BUILDING AREA		93,840 SF	
RV STORAGE		92,400 SF	
OFFICE		1,440	
NET COVERAGE		22.28%	
PARKING PROVIDED		7	STALLS
	STANDARD	5	AUTO
	ADA	2	AUTO
	TRAILER STALLS	130	TRAILER

MINI STORAGE AREA	3.67 AC	159,969 SF
TOTAL BUILDING AREA		36,570 SF
RV STORAGE		11,900 SF
SELF STORAGE		24,670
NET COVERAGE		22.86%

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URBAN CROSSROADS

EAP scenario will be the basis for determining project impacts and mitigations. EAPC is for fair-share contribution. It is assumed that intersection improvements required for EAPC beyond EAP traffic impacts will be addressed through either an existing fee program, or through a fair-share contribution.

Horizon Year (2035) analysis identifies cumulative impacts for long-range traffic conditions. Future intersection improvements required to address long-range cumulative traffic impacts are generally addressed through either an existing fee program, or through a fair-share contribution. Horizon Year (2035) traffic forecasts are derived from the City of Lake Elsinore refined version of RivTAM 2035.

1.2.1 EXISTING (2017) CONDITIONS

Information for Existing (2017) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared.

1.2.2 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 scenario has been provided for information purposes.

1.2.3 EXISTING PLUS AMBIENT GROWTH PLUS PROJECT (2018) CONDITIONS

The Existing plus Ambient Growth plus Project (EAP) (2018) conditions analysis determines the traffic impacts based on a comparison of the EAP traffic conditions to Existing conditions (i.e., baseline conditions). To account for background traffic growth, an ambient growth from Existing conditions of 2% is included for EAP traffic conditions. Cumulative development projects are not included as part of the EAP analysis. For the purposes of this traffic analysis, the EAP scenario has been utilized to discern Project impacts consistent with the County's traffic study guidelines.

1.2.4 EXISTING PLUS AMBIENT GROWTH PLUS PROJECT PLUS CUMULATIVE (2018) CONDITIONS

The Existing plus Ambient Growth plus Project plus Cumulative (2018) (EAPC) conditions analysis is utilized to determine if improvements funded through regional transportation mitigation fee programs, such as the Western Riverside Council of Governments (WRCOG) Transportation Uniform Mitigation Fee (TUMF) and City's Traffic Infrastructure Fee (TIF) programs, or other approved funding mechanism can accommodate the near-term cumulative traffic at the target level of service (LOS) identified in the County of Riverside General Plan. (3) If the "funded" improvements can provide the target LOS, then the Project's payment into TUMF and/or TIF will be considered as near-term cumulative mitigation through the conditions of approval. Other improvements needed beyond the "funded" improvements (such as localized improvements to non-TUMF facilities) are identified as such. To account for background traffic, other known cumulative development projects in the study area were included in addition to 2% of ambient growth for EAPC traffic conditions in conjunction with traffic associated with the proposed Project.

1.2.5 HORIZON YEAR (2035) CONDITIONS

Traffic projections for Horizon Year Without Project conditions were derived from a version of Riverside County Transportation Analysis Model (RivTAM) modified to represent General Plan Buildout conditions for the City of Lake Elsinore using accepted procedures for model forecast refinement and smoothing. The traffic forecasts reflect the area-wide growth anticipated between Existing conditions and Horizon Year conditions. The Horizon Year Without Project traffic forecasts were determined by from the RivTAM model consistent with nearby traffic analyses and Project traffic was subsequently added to determine Horizon Year With Project traffic forecasts. The Horizon Year Without and With Project traffic conditions analyses will be utilized to determine if improvements funded through regional transportation mitigation fee programs, such as the TUMF or TIF programs, or other approved funding mechanism can accommodate the long-range cumulative traffic at the target LOS identified in the City of Lake Elsinore General Plan. If the "funded" improvements can provide the target LOS, then the Project's payment into TUMF and TIF will be considered as cumulative mitigation through the conditions of approval. Other improvements needed beyond the "funded" improvements (such as localized improvements to non-TUMF or non-TIF facilities) are identified as such.

The traffic model zone structure is not designed to provide accurate turning movements along arterial roadways unless refinement and reasonableness checking is performed. As such, Horizon Year turning volumes were compared to EAPC volumes in order to ensure a minimum growth of 10 percent as a part of the refinement process, where applicable. The minimum 10 percent growth includes any additional growth between EAPC and Horizon Year With Project traffic conditions that is not accounted for by the traffic generated by cumulative development projects and the ambient growth between Existing and EAPC conditions. The initial estimate of the future Horizon Year With Project peak hour turning movements was then reviewed by Urban Crossroads for reasonableness at intersections where model results showed unreasonable turning movements. The initial raw model estimates were adjusted to achieve flow conservation (where applicable), reasonable growth, and reasonable diversion between parallel routes.

1.3 STUDY AREA

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

1.3.1 INTERSECTIONS

The following 8 study area intersections shown on previously on Exhibit 1-1 and listed in Table 1-1 were selected for this TIA based on consultation with City of Lake Elsinore staff. The study area includes intersections where the Project is anticipated to contribute 50 or more peak hour trips per the County's traffic study guidelines. (1) Furthermore, the rationale for evaluating intersections where a project would contribute 50 or more peak-hour trips is standard industry practice and supported by substantial evidence. It should also be noted that the 50 peak hour

trip threshold is used by several other lead agencies throughout southern California including Caltrans and County of Riverside. The 50 peak hour trip threshold is based on the desire to analyze potential impacts when the Project contributes 3 percent or more of the capacity of a typical signalized intersection. The 50 peak hour threshold represents less than 3 percent of capacity of a signalized intersection for critical movements, estimated based on the Highway Capacity Manual (HCM) at approximately 1700 vehicles per hour.

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection	Jurisdiction
1	Lake St. / I-15 NB Ramps	Caltrans, Lake Elsinore
2	Lake St. / I-15 SB Ramps	Caltrans, Lake Elsinore
3	Lake St. / Project Access	Lake Elsinore
4	Lake St. / Temescal Cyn. Rd.	Lake Elsinore
5	Lake St. / Nichols Rd.	Lake Elsinore
6	Lake St. / A St.	Lake Elsinore
7	Lake St. / B St.	Lake Elsinore
8	Lake St. / D St.	Lake Elsinore

In effect, acting as the lead agency, these jurisdictions have established 50 project trips as the threshold of significance for when to analyze signalized intersections. Therefore, a project trip contribution of less than 50 peak hour trips is typically not evaluated.

1.3.2 FREEWAY MAINLINE SEGMENTS

Study area freeway mainline analysis locations were selected based on Caltrans traffic study guidelines, which may require the analysis of State highway facilities. (2) Although the Project is anticipated to contribute less than 50 peak hour trips to the State Highway System (SHS), this study evaluates the following freeway segments adjacent to the point of entry to the SHS (see Table 1-2):

TABLE 1-2: FREEWAY MAINLINE SEGMENT ANALYSIS LOCATIONS

ID	Freeway Mainline Segments
1	I-15 Freeway – Northbound, South of Lake Street
2	I-15 Freeway – Northbound, Between Ramps
3	I-15 Freeway – Northbound, North of Lake Street
4	I-15 Freeway – Southbound, North of Lake Street
5	I-15 Freeway – Southbound, Between Ramps
6	I-15 Freeway – Southbound, South of Lake Street

1.3.3 FREEWAY MERGE/DIVERGE RAMP JUNCTIONS

Similarly, the Project is anticipated to contribute less than 50 peak hour trips to the study area freeway merge/diverge ramp junction analysis locations, however, the following freeway ramp

junctions for each direction of flow as shown on Table 1-3 were evaluated as part of this traffic study:

TABLE 1-3: FREEWAY MERGE/DIVERGE RAMP JUNCTION ANALYSIS LOCATIONS

ID	Freeway Merge/Diverge Ramp Junctions
1	I-15 Freeway – Northbound, Off-Ramp at Lake Street (Diverge)
2	I-15 Freeway – Northbound, On-Ramp at Lake Street (Merge)
3	I-15 Freeway – Southbound, Off-Ramp at Lake Street (Diverge)
4	I-15 Freeway – Southbound, On-Ramp at Lake Street (Merge)

1.4 SUMMARY OF LOS DEFICIENCIES

1.4.1 E+P (2017) AND EAP (2018) CONDITIONS

The study area intersections are currently operating at acceptable LOS during the peak hours, with the exception of Intersection #1 (Lake Street at I-15 NB Ramps). During the AM peak hour, Intersection #1 operates at LOS "F" for existing conditions. For E+P and EAP conditions, Intersection #1 (Lake Street at I-15 NB Ramps) continues to experience deficient operations in the AM peak hour, consistent with Existing conditions. The PM peak hour also experiences deficient operations at this intersection for E+P and EAP conditions. One additional study area intersection is anticipated to experience deficient operations with the addition of the Project: The Lake Street / Project Access intersection is projected to operate at LOS "F" in both the AM and PM peak hours without improvements for E+P and EAP conditions. The remaining existing intersections experience acceptable operations for E+P and EAP conditions. The following study area intersections are anticipated to operate at unacceptable LOS during the peak hours under E+P (2017) and EAP (2018) traffic conditions:

ID	Intersection Location
1	Lake Street / I-15 Northbound Ramps – LOS F AM and PM peak hours
3	Lake Street / Project Access – LOS F AM and PM peak hours

Similarly, the I-15 Freeway mainline segments and merge/diverge ramp junctions are currently operating at acceptable LOS and are anticipated to continue to operate acceptably with the addition of Project traffic.

1.4.2 EAPC (2018) CONDITIONS

The following study area intersections are anticipated to operate at unacceptable LOS during the peak hours under EAPC (2018) traffic conditions:

ID	Intersection Location
1	Lake Street / I-15 Northbound Ramps – LOS F AM and PM peak hours
2	Lake Street / I-15 Southbound Ramps – LOS E AM peak hour; LOS F PM peak hour
3	Lake Street / Project Access – LOS F AM and PM peak hours

Similar to Existing, E+P, and EAP traffic conditions, the I-15 Freeway mainline and merge/diverge ramp junctions are anticipated to operate at acceptable LOS under EAPC traffic conditions. As such, no improvement have been identified or evaluated.

1.4.3 HORIZON YEAR (2035) WITHOUT AND WITH PROJECT CONDITIONS

Based on the assessment of Horizon Year Without and With Project traffic conditions, which includes planned improvements, there were no intersections found to operate at a deficient LOS.

All of the I-15 Freeway mainline segments and the merge/diverge ramp junctions at Lake Street are anticipated to operate at unacceptable LOS under Horizon Year Without and With Project traffic conditions. Planned improvements (i.e., long-range plans for 2 tolled Express Lanes, a 2nd lane for the NB On-Ramp from Lake Street, and a 2nd lane for the SB Off-Ramp to Lake Street) for the I-15 Freeway are anticipated to improve the peak hour LOS, however, the following I-15 Freeway mainline segments and ramp junctions are anticipated to continue to operate at unacceptable LOS:

Freeway Mainline Segments
I-15 Freeway – Southbound, North of Lake Street – LOS "F" PM peak hour only
I-15 Freeway – Southbound, South of Lake Street – LOS "E" PM peak hour only
I-15 Freeway – Northbound, South of Lake Street – LOS "E" AM and PM peak hours

There are no additional improvements planned along the I-15 Freeway in addition to those discussed above.

1.5 PROGRAMMED TUMF/TIF IMPROVEMENTS

Table 1-4 lists the recommended improvements necessary to reduce the identified intersection LOS deficiencies by traffic condition. Locally funded improvements (TRACT 28214, see Appendix 1.2) listed for E+P and EAP (2018), and EAPC conditions at the Lake Street/I-15 interchange include the following:

E+P and EAP (2018) Improvements (TR 28214)

- Traffic signal at the intersection of Lake Street/I-15 NB Ramps (#1)
- Provide a separate northbound right turn lane and a separate southbound left turn lane at the intersection of Lake Street/I-15 SB Ramps (#2)

EAPC (2018) Additional Improvements (TR 28214)

- Provide a separate northbound left turn lane and a separate westbound left turn lane at the intersection of Lake Street/I-15 NB Ramps (#1)
- Traffic signal at the intersection of Lake Street/I-15 SB Ramps (#2)

Other off-site recommended improvements are included as part of the Transportation Uniform Mitigation Fee (TUMF) or City's Traffic Infrastructure Fee (TIF), as such, fair share contribution based on the Project's percentage contribution has not been provided. 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.

The improvements listed in Table 1-4 are comprised of lane additions/modifications, installation of signals and signal modifications. The improvements that are covered either by the TUMF program or the TIF program have been identified as such. Other improvements are consistent with the recently approved Alberhill Villages Specific Plan TIA. Planned lane additions are shown as the number of lanes required and the direction of travel. Depending on the width of the existing pavement and right-of-way, these improvements may involve only striping modifications or they may involve construction of additional pavement width. Additional discussion of the relevant pre-existing transportation impact fee programs is provided below.

1.6 LOCAL AND REGIONAL FUNDING MECHANISMS

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 Western Riverside Council of Governments (WRCOG) TUMF program or the City's TIF program. Identification and timing of needed improvements is generally determined through local jurisdictions based upon a variety of factors.

1.6.1 TRANSPORTATION UNIFORM MITIGATION FEE (TUMF) PROGRAM

The WRCOG is responsible for establishing and updating TUMF rates. The County may grant to developers a credit against the specific components of fees for the dedication of land or the construction of facilities identified in the list of improvements funded by each of these fee programs. Fees are based upon projected land uses and a related transportation needs to address growth based upon a 2015 Nexus study update.

TUMF is an ambitious regional program created to address impacts of growth throughout Western Riverside County. Program guidelines are being handled on an iterative basis. Exemptions, credits, reimbursements and local administration are being deferred to primary agencies. The County of Riverside serves this function for the proposed Project. Fees submitted to the County are passed on to the WRCOG as the ultimate program administrator.

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.

TABLE 1-4: SUMMARY OF IMPROVEMENTS BY ANALYSIS SCENARIO

Location	E+P Recommended Improvements	EAP (2018) Recommended Improvements	EAPC (2018) Recommended Improvements	2035 Without Project Recommended Improvements	2035 With Project Recommended Improvements	Improvements in TUMF or TIF?[1]	Fair Share %[2,3]
Roadway Segments							
Lake Street, I-15 to Temescal Canyon Road	None None	None None	None None	add bridge widen from 2 lanes to 6 lanes	Same Same	TUMF	N/A
Lake Street, Temescal Canyon Road to Mountain Avenue	None	None	None	widen from 2 lanes to 6 lanes	Same	TUMF	N/A
Nichols Road, I-15 to Lake St.	None	None	None	widen from 2 lanes to 4 lanes	Same	TUMF	N/A
Temescal Canyon Road, I-15 to Lake Street	None None None	None None None	None None None	Reconstruct bridge realign arterial segment widen from 2 lanes to 4 lanes	Same Same Same	TIF & TUMF	N/A
Freeways and Interchanges							
Lake Street & I-15 Interchange	None	None	None	interchange improvements, per Lake St Alignment Study, ints below	Same	TUMF	N/A
Lake Street / I-15 NB Ramps (Int #1)	traffic signal None None None	Same None None None	Same NB left turn lane None WB left turn lane	Same 2 NB left turn lanes 2nd SB through lane Same	Same	TUMF	3.0%
Lake Street / I-15 SB Ramps (Int #2)	None None NB right turn lane SB left turn lane None	None None Same Same None	traffic signal None Same Same None	Same 2nd NB through lane Same Same 2nd SB through lane	Same	TUMF	5.0%
Arterial Intersections							
Lake Street / Project Access (Int #3)	None None	None None	None None	2nd & 3rd NB through lanes 2nd & 3rd SB through lanes	Same	TUMF	9.0%
	Full Access Signal at Project Entry				Full Access Signal at Project Entry		100.0%
	- traffic signal	Same	Same	None	- traffic signal		
	- SB left turn lane	Same	Same	None	- SB left turn lane		
	- WB left turn lane	Same	Same	None	- WB left turn lane		
	- WB right turn lane	Same	Same	None	- WB right turn lane		
	OR						
	No Left-Out/Left-In Unsignalized at Project Entry						
	- Cross-Street Stop	Same	Same	None	traffic signal		
	- SB left turn lane	Same	Same	None	SB left turn lane		
	- WB right turn lane	Same	Same	None	WB left turn lane with		

TABLE 1-4: SUMMARY OF IMPROVEMENTS BY ANALYSIS SCENARIO

Location	E+P Recommended Improvements	EAP (2018) Recommended Improvements	EAPC (2018) Recommended Improvements	2035 Without Project Recommended Improvements	2035 With Project Recommended Improvements	Improvements in TUMF or TIF?[1]	Fair Share %[2,3]
Lake Street / Temescal Canyon Road (Int #4)	None	None	None	2nd NB left turn lane	Same	TUMF	3.0%
	None	None	None	2nd & 3rd NB through lanes			
	None	None	None	2nd & 3rd SB through lanes			
	None	None	None	2nd EB left turn lane			
Lake Street / Nichols Road (Int #5)	None	None	None	2nd & 3rd NB through lanes	Same	TUMF	1.0%
	None	None	None	NB free right turn lane			
	None	None	None	2nd SB left turn lane			
	None	None	None	2nd SB through lane			
	None	None	None	SB right turn lane			
	None	None	None	2 EB left turn lanes			
	None	None	None	2nd EB through lane			
	None	None	None	EB right turn lane			
	None	None	None	2 WB left turn lanes			
	None	None	None	2nd WB through lane			
	None	None	None	WB right turn lane with overlap phase			
Lake Street / A Street (Int #6)	None	None	None	traffic signal	Same		3.0%
	None	None	None	NB left turn lane			
	None	None	None	3 NB through lanes	Same	TUMF	
	None	None	None	SB left turn lane	Same		
	None	None	None	3 SB through lanes	Same	TUMF	
	None	None	None	SB right turn lane with overlap phase	Same		
	None	None	None	2 EB left turn lanes			
	None	None	None	EB through lane			
	None	None	None	EB right turn lane			
	None	None	None	WB left turn lane			
	None	None	None	WB through lane			
	None	None	None	WB right turn lane			

TABLE 1-4: SUMMARY OF IMPROVEMENTS BY ANALYSIS SCENARIO

Location	E+P Recommended Improvements	EAP (2018) Recommended Improvements	EAPC (2018) Recommended Improvements	2035 Without Project Recommended Improvements	2035 With Project Recommended Improvements	Improvements in TUMF or TIF?[1]	Fair Share %[2,3]
Lake Street / B Street (Int #7)	None	None	None	traffic signal	Same		2.0%
	None	None	None	NB left turn lane			
	None	None	None	3 NB through lanes	Same	TUMF	
	None	None	None	SB left turn lane	Same		
	None	None	None	3 SB through lanes	Same	TUMF	
	None	None	None	EB left turn lane	Same		
	None	None	None	EB through lane			
	None	None	None	WB left turn lane			
	None	None	None	WB through lane			
Lake Street / D Street (Int #8)	None	None	None	traffic signal	Same		1.0%
	None	None	None	NB left turn lane			
	None	None	None	3 NB through lanes	Same	TUMF	
	None	None	None	SB left turn lane	Same		
	None	None	None	3 SB through lanes	Same	TUMF	
	None	None	None	EB left turn lane	Same		
	None	None	None	EB through lane			
	None	None	None	WB left turn lane			
	None	None	None	WB through lane			

[1] Improvements are included wholly or partially in one or more of the following: County of Riverside TUMF or City of Lake Elsinore TIF for local, regional, and specific plan components. Final determination on extent of the improvements included and covered by these fee programs is to be established by the governing lead agency.

[2] Fair share percentages indicated as N/A are not shown because the recommended improvements at these locations are included in a pre-existing fee program.

[3] Project Fair Share % = (Project Only Traffic / (HY 2035 With Project Traffic - Existing Traffic))

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1.6.2 CITY OF LAKE ELSINORE TRAFFIC INFRASTRUCTURE FEE (TIF) PROGRAM

The City of Lake Elsinore has created its own local Traffic Infrastructure Fee (TIF) program to impose and collect fees from new residential, commercial and industrial development for the purpose of funding roadways and intersections necessary to accommodate City growth as identified in the City's General Plan Circulation Element. The City of Lake Elsinore's TIF program includes facilities that are not part of, or which may exceed improvements identified and covered by the TUMF program. As a result, the pairing of the regional and local fee programs.

The City of Lake Elsinore provides a more comprehensive funding and implementation plan to ensure an adequate and interconnected transportation system. Under the City of Lake Elsinore's TIF program, the City of Lake Elsinore 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 of Lake Elsinore's Public Works Department. Periodic traffic counts, review of traffic accidents, and a review of traffic trends throughout the City of Lake Elsinore are also periodically performed by City of Lake Elsinore staff and consultants. The City of Lake Elsinore uses this data to determine the timing of implementing the improvements listed in its facilities list.

As shown in Table 1-4, a few of the facilities forecasted to be impacted by the Project are planned for improvements through the City of Lake Elsinore's TIF Program. The Project will be subject to the City of Lake Elsinore's TIF fee program, and will pay the requisite City of Lake Elsinore TIF fees at the rates then in effect pursuant to the City of Lake Elsinore's ordinance. The TIF network improvement needs were last updated in 2002 with an expected completion date by 2025. Improvements are identified in the Nexus Study by location rather than with specific geometrics. Table E of that study identifies TIF improvement locations and eligible program costs but does not provide discrete improvements. As a result, Table 1-4 identifies TIF intersections with an expectation that City of Lake Elsinore, as program administrator, can distinguish if the program fees are sufficient to cover the fair share impacts for proportionality.

1.7 SITE ACCESS IMPROVEMENTS

The recommended site access driveway improvements for the Project are described below. Concept striping of the on-site and site adjacent recommended roadway lane improvements is presented in Section 8.1.

Lake Street at Project Access (#3) – The driveway may be configured as a full access driveway with signal control in near term and long range conditions, OR left turn out access may be prohibited and the driveway controlled by a stop sign (near term) transitioning to modified signal control (long term).

For the full access with signal control driveway, improvements are the same for all With Project scenarios. Install traffic signal and construct the intersection to provide the following geometrics:

Northbound Approach: Three through lanes (TUMF)

Southbound Approach: One left turn lane and three through lanes

Westbound Approach: One left turn lane, one right turn lane

OR for the no left turn out / left turn in scenario, the E+P, EAP, and EAPC conditions can be controlled by a Stop sign on the cross-street with the following geometrics:

Northbound Approach: Three through lanes (TUMF)

Southbound Approach: One left turn lane and three through lanes

Westbound Approach: One right turn lane

For Horizon Year 2035 With Project conditions, the no left turn out / left turn in scenario would also require a traffic signal to control the southbound left and northbound movements.

In either case, on-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the Project site. A cross-walk is recommended for the Project Access leg.

Sight distance at each project access point should be reviewed with respect to standard Caltrans and City of Lake Elsinore sight distance standards at the time of preparation of final grading, landscape and street improvement plans.

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 the County of Riverside and Caltrans traffic study guidelines. (1) (2)

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 2010) 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 2010. (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 9.1) 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

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 x Peak 15-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 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)

California Department of Transportation (Caltrans)

Per the Caltrans *Guide for the Preparation of Traffic Impact Studies*, the traffic modeling and signal timing optimization software package Synchro (Version 9.1) has also been utilized to analyze signalized intersections under Caltrans' jurisdiction, which include interchange to arterial ramps (i.e. I-15 Freeway ramps at Lake Street). (2)

2.2.2 UNSIGNALIZED INTERSECTIONS

The City of Lake Elsinore requires the operations of unsignalized intersections be evaluated using the methodology described 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 2010

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 FREEWAY OFF-RAMP QUEUING ANALYSIS

The study area for this TIA includes the freeway-to-arterial interchange of the I-15 Freeway at Lake Street off-ramps. Consistent with Caltrans requirements, the 95th percentile queuing of vehicles has been assessed at the off-ramps to determine potential queuing deficiencies at the freeway ramp intersections on Lake Street. Specifically, the queuing analysis is utilized to identify any potential queuing and "spill back" onto the I-15 Freeway mainline from the off-ramps.

The traffic progression analysis tool and HCM intersection analysis program, Synchro, has been used to assess the potential deficiencies/needs of the intersections with traffic added from the proposed Project. Storage (turn-pocket) length recommendations at the ramps have been based upon the 95th percentile queue resulting from the Synchro progression analysis. The queue length reported is for the lane with the highest queue in the lane group.

A vehicle is considered queued whenever it is traveling at less than 10 feet/second. A vehicle will only become queued when it is either at the stop bar or behind another queued vehicle. Although only the 95th percentile queue has been reported in the tables, the 50th percentile queue can be found in the appendix alongside the 95th percentile queue for each ramp location. The 50th percentile maximum queue is the maximum back of queue on a typical cycle during the peak hour, while the 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes during the peak hour. In other words, if traffic were observed for 100 cycles, the 95th percentile queue would be the queue experienced with the 95th busiest cycle (or 5% of the time). The 50th percentile or average queue represents the typical queue length for peak hour traffic conditions, while the 95th percentile queue is derived from the average queue plus 1.65 standard deviations. The 95th percentile queue is not necessarily ever observed, it is simply based on statistical calculations.

2.4 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 uses the signal warrant criteria presented in the latest edition of the Federal Highway Administration's (FHWA) *Manual on Uniform Traffic Control Devices (MUTCD)*, as amended by *the MUTCD 2014 California Supplement*, 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. Both the FHWA's *MUTCD* and the *MUTCD 2014 California Supplement* indicate 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 criteria are basically identical for both the FHWA's *MUTCD* and the *MUTCD 2014 California Supplement*. Warrant 3 is appropriate to use for this TIA 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 on Table 2-3, traffic signal warrant analyses were performed for the following unsignalized study area intersections during the peak weekday conditions:

TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction
1	Lake Street / I-15 Northbound Ramps	Caltrans, Lake Elsinore
2	Lake Street / I-15 Southbound Ramps	Caltrans, Lake Elsinore
3	Lake Street / Project Access	Lake Elsinore

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 Analysis,* Section 6 *EAP (2018) Traffic Analysis, and* Section 7 *EAPC (2018) Traffic Analysis* 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.

2.5 FREEWAY MAINLINE SEGMENT ANALYSIS METHODOLOGY

Consistent with recent Caltrans guidance and because deficiencies to freeway segments dissipate with distance from the point of State Highway System (SHS) entry, quantitative study of freeway segments beyond those immediately adjacent to the point of entry is not required. As such, the traffic study has evaluated the freeway segments along the I-15 Freeway where the Project is anticipated to contribute 50 or more peak hour trips.

The freeway system in the study area has been broken into segments defined by the freeway-to-arterial interchange locations. The freeway segments have been evaluated in this TIA based upon peak hour directional volumes. The freeway segment analysis is based on the methodology described in the HCM and performed using HCS2010 software. The performance measure preferred by Caltrans to calculate LOS is density. Density is expressed in terms of passenger cars per mile per lane. Table 2-4 illustrates the freeway segment LOS descriptions for each density range utilized for this analysis.

The number of lanes for existing baseline conditions has been obtained from field observations conducted by Urban Crossroads in May 2017. These existing freeway geometrics have been utilized for Existing, E+P, EAP, EAPC, and Horizon Year Without and With Project conditions.

The I-15 Freeway mainline volume data were obtained from the Caltrans Performance Measurement System (PeMS) website for the segments of the I-15 Freeway interchange, south of Lake Street. The data was obtained from May 2017. In an effort to conduct a conservative analysis, the maximum value observed within the three day period was utilized for the weekday morning (AM) and weekday evening (PM) peak hours. In addition, truck traffic, represented as a percentage of total traffic, has been utilized for the purposes of this analysis in an effort to not overstate traffic volumes and peak hour deficiencies. As such, actual vehicles (as opposed to PCE volumes) have been utilized. (7)

TABLE 2-4: DESCRIPTION OF FREEWAY MAINLINE LOS

Level of Service	Description	Density Range (pc/mi/ln)[1]
A	Free-flow operations in which vehicles are relatively unimpeded in their ability to maneuver within the traffic stream. Effects of incidents are easily absorbed.	0.0 – 11.0
B	Relative free-flow operations in which vehicle maneuvers within the traffic stream are slightly restricted. Effects of minor incidents are easily absorbed.	11.1 – 18.0
C	Travel is still at relative free-flow speeds, but freedom to maneuver within the traffic stream is noticeably restricted. Minor incidents may be absorbed, but local deterioration in service will be substantial. Queues begin to form behind significant blockages.	18.1 – 26.0
D	Speeds begin to decline slightly and flows and densities begin to increase more quickly. Freedom to maneuver is noticeably limited. Minor incidents can be expected to create queuing as the traffic stream has little space to absorb disruptions.	26.1 – 35.0
E	Operation at capacity. Vehicles are closely spaced with little room to maneuver. Any disruption in the traffic stream can establish a disruption wave that propagates throughout the upstream traffic flow. Any incident can be expected to produce a serious disruption in traffic flow and extensive queuing.	35.1 – 45.0
F	Breakdown in vehicle flow.	>45.0

[1] pc/mi/ln = passenger cars per mile per lane. Source: HCM

2.6 FREEWAY MERGE/DIVERGE RAMP JUNCTION ANALYSIS

The freeway system in the study area has been broken into segments defined by freeway-to-arterial interchange locations resulting in two existing on and off ramp locations. Although the HCM indicates the influence area for a merge/diverge junction is 1,500 feet, the analysis presented in this traffic study has been performed at all ramp locations with respect to the nearest on or off ramp at each interchange in an effort to be consistent with Caltrans guidance/comments on other projects Urban Crossroads has worked on in the region.

The merge/diverge analysis is based on the HCM Ramps and Ramp Junctions analysis method and performed using HCS2010 software. The measure of effectiveness (reported in passenger car/mile/lane) are calculated based on the existing number of travel lanes, number of lanes at the on and off ramps both at the analysis junction and at upstream and downstream locations (if applicable) and acceleration/deceleration lengths at each merge/diverge point. Table 2-5 presents the merge/diverge area level of service descriptions for each density range utilized for this analysis.

TABLE 2-5: DESCRIPTION OF FREEWAY MERGE AND DIVERGE LOS

Level of Service	Density Range (pc/mi/ln)[1]
A	≤10.0
B	10.0 – 20.0
C	20.0 – 28.0
D	28.0 – 35.0
E	>35.0
F	Demand Exceeds Capacity

[1] pc/mi/ln = passenger cars per mile per lane. Source: HCM

Similar to the basic freeway segment analysis, the I-15 Freeway mainline volume data were obtained from the Caltrans maintained PeMS website for the segments of the I-15 Freeway interchange, north of Lake Street. The ramp data (per the count data presented in Appendix 3.1) were then utilized to flow conserve the mainline volumes to determine the remaining I-15 Freeway mainline segment volumes. Flow conservation checks ensure that traffic flows from north to south (and vice versa) of the interchange area with no unexplained loss of vehicles. The data was obtained from May 2017. In an effort to conduct a conservative analysis, the maximum value observed within the three day period was utilized for the weekday morning (AM) and weekday evening (PM) peak hours. In addition, truck traffic, represented as a percentage of total traffic, has been utilized for the purposes of this analysis in an effort to not overstate traffic volumes and peak hour deficiencies. (7)

2.7 MINIMUM LEVEL OF SERVICE (LOS)

The definition of an intersection deficiency has been obtained from each of the applicable surrounding jurisdictions.

2.7.1 CITY OF LAKE ELSINORE

The definition of an intersection deficiency in the City of Lake Elsinore is based on the City of Lake Elsinore General Plan Circulation Element. The City of Lake Elsinore General Plan states that target LOS D be maintained along City roads (including intersections) wherever possible. As an exception, the City's General Plan allows for LOS E operations in the Historic Area of the City within the Main Street overlay and the City's Ballpark District. However, this Project is not located within the Main Street overlay or the City's Ballpark District. As such, LOS D has been considered the minimum LOS at the study area intersections.

2.7.2 CALTRANS

Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State Highway System (SHS) facilities, however, Caltrans acknowledges that this may not always be feasible and recommends that the lead agency consult with Caltrans to determine the appropriate target LOS. If an existing State highway facility is operating at less than this target LOS, the existing LOS should be maintained. In general, the region-wide goal for an acceptable LOS on all freeways, roadway segments, and intersections is LOS D. Consistent with the City of Lake Elsinore LOS threshold of LOS D and in excess of the Riverside County Congestion Management Program (CMP) stated LOS threshold of LOS E, LOS D will be used as the target LOS for freeway ramps, freeway segments, and freeway merge/diverge ramp junctions.

2.8 CEQA COMPLIANCE AND DOCUMENTATION

This section outlines the methodology used in this analysis related to identifying circulation system deficiencies.

2.8.1 INTERSECTIONS

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

- When project traffic, when added to existing traffic, will deteriorate the LOS to below the target LOS.
- When cumulative traffic exceeds the target LOS.

2.8.2 CALTRANS FACILITIES

To determine whether the addition of project traffic to the SHS freeway segments would result in a deficiency, the following will be utilized:

- The traffic study finds that the LOS of a segment will degrade from D or better to E or F.
- The traffic study finds that the project will exacerbate an already deficient condition by contributing 50 or more peak hour trips. A segment that is operating at or near capacity is deemed to be deficient.

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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, traffic signal warrant, and freeway mainline operations 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 4 existing intersections as shown previously on Exhibit 1-2 where the Project is anticipated to contribute 50 or more peak hour trips. 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. The current site configuration is shown on Exhibit 3-2. As shown on Exhibit 3-2, the Project Access is located south of the I-15 Southbound Ramps at Lake Street. Lake Street is currently one lane in each direction at the Project driveway.

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 on the City of Lake Elsinore General Plan Circulation Element, are described subsequently. Exhibit 3-3 shows the City of Lake Elsinore General Plan Circulation Element, and Exhibit 3-4 illustrates the City of Lake Elsinore General Plan roadway cross-sections. Since adoption of the General Plan, the Alberhill Villages Specific Plan has been adopted in the study area. Exhibit 3-5 shows the Circulation Plan for the Alberhill Villages Specific Plan.

Exhibit 3-6 shows the Riverside County General Plan Circulation Element, and Exhibit 3-7 illustrates the Riverside County General Plan roadway cross-sections.

Urban Arterial Highways are 6 lanes with a minimum right-of-way of 120-feet. An Augmented Urban Arterial if 8 lanes. These highways are primarily for through traffic where traffic volumes exceed four-lane capacities. Access from other streets or highways shall be limited to approximately one-quarter mile intervals. The following study area roadway within the City of Lake Elsinore is classified as an Urban Arterial Highway:

- Lake Street
- Temescal Canyon Road
- Nichols Road

Lake Street is an Urban Arterial from Temescal Canyon Road south through the study area. North of Temescal Canyon Road, Lake Street is classified as an Augmented Urban Arterial however, the TUMF 2015 Nexus Update indicates that recent modeling results do not support increasing future lanes to 8 lanes. TUMF recommends 6 lanes for the section of Lake Street

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

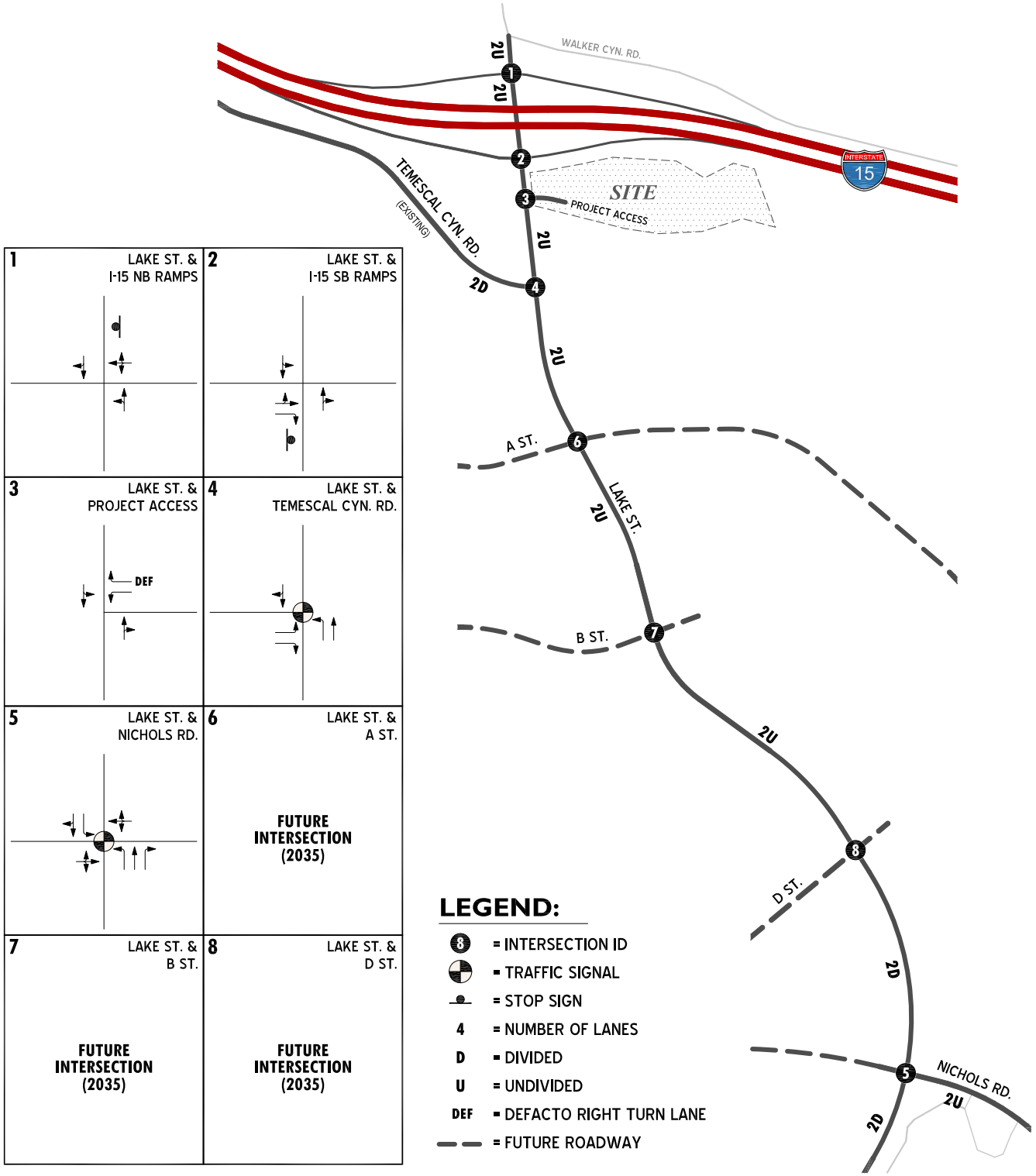
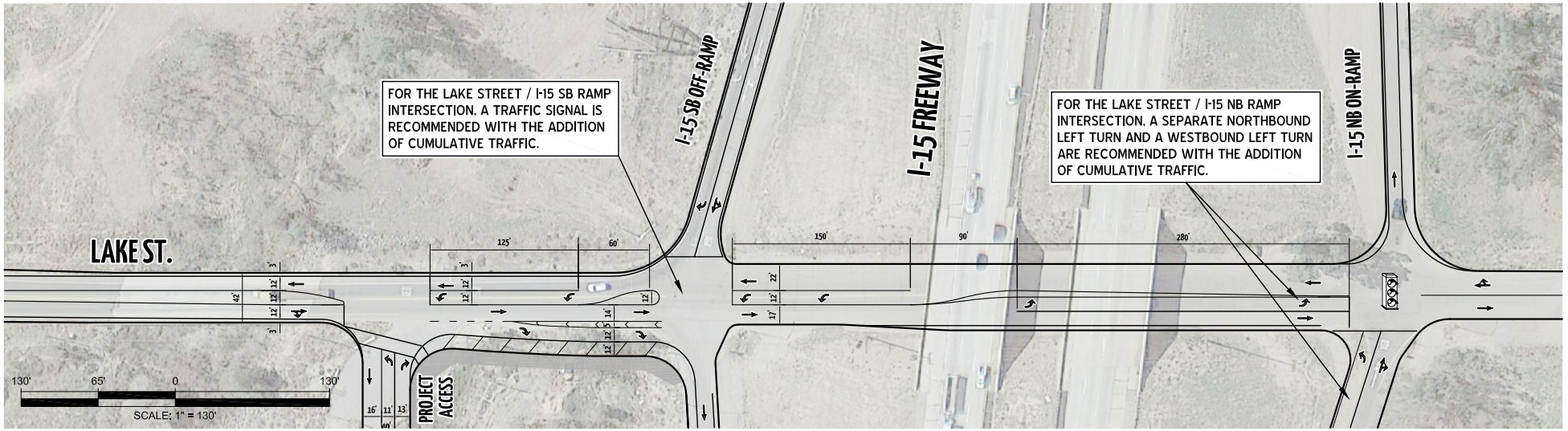
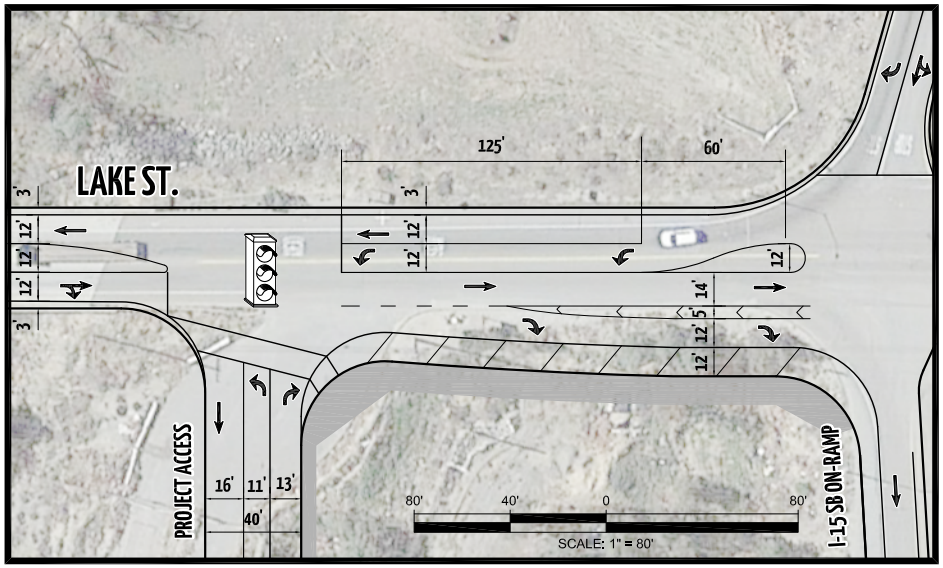


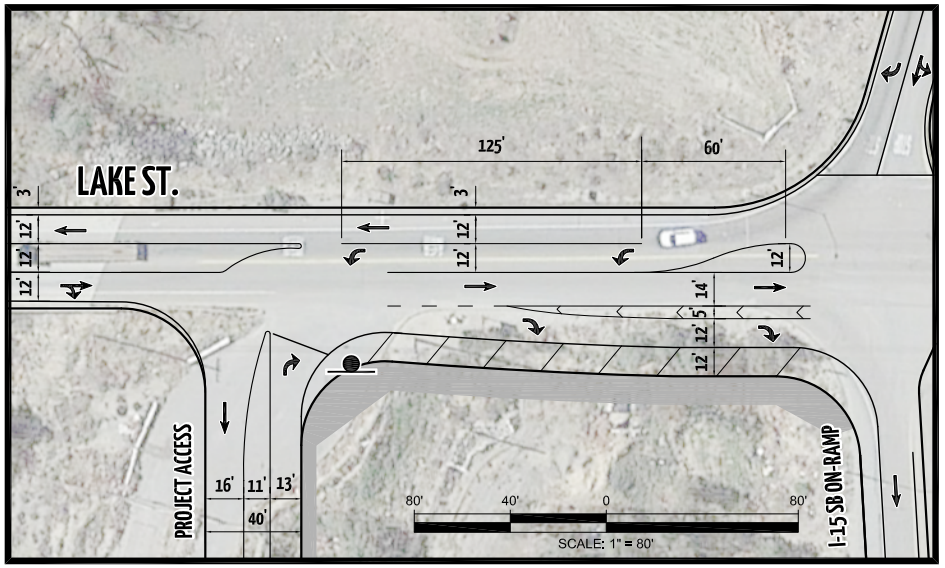
EXHIBIT 3-2: EXISTING PLUS PROJECT CONDITIONS WITH ADJUSTED DRIVEWAY



FULL ACCESS SIGNAL AT PROJECT ENTRY



NO LEFT-OUT/LEFT-IN CROSS-STREET STOP AT PROJECT ENTRY

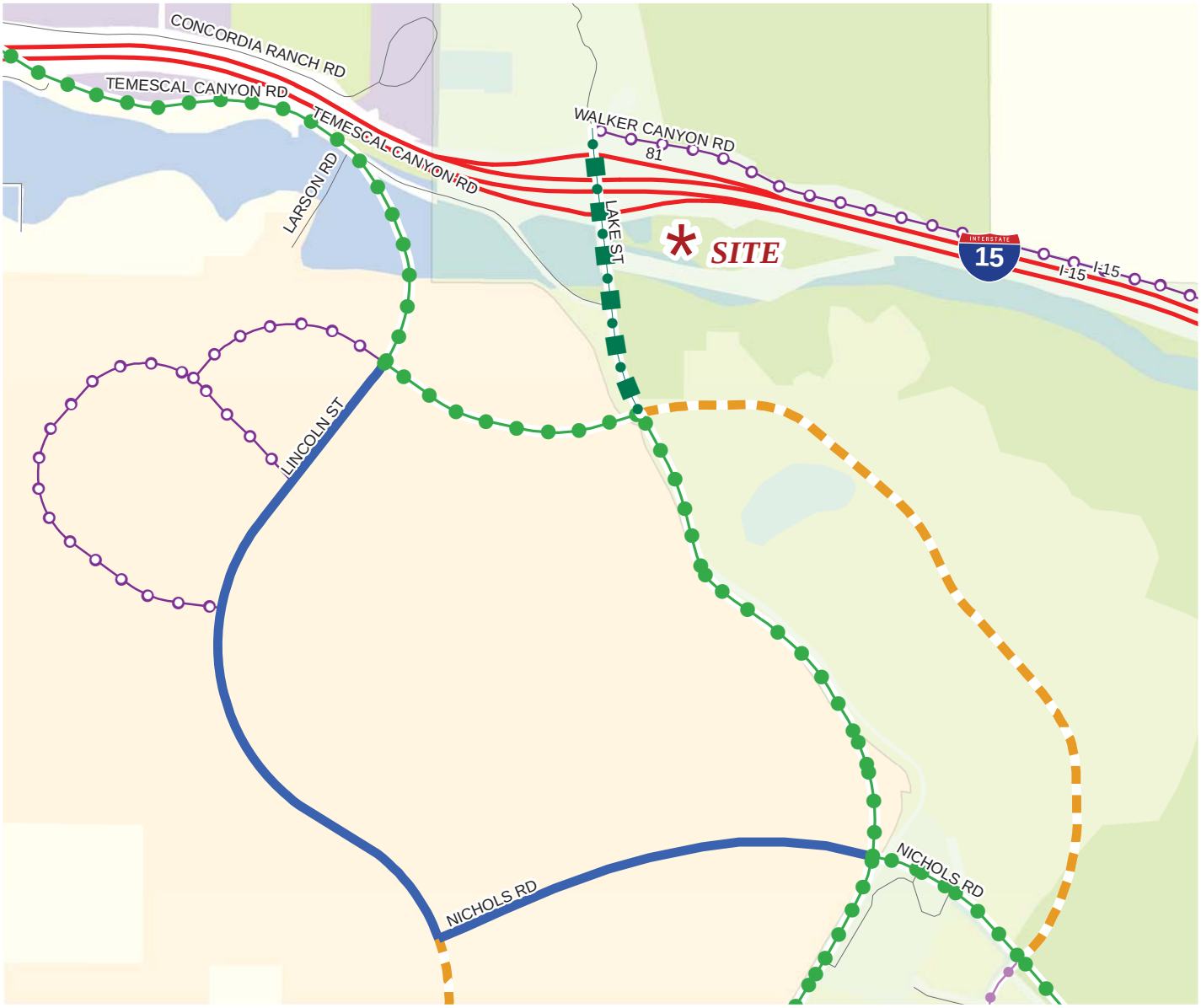


LEGEND:

= TRAFFIC SIGNAL = STOP SIGN

N

EXHIBIT 3-3: CITY OF LAKE ELSINORE GENERAL PLAN ROADWAY CLASSIFICATIONS



Legend

CITY CLASSIFICATION

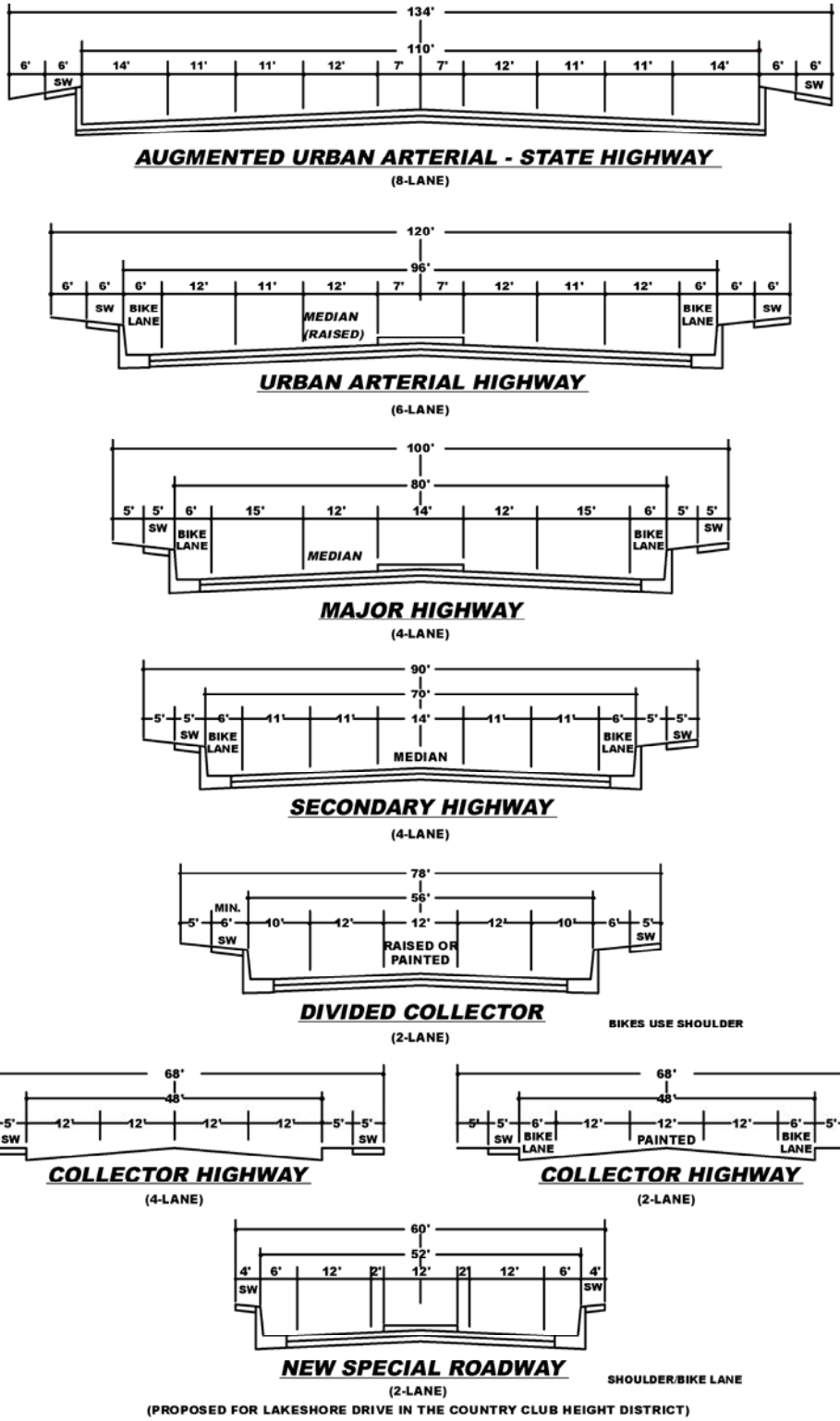
- AUGMENTED URBAN ARTERIAL (8-LANES)
- URBAN ARTERIAL (6-LANES / 120' R.O.W.)
- MAJOR (4-LANES / 100' R.O.W.)
- SECONDARY (4-LANES / 90' R.O.W.)
- DIVIDED COLLECTOR (2-LANES W/ POTENTIAL AUGMENTED INTERSECTIONS)
- COLLECTOR (2-LANES / 68' R.O.W.)
- FREEWAY, RAMPS

N

10898-Rivtam_recgpce.mxd

URBAN CROSSROADS

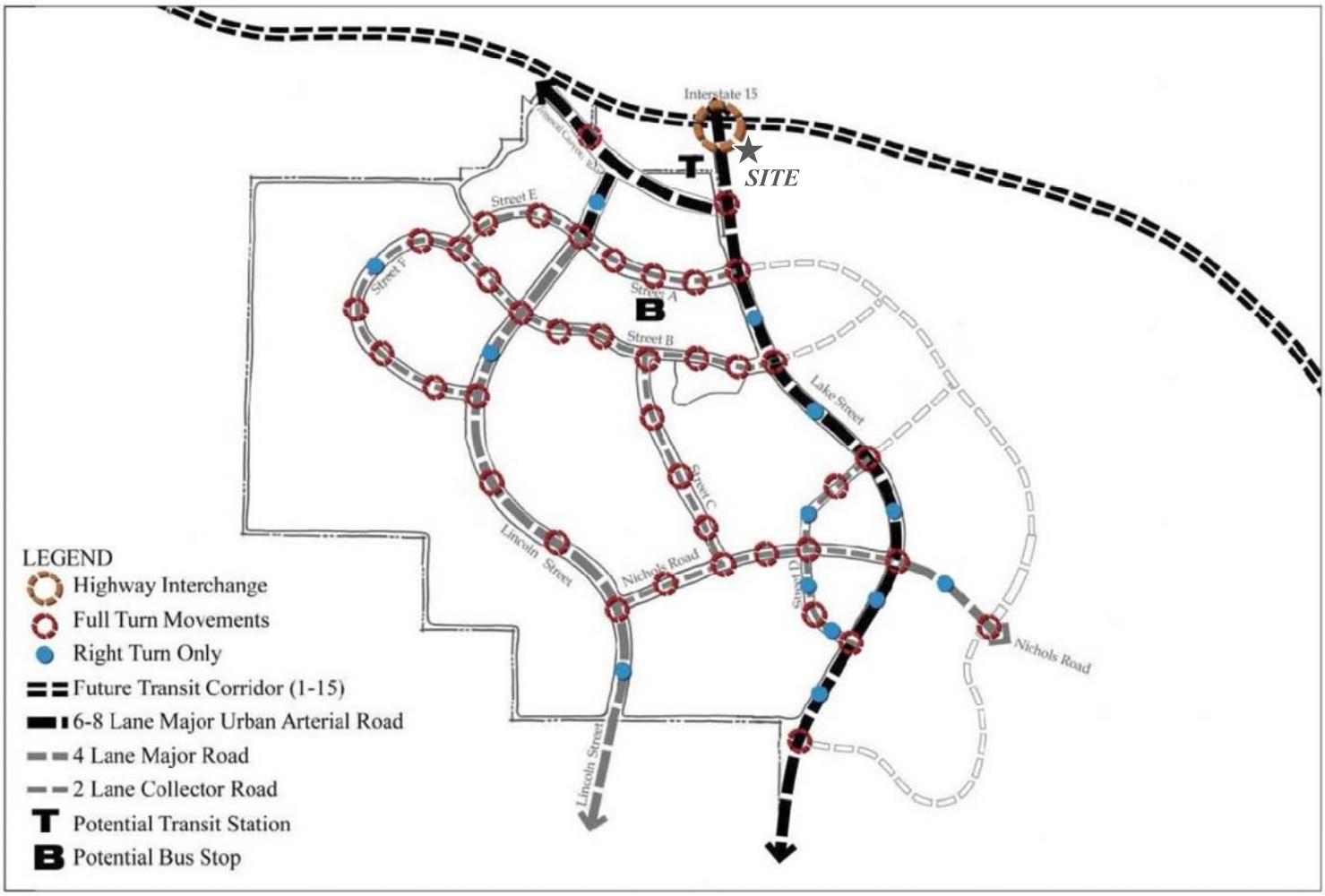
EXHIBIT 3-4: CITY OF LAKE ELSINORE GENERAL PLAN ROADWAY CROSS-SECTIONS



* 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.
STRIPING OF COLLECTOR HIGHWAY AS DIRECTED BY CITY ENGINEER.

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

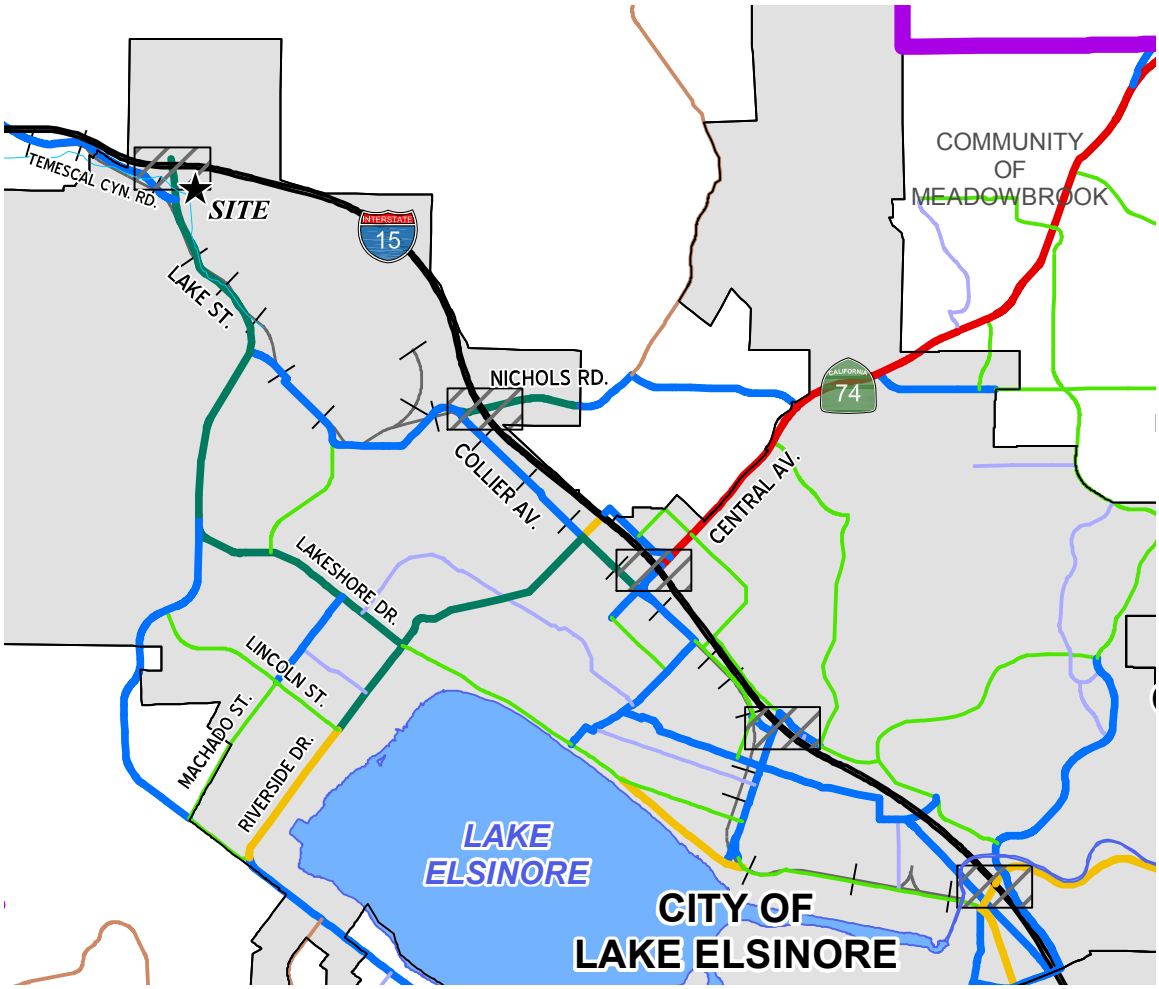
EXHIBIT 3-5: ALBERHILL VILLAGES SPECIFIC PLAN CIRCULATION PLAN



Source: Alberhill Villages Specific Plan (Adopted June 2016)

N

EXHIBIT 3-6: COUNTY OF RIVERSIDE GENERAL PLAN CIRCULATION ELEMENT

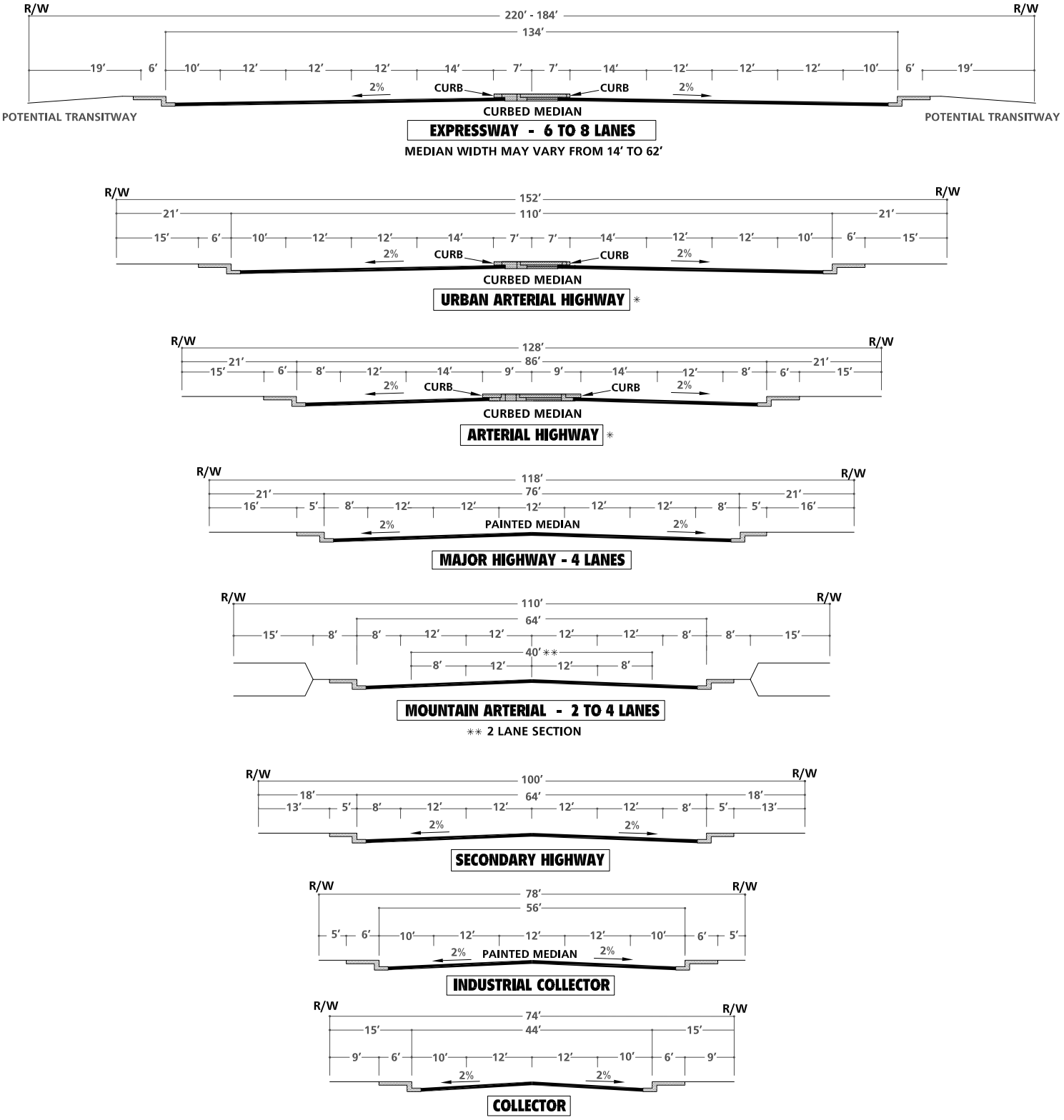


SOURCE: Riverside County Integrated Project (December 2015)

- Freeway (Variable ROW)
- Expressway (128' to 220' ROW)
- Urban Arterial (152' ROW)
- Arterial (128' ROW)
- Major (118' ROW)
- Secondary (100' ROW)
- Mountain Arterial 2 Ln (110' ROW)
- Collector (74' ROW)
- **Existing Interchange**
- **Proposed Interchange**
- **Existing Bridge**
- **Proposed Bridge**
- **Railroads Amended**
- **Highways**
- **Area Plan Boundary**
- **City Boundary**
- **Waterbodies**

N

EXHIBIT 3-7: COUNTY OF RIVERSIDE GENERAL PLAN ROADWAY CROSS-SECTIONS



* *IMPROVEMENTS MAY BE RECONFIGURED TO ACCOMMODATE EXCLUSIVE TRANSIT LANES OR ALTERNATIVE LANE ARRANGEMENTS ADDITIONAL RIGHT OF WAY MAY BE REQUIRED AT INTERSECTIONS TO ACCOMMODATE ULTIMATE IMPROVEMENTS FOR STATE HIGHWAYS SHALL CONFORM TO CALTRANS DESIGN STANDARDS.*

SOURCE: COUNTY OF RIVERSIDE

from Temescal Canyon Road through the I-15 interchange. The Lake Street Alignment Study (2015) shows 3 through lanes in each direction (6 lanes).

Secondary Highways are 4 lanes with right-of-way of 90-feet. A Street east of Lake Street is classified as Secondary.

Additional 4-lane roads in the Alberhill Villages Specific Plan area include A Street, B Street, D Street, and Nichols Road west of Lake Street.

3.3 BICYCLE & PEDESTRIAN FACILITIES

In an effort to promote alternative modes of transportation, the City of Lake Elsinore also includes a trails and bikeway system. The trails and bikeway system, shown on Exhibits 3-8 and 3-9, shows the proposed trails are connected with major features within the City and County.

Bike lanes are included on Urban Arterial highways, Major Highways, and Secondary Highways, according to the City of Lake Elsinore Roadway Cross-Sections. The Alberhill Villages Specific Plan identifies bike lanes on A Street, and discusses additional multi-use trails.

There is a regional trail along the east side of the I-15 Freeway within the study area. An Historic Trail is shown along Lake Street. A Combination Trail (Regional and Class I Bikeway) is shown along Temescal Canyon Road.

Class II bike lanes are shown for Lake Street, Temescal Canyon Road, and Nichols Road within the study area.

Field observations conducted in May 2017 indicate nominal pedestrian and bicycle activity within the study area. There are limited pedestrian and bicycle facilities within the study area.

3.4 TRANSIT SERVICE

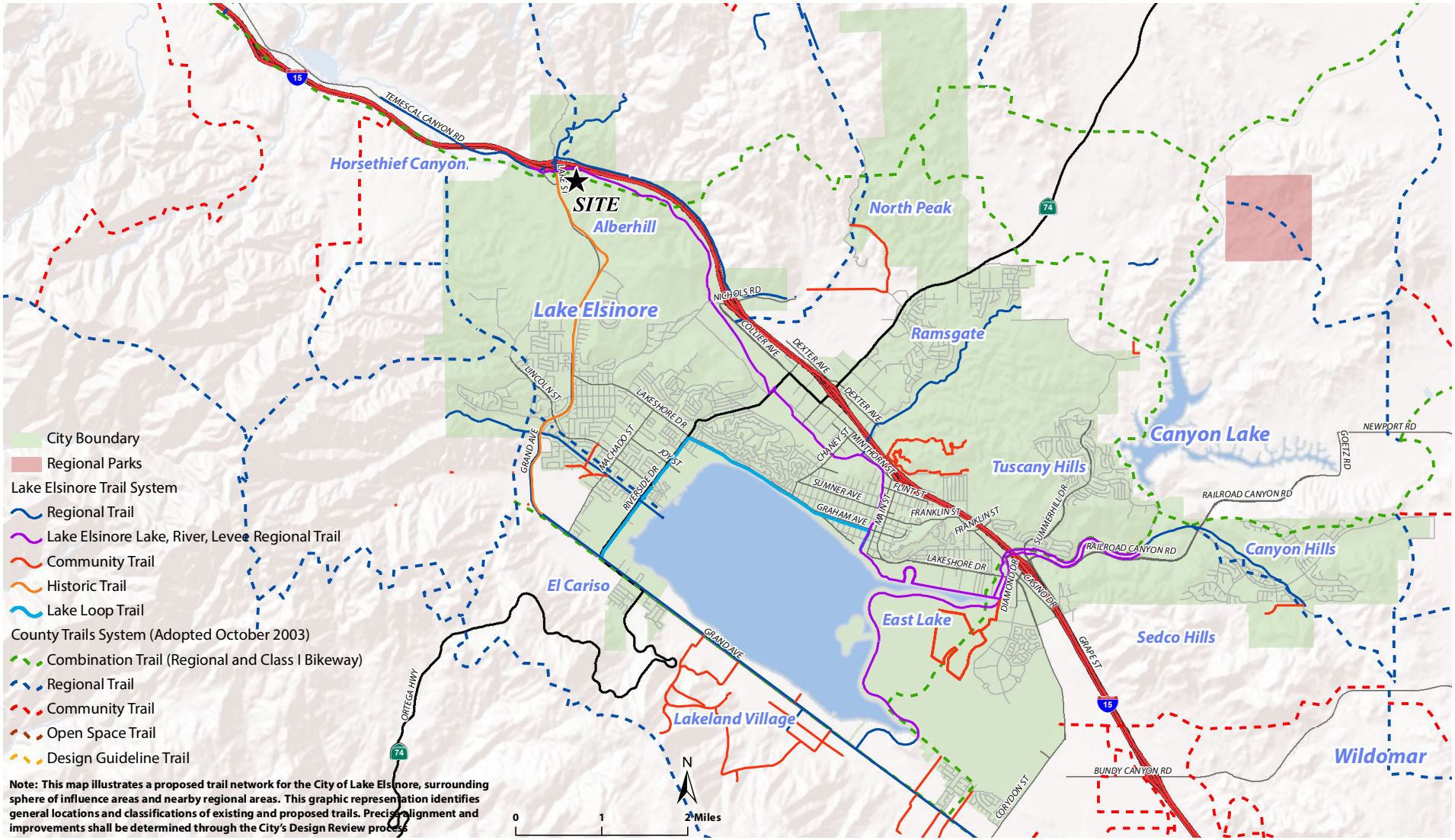
The study area is currently served by the Riverside Transit Authority (RTA), a public transit agency serving the unincorporated Riverside County region. There are currently no existing bus routes that serve the roadways within the study area in close proximity to the proposed Project. Transit service is reviewed and updated by RTA periodically to address ridership, budget and community demand needs. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate.

3.5 EXISTING (2017) TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in May 2017. The following peak hours were selected for analysis:

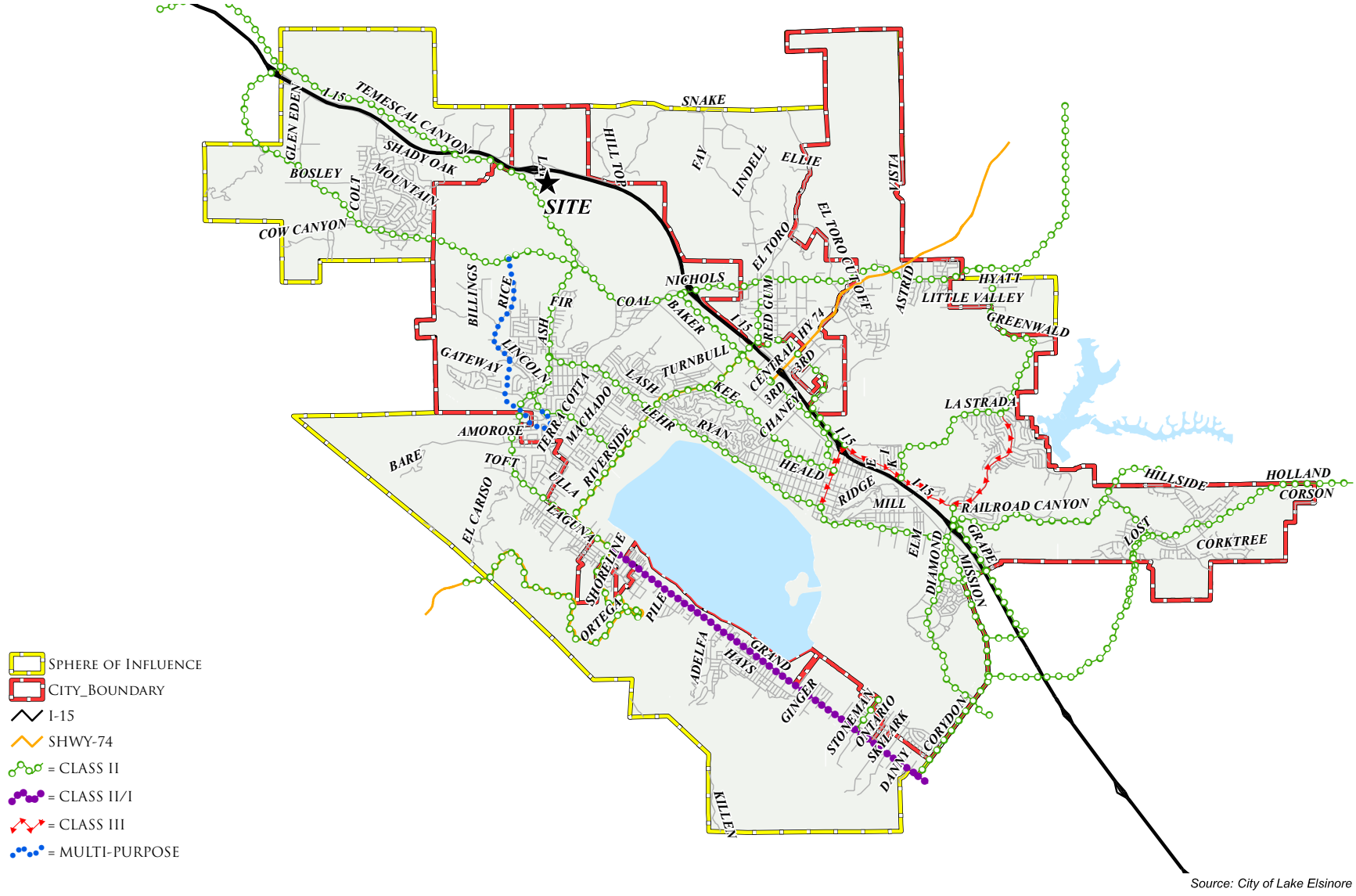
- Weekday AM Peak Hour (peak hour between 7:00 AM and 9:00 AM)
- Weekday PM Peak Hour (peak hour between 4:00 PM and 6:00 PM)

EXHIBIT 3-8: CITY OF LAKE ELSINORE AREA TRAILS SYSTEM



Source: City of Lake Elsinore

EXHIBIT 3-9: CITY OF LAKE ELSINORE BIKEWAY PLAN



Source: City of Lake Elsinore

The weekday AM and weekday PM peak hour count data is representative of typical weekday peak hour traffic conditions in the study area. The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1. These raw turning volumes have been flow conserved between intersections with limited access, no access and where there are currently no uses generating traffic (e.g., between ramp-to-arterial intersections, etc.). The traffic counts collected in May 2017 include the vehicle classifications as shown below:

- Passenger Cars
- 2-Axle Trucks
- 3-Axle Trucks
- 4 or More Axle Trucks

Existing weekday average daily traffic (ADT) volumes on arterial highways throughout the study area are shown on Exhibit 3-10. 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:

Weekday PM Peak Hour (Approach Volume + Exit Volume) x 12 = Leg Volume

Existing weekday AM and weekday PM peak hour intersection volumes are also shown on Exhibit 3-10.

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 the existing study area intersections are currently experiencing acceptable operations during the peak hours with the exception of Intersection #1 (Lake Street at I-15 NB Ramps). During the AM peak hour, Intersection #1 operates at LOS "F" for existing conditions:

ID	Intersection Location
1	Lake Street / I-15 Northbound Ramps – LOS F AM peak hour

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 traffic conditions are based on existing peak hour intersection turning volumes. Two study area intersections currently warrant a traffic signal for Existing traffic conditions: Lake Street / I-15 Northbound Ramps and Lake Street / I-15 Southbound Ramps. Existing conditions traffic signal warrant analysis worksheets are provided in Appendix 3.3.

3.8 BASIC FREEWAY SEGMENT ANALYSIS

Existing mainline directional volumes for the weekday AM and PM peak hours are also provided on Exhibit 3-10. As shown on Table 3-2, the basic freeway segments analyzed for this study were found to operate at an acceptable LOS during the peak hours. Existing basic freeway segment analysis worksheets are provided in Appendix 3.4.

3.9 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for Existing conditions and the results of this analysis are presented in Table 3-3. As shown in Table 3-3, the freeway ramp merge and diverge areas currently operate at LOS D or better. Existing freeway ramp junction operations analysis worksheets are provided in Appendix 3.5.

EXHIBIT 3-10: EXISTING (2017) TRAFFIC VOLUMES

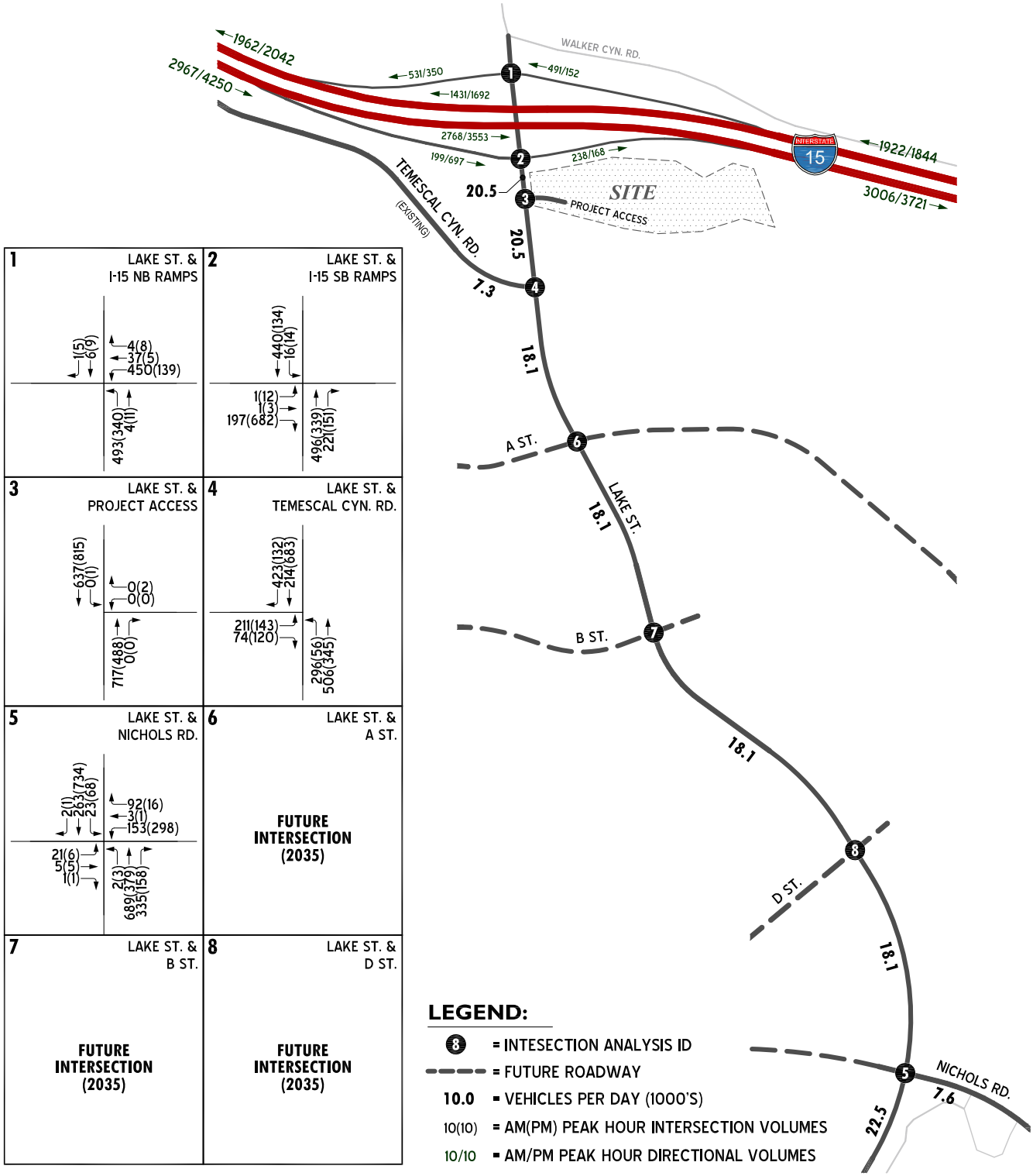


TABLE 3-1: INTERSECTION ANALYSIS FOR EXISTING (2017) CONDITIONS

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (Secs)		Level of Service[2]	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Lake St. / I-15 NB Ramps	CSS	0.5	0.5	0	0	1	0	0	0	0	0	1!	0	**>80**	33.2	**F**	D
2	Lake St. / I-15 SB Ramps	CSS	0	1	0	0.5	0.5	0	0.5	0.5	1	0	0	0	22.3	25.4	C	D
3	Lake St. / Project Access	CSS	0	1	0	0.5	0.5	0	0	0	0	1	0	d	0.0	12.0	A	B
4	Lake St. / Temescal Cyn. Rd.	TS	1	1	0	0	1	0	1	0	1	0	0	0	28.0	16.7	C	B
5	Lake St. / Nichols Rd.	TS	1	1	1	1	1	0	0	1!	0	0	1!	0	17.3	23.7	B	C
6	Lake St. / A St.		Intersection Does Not Exist															
7	Lake St. / B St.		Intersection Does Not Exist															
8	Lake St. / D St.		Intersection Does Not Exist															

[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; 1! = Shared Left / Through / Right Turn Lane; d = Defacto Right Turn Lane

[2] Per the 2010 Highway Capacity Manual, 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. Delay and level of service is calculated using Synchro 9.1 analysis software.

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[3] TS = Traffic Signal; CSY = Cross-street Yield (implied); CSS = Cross-street Stop; AWS = All-Way Stop

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TABLE 3-2: BASIC FREEWAY SEGMENT ANALYSIS FOR EXISTING (2017) CONDITIONS

Freeway	Direction	Mainline Segment Location	Lanes[1]	Volume		Density [2]		LOS [3]	
				AM	PM	AM	PM	AM	PM
I-15 Freeway	NB	South of Lake St.	3	1,922	1,844	10.3	9.9	A	A
		Between Ramps	3	1,431	1,692	7.7	9.1	A	A
		North of Lake St.	3	1,962	2,042	10.5	10.9	A	A
	SB	North of Lake St.	3	2,967	4,250	15.9	23.4	B	C
		Between Ramps	3	2,768	3,553	14.8	19.1	B	C
		South of Lake St.	3	3,006	3,721	16.1	20.1	B	C

[1] Number of lanes are in the specified direction and is based on existing conditions.

[2] Density is measured by passenger cars per mile per lane (pc/mi/ln).

[3] Level of service determined using HCS 2010: Basic Freeway Segments software, Version 6.65

BOLD = LOS E or F

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TABLE 3-3: FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS FOR EXISTING (2017) CONDITIONS

Freeway	Direction	Ramp Location	Junction Type	Lanes on Freeway	Lanes on Ramp	Volume		Density [1]		LOS [2]	
						AM	PM	AM	PM	AM	PM
I-15 Freeway	NB	NB Off Ramp at Lake St.	Diverge	3	1	491	152	15.5	14.3	B	B
		NB On Ramp at Lake St.	Merge	3	1	531	350	13.2	13.1	B	B
	SB	SB Off Ramp at Lake St.	Diverge	3	1	199	697	20.7	28.4	C	D
		SB On Ramp at Lake St.	Merge	3	1	238	168	17.3	20.8	B	C

[1] Density calculated based on the Highway Capacity Manual (HCM) analysis; (pc/mi/ln) = passenger car per mile per lane

[2] Level of service determined using HCS2010 : Ramps and Ramp Junction software, Version 6.65

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4 PROJECTED FUTURE TRAFFIC

The Project is proposed to consist of a gas station, indoor and outdoor RV storage, and self-storage buildings. The gas station includes 12 vehicle fueling positions. There are approximately 13.34 acres of RV storage and self storage.

Access to the Project site will be provided to Lake Street, with two options for driveway configuration documented in Sections 5.1 and 8.1. The driveway is planned to be configured as a full access driveway with signal control in near term and long range conditions, but an alternative access scenario evaluates the project without left turn out access, and the driveway controlled by a stop sign (near term) transitioning to modified signal control (long term). Regional access to the Project site is provided via the I-15 Freeway at Lake Street interchange.

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 statistics published in the Institute of Transportation Engineers (ITE) Trip Generation (9th Edition, 2012) manual for the proposed land use (ITE Land Use Code 151 – Mini Warehouse combined with ITE Land Use Code 945 – Gasoline/Service Station w/Convenience Market) are utilized in this traffic study. Table 4-1 presents the trip generation rates and trip generation total based on the quantities associated with the proposed Project.

As shown on Table 4-1, the proposed development is anticipated to generate a net total of approximately 2,426 trip-ends per day with 156 AM peak hour and 210 PM peak hour trips.

4.2 PROJECT TRIP DISTRIBUTION

Trip distribution is the process of identifying the probable destinations, directions or traffic routes that will be utilized by Project traffic. The potential interaction between the planned land uses and surrounding regional access routes are considered, to identify routes the Project traffic would use.

The Project trip distribution was developed based on anticipated travel patterns to and from the Project site. 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.

The Project trip distribution patterns for opening year traffic conditions are graphically depicted on Exhibit 4-1. Exhibit 4-2 illustrates the proposed Project trip distribution patterns under horizon year (2035) traffic conditions.

TABLE 4-1: PROJECT TRIP GENERATION SUMMARY

Trip Generation Rates[1]										
Land Use	ITE LU Code	Quantity[2]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Mini Warehouse	151	13.34 AC	1.16	1.42	2.58	1.79	1.78	3.57	35.43
Gasoline/Service Station w/Conven. Mkt.	945	12 VFP	5.08	5.08	10.16	6.76	6.75	13.51	162.78

Trip Generation Results									
Land Use	ITE LU Code	Quantity[2]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Public RV Storage & Self Storage	151	13.34 AC	15	19	34	24	24	48	473
Gasoline/Service Station w/Conven. Mkt.	945	12 VFP	61	61	122	81	81	162	1,953
TOTAL			**76**	**80**	**156**	**105**	**105**	**210**	**2,426**

[1] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, 9th Edition (2012).

[2] AC = Acres; VFP = Vehicle Fueling Positions

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EXHIBIT 4-1: PROJECT (OPENING YEAR) TRIP DISTRIBUTION

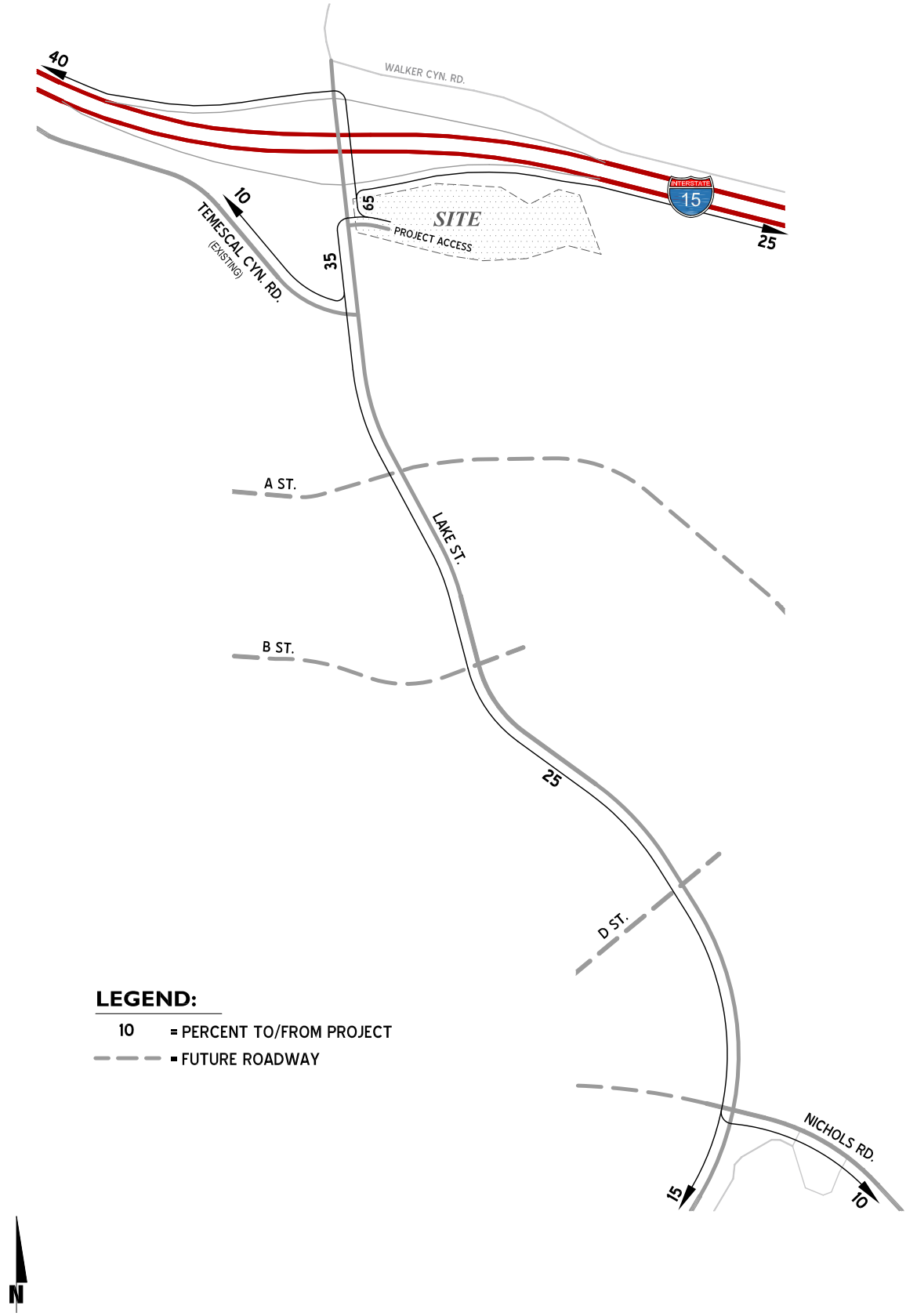
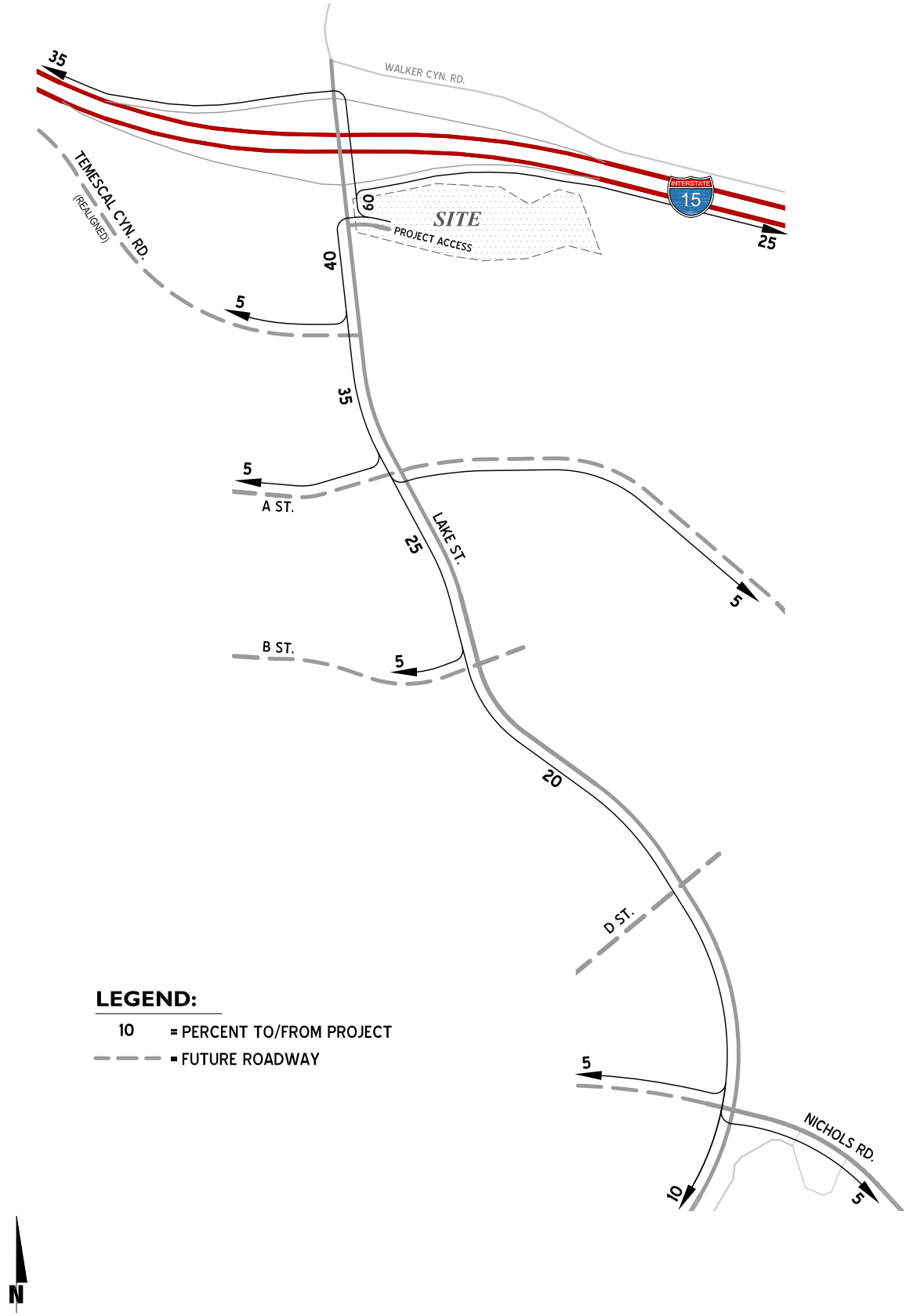


EXHIBIT 4-2: PROJECT (HORIZON YEAR 2035) TRIP DISTRIBUTION



4.3 MODAL SPLIT

The traffic reducing potential of public transit, walking or bicycling have not been considered in this TIA. Essentially, the traffic projections are "conservative" in that these alternative travel modes might be able to 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 ADT and peak hour intersection turning movement volumes are shown on Exhibit 4-3 for opening year conditions. Similarly, Project traffic volumes for Horizon Year (2035) are shown on Exhibit 4-4.

4.5 BACKGROUND TRAFFIC

Future year traffic forecasts have been based upon background (ambient) growth at 2% per year for 2018 traffic conditions. The ambient growth factor is intended to approximate regional traffic growth. 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.

4.6 CUMULATIVE DEVELOPMENT TRAFFIC

California Environmental Quality Act (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, the cumulative project list includes known and foreseeable projects that are anticipated to contribute traffic to the study area intersections. The cumulative projects provided by the City of Lake Elsinore are provided in Appendix 4.1.

Where applicable, cumulative projects anticipated to contribute measurable traffic (i.e. 50 or more peak hour trips) to study area intersections have been manually added to the study area network to generate EAPC forecasts. In other words, this list of cumulative development projects has been reviewed to determine which projects would likely contribute measurable traffic through the study area intersections (e.g., those cumulative projects in close proximity to the proposed Project). For the purposes of this analysis, the cumulative projects that were determined to affect one or more of the study area intersections are shown on Exhibit 4-5 and listed on Table 4-2.

EXHIBIT 4-3: PROJECT ONLY (OPENING YEAR 2018) TRAFFIC VOLUMES

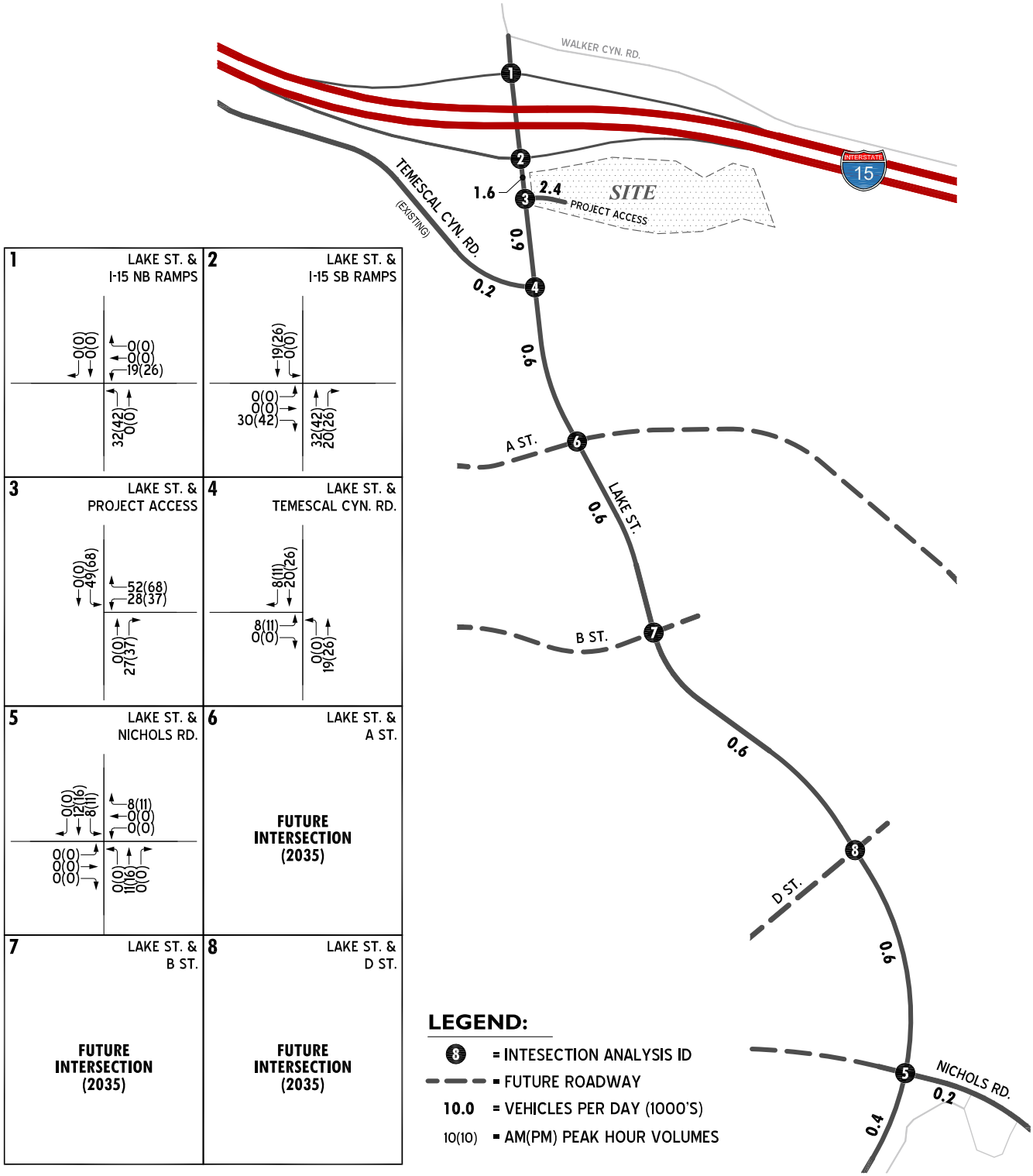


EXHIBIT 4-4: PROJECT ONLY (HORIZON YEAR 2035) TRAFFIC VOLUMES

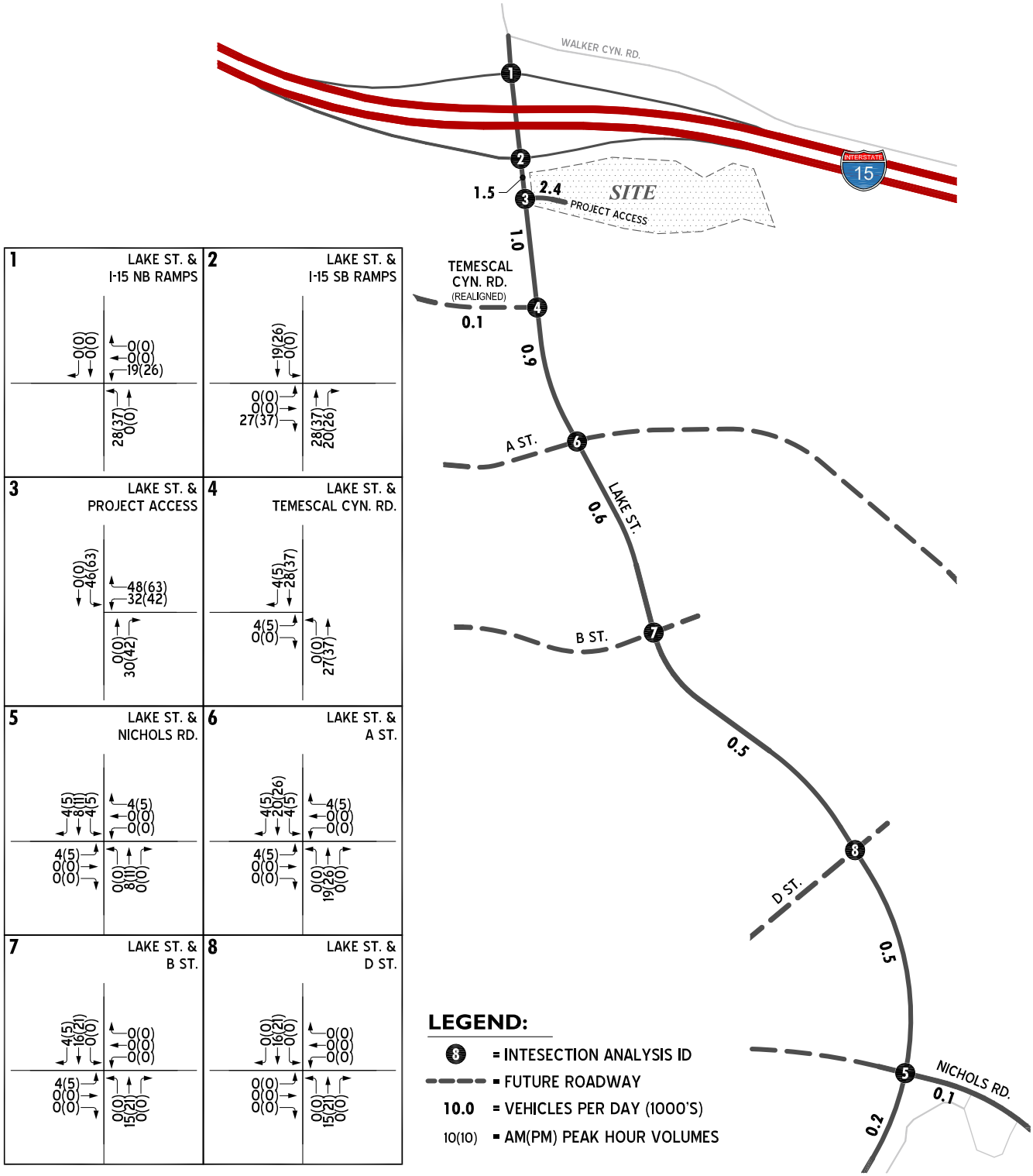


EXHIBIT 4-5: CUMULATIVE DEVELOPMENT PROJECTS LOCATION MAP

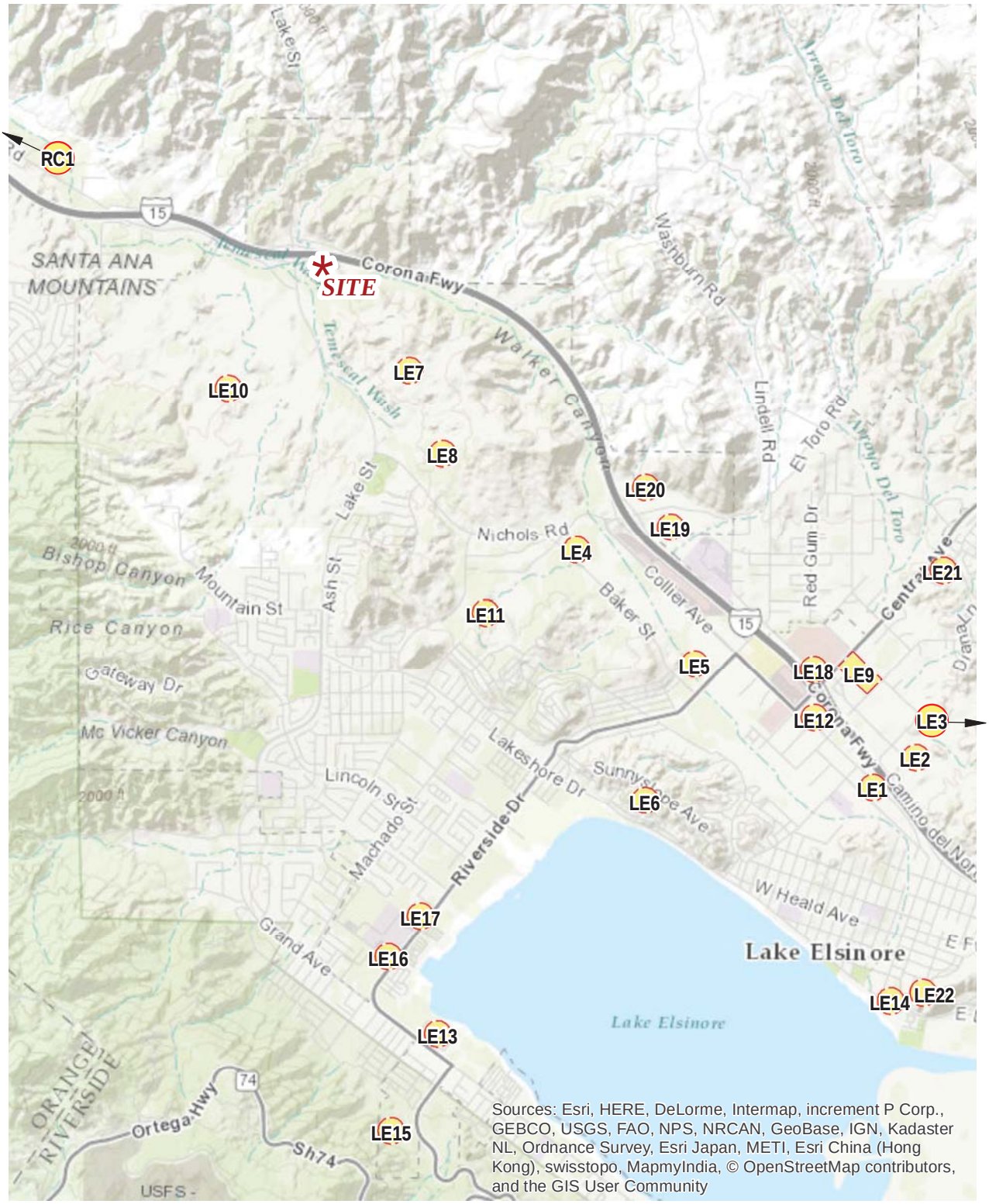


TABLE 4-2: CUMULATIVE DEVELOPMENT TRIP GENERATION SUMMARY (2018)

ID	Project Name	Land Use	ITE LU Code	Opening Year 2018 Quantity[1,2]	AM Peak Hour			PM Peak Hour			Daily
					In	Out	Total	In	Out	Total	
LE1	1400 Minthorn Street	Single Family Detached	210	84 DU	16	47	63	53	31	84	800
LE2	Spyglass Ranch[3]	Single Family Detached	210	123 DU	23	69	92	77	46	123	1,171
LE3	South Shore[3]	Single Family Detached	210	113 DU	21	63	84	71	42	113	1,076
LE4	Quikrete Plant	General Office Building	710	7.034 TSF	20	3	23	15	72	87	175
		Manufacturing	140	57.966 TSF	33	9	42	15	27	42	221
		Outdoor Storage	151	98.905 TSF	8	6	14	13	13	26	247
	Subtotal				61	18	79	43	112	155	643
LE5	Kassab Travel Center	Gasoline/Service Station w/Conven. Mkt.	945	6.0 TSF	251	241	492	292	292	584	7,046
		Fast Food w/ Drive Thru	934	2.543 TSF	59	57	116	43	40	83	1,262
	Tige Watersports	Industrial Park	130	25.682 TSF	17	4	21	5	17	22	175
	Subtotal				327	302	629	340	349	689	8,483
LE6	Hotel at 17584 Lawrence Wy.	Hotel	310	57 RM	22	16	38	19	21	40	508
LE7	Alberhill Ridge (Tract 35001)[4]	Mixed-Use	-	- -	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LE8	Alberhill Ranch[3]	Single Family Detached	210	362 DU	69	203	272	228	134	362	3,446
LE9	Lake Elsinore Walmart[5]	Mixed-Use	-	- -	339	256	595	412	417	829	11,723
LE10	Alberhill Villages[4]	Mixed-Use	-	- -	N/A	N/A	N/A	N/A	N/A	N/A	N/A
LE11	Terracina	Single Family Detached	210	112 DU	21	63	84	71	41	112	1,066
		Residential Condo/Townhouse	230	51 DU	4	19	23	18	9	27	296
	Subtotal				25	82	107	89	50	139	1,362
LE12	Central Plaza	Shopping Center	820	53.469 TSF	66	41	107	189	205	394	4,521
		Fast Food w/ Drive Thru	934	12.334 TSF	286	275	561	209	193	402	6,119
	Subtotal				352	316	668	398	398	796	10,640
LE13	Wake Rider Beach Resort[6]	Single Tenant Office Building	715	1.785 TSF	3	0	3	0	3	3	21
		Fast Food w/ Drive Thru	934	2.315 TSF	54	52	106	39	36	75	1,149
		Resort Hotel	330	50 RM	11	5	16	9	12	21	300
		Quality Restaurant	931	7.395 TSF	4	2	6	37	18	55	665
		Marina	420	15 BERTH	1	1	2	3	2	5	66
	Subtotal				73	60	133	88	71	159	2,201
LE14	Lakeshore Town Center[3]	Town Center	-	118.7 TSF	12	49	61	47	26	73	789
LE15	Ortega[3]	Single Family Detached	210	52.5 DU	10	29	39	33	19	52	500
LE16	Village at Lake Elsinore SPA #1	Single Family Detached	210	82 DU	16	46	62	52	30	82	781
LE17	Lake Shore Pointe	Apartment	220	76 DU	8	31	39	30	17	47	505
LE18	Golden Corral Restaurant	High Turnover (Sit-Down) Restaurant	932	7.798 TSF	46	38	84	46	31	77	992
LE19	South Nichols Mixed-Use[7]	Mixed-Use	-	- -	107	139	246	158	119	277	3,017
LE20	Amendment No.2 to Reclamation Plan 2006-01[8]	Mine Expansion	-	0.857 MTPY	34	30	64	26	27	53	425

TABLE 4-2: CUMULATIVE DEVELOPMENT TRIP GENERATION SUMMARY (2018)

ID	Project Name	Land Use	ITE LU Code	Opening Year 2018 Quantity[1,2]	AM Peak Hour			PM Peak Hour			Daily
					In	Out	Total	In	Out	Total	
LE21	Trieste Residential (Tract 36624)	Single Family Detached	210	75 DU	14	42	56	47	28	75	714
LE22	Sky Memorial Center	Museum	580	20 TSF	5	1	6	1	3	4	36
RC1	Toscana SP (TTM 36826)	Single Family Detached	210	125 DU	24	70	94	79	46	125	1,190
Cumulative Development Projects Total Trips					**1,604**	**1,907**	**3,511**	**2,337**	**2,017**	**4,354**	**51,002**

[1] DU = Dwelling Units; TSF = Thousand Square Feet; VFP = Vehicle Fueling Positions; RM = Rooms; MTPY = Million Tons Per Year; STU = Students

[2] Assumued Absorption Rates for Opening Year 2018:
Residential Use: ≤ 100 DU = 100% built; 101 to 300 DU = 50% built; >300 = 25% built
Non-Residential Use: ≤ 300 TSF = 100% built; 301 to 500 = 50% built; >500 = 25% built

[3] Source: Lake Elsinore Current Developer Projects List (City of Lake Elsinore, 2013)

[4] Occupancies within this development project are not anticipated by 2018

[5] Source: Lake Elsinore Walmart (November 2013). Prepared by Urban Crossroads, Inc.

[6] Source: Wakerider Beach Resort Traffic Study (May 2015). Prepared by RK Engineering.

[7] Source: South Nichols Mixed-Use Development TIA (June 2017). Prepared by Urban Crossroads, Inc.

[8] Source: Amendment No. 2 to Reclamatioin Plan 2006-01 TIA (August 2016). Prepared by Urban Crossroads, Inc.

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Any other cumulative projects that are not expected to contribute measurable traffic to study area intersections have not been included since the traffic would dissipate due to the distance from the Project site and study area intersections. Any additional traffic generated by other projects not on the cumulative projects list is accounted for through background ambient growth factors that have been applied to the peak hour volumes at study area intersections as discussed in Section 4.5 *Background Traffic*. Cumulative Project ADT and peak hour intersection turning movement volumes are shown on Exhibit 4-6 for opening year conditions.

4.7 NEAR-TERM TRAFFIC FORECASTS

To provide a comprehensive assessment of potential transportation network deficiencies, two types of analyses, "buildup" and "buildout", were performed in support of this work effort. The "buildup" method was used to approximate the EAP traffic forecasts includes background traffic, and is intended to identify the peak hour LOS deficiencies on both the existing and planned near-term circulation system. The "buildup" method was also utilized to approximate the EAPC traffic forecasts, and is intended to identify the LOS deficiencies on the existing and near-term circulation system. The EAPC traffic forecasts include background traffic, traffic generated by other cumulative development projects within the study area, and the traffic generated by the proposed Project. The "buildout" approach is used to forecast the Horizon Year Without and With Project conditions of the study area.

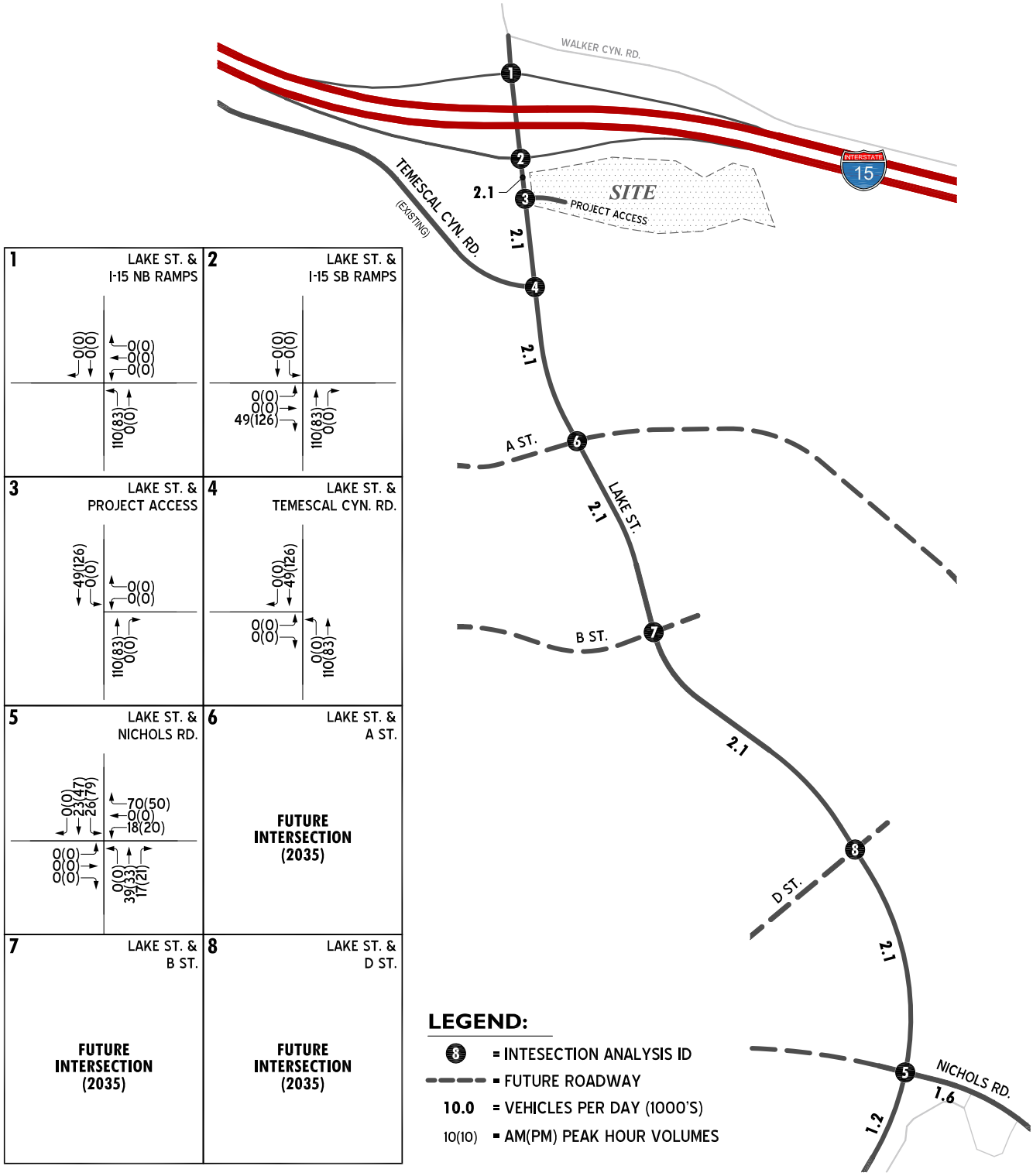
The near-term traffic analysis includes the following traffic components:

- EAP (2018)
    - Existing 2017 counts
    - Ambient growth traffic (2%)
    - Project traffic

- EAPC (2018)
    - Existing 2017 counts
    - Ambient growth traffic (2%)
    - Cumulative Development Project traffic
    - Project traffic

The "buildup" approach combines existing traffic counts with a background ambient growth factor to forecast the near-term 2018 traffic conditions. An ambient growth factor of 2% (2018) accounts for background (area-wide) traffic increases that occur over time, up to the year 2018 from the year 2017 (two percent per year growth over a one year period). Traffic volumes generated by the Project are then added to assess the EAP and EAPC traffic conditions. The 2018 roadway network is consistent with the existing conditions roadway network.

EXHIBIT 4-6: CUMULATIVE DEVELOPMENT ONLY TRAFFIC VOLUMES



4.8 HORIZON YEAR (2035) VOLUME DEVELOPMENT

The Horizon Year (2035) With Project traffic conditions were derived from the Riverside County Transportation Analysis Model (RivTAM) using accepted procedures for model forecast refinement and smoothing. The traffic forecasts reflect the area-wide growth anticipated between Existing conditions and Horizon Year conditions.

In most instances the traffic model zone structure is not designed to provide accurate turning movements along arterial roadways unless refinement and reasonableness checking is performed. Therefore, the Horizon Year With Project peak hour forecasts were refined using the model derived long-range forecasts, along with existing peak hour traffic count data collected at each analysis location in May 2017. Future estimated peak hour traffic data was used for new intersections and intersections with an anticipated change in travel patterns to further refine the Horizon Year With Project peak hour forecasts.

The refined future peak hour approach and departure volumes obtained from the model output data are reviewed and post-processed in accordance with accepted procedures. In an effort to conduct a conservative analysis, reductions to traffic forecasts from either Existing or EAPC traffic conditions were not assumed as part of this analysis. As such, in conjunction with the addition of cumulative projects that are not consistent with the General Plan, additional growth has also been applied on a movement-by-movement basis, where applicable, to estimate reasonable Horizon Year forecasts. Horizon Year turning volumes were compared to EAPC volumes in order to ensure a minimum growth as a part of the refinement process. The minimum growth includes any additional growth between EAPC and Horizon Year traffic conditions that is not accounted for by the traffic generated by cumulative development projects and ambient growth rates assumed between Existing (2017) and EAPC traffic conditions. Future estimated peak hour traffic data was used for new intersections and intersections with an anticipated change in travel patterns to further refine the Horizon Year peak hour forecasts.

The future Horizon Year without Project peak hour turning movements were then reviewed by Urban Crossroads for reasonableness, and in some cases, were adjusted to achieve flow conservation, reasonable growth, and reasonable diversion between parallel routes. Flow conservation checks ensure that traffic flow between two closely spaced intersections, such as two freeway ramp locations, is verified in order to make certain that vehicles leaving one intersection are entering the adjacent intersection and that there are no unexplained loss of vehicles. The result of this traffic forecasting procedure is a series of traffic volumes which are suitable for traffic operations analysis.

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5 E+P TRAFFIC CONDITIONS

This section discusses the traffic forecasts for Existing plus Project (E+P) conditions and the resulting intersection operations, traffic signal warrant, freeway mainline and ramp 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 Project Access to Lake Street. The concept layout of the Project Access, including nearby intersections is shown on Exhibit 3-2 (previously presented). Two alternatives for the Project Access are shown: full access with traffic signal control, or no left out (with left in and right in/out) access with cross-street stop control.

5.2 EXISTING PLUS PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus Project traffic. Exhibit 5-1 shows the ADT and peak hour intersection turning movement volumes anticipated for E+P traffic conditions.

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 operations analysis results are summarized in Table 5-1. The following study area intersections are anticipated to operate at unacceptable LOS during the peak hours under E+P (2017) traffic conditions:

ID	Intersection Location
1	Lake Street / I-15 Northbound Ramps – LOS F AM and PM peak hours
3	Lake Street / Project Access – LOS F AM and PM peak hours

Intersection #1 (Lake Street at I-15 NB Ramps) continues to experience deficient operations in the AM peak hour, consistent with Existing conditions. The PM peak hour also experiences deficient operations at this intersection for E+P conditions. One additional study area intersection is anticipated to experience deficient operations with the addition of the Project. Lake Street at Project Access is projected to operate at LOS "F" in both the AM and PM peak hours without improvements for E+P conditions. The remaining existing intersections experience acceptable operations for E+P conditions. The intersection operations analysis worksheets for E+P traffic conditions are included in Appendix 5.1 of this TIA. Measures to address E+P deficiencies are discussed in Section 5.7 *E+P Deficiencies and Recommended Improvements*.

EXHIBIT 5-1: EXISTING PLUS PROJECT TRAFFIC VOLUMES

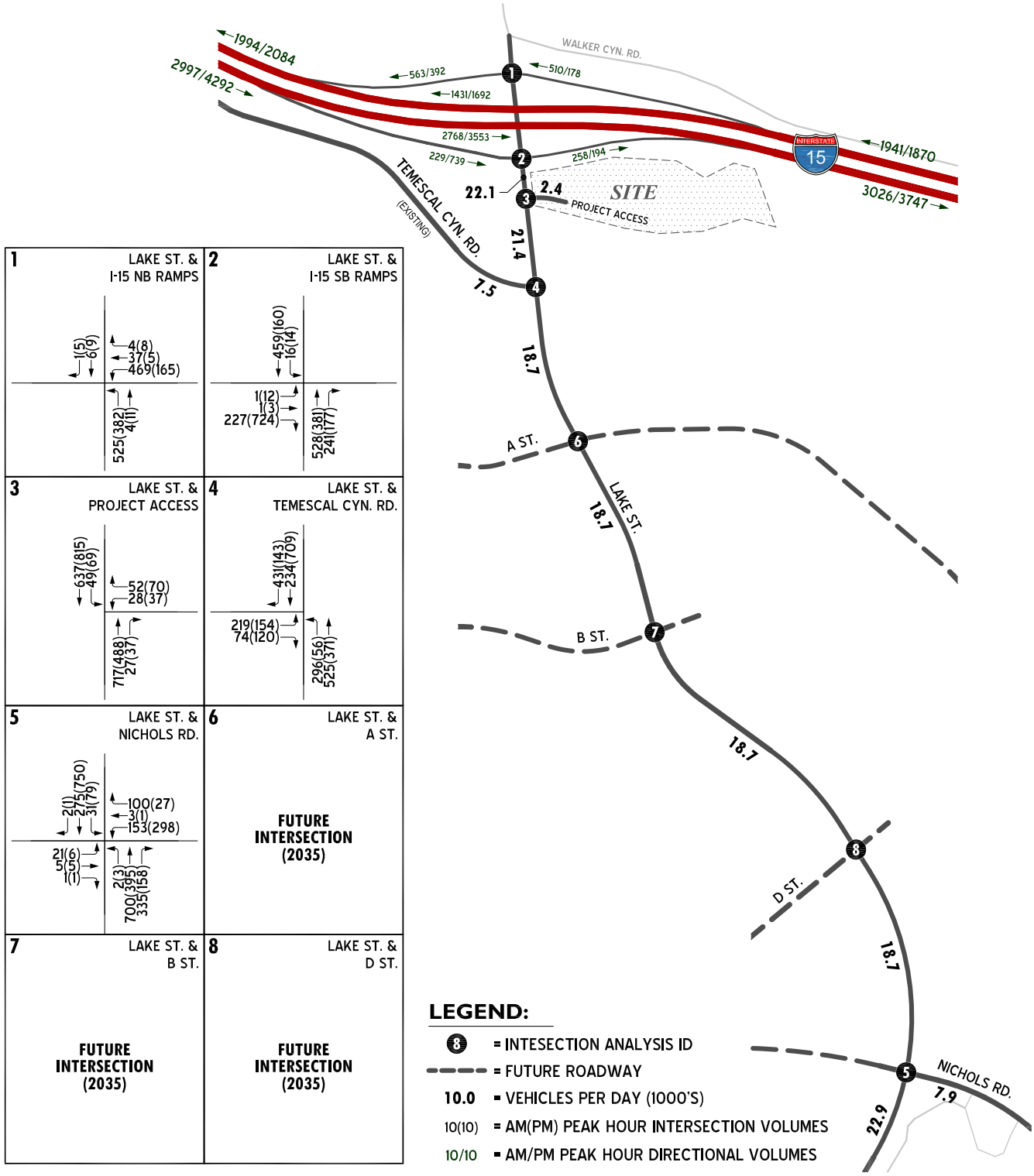

TABLE 5-1: INTERSECTION ANALYSIS FOR EXISTING PLUS PROJECT CONDITIONS

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (Secs)		Level of Service[2]	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Lake St. / I-15 NB Ramps																	
	- Without Improvements	CSS	0.5	0.5	0	0	1	0	0	0	0	0	1!	0	**>80**	**60.6**	**F**	**F**
	- With Improvements	**TS**	0.5	0.5	0	0	1	0	0	0	0	0	1!	0	31.3	15.2	C	B
2	Lake St. / I-15 SB Ramps																	
	- Without Improvements	CSS	0	1	0	0.5	0.5	0	0.5	0.5	1	0	0	0	24.1	33.5	C	D
	- With Improvements	CSS	0	1	**1**	**1**	1	0	0.5	0.5	1	0	0	0	20.7	33.5	C	D
3	Lake St. / Project Access																	
	- Without Improvements	CSS	0	1	0	0.5	0.5	0	0	0	0	1	0	d	**55.6**	**72.7**	**F**	**F**
	- Full Access at Project Entry	**TS**	0	1	0	**1**	1	0	0	0	0	1	0	**1**	8.1	8.6	A	A
	- No Left-Out/Left-In at Project Entry	CSS	0	1	0	**1**	1	0	0	0	0	**0**	0	**1**	17.7	14.3	C	B
4	Lake St. / Temescal Cyn. Rd.	TS	1	1	0	0	1	0	1	0	1	0	0	0	30.0	17.5	C	B
5	Lake St. / Nichols Rd.	TS	1	1	1	1	1	0	0	1!	0	0	1!	0	18.1	25.1	B	C
6	Lake St. / A St.		Intersection Does Not Exist															
7	Lake St. / B St.		Intersection Does Not Exist															
8	Lake St. / D St.		Intersection Does Not Exist															

[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; 1! = Shared Left / Through / Right Turn Lane; d = Defacto Right Turn Lane

[2] Per the 2010 Highway Capacity Manual, 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. Delay and level of service is calculated using Synchro 9.1 analysis software.

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[3] TS = Traffic Signal; CSY = Cross-street Yield (implied); CSS = Cross-street Stop; AWS = All-Way Stop

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5.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

In addition to the two intersections that satisfy signal warrants in Existing conditions, there is one additional intersection anticipated to meet traffic signal warrants for E+P traffic conditions: Lake Street at Project Access (see Appendix 5.2).

5.5 BASIC FREEWAY SEGMENT ANALYSIS

E+P mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibits 5-1. As shown on Table 5-2, the basic freeway segments analyzed for this study are anticipated to operate at an acceptable LOS during the peak hours, with the addition of Project traffic. E+P basic freeway segment analysis worksheets are provided in Appendix 5.3.

5.6 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for E+P traffic conditions and the results of this analysis are presented in Table 5-3. As shown in Table 5-3, the freeway ramp merge and diverge areas are anticipated to operate at LOS D or better. E+P freeway ramp junction operations analysis worksheets are provided in Appendix 5.4.

5.7 E+P DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

Improvement strategies have been recommended at intersections that have been identified as deficient in an effort to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS D or better). The effectiveness of the recommended improvement strategies discussed below to address E+P traffic deficiencies is presented in Table 5-1. Worksheets for E+P conditions, with improvements, HCM calculation worksheets are provided also in Appendix 5.1.

Locally funded improvements (TRACT 28214) for E+P conditions at the Lake Street/I-15 interchange include the following:

- Traffic signal at the intersection of Lake Street/I-15 NB Ramps (#1)
- Provide a separate northbound right turn lane and a separate southbound left turn lane at the intersection of Lake Street/I-15 SB Ramps (#2)

TABLE 5-2: BASIC FREEWAY SEGMENT ANALYSIS FOR EXISTING PLUS PROJECT CONDITIONS

Freeway	Direction	Mainline Segment Location	Lanes[1]	Volume		Density[2]		LOS[3]	
				AM	PM	AM	PM	AM	PM
I-15 Freeway	NB	South of Lake St.	3	1,941	1,870	10.4	10.0	A	A
		Between Ramps	3	1,431	1,692	7.7	9.1	A	A
		North of Lake St.	3	1,994	2,084	10.7	11.2	A	B
	SB	North of Lake St.	3	2,997	4,292	16.1	23.6	B	C
		Between Ramps	3	2,768	3,553	14.8	19.1	B	C
		South of Lake St.	3	3,026	3,747	16.2	20.2	B	C

[1] Number of lanes are in the specified direction and is based on existing conditions

[2] Density is measured by passenger cars per mile per lane (pc/mi/ln)

[3] Level of service determined using HCS 2010: Basic Freeway Segments software, Version 6.65

BOLD = LOS E or F

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TABLE 5-3: FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS FOR EXISTING PLUS PROJECT CONDITIONS

Freeway	Direction	Ramp Location	Junction Type	Lanes on Freeway	Lanes on Ramp	Volume		Density [1]		LOS [2]	
						AM	PM	AM	PM	AM	PM
I-15 Freeway	NB	NB Off Ramp at Lake St.	Diverge	3	1	510	178	15.7	14.5	B	B
		NB On Ramp at Lake St.	Merge	3	1	563	392	13.5	13.5	B	B
	SB	SB Off Ramp at Lake St.	Diverge	3	1	229	739	20.9	28.7	C	D
		SB On Ramp at Lake St.	Merge	3	1	258	194	17.5	21.0	B	C

[1] Density calculated based on the Highway Capacity Manual (HCM) analysis; (pc/mi/ln) = passenger car per mile per lane

[2] Level of service determined using HCS2010 : Ramps and Ramp Junction software, Version 6.65

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6 EAP (2018) TRAFFIC CONDITIONS

This section discusses the methods used to develop Existing plus Ambient Growth plus Project (EAP) (2018) traffic forecasts, and the resulting intersection operations, traffic signal warrant, and freeway mainline operations analyses.

6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for EAP conditions are consistent with those documented in Section 5.1.

6.2 EAP (2018) TRAFFIC VOLUME FORECASTS

To account for background traffic growth, an ambient growth from Existing conditions of 2% (2 percent per year for 1 year) is included for EAP traffic conditions. Cumulative development projects are not included as part of the EAP analysis. The weekday ADT and weekday AM and PM peak hour volumes anticipated for EAP traffic conditions are shown on Exhibit 6-1.

6.3 INTERSECTION OPERATIONS ANALYSIS

LOS calculations (see Table 6-1) were conducted for the study intersections to evaluate their operations under EAP conditions with roadway and intersection geometrics consistent with Section 6.1 *Roadway Improvements*. The following study area intersections are anticipated to operate at unacceptable LOS during the peak hours under EAP (2018) traffic conditions:

ID	Intersection Location
1	Lake Street / I-15 Northbound Ramps – LOS F AM and PM peak hours
3	Lake Street / Project Access – LOS F AM and PM peak hours

Intersection #1 (Lake Street at I-15 NB Ramps) continues to experience deficient operations in the AM peak hour, consistent with Existing conditions. The PM peak hour also experiences deficient operations at this intersection for EAP conditions. One additional study area intersection is anticipated to experience deficient operations with the addition of the Project. Lake Street at Project Access is projected to operate at LOS "F" in both the AM and PM peak hours without improvements for EAP conditions. The remaining existing intersections experience acceptable operations for EAP conditions.

The intersection operations analysis worksheets for EAP traffic conditions are included in Appendix 6.1 of this TIA. Measures to address EAP deficiencies are discussed in Section 6.7 *EAP Deficiencies and Recommended Improvements*.

6.4 QUEUING ANALYSIS

A queuing analysis was performed to assess the adequacy of turn bay lengths to accommodate vehicle queues for the Project entry and nearby interchange area (including Lake Street at the I-15 Ramps and Lake Street at Project Access). Queuing analysis findings are presented in Table 6-2 for EAPC traffic conditions.

EXHIBIT 6-1: EXISTING PLUS AMBIENT PLUS PROJECT (2018) TRAFFIC VOLUMES

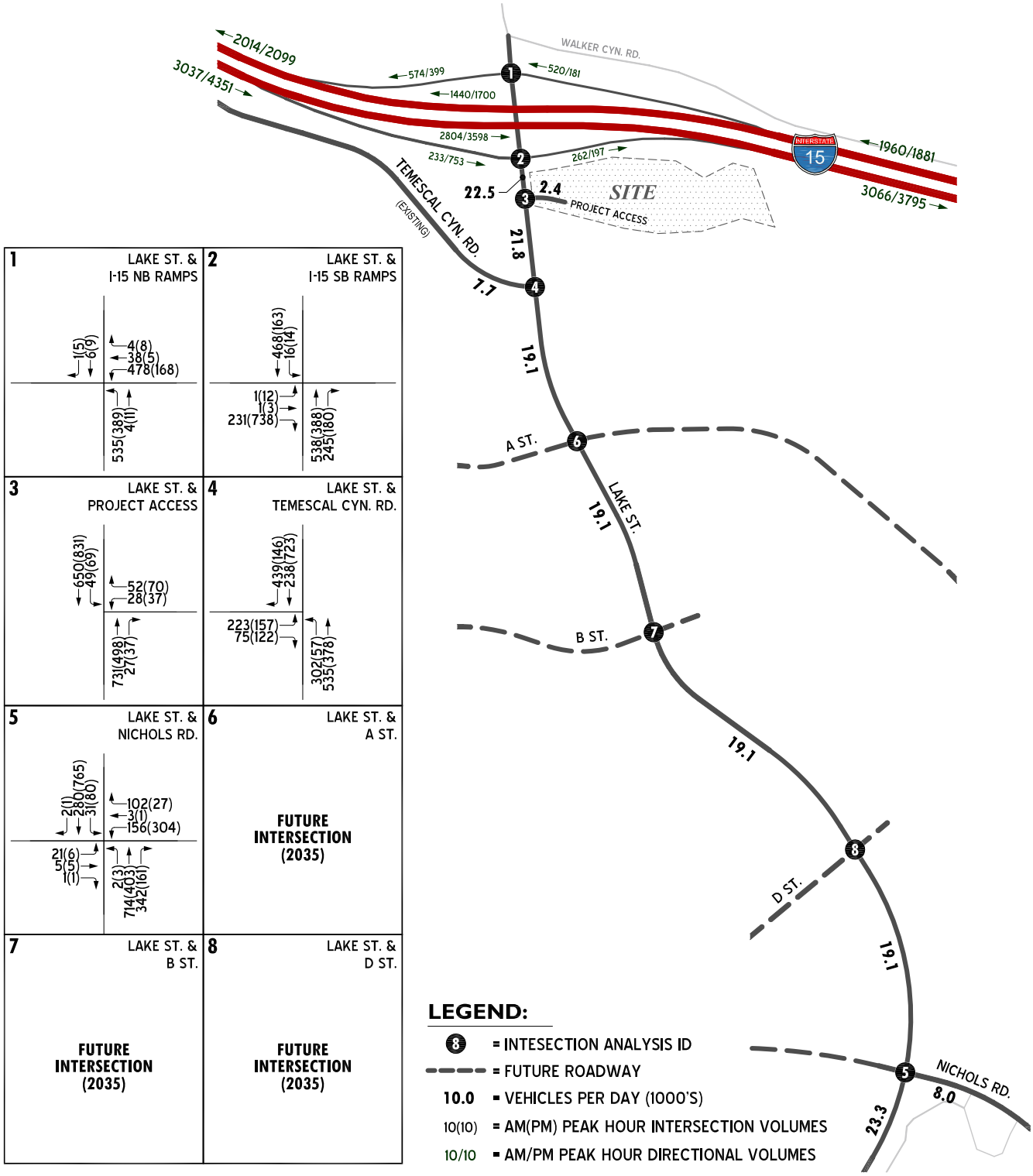

TABLE 6-1: INTERSECTION ANALYSIS FOR EXISTING PLUS AMBIENT PLUS PROJECT (2018) CONDITIONS

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (Secs)		Level of Service[2]	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Lake St. / I-15 NB Ramps																	
	- Without Improvements	CSS	0.5	0.5	0	0	1	0	0	0	0	0	1!	0	**>80**	**68.0**	**F**	**F**
	- With Improvements	**TS**	0.5	0.5	0	0	1	0	0	0	0	0	1!	0	32.2	15.4	C	B
2	Lake St. / I-15 SB Ramps																	
	- Without Improvements	CSS	0	1	0	0.5	0.5	0	0.5	0.5	1	0	0	0	31.7	34.3	D	D
	- With Improvements	CSS	0	1	**1**	**1**	1	0	0.5	0.5	1	0	0	0	21.1	34.3	C	D
3	Lake St. / Project Access																	
	- Without Improvements	CSS	0	1	0	0.5	0.5	0	0	0	0	1	0	d	**58.5**	**77.9**	**F**	**F**
	- Full Access at Project Entry	**TS**	0	1	0	**1**	1	0	0	0	0	1	0	**1**	8.1	8.6	A	A
	- No Left-Out/Left-In at Project Entry	CSS	0	1	0	**1**	1	0	0	0	0	**0**	0	**1**	18.0	14.5	C	B
4	Lake St. / Temescal Cyn. Rd.	TS	1	1	0	0	1	0	1	0	1	0	0	0	31.4	18.1	C	B
5	Lake St. / Nichols Rd.	TS	1	1	1	1	1	0	0	1!	0	0	1!	0	18.5	26.1	B	C
6	Lake St. / A St.		Intersection Does Not Exist															
7	Lake St. / B St.		Intersection Does Not Exist															
8	Lake St. / D St.		Intersection Does Not Exist															

[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; 1! = Shared Left / Through / Right Turn Lane; d = Defacto Right Turn Lane

[2] Per the 2010 Highway Capacity Manual, 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. Delay and level of service is calculated using Synchro 9.1 analysis software.

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[3] TS = Traffic Signal; CSY = Cross-street Yield (implied); CSS = Cross-street Stop; AWS = All-Way Stop

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TABLE 6-2: LEFT TURN STORAGE LENGTHS AT THE PROJECT ENTRY AND INTERCHANGE AREA FOR EXISTING PLUS AMBIENT PLUS PROJECT (2018) CONDITIONS

ID	Intersection	Turning Movement Lane	Existing Plust Ambient Plus Project (2018)				Storage Length[2] (feet)	95th Percentile Queue Length Per Lane (feet)	
			AM	PM	Peak Hour	Volume/Lane		AM	PM
1	Lake St. / I-15 NB Ramps	NBL/T	539	400	PM	270	±520	171	105
2	Lake St. / I-15 SB Ramps	NBR	245	180	AM	245	**200**	0	0
		SBL	16	14	AM	16	**150**	0	0
3	Lake St. / Project Access	SBL	49	69	PM	69	**125**	82	90

[1] Queue length calculated using SimTraffic.

[2] Storage Length: 100 = Existing; **100** = Planned/Minimum recommended storage length needed to accommodate the anticipated 95th percentile queues.

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As shown on Table 6-2, the recommended turn bay lengths can accommodate the weekday AM or weekday PM peak 95th percentile traffic flows for EAP traffic conditions. Worksheets for EAP conditions off-ramp queuing analysis are provided in Appendix 6.1.

6.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no additional intersections anticipated to meet traffic signal warrants for EAP traffic conditions beyond the two study area intersections currently warrant a traffic signal for Existing traffic conditions: Lake Street / I-15 Northbound Ramps and Lake Street / I-15 Southbound Ramps, and the traffic signal warranted for full access at the project entry.

6.6 BASIC FREEWAY SEGMENT ANALYSIS

EAP mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibit 6-1. As shown on Table 6-3, the freeway segments analyzed for this study are anticipated to operate at an acceptable LOS during the peak hours. EAP basic freeway segment analysis worksheets are provided in Appendix 6.2.

6.7 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for EAP conditions and the results of this analysis are presented in Table 6-4. As shown in Table 6-4, the freeway ramp merge and diverge areas are anticipated to operate at LOS D or better. EAP freeway ramp junction operations analysis worksheets are provided in Appendix 6.3.

6.8 EAP DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

Improvement strategies have been recommended at intersections that have been identified as deficient in an effort to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS D or better). The effectiveness of the recommended improvement strategies discussed below to address EAP traffic deficiencies is presented in Table 6-1. Exhibit 6-2 presents the study area intersection lanes for EAP conditions. Worksheets for EAP conditions, with improvements, HCM calculation worksheets are also provided in Appendix 6.1.

Consistent with E+P conditions, locally funded improvements (TRACT 28214) for EAP conditions at the Lake Street/I-15 interchange include the following:

- Traffic signal at the intersection of Lake Street/I-15 NB Ramps (#1)
- Provide a separate northbound right turn lane and a separate southbound left turn lane at the intersection of Lake Street/I-15 SB Ramps (#2)

TABLE 6-3: BASIC FREEWAY SEGMENT ANALYSIS FOR EXISTING PLUS AMBIENT PLUS PROJECT (2018) CONDITIONS

Freeway	Direction	Mainline Segment Location	Lanes[1]	Volume		Density[2]		LOS[3]	
				AM	PM	AM	PM	AM	PM
I-15 Freeway	NB	South of Lake St.	3	1,960	1,881	10.5	10.1	A	A
		Between Ramps	3	1,440	1,700	7.7	9.1	A	A
		North of Lake St.	3	2,014	2,099	10.8	11.2	A	B
	SB	North of Lake St.	3	3,037	4,351	16.3	24.1	B	C
		Between Ramps	3	2,804	3,598	15.0	19.3	B	C
		South of Lake St.	3	3,066	3,795	16.4	20.5	B	C

[1] Number of lanes are in the specified direction and is based on existing conditions

[2] Density is measured by passenger cars per mile per lane (pc/mi/ln)

[3] Level of service determined using HCS 2010: Basic Freeway Segments software, Version 6.65

BOLD = LOS E or F

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TABLE 6-4: FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS FOR EXISTING PLUS AMBIENT PLUS PROJECT (2018) CONDITIONS

Freeway	Direction	Ramp Location	Junction Type	Lanes on Freeway	Lanes on Ramp	Volume		Density [1]		LOS [2]	
						AM	PM	AM	PM	AM	PM
I-15 Freeway	NB	NB Off Ramp at Lake St.	Diverge	3	1	520	181	15.8	14.6	B	B
		NB On Ramp at Lake St.	Merge	3	1	574	399	13.6	13.6	B	B
	SB	SB Off Ramp at Lake St.	Diverge	3	1	233	753	21.1	29.0	C	D
		SB On Ramp at Lake St.	Merge	3	1	262	197	17.7	21.3	B	C

[1] Density calculated based on the Highway Capacity Manual (HCM) analysis; (pc/mi/ln) = passenger car per mile per lane

[2] Level of service determined using HCS2010 : Ramps and Ramp Junction software, Version 6.65

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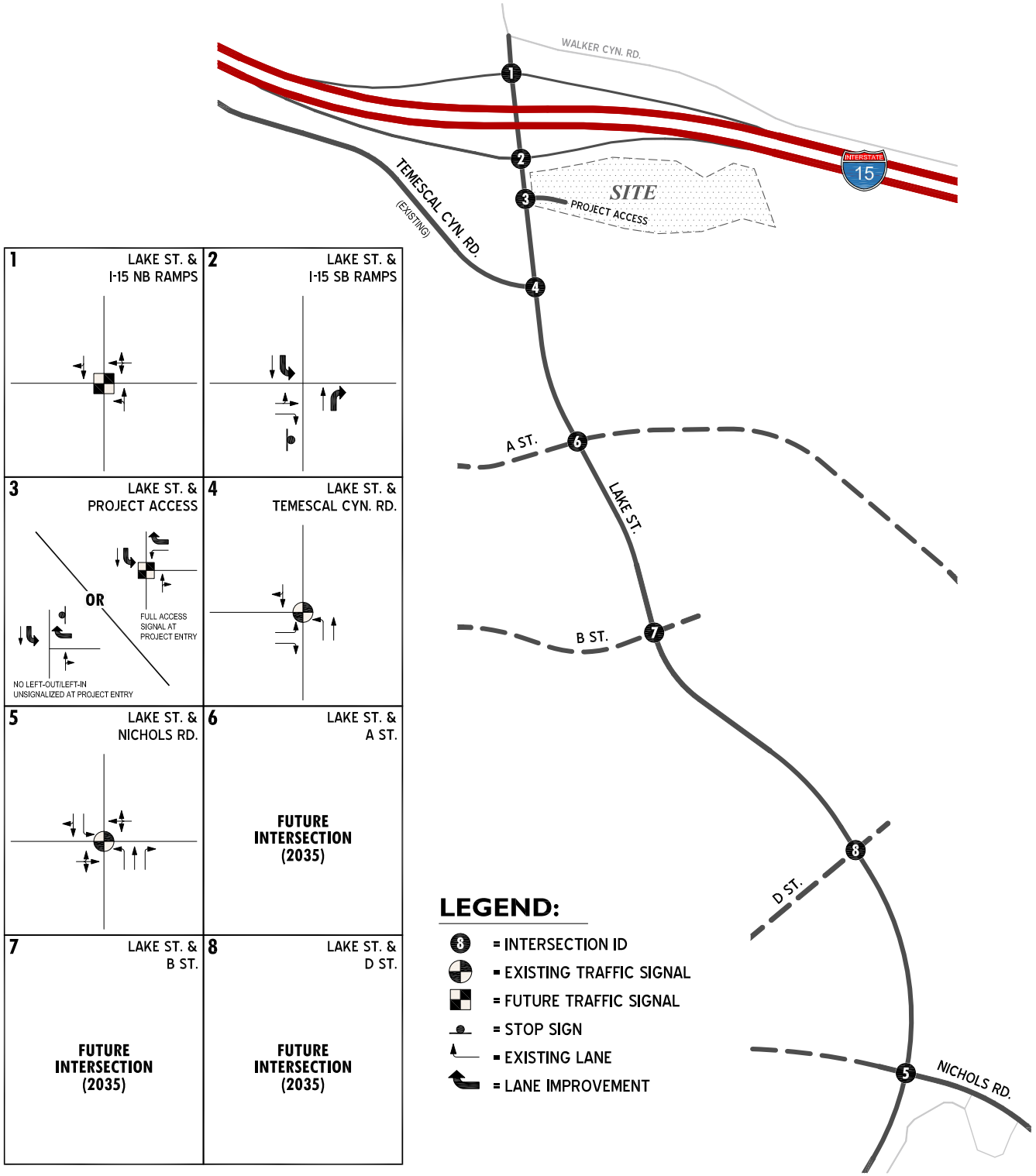
EXHIBIT 6-2: EXISTING PLUS AMBIENT PLUS PROJECT (2018) LANE CONFIGURATION AND INTERSECTION CONTROL



7 EAPC (2018) TRAFFIC CONDITIONS

This section discusses the methods used to develop Existing plus Ambient Growth plus Project plus Cumulative (EAPC) (2018) traffic forecasts, and the resulting intersection operations, traffic signal warrant, and freeway mainline operations analyses.

7.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for EAPC (2018) conditions are consistent with those documented in Sections 5.1 and 6.1.

7.2 EAPC (2018) TRAFFIC VOLUME FORECASTS

To account for background traffic, other known cumulative development projects in the study area were included in addition to 2% of ambient growth for EAPC traffic conditions in conjunction with traffic associated with the proposed Project. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for EAPC (2018) 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 conditions with roadway and intersection geometrics consistent with Section 7.1 *Roadway Improvements*. As shown in Table 7-1, the study area intersections are anticipated to operate at acceptable levels of service, with the exception of the following locations:

ID	Intersection Location
1	Lake Street / I-15 Northbound Ramps – LOS F AM and PM peak hours
2	Lake Street / I-15 Southbound Ramps – LOS F PM peak hour
3	Lake Street / Project Access – LOS F AM and PM peak hours

The intersection operations analysis worksheets for EAPC traffic conditions are included in Appendix 7.1 of this TIA. Measures to address near-term cumulative deficiencies for EAPC traffic conditions are discussed in Section 7.8 *EAPC Deficiencies and Recommended Improvements.*

7.4 QUEUING ANALYSIS

A queuing analysis was performed to assess the adequacy of turn bay lengths to accommodate vehicle queues for the Project entry and nearby interchange area (including Lake Street at the I-15 Ramps and Lake Street at Project Access). Queuing analysis findings are presented in Table 7-2 for EAPC traffic conditions. As shown on Table 7-2, the recommended turn bay lengths can accommodate the weekday AM or weekday PM peak 95th percentile traffic flows for EAPC traffic conditions. Worksheets for EAPC conditions off-ramp queuing analysis are provided in Appendix 7.1.

EXHIBIT 7-1: EXISTING PLUS AMBIENT PLUS PROJECT PLUS CUMULATIVE (2018) TRAFFIC VOLUMES

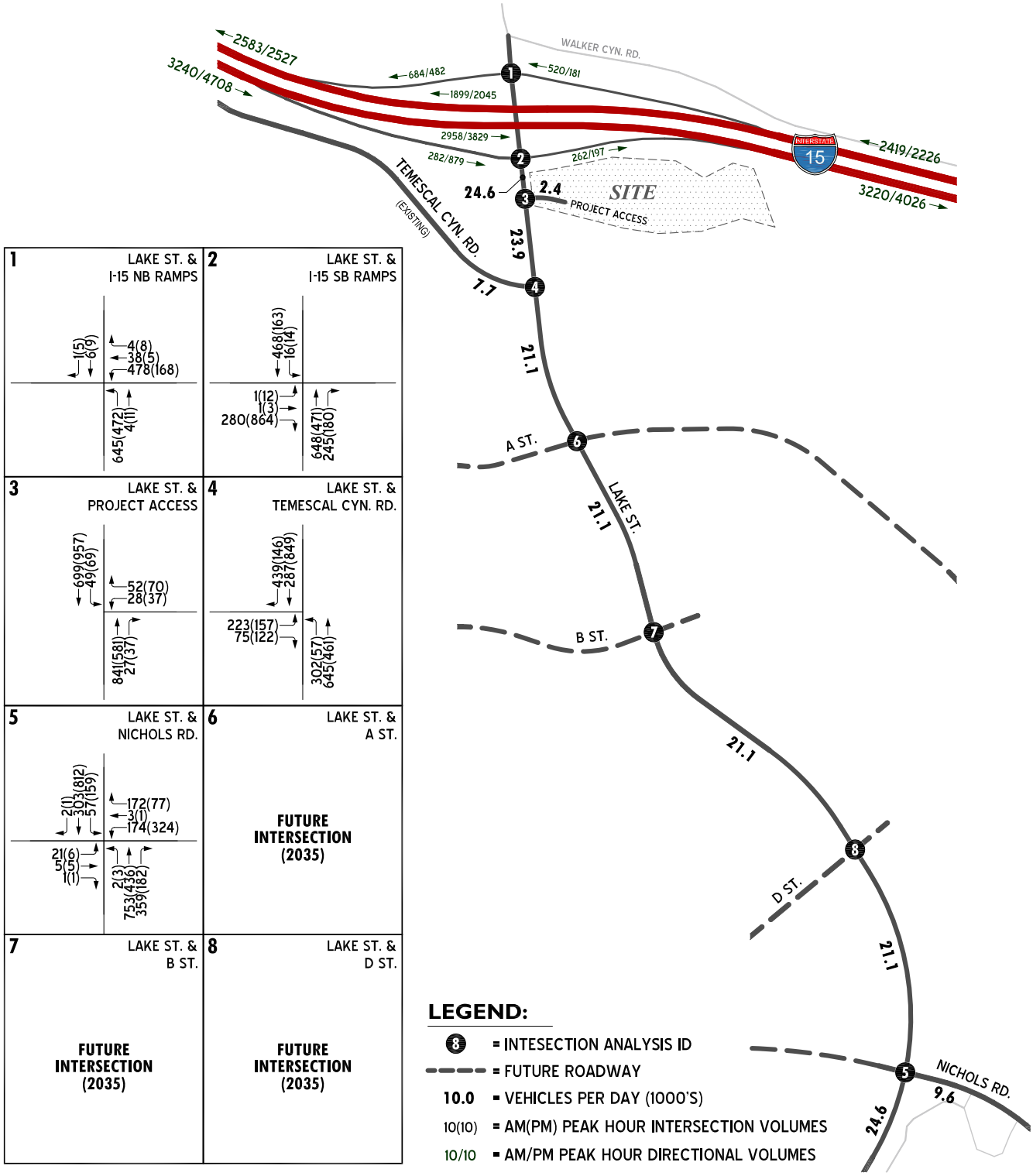


TABLE 7-1: INTERSECTION ANALYSIS FOR EXISTING PLUS AMBIENT PLUS PROJECT PLUS CUMULATIVE (2018) CONDITIONS

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (Secs)		Level of Service[2]	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Lake St. / I-15 NB Ramps																	
	- Without Improvements	CSS	0.5	0.5	0	0	1	0	0	0	0	0	1!	0	**>80**	**>80**	**F**	**F**
	- With Improvements	**TS**	**1**	1	0	0	1	0	0	0	0	**1**	1	0	33.2	14.1	C	B
2	Lake St. / I-15 SB Ramps																	
	- Without Improvements	CSS	0	1	0	0.5	0.5	0	0.5	0.5	1	0	0	0	28.2	**>80**	D	**F**
	- With Improvements	**TS**	0	1	**1**	**1**	1	0	0.5	0.5	1	0	0	0	10.8	52.3	B	D
3	Lake St. / Project Access																	
	- Without Improvements	CSS	0	1	0	0.5	0.5	0	0	0	0	1	0	d	**>80**	**>80**	**F**	**F**
	- Full Access at Project Entry	**TS**	0	1	0	**1**	1	0	0	0	0	1	0	**1**	8.6	10.2	A	B
	- No Left-Out/Left-In at Project Entry	CSS	0	1	0	**1**	1	0	0	0	0	**0**	0	**1**	21.1	16.2	C	C
4	Lake St. / Temescal Cyn. Rd.	TS	1	1	0	0	1	0	1	0	1	0	0	0	34.4	22.0	C	C
5	Lake St. / Nichols Rd.	TS	1	1	1	1	1	0	0	1!	0	0	1!	0	25.9	36.0	C	D
6	Lake St. / A St.		Intersection Does Not Exist															
7	Lake St. / B St.		Intersection Does Not Exist															
8	Lake St. / D St.		Intersection Does Not Exist															

[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; 1! = Shared Left / Through / Right Turn Lane; d = Defacto Right Turn Lane

[2] Per the 2010 Highway Capacity Manual, 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. Delay and level of service is calculated using Synchro 9.1 analysis software.

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

[3] TS = Traffic Signal; CSY = Cross-street Yield (implied); CSS = Cross-street Stop; AWS = All-Way Stop

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TABLE 7-2: LEFT TURN STORAGE LENGTHS AT THE PROJECT ENTRY AND INTERCHANGE AREA FOR EXISTING PLUS AMBIENT PLUS PROJECT PLUS CUMULATIVE (2018) CONDITIONS

ID	Intersection	Turning Movement Lane	Existing Plust Ambient Plus Project Plus Cumulative (2018)				Storage Length[2] (feet)	95th Percentile Queue Length Per Lane (feet)	
			AM	PM	Peak Hour	Volume/Lane		AM	PM
1	Lake St. / I-15 NB Ramps	NBL	649	483	PM	325	**280**	150	269
2	Lake St. / I-15 SB Ramps	NBR	245	180	AM	245	**200**	24	168
		SBL	16	14	AM	16	**150**	0	0
3	Lake St. / Project Access	SBL	49	69	PM	69	**125**	110	107

[1] Queue length calculated using SimTraffic.

[2] Storage Length: 100 = Existing; **100** = Planned/Minimum recommended storage length needed to accommodate the anticipated 95th percentile queues.

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7.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no additional intersections anticipated to meet traffic signal warrants for EAPC traffic conditions beyond the two study area intersections currently warrant a traffic signal for Existing traffic conditions: Lake Street / I-15 Northbound Ramps and Lake Street / I-15 Southbound Ramps, and the traffic signal warranted for full access at the project entry.

7.6 BASIC FREEWAY SEGMENT ANALYSIS

EAPC mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibit 7-1. As shown on Table 7-3, the freeway segments analyzed for this study are anticipated to operate at an acceptable LOS (i.e., LOS D or better) during the peak hours. EAPC basic freeway segment analysis worksheets are provided in Appendix 7.2.

7.7 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for EAPC conditions and the results of this analysis are presented in Table 7-4. As shown in Table 7-4, the freeway ramp merge and diverge areas are anticipated to operate at LOS D or better. EAPC freeway ramp junction operations analysis worksheets are provided in Appendix 7.3.

7.8 EAPC DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

Improvement strategies have been recommended at intersections that have been identified as deficient in an effort to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS D or better). The effectiveness of the recommended improvement strategies discussed below to address EAPC traffic deficiencies is presented in Table 7-1. Exhibit 7-2 presents the study area intersection lanes for EAPC conditions. Worksheets for EAPC conditions, with improvements, HCM calculation worksheets are also provided in Appendix 7.1.

Locally funded improvements (TRACT 28214) listed for EAPC conditions at the Lake Street/I-15 interchange include the following:

Lake Street/I-15 NB Ramps (#1)

- Traffic signal
- Provide a separate northbound left turn lane
- Provide a separate westbound left turn lane

Lake Street/I-15 SB Ramps (#2)

- Traffic signal
- Provide a separate northbound right turn lane
- Provide a separate southbound northbound left turn lane

TABLE 7-3: BASIC FREEWAY SEGMENT ANALYSIS FOR EXISTING PLUS AMBIENT PLUS PROJECT PLUS CUMULATIVE (2018) CONDITIONS

Freeway	Direction	Mainline Segment Location	Lanes[1]	Volume		Density [2]		LOS [3]	
				AM	PM	AM	PM	AM	PM
I-15 Freeway	NB	South of Lake St.	3	2,419	2,226	13.0	11.9	B	B
		Between Ramps	3	1,899	2,045	10.2	11.0	A	A
		North of Lake St.	3	2,583	2,527	13.8	13.5	B	B
	SB	North of Lake St.	3	3,240	4,708	17.4	26.6	B	D
		Between Ramps	3	2,958	3,829	15.8	20.7	B	C
		South of Lake St.	3	3,220	4,026	17.2	21.9	B	C

[1] Number of lanes are in the specified direction and is based on existing conditions

[2] Density is measured by passenger cars per mile per lane (pc/mi/ln)

[3] Level of service determined using HCS 2010: Basic Freeway Segments software, Version 6.65

BOLD = LOS E or F

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TABLE 7-4: FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS FOR EXISTING PLUS AMBIENT PLUS PROJECT PLUS CUMULATIVE (2018) CONDITIONS

Freeway	Direction	Ramp Location	Junction Type	Lanes on Freeway	Lanes on Ramp	Volume		Density [1]		LOS [2]	
						AM	PM	AM	PM	AM	PM
I-15 Freeway	NB	NB Off Ramp at Lake St.	Diverge	3	1	520	181	18.6	16.7	B	B
		NB On Ramp at Lake St.	Merge	3	1	684	482	16.9	16.0	B	B
	SB	SB Off Ramp at Lake St.	Diverge	3	1	282	879	22.4	30.9	C	D
		SB On Ramp at Lake St.	Merge	3	1	262	197	18.5	22.5	B	C

[1] Density calculated based on the Highway Capacity Manual (HCM) analysis; (pc/mi/ln) = passenger car per mile per lane

[2] Level of service determined using HCS2010 : Ramps and Ramp Junction software, Version 6.65

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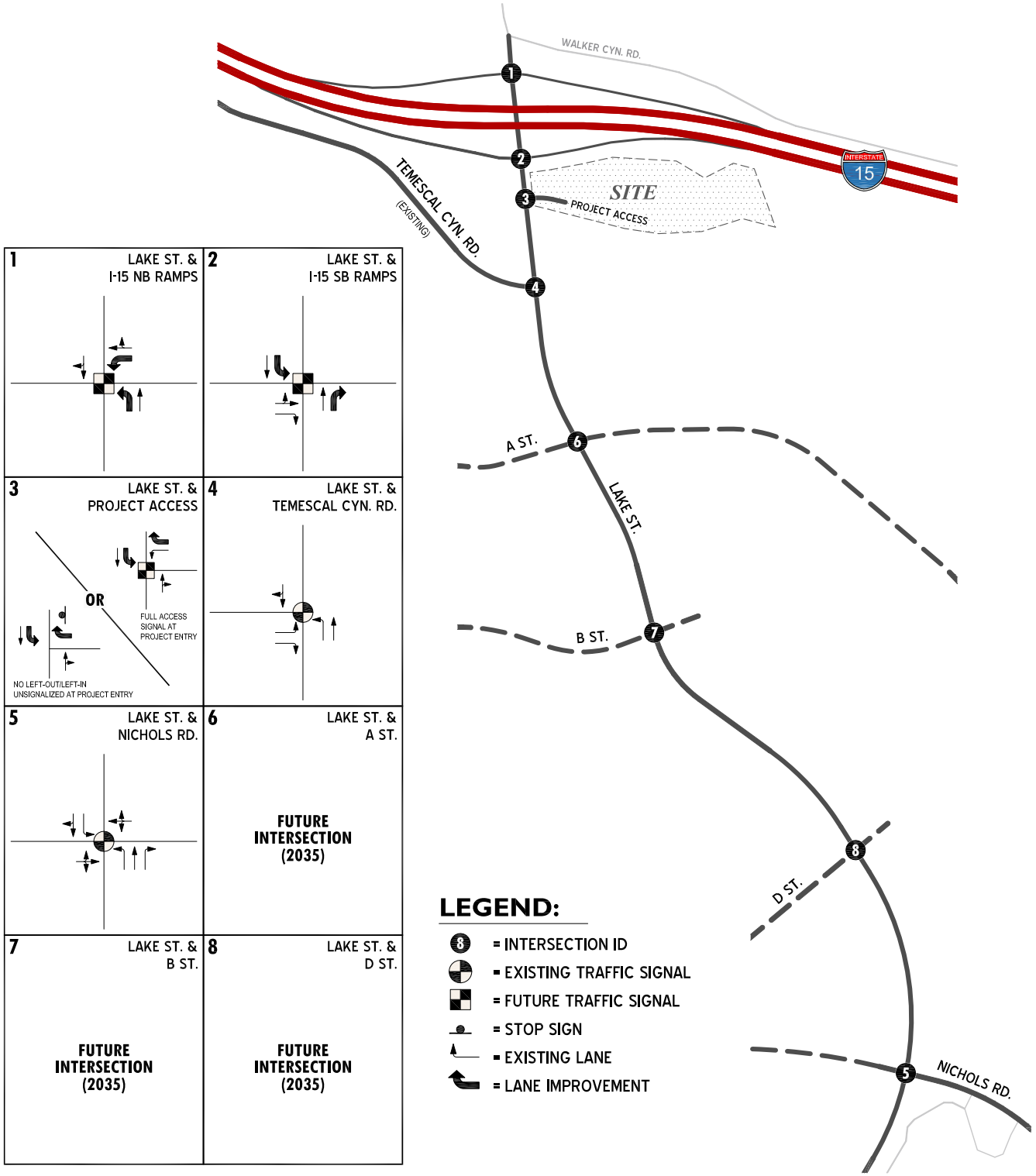
EXHIBIT 7-2: EXISTING PLUS AMBIENT PLUS PROJECT PLUS CUMULATIVE (2018) LANE CONFIGURATION AND INTERSECTION CONTROL



8 HORIZON YEAR (2035) TRAFFIC CONDITIONS

This section discusses the methods used to develop Horizon Year (2035) Without and With Project traffic forecasts, and the resulting intersection operations, traffic signal warrant, and freeway mainline operations analyses.

8.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Horizon Year conditions are shown on Exhibit 8-1:

- Two additional through lanes in each direction (northbound and southbound) on Lake Street throughout the study area (to 6 total lanes), including at all Lake Street study area intersections
- One additional through lane in each direction (eastbound and westbound) on Nichols Road (to 4 total lanes), with additional turn lanes for the Lake Street / Nichols Road intersection
- One additional through lane in each direction (eastbound and westbound) on Temescal Canyon Road (to 4 total lanes) , with additional turn lanes for the Lake Street / Temescal Canyon Road intersection
- Lake Street at I-15 Freeway interchange improvements, including new traffic signals at northbound and southbound interchange ramps, additional turn and through lanes, pursuant to Lake Street Alignment Study and shown on Exhibit 8-1
- Turn lane General Plan improvements consistent with Alberhill Villages Specific Plan for Lake Street / A street, Lake Street / B Street, Lake Street / D Street

The concept layout of the Project Access for Horizon Year 2035 With Project conditions, including nearby intersections is shown on Exhibit 8-2. Two alternatives for the Project Access are shown: full access with traffic signal control, or no left out (with left in and right in/out) access with modified traffic signal control.

For the alternative that eliminates left turn out access, traffic signal control would be provided for the southbound left, northbound through/right, and westbound right turn movements. Southbound through vehicle flow would remain uncontrolled. This modified traffic signal control would provide gaps for southbound left turning vehicles to cross the northbound traffic lanes, while allowing maximum capacity for southbound through vehicles.

8.2 HORIZON YEAR (2035) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-processed volumes obtained from the RivTAM. For additional information on the development of the Horizon Year Without Project traffic forecasts, see Section 4.8 *Horizon Year (2035) Volume Development* of this TIA. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Horizon Year Without Project traffic conditions are shown on Exhibit 8-3.

EXHIBIT 8-1: HORIZON YEAR (2035)
LANE CONFIGURATION AND INTERSECTION CONTROL

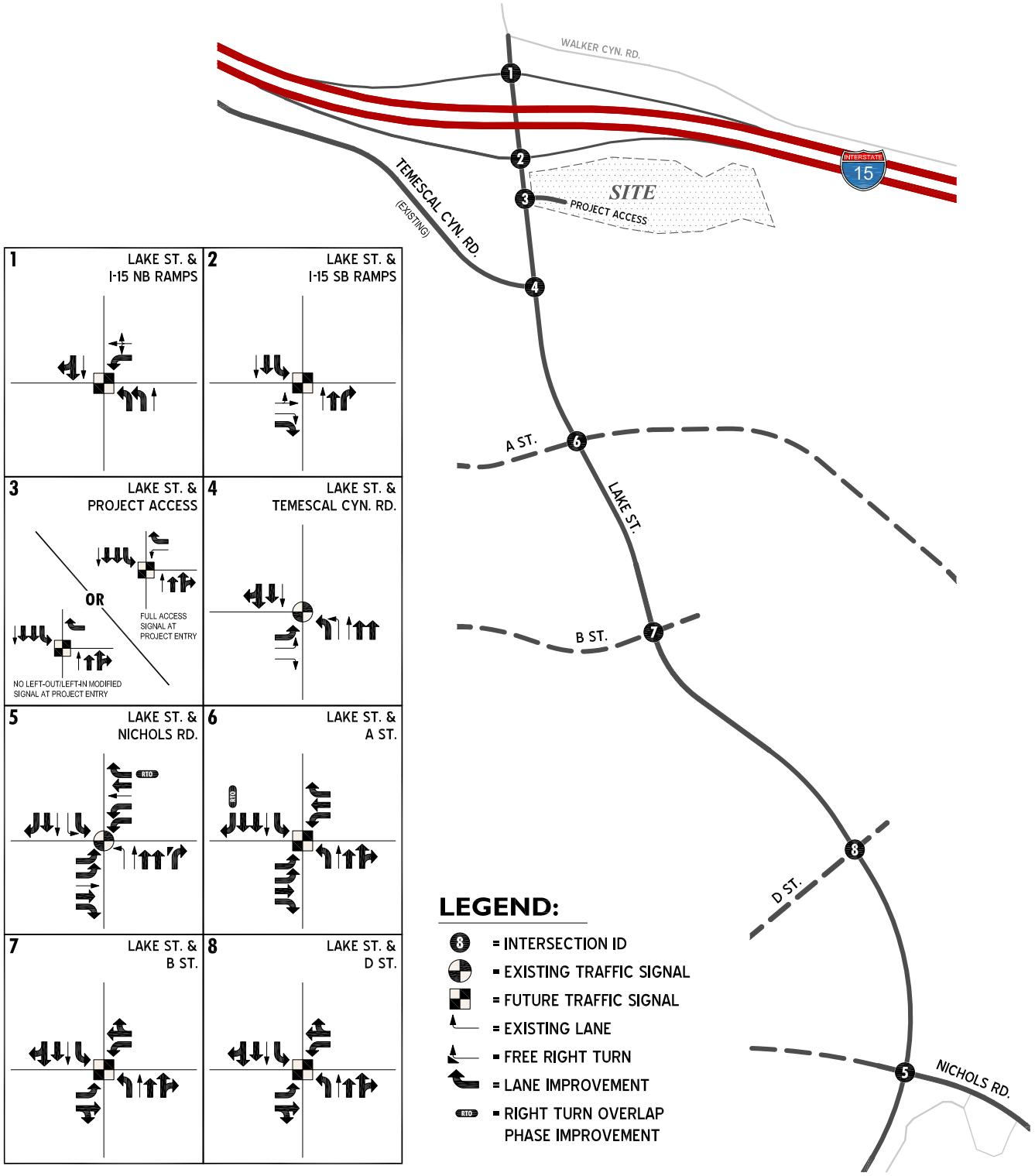
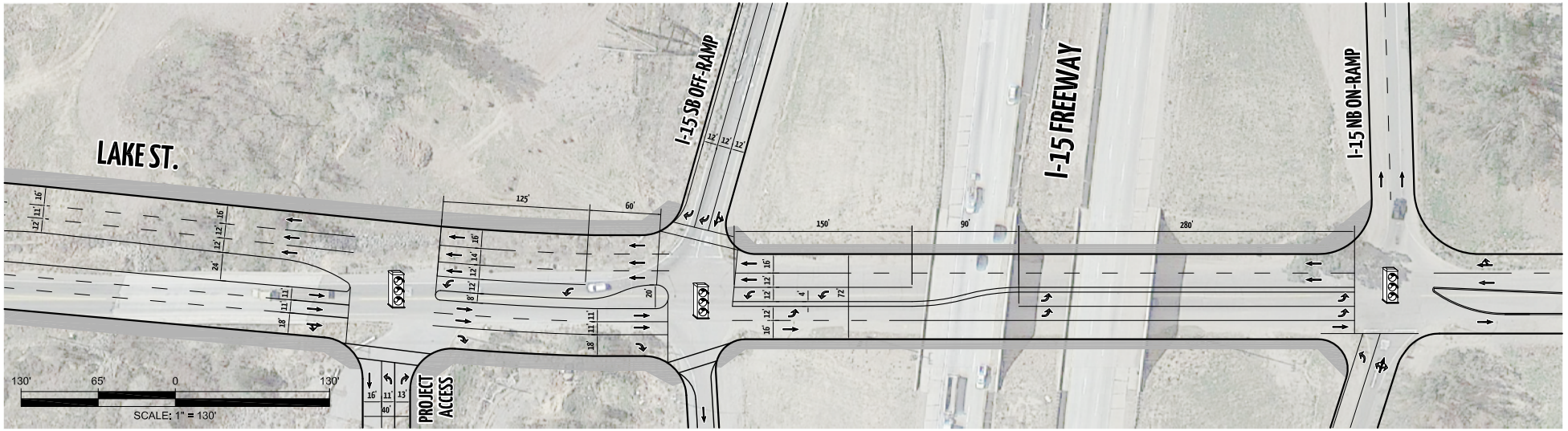
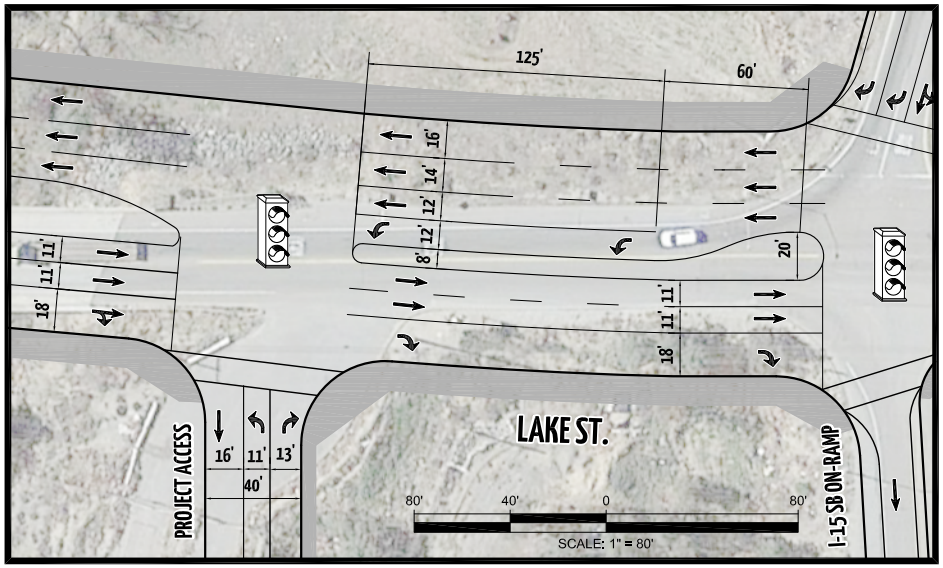


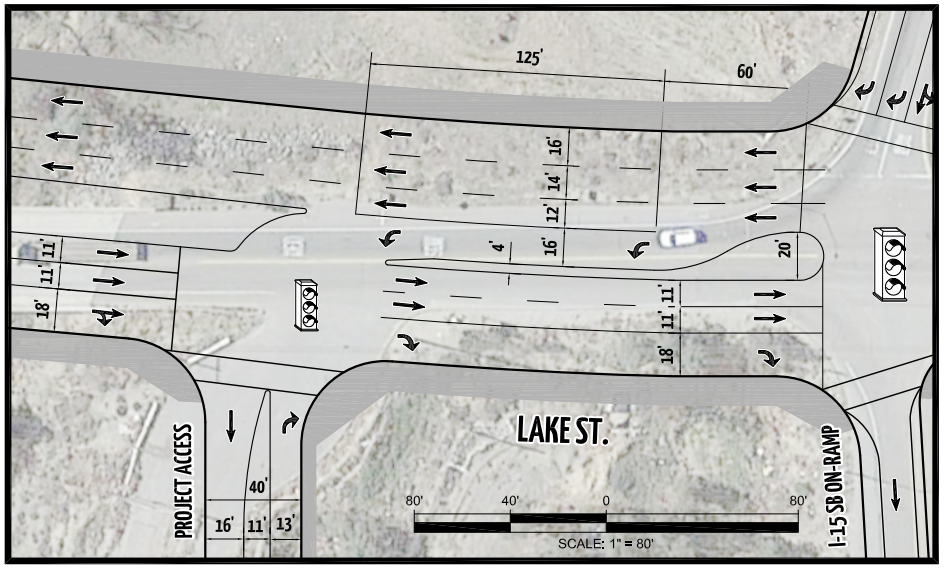
EXHIBIT 8-2: HORIZON YEAR (2035) CONDITIONS WITH PROJECT ACCESS



FULL ACCESS SIGNAL AT PROJECT ENTRY



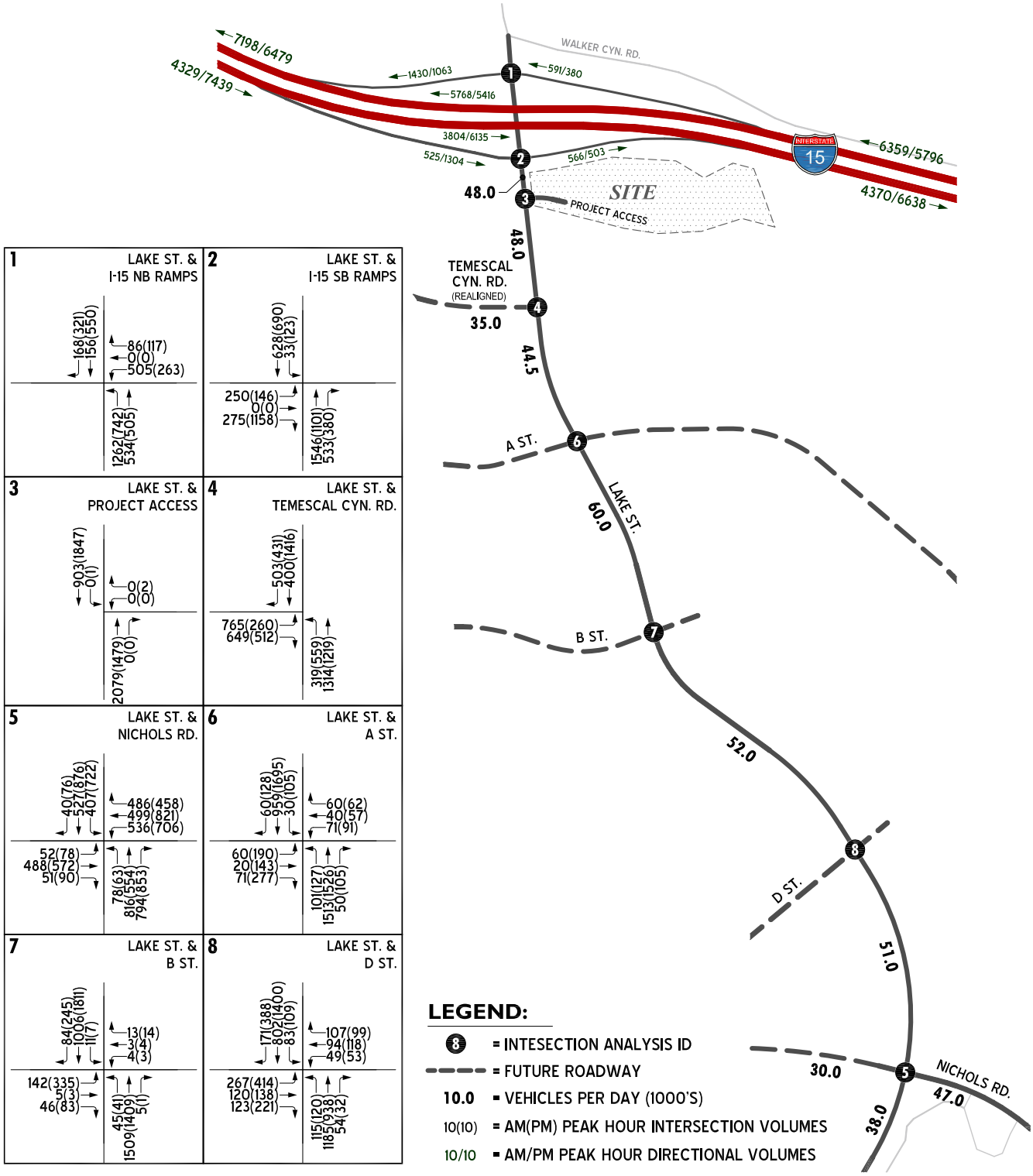
NO LEFT-OUT/LEFT-IN MODIFIED SIGNAL AT PROJECT ENTRY



LEGEND:

= TRAFFIC SIGNAL

EXHIBIT 8-3: HORIZON YEAR (2035) WITHOUT PROJECT TRAFFIC VOLUMES



8.3 HORIZON YEAR (2035) WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-processed volumes obtained from the RivTAM, plus Project traffic. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Horizon Year With Project traffic conditions are shown on Exhibit 8-4.

8.4 INTERSECTION OPERATIONS ANALYSIS

8.4.1 HORIZON YEAR WITHOUT PROJECT TRAFFIC CONDITIONS

LOS calculations were conducted for the study intersections to evaluate their operations under Horizon Year Without Project conditions with roadway and intersection geometrics consistent with Section 8.1 *Roadway Improvements*. As shown in Table 8-1, there are no intersections found to operate at a deficient LOS.

The intersection operations analysis worksheets for Horizon Year Without Project traffic conditions are included in Appendix 8.1 of this TIA.

8.4.2 HORIZON YEAR WITH PROJECT TRAFFIC CONDITIONS

Table 8-2 summarizes peak hour LOS for Horizon Year With Project conditions. As shown on Table 8-2, there are no additional study area intersections anticipated to experience unacceptable LOS (LOS E or worse) with the addition of Project traffic during one or more peak hours in addition to those previously identified under Horizon Year Without Project conditions. The intersection operations analysis worksheets for Horizon Year With Project traffic conditions are included in Appendix 8.2 of this TIA. Measures to address long range deficiencies for Long Range traffic conditions are discussed in Section 8.8 *Horizon Year Deficiencies and Recommended Improvements.*

8.5 HORIZON YEAR WITH PROJECT QUEUING ANALYSIS

A queuing analysis was performed to assess the adequacy of turn bay lengths to accommodate vehicle queues for the Project entry and nearby interchange area (including Lake Street at the I-15 Ramps and Lake Street at Project Access). Queuing analysis findings are presented in Table 8-3 for Horizon Year With Project traffic conditions. Queuing lengths may be shorter than for EAPC conditions, as additional lanes are provided for Horizon Year conditions. As shown on Table 8-3, the recommended turn bay lengths can accommodate the weekday AM or weekday PM peak 95th percentile traffic flows for Horizon Year With Project traffic conditions. Worksheets for Horizon Year With Project conditions off-ramp queuing analysis are provided in Appendix 8.2.

8.6 TRAFFIC SIGNAL WARRANTS ANALYSIS

In addition to the traffic signals previously warranted under Existing and E+P traffic conditions, the following intersections are anticipated to satisfy traffic signal warrants for Horizon Year Without Project conditions: Lake Street / A Street, Lake Street / B Street, and Lake Street / D Street.

EXHIBIT 8-4: HORIZON YEAR (2035) WITH PROJECT TRAFFIC VOLUMES

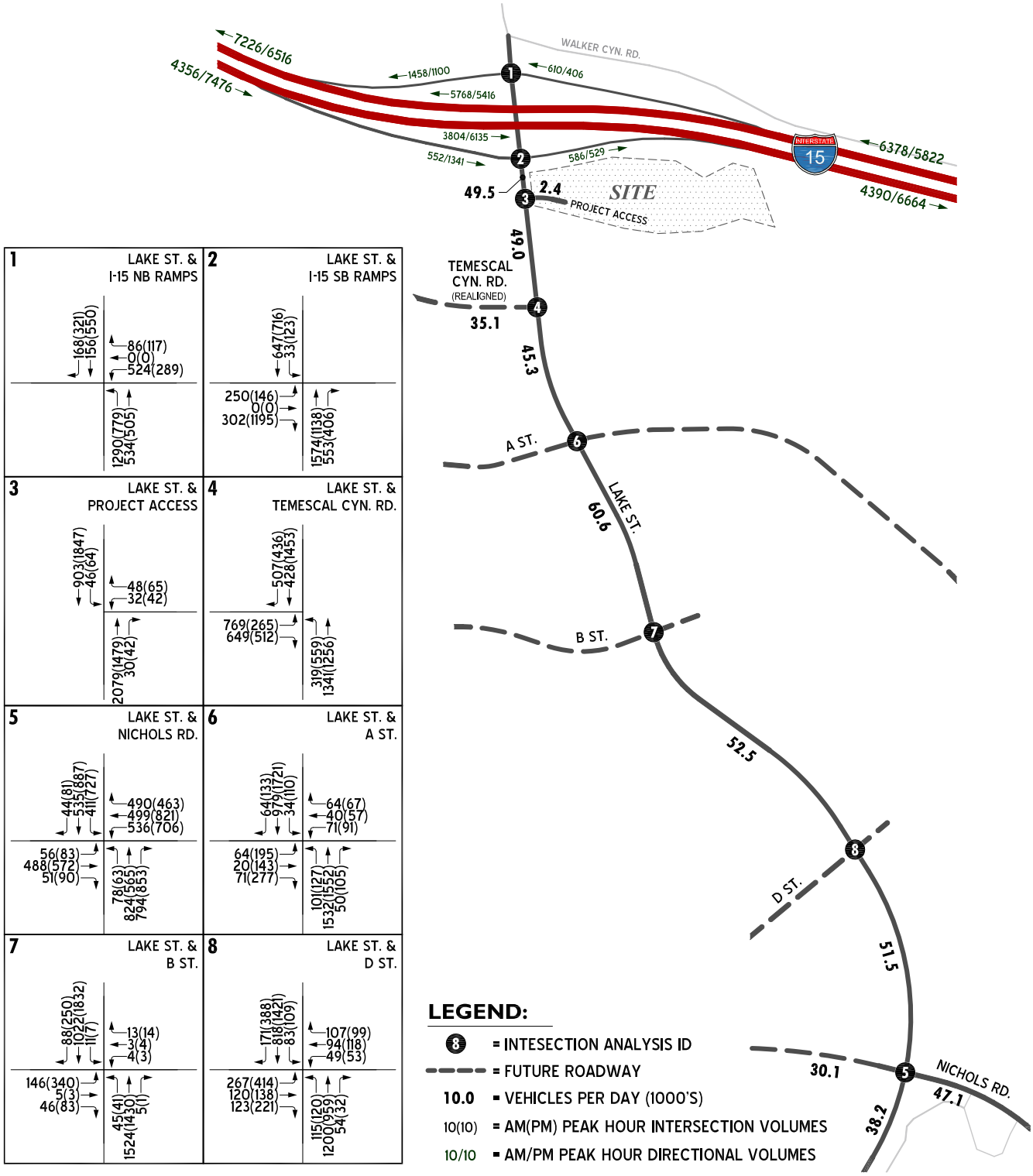


TABLE 8-1: INTERSECTION ANALYSIS FOR HORIZON YEAR (2035) WITHOUT PROJECT CONDITIONS

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (Secs)		Level of Service[2]	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Lake St. / I-15 NB Ramps - With Improvements[4]	**TS**	**2**	1	0	0	**2**	0	0	0	0	**1**	1!	0	38.5	30.8	D	C
2	Lake St. / I-15 SB Ramps - With Improvements[4,5]	**TS**	0	**2**	**1**	**1**	**2**	0	0.5	0.5	**2**	0	0	0	7.9	53.7	A	D
3	Lake St. / Project Access - With Improvements[4]	CSS	0	**3**	0	0.5	**2.5**	0	0	0	0	1	0	d	0.0	25.8	A	D
4	Lake St. / Temescal Cyn. Rd. - With Improvements[4]	TS	**2**	**3**	0	0	**3**	0	**2**	0	1	0	0	0	37.2	49.4	D	D
5	Lake St. / Nichols Rd. - With Improvements[4]	TS	1	**3**	**1>>**	**2**	**2**	**1**	**2**	**2**	**1**	**2**	**2**	**1>**	32.6	44.9	C	D
6	Lake St. / A St. - With Improvements[4]	**TS**	**1**	**3**	**0**	**1**	**3**	**1>**	**2**	**1**	**1**	**1**	**1**	**1**	21.0	27.2	C	C
7	Lake St. / B St. - With Improvements[4]	**TS**	**1**	**3**	**0**	**1**	**3**	**0**	**1**	**1**	**0**	**1**	**1**	**0**	12.4	10.0	B	A
8	Lake St. / D St. - With Improvements[4]	**TS**	**1**	**3**	**0**	**1**	**3**	**0**	**1**	**1**	**0**	**1**	**1**	**0**	26.2	44.2	C	D

[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; 1! = Shared Left / Through / Right Turn Lane; > = Right-Turn Overlap Phasing; >> = Free-Right Turn Lane; d = Defacto Right Turn Lane; **1** = Improvement

[2] Per the 2010 Highway Capacity Manual, 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. Delay and level of service is calculated using Synchro 9.1 analysis software.

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

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

[4] Improvements shown are consistent with the approved Alberhill Villages Specific Plan TIA (October 2015). Prepared by LLG Engineers.

[5] A 2nd eastbound right turn lane at this intersection is needed to serve the 2035 baseline without and with project conditions.

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TABLE 8-2: INTERSECTION ANALYSIS FOR HORIZON YEAR (2035) WITH PROJECT CONDITIONS

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (Secs)		Level of Service[2]	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Lake St. / I-15 NB Ramps																	
	- With Improvements[4]	**TS**	**2**	1	0	0	**2**	0	0	0	0	**1**	1!	0	42.3	32.0	D	C
2	Lake St. / I-15 SB Ramps																	
	- With Improvements[4,5]	**TS**	0	**2**	**1**	**1**	**2**	0	0.5	0.5	**2**	0	0	0	8.2	53.7	A	D
3	Lake St. / Project Access																	
	- Full Access at Project Entry	**TS**	0	**3**	0	**1**	**3**	0	0	0	0	1	0	**1**	5.9	5.5	A	A
	- No Left-Out/Left-In at Project Entry[6]	**TS**	0	**3**	0	**1**	**3**	0	0	0	0	**0**	0	**1**	3.9	4.2	A	A
4	Lake St. / Temescal Cyn. Rd.																	
	- With Improvements[4]	TS	**2**	**3**	0	0	**3**	0	**2**	0	1	0	0	0	37.5	51.0	D	D
5	Lake St. / Nichols Rd.																	
	- With Improvements[4]	TS	1	**3**	**1>>**	**2**	**2**	**1**	**2**	**2**	**1**	**2**	**2**	**1>**	32.6	44.9	C	D
6	Lake St. / A St.																	
	- With Improvements[4]	**TS**	**1**	**3**	**0**	**1**	**3**	**1>**	**2**	**1**	**1**	**1**	**1**	**1**	21.3	28.1	C	C
7	Lake St. / B St.																	
	- With Improvements[4]	**TS**	**1**	**3**	**0**	**1**	**3**	**0**	**1**	**1**	**0**	**1**	**1**	**0**	12.7	10.1	B	B
8	Lake St. / D St.																	
	- With Improvements[4]	**TS**	**1**	**3**	**0**	**1**	**3**	**0**	**1**	**1**	**0**	**1**	**1**	**0**	26.8	45.2	C	D

[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; 1! = Shared Left / Through / Right Turn Lane; > = Right-Turn Overlap Phasing; >> = Free-Right Turn Lane; d = Defacto Right Turn Lane; **1** = Improvement

[2] Per the 2010 Highway Capacity Manual, 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. Delay and level of service is calculated using Synchro 9.1 analysis software.

BOLD = LOS does not meet the applicable jurisdictional requirements (i.e., unacceptable LOS).

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

[4] Improvements shown are consistent with the approved Alberhill Villages Specific Plan TIA (October 2015). Prepared by LLG Engineers.

[5] A 2nd eastbound right turn lane at this intersection is needed to serve the 2035 baseline without and with project conditions.

[6] With Modified Signal (SB through = Uncontrolled; SB Left & NB Through = Signal Controlled; and WB Right = Stop controlled.

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TABLE 8-3: LEFT TURN STORAGE LENGTHS AT THE PROJECT ENTRY AND INTERCHANGE AREA FOR HORIZON YEAR (2035) WITH PROJECT CONDITIONS

Full Access at Project Entry									
			Horizon Year (2035) With Project					95th Percentile Queue Length Per Lane (feet)	
ID	Intersection	Turning Movement Lane	AM	PM	Peak Hour	Volume/Lane	Storage Length[2] (feet)	AM	PM
1	Lake St. / I-15 NB Ramps	NBL (2x)	1,290	779	AM	645	**525** [3]	260	103
2	Lake St. / I-15 SB Ramps	NBR	553	406	AM	553	**200**	48	95
		SBL	33	123	PM	123	**150**	65	121
3	Lake St. / Project Access	SBL	46	64	PM	64	**125**	76	102

No Left-Out/Left-In at Project Entry									
			Horizon Year (2035) With Project					95th Percentile Queue Length Per Lane (feet)	
ID	Intersection	Turning Movement Lane	AM	PM	Peak Hour	Volume/Lane	Storage Length[2] (feet)	AM	PM
1	Lake St. / I-15 NB Ramps	NBL (2x)	1,322	821	AM	661	**525** [3]	223	266
2	Lake St. / I-15 SB Ramps	NBR	553	406	AM	553	**200**	98	191
		SBL	33	123	PM	123	**150**	51	101
3	Lake St. / Project Access	SBL	46	64	PM	64	**125**	102	125

[1] Queue length calculated using SimTraffic.

[2] Storage Length: 100 = Existing; **100** = Planned/Minimum recommended storage length needed to accommodate the anticipated 95th percentile queues.

[3] Dual left turn lanes provided (280 ft. and 525 ft.)

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8.7 BASIC FREEWAY SEGMENT ANALYSIS

8.7.1 HORIZON YEAR WITHOUT PROJECT TRAFFIC CONDITIONS

Horizon Year Without Project mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibit 8-3. As shown on Table 8-4, all of the freeway segments analyzed for this study are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours. Horizon Year Without Project basic freeway segment analysis worksheets are provided in Appendix 8.3.

8.7.2 HORIZON YEAR WITH PROJECT TRAFFIC CONDITIONS

Horizon Year With Project mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibit 8-4. As shown on Table 8-4, there are no additional freeway segments anticipated to operate at an unacceptable LOS with the addition of Project traffic, in addition to those previously identified under Horizon Year Without Project conditions. Worksheets for Horizon Year With Project conditions basic freeway segment analysis worksheets are provided in Appendix 8.4.

8.8 FREEWAY MERGE/DIVERGE ANALYSIS

8.8.1 HORIZON YEAR (2035) WITHOUT PROJECT TRAFFIC CONDITIONS

Ramp merge and diverge operations were also evaluated for Horizon Year Without Project conditions and the results of this analysis are presented in Table 8-5. As shown in Table 8-5, all of the study area freeway merge and diverge ramp junctions are anticipated to operate at deficient LOS (i.e., LOS E or worse). Horizon Year Without Project freeway ramp junction operations analysis worksheets are provided in Appendix 8.5.

8.8.2 HORIZON YEAR (2035) WITH PROJECT TRAFFIC CONDITIONS

As shown on Table 8-5, there are no additional freeway merge/diverge ramp junctions anticipated to operate at an unacceptable LOS with the addition of Project traffic, in addition to those previously identified under Horizon Year Without Project conditions. Worksheets for Horizon Year With Project conditions freeway ramp junction operations analysis worksheets are provided in Appendix 8.6.

8.9 HORIZON YEAR DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

8.9.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies shown in Table 8-1 are consistent with the improvements identified in the Alberhill Villages Specific Plan TIA with the exception of the 2nd eastbound right turn lane at the intersection of Lake Street / I-15 SB Ramps (#2). It should be noted that the dual right turn lane is needed to serve cumulative traffic without or with the addition of project traffic. As shown on Table 8-3, there are no off-ramp queuing issues anticipated with the implementation of the recommended improvements shown on Table 8-1.

TABLE 8-4: BASIC FREEWAY SEGMENT ANALYSIS FOR HORIZON YEAR (2035) PROJECT CONDITIONS

HORIZON YEAR (2035) WITHOUT PROJECT CONDITIONS									
Freeway	Direction	Mainline Segment Location	Lanes[1]	Volume		Density [2]		LOS [3]	
				AM	PM	AM	PM	AM	PM
I-15 Freeway	NB	South of Lake St.	3	6,359	5,796	44.4	36.8	**E**	**E**
		Between Ramps	3	5,768	5,416	36.5	32.8	**E**	D
		North of Lake St.	3	7,198	6,479	61.4	46.3	**F**	**F**
	SB	North of Lake St.	3	4,329	7,439	23.9	68.6	C	**F**
		Between Ramps	3	3,804	6,135	20.5	41.1	C	**E**
		South of Lake St.	3	4,370	6,638	24.2	49.1	C	**F**

HORIZON YEAR (2035) WITH PROJECT CONDITIONS									
Freeway	Direction	Mainline Segment Location	Lanes[1]	Volume		Density [2]		LOS [3]	
				AM	PM	AM	PM	AM	PM
I-15 Freeway	NB	South of Lake St.	3	6,378	5,822	44.7	37.1	**E**	**E**
		Between Ramps	3	5,768	5,416	36.5	32.8	**E**	D
		North of Lake St.	3	7,226	6,516	62.2	46.9	**F**	**F**
	SB	North of Lake St.	3	4,356	7,476	24.1	69.7	C	**F**
		Between Ramps	3	3,804	6,135	20.5	41.1	C	**E**
		South of Lake St.	3	4,390	6,664	24.3	49.6	C	**F**

[1] Number of lanes are in the specified direction and is based on existing conditions.

[2] Density is measured by passenger cars per mile per lane (pc/mi/ln).

[3] Level of service determined using HCS 2010: Basic Freeway Segments software, Version 6.65

BOLD = LOS E or F

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TABLE 8-5: FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS FOR HORIZON YEAR (2035) CONDITIONS

HORIZON YEAR (2035) WITHOUT PROJECT CONDITIONS											
Freeway	Direction	Ramp Location	Junction Type	Lanes on Freeway	Lanes on Ramp	Volume		Density [1]		LOS [2]	
						AM	PM	AM	PM	AM	PM
I-15 Freeway	NB	NB Off Ramp at Lake St.	Diverge	3	1	591	380	**39.7**	**35.3**	**E**	**E**
		NB On Ramp at Lake St.	Merge	3	1	1,430	1,063	**43.1**	**38.3**	**E**	**E**
	SB	SB Off Ramp at Lake St.	Diverge	3	1	525	1,304	28.5	**49.7**	D	**F**
		SB On Ramp at Lake St.	Merge	3	1	566	503	25.4	**37.6**	C	**E**

HORIZON YEAR (2035) WITH PROJECT CONDITIONS											
Freeway	Direction	Ramp Location	Junction Type	Lanes on Freeway	Lanes on Ramp	Volume		Density [1]		LOS [2]	
						AM	PM	AM	PM	AM	PM
I-15 Freeway	NB	NB Off Ramp at Lake St.	Diverge	3	1	610	406	**39.9**	**35.4**	**E**	**E**
		NB On Ramp at Lake St.	Merge	3	1	1,458	1,100	**43.3**	**38.6**	**E**	**E**
	SB	SB Off Ramp at Lake St.	Diverge	3	1	552	1,341	28.6	**50.0**	D	**F**
		SB On Ramp at Lake St.	Merge	3	1	586	529	25.5	**37.8**	C	**E**

[1] Density calculated based on the Highway Capacity Manual (HCM) analysis; (pc/mi/ln) = passenger car per mile per lane

[2] Level of service determined using HCS2010 : Ramps and Ramp Junction software, Version 6.65

BOLD = LOS E or F

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8.9.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

Long range plans along the I-15 Freeway include the construction of two tolled Express Lanes from Cajalco Road to Central Avenue (SR-74). Based on information provided in the Project report, these improvements are longer range and subject to available funding. (9)

Due to the dynamic nature of ongoing corridor improvement planning work along the I-15 corridor, the effects of toll lane improvements are no longer considered in this analysis, and the results represent conservative/ worst case conditions.

Planned ramp improvements include a 2nd lane for the NB On-Ramp from Lake Street, and a 2nd lane for the SB Off-Ramp to Lake Street.

Table 8-6 shows that the I-15 Freeway ramp junctions are anticipated to operate at LOS "E" conditions with the planned improvements discussed above for without and with project conditions.

Horizon Year Without and With Project freeway ramp junction level of service analysis worksheets, with improvements, are provided in Appendix 8.7 and Appendix 8.8.

8.8.3 RECOMMENDED SITE ACCESS IMPROVEMENTS

The recommended site access driveway improvements for the Project are described below. Exhibit 1-3 illustrates the on-site and site adjacent recommended roadway lane improvements.

Lake Street – construct Lake Street along the Project frontage at its ultimate half section width as an Augmented Urban Arterial.

Lake Street at Project Access (#3) – The driveway may be configured as a full access driveway with signal control in near term and long range conditions, OR left turn out access may be prohibited and the driveway controlled by a stop sign (near term) transitioning to modified signal control (long term).

For the full access with signal control driveway, improvements are the same for all With Project scenarios. Install traffic signal and construct the intersection to provide the following geometrics:

Northbound Approach: Three through lanes (TUMF)

Southbound Approach: One left turn lane and three through lanes

Westbound Approach: One left turn lane, one right turn lane

OR for the no left turn out / left turn in scenario, the E+P, EAP, and EAPC conditions can be controlled by a Stop sign on the cross-street with the following geometrics:

Northbound Approach: Three through lanes (TUMF)

Southbound Approach: One left turn lane and three through lanes

Westbound Approach: One right turn lane

For Horizon Year 2035 With Project conditions, the no left turn out / left turn in scenario would also require a traffic signal to control the southbound left and northbound movements.

In either case, on-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the Project site. A cross-walk is recommended for the Project Access leg.

Sight distance at each project access point should be reviewed with respect to standard Caltrans and City of Lake Elsinore sight distance standards at the time of preparation of final grading, landscape and street improvement plans.

TABLE 8-6: FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS FOR HORIZON YEAR (2035) CONDITIONS WITH IMPROVEMENTS

HORIZON YEAR (2035) WITHOUT PROJECT CONDITIONS											
Freeway	Direction	Ramp Location	Junction Type	Lanes on Freeway[3]	Lanes on Ramp[4]	Volume		Density [1]		LOS [2]	
						AM	PM	AM	PM	AM	PM
I-15 Freeway	NB	NB Off Ramp at Lake St.	Diverge	3	1	591	380	**39.7**	**35.3**	**E**	**E**
		NB On Ramp at Lake St.	Merge	3	**2**	1,430	1,063	**35.3**	29.9	**E**	D
	SB	SB Off Ramp at Lake St.	Diverge	3	**2**	525	1,304	17.0	**41.8**	B	**E**
		SB On Ramp at Lake St.	Merge	3	1	566	503	25.4	**37.6**	C	**E**

HORIZON YEAR (2035) WITH PROJECT CONDITIONS											
Freeway	Direction	Ramp Location	Junction Type	Lanes on Freeway[3]	Lanes on Ramp[4]	Volume		Density [1]		LOS [2]	
						AM	PM	AM	PM	AM	PM
I-15 Freeway	NB	NB Off Ramp at Lake St.	Diverge	3	1	610	406	**39.9**	**35.4**	**E**	**E**
		NB On Ramp at Lake St.	Merge	3	**2**	1,458	1,100	**35.5**	30.2	**E**	D
	SB	SB Off Ramp at Lake St.	Diverge	3	**2**	552	1,341	17.2	**42.2**	B	**E**
		SB On Ramp at Lake St.	Merge	3	1	586	529	25.5	**37.8**	C	**E**

[1] Density calculated based on the Highway Capacity Manual (HCM) analysis; (pc/mi/ln) = passenger car per mile per lane

[2] Level of service determined using HCS2010 : Ramps and Ramp Junction software, Version 6.65

[3] Number of mixed-flow lanes are in the specified direction and is based on existing conditions.

[4] Number of lanes on ramp: 1 = Existing; **1** = Improvement

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