Nichols Ranch

TRAFFIC IMPACT ANALYSIS

CITY OF LAKE ELSINORE

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TABLE OF CONTENTS

TABLE OF CONTENTS I
APPENDICES V
LIST OF EXHIBITS IX
LIST OF TABLES XI
LIST OF ABBREVIATED TERMS XIII
1 INTRODUCTION 1
1.1 Project Overview 1
1.2 Analysis Scenarios 3
1.3 Study Area 4
1.4 Analysis Findings 7
1.5 Local and Regional Funding Mechanisms 24
1.6 On-Site Roadway and Site Access Improvements 30
2 METHODOLOGIES 39
2.1 Level of Service 39
2.2 Intersection Capacity Analysis 39
2.3 Freeway Off-Ramp Queuing Analysis 41
2.4 Traffic Signal Warrant Analysis Methodology 42
2.5 Freeway Mainline Segment Analysis Methodology 43
2.6 Freeway Merge/Diverge Ramp Junction Analysis 44
2.7 Minimum Level of Service (LOS) 45
2.8 CEQA Compliance and Documentation 46
2.9 Project Fair Share Calculation Methodology 47
3 AREA CONDITIONS 49
3.1 Existing Circulation Network 49
3.2 City of Lake Elsinore General Plan Circulation Element 49
3.3 Bicycle & Pedestrian Facilities 55
3.4 Transit Service 55
3.5 Existing (2018) Traffic Counts 55
3.6 Intersection Operations Analysis 59
3.7 Traffic Signal Warrants Analysis 62
3.8 Off-Ramp Queuing Analysis 62
3.9 Basic Freeway Segment Analysis 62
3.10 Freeway Merge/Diverge Analysis 62
3.11 Recommended Improvements 68
4 PROJECTED FUTURE TRAFFIC 71
4.1 Project Trip Generation 71
4.2 Project Trip Distribution 76
4.3 Modal Split 76
4.4 Project Trip Assignment 76
4.5 Cumulative Development Traffic 84
4.6 Background Traffic 84
4.7 Near-Term Traffic Forecasts 91
5 E+P TRAFFIC CONDITIONS 93

5.1 Roadway Improvements 93
5.2 E+P Traffic Volume Forecasts 93
5.3 Intersection Operations Analysis 93
5.4 Traffic Signal Warrants Analysis 98
5.5 Off-Ramp Queuing Analysis 98
5.6 Basic Freeway Segment Analysis 98
5.7 Freeway Merge/Diverge Analysis 107
5.8 Recommended Improvements 107

6 EA AND EAP (2020) TRAFFIC CONDITIONS 113

6.1 Roadway Improvements 113
6.2 EA (2020) Traffic Volume Forecasts 113
6.3 EAP (2020) Traffic Volume Forecasts 113
6.4 Intersection Operations Analysis 116
6.5 Traffic Signal Warrants Analysis 116
6.6 Off-Ramp Queuing Analysis 116
6.7 Basic Freeway Segment Analysis 116
6.8 Freeway Merge/Diverge Analysis 124
6.9 Recommended Improvements 124

7 EA AND EAP (2021) TRAFFIC CONDITIONS 127

7.1 Roadway Improvements 127
7.2 EA (2021) Traffic Volume Forecasts 127
7.3 EAP (2021) Traffic Volume Forecasts 127
7.4 Intersection Operations Analysis 130
7.5 Traffic Signal Warrants Analysis 130
7.6 Off-Ramp Queuing Analysis 130
7.7 Basic Freeway Segment Analysis 135
7.8 Freeway Merge/Diverge Analysis 135
7.9 Recommended Improvements 135

8 EA AND EAP (2024) TRAFFIC CONDITIONS 143

8.1 Roadway Improvements 143
8.2 EA (2024) Traffic Volume Forecasts 143
8.3 EAP Traffic Volume Forecasts 143
8.4 Intersection Operations Analysis 146
8.5 Traffic Signal Warrants Analysis 146
8.6 Off-Ramp Queuing Analysis 146
8.7 Basic Freeway Segment Analysis 151
8.8 Freeway Merge/Diverge Analysis 151
8.9 Recommended Improvements 151

9 EAPC TRAFFIC CONDITIONS 161

9.1 Roadway Improvements 161
9.2 EAPC Traffic Volume Forecasts 161
9.3 Intersection Operations Analysis 165
9.4 Traffic Signal Warrants Analysis 165
9.5 Off-Ramp Queuing Analysis 170
9.6 Basic Freeway Segment Analysis 170

9.7 Freeway Merge/Diverge Analysis 177
9.8 EAPC Deficiencies and Recommended Improvements 177
10 REFERENCES 187

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APPENDICES

APPENDIX 1.1: APPROVED TRAFFIC STUDY SCOPING AGREEMENT
APPENDIX 1.2: SITE ADJACENT QUEUING ANALYSIS WORKSHEETS
APPENDIX 3.1: EXISTING TRAFFIC COUNTS – MAY 2017
APPENDIX 3.2: EXISTING (2018) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
APPENDIX 3.3: EXISTING (2018) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS
APPENDIX 3.4: EXISTING (2018) CONDITIONS OFF-RAMP QUEUEING ANALYSIS WORKSHEETS
APPENDIX 3.5: EXISTING (2018) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS
APPENDIX 3.6: EXISTING (2018) CONDITIONS FREEWAY MERGE/DIVERGE ANALYSIS WORKSHEETS
APPENDIX 3.7: EXISTING (2018) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 4.1: CUMULATIVE PROJECT TRIP GENERATION
APPENDIX 5.1: E+P (PHASE 1) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
APPENDIX 5.2: E+P (PHASE 2) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
APPENDIX 5.3: E+P (BUILDOUT) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
APPENDIX 5.4: E+P (PHASE 1) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS
APPENDIX 5.5: E+P (PHASE 2) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS
APPENDIX 5.6: E+P (BUILDOUT) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS
APPENDIX 5.7: E+P (PHASE 1) CONDITIONS OFF-RAMP QUEUEING ANALYSIS WORKSHEETS
APPENDIX 5.8: E+P (PHASE 2) CONDITIONS OFF-RAMP QUEUEING ANALYSIS WORKSHEETS
APPENDIX 5.9: E+P (BUILDOUT) CONDITIONS OFF-RAMP QUEUEING ANALYSIS WORKSHEETS
APPENDIX 5.10: E+P (PHASE 1) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS
APPENDIX 5.11: E+P (PHASE 2) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS
APPENDIX 5.12: E+P (BUILDOUT) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS
APPENDIX 5.13: E+P (PHASE 1) CONDITIONS FREEWAY MERGE/DIVERGE ANALYSIS WORKSHEETS
APPENDIX 5.14: E+P (PHASE 2) CONDITIONS FREEWAY MERGE/DIVERGE ANALYSIS WORKSHEETS
APPENDIX 5.15: E+P (BUILDOUT) CONDITIONS FREEWAY MERGE/DIVERGE ANALYSIS WORKSHEETS
APPENDIX 5.16: E+P (PHASE 1) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 5.17: E+P (PHASE 2) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 5.18: E+P (BUILDOUT) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 6.1: EA (2020) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
APPENDIX 6.2: EAP (2020) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
APPENDIX 6.3: EA (2020) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS
APPENDIX 6.4: EAP (2020) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS
APPENDIX 6.5: EA (2020) CONDITIONS OFF-RAMP QUEUEING ANALYSIS WORKSHEETS
APPENDIX 6.6: EAP (2020) CONDITIONS OFF-RAMP QUEUEING ANALYSIS WORKSHEETS
APPENDIX 6.7: EA (2020) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS
APPENDIX 6.8: EAP (2020) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS
APPENDIX 6.9: EA (2020) CONDITIONS FREEWAY MERGE/DIVERGE ANALYSIS WORKSHEETS
APPENDIX 6.10: EAP (2020) CONDITIONS FREEWAY MERGE/DIVERGE ANALYSIS WORKSHEETS
APPENDIX 6.11: EA (2020) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS

APPENDIX 6.12: EAP (2020) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 7.1: EA (2021) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
APPENDIX 7.2: EAP (2021) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
APPENDIX 7.3: EA (2021) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS
APPENDIX 7.4: EAP (2021) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS
APPENDIX 7.5: EA (2021) CONDITIONS OFF-RAMP QUEUEING ANALYSIS WORKSHEETS
APPENDIX 7.6: EAP (2021) CONDITIONS OFF-RAMP QUEUEING ANALYSIS WORKSHEETS
APPENDIX 7.7: EA (2021) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS
APPENDIX 7.8: EAP (2021) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS
APPENDIX 7.9: EA (2021) CONDITIONS FREEWAY MERGE/DIVERGE ANALYSIS WORKSHEETS
APPENDIX 7.10: EAP (2021) CONDITIONS FREEWAY MERGE/DIVERGE ANALYSIS WORKSHEETS
APPENDIX 7.11: EA (2021) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 7.12: EAP (2021) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 8.1: EA (2024) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
APPENDIX 8.2: EAP (2024) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
APPENDIX 8.3: EA (2024) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS
APPENDIX 8.4: EAP (2024) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS
APPENDIX 8.5: EA (2024) CONDITIONS OFF-RAMP QUEUEING ANALYSIS WORKSHEETS
APPENDIX 8.6: EAP (2024) CONDITIONS OFF-RAMP QUEUEING ANALYSIS WORKSHEETS
APPENDIX 8.7: EA (2024) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS
APPENDIX 8.8: EAP (2024) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS
APPENDIX 8.9: EA (2024) CONDITIONS FREEWAY MERGE/DIVERGE ANALYSIS WORKSHEETS
APPENDIX 8.10: EAP (2024) CONDITIONS FREEWAY MERGE/DIVERGE ANALYSIS WORKSHEETS
APPENDIX 8.11: EA (2024) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 8.12: EAP (2024) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 8.13: EAP (2024) CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 9.1: EAPC (2020) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
APPENDIX 9.2: EAPC (2021) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
APPENDIX 9.3: EAPC (2024) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
APPENDIX 9.4: EAPC (2020) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS
APPENDIX 9.5: EAPC (2021) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS
APPENDIX 9.6: EAPC (2024) CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS
APPENDIX 9.7: EAPC (2020) CONDITIONS OFF-RAMP QUEUEING ANALYSIS WORKSHEETS
APPENDIX 9.8: EAPC (2021) CONDITIONS OFF-RAMP QUEUEING ANALYSIS WORKSHEETS
APPENDIX 9.9: EAPC (2024) CONDITIONS OFF-RAMP QUEUEING ANALYSIS WORKSHEETS
APPENDIX 9.10: EAPC (2020) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS
APPENDIX 9.11: EAPC (2021) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS
APPENDIX 9.12: EAPC (2024) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS
APPENDIX 9.13: EAPC (2020) CONDITIONS FREEWAY MERGE/DIVERGE ANALYSIS WORKSHEETS
APPENDIX 9.14: EAPC (2021) CONDITIONS FREEWAY MERGE/DIVERGE ANALYSIS WORKSHEETS
APPENDIX 9.15: EAPC (2024) CONDITIONS FREEWAY MERGE/DIVERGE ANALYSIS WORKSHEETS

APPENDIX 9.16: EAPC (2020) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 9.17: EAPC (2021) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 9.18: EAPC (2024) CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 9.19: EAPC (2024) CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS WITH IMPROVEMENTS

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LIST OF EXHIBITS

EXHIBIT 1-1: PRELIMINARY SITE PLAN 2
EXHIBIT 1-2: LOCATION MAP 6
EXHIBIT 1-3: SUMMARY OF DEFICIENT INTERSECTIONS BY ANALYSIS SCENARIO 9
EXHIBIT 1-4: SITE ADJACENT ROADWAY AND SITE ACCESS RECOMMENDATIONS FOR PHASE 1 (2020) 32
EXHIBIT 1-5: SITE ADJACENT ROADWAY AND SITE ACCESS RECOMMENDATIONS FOR PHASE 2 (2021) 33
EXHIBIT 1-6: SITE ADJACENT ROADWAY AND SITE ACCESS RECOMMENDATIONS FOR BUILDOUT (2024) 34
EXHIBIT 1-7: CONCEPTUAL STRIPING FOR NICHOLS ROAD AND A STREET 35
EXHIBIT 3-1: EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS 50
EXHIBIT 3-2: CITY OF LAKE ELSINORE GENERAL PLAN CIRCULATION ELEMENT 51
EXHIBIT 3-3: CITY OF LAKE ELSINORE GENERAL PLAN ROADWAY CROSS-SECTIONS 52
EXHIBIT 3-4: COUNTY OF RIVERSIDE GENERAL PLAN CIRCULATION ELEMENT 53
EXHIBIT 3-5: COUNTY OF RIVERSIDE GENERAL PLAN ROADWAY CROSS-SECTIONS 54
EXHIBIT 3-6: CITY OF LAKE ELSINORE AREA TRAILS SYSTEM 56
EXHIBIT 3-7: CITY OF LAKE ELSINORE BIKEWAY PLAN 57
EXHIBIT 3-8: EXISTING TRANSIT ROUTES 58
EXHIBIT 3-9: EXISTING (2018) TRAFFIC VOLUMES 60
EXHIBIT 3-10: EXISTING (2018) SUMMARY OF LOS 63
EXHIBIT 3-11: EXISTING (2018) FREEWAY MAINLINE VOLUMES 64
EXHIBIT 4-1: PROJECT (RESIDENTIAL) (PHASE 1, PHASE 2, AND PROJECT BUILDOUT) TRIP DISTRIBUTION 78
EXHIBIT 4-2: PROJECT (RETAIL/OFFICE/GAS STATION) (PROJECT BUILDOUT) TRIP DISTRIBUTION 79
EXHIBIT 4-3: PROJECT (HOTEL) (PROJECT BUILDOUT) TRIP DISTRIBUTION 80
EXHIBIT 4-4: PROJECT ONLY (PHASE 1) TRAFFIC VOLUMES 81
EXHIBIT 4-5: PROJECT ONLY (PHASE 2) TRAFFIC VOLUMES 82
EXHIBIT 4-6: PROJECT ONLY (BUILDOUT) TRAFFIC VOLUMES 83
EXHIBIT 4-7: CUMULATIVE DEVELOPMENT PROJECTS LOCATION MAP 85
EXHIBIT 4-8: CUMULATIVE ONLY (2020) TRAFFIC VOLUMES 86
EXHIBIT 4-9: CUMULATIVE ONLY (2021) TRAFFIC VOLUMES 87
EXHIBIT 4-10: CUMULATIVE ONLY (2024) TRAFFIC VOLUMES 88
EXHIBIT 5-1: E+P (PHASE 1) TRAFFIC VOLUMES 94
EXHIBIT 5-2: E+P (PHASE 2) TRAFFIC VOLUMES 95
EXHIBIT 5-3: E+P (PROJECT BUILDOUT) TRAFFIC VOLUMES 96
EXHIBIT 5-4: E+P (PHASE 1) SUMMARY OF LOS 99
EXHIBIT 5-5: E+P (PHASE 2) SUMMARY OF LOS 100
EXHIBIT 5-6: E+P (PROJECT BUILDOUT) SUMMARY OF LOS 101
EXHIBIT 5-7: E+P (PHASE 1) FREEWAY MAINLINE VOLUMES 102
EXHIBIT 5-8: E+P (PHASE 2) FREEWAY MAINLINE VOLUMES 103
EXHIBIT 5-9: E+P (PROJECT BUILDOUT) FREEWAY MAINLINE VOLUMES 104
EXHIBIT 6-1: EA (2020) TRAFFIC VOLUMES 114
EXHIBIT 6-2: EAP (2020) TRAFFIC VOLUMES 115
EXHIBIT 6-3: EA (2020) SUMMARY OF LOS 120
EXHIBIT 6-4: EAP (2020) SUMMARY OF LOS 121
EXHIBIT 6-5: EA (2020) FREEWAY MAINLINE VOLUMES 122
EXHIBIT 6-6: EAP (2020) FREEWAY MAINLINE VOLUMES 123
EXHIBIT 7-1: EA (2021) TRAFFIC VOLUMES 128

EXHIBIT 7-2: EAP (2021) TRAFFIC VOLUMES 129
EXHIBIT 7-3: EA (2021) SUMMARY OF LOS..... 133
EXHIBIT 7-4: EAP (2021) SUMMARY OF LOS..... 134
EXHIBIT 7-5: EA (2021) FREEWAY MAINLINE VOLUMES 136
EXHIBIT 7-6: EAP (2021) FREEWAY MAINLINE VOLUMES 137
EXHIBIT 8-1: EA (2024) TRAFFIC VOLUMES 144
EXHIBIT 8-2: EAP (2024) TRAFFIC VOLUMES 145
EXHIBIT 8-3: EA (2024) SUMMARY OF LOS..... 149
EXHIBIT 8-4: EAP (2024) SUMMARY OF LOS..... 150
EXHIBIT 8-5: EA (2024) FREEWAY MAINLINE VOLUMES 152
EXHIBIT 8-6: EAP (2024) FREEWAY MAINLINE VOLUMES 153
EXHIBIT 9-1: EAPC (2020) TRAFFIC VOLUMES 162
EXHIBIT 9-2: EAPC (2021) TRAFFIC VOLUMES 163
EXHIBIT 9-3: EAPC (2024) TRAFFIC VOLUMES 164
EXHIBIT 9-4: EAPC (2020) SUMMARY OF LOS..... 167
EXHIBIT 9-5: EAPC (2021) SUMMARY OF LOS..... 168
EXHIBIT 9-6: EAPC (2024) SUMMARY OF LOS..... 169
EXHIBIT 9-7: EAPC (2020) FREEWAY MAINLINE VOLUMES 174
EXHIBIT 9-8: EAPC (2021) FREEWAY MAINLINE VOLUMES 175
EXHIBIT 9-9: EAPC (2024) FREEWAY MAINLINE VOLUMES 176
EXHIBIT 9-10: I-15/SR-74 INTERCHANGE PROPOSED CONCEPTUAL DESIGN 183

LIST OF TABLES

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS 5
TABLE 1-2: FREEWAY MAINLINE SEGMENT ANALYSIS LOCATIONS 7
TABLE 1-3: FREEWAY MERGE/DIVERGE RAMP JUNCTION ANALYSIS LOCATIONS 7
TABLE 1-4: SUMMARY OF IMPROVEMENTS BY ANALYSIS SCENARIO 26
TABLE 1-5: PROJECT FAIR SHARE CALCULATIONS FOR INTERSECTIONS 28
TABLE 2-1: SIGNALIZED INTERSECTION LOS THRESHOLDS 40
TABLE 2-2: UNSIGNALIZED INTERSECTION LOS THRESHOLDS 41
TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS 43
TABLE 2-4: DESCRIPTION OF FREEWAY MAINLINE LOS 44
TABLE 2-5: DESCRIPTION OF FREEWAY MERGE AND DIVERGE LOS 45
TABLE 3-1: INTERSECTION ANALYSIS FOR EXISTING (2018) CONDITIONS 61
TABLE 3-2: PEAK HOUR FREEWAY OFF-RAMP QUEUING SUMMARY FOR EXISTING (2018) CONDITIONS 65
TABLE 3-3: BASIC FREEWAY SEGMENT ANALYSIS FOR EXISTING (2018) CONDITIONS 66
TABLE 3-4: FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS FOR EXISTING (2018) CONDITIONS 67
TABLE 3-5: INTERSECTION ANALYSIS FOR EXISTING (2018) CONDITIONS WITH IMPROVEMENTS 69
TABLE 4-1: PROJECT TRIP GENERATION RATES 73
TABLE 4-2: PROJECT TRIP GENERATION SUMMARY 74
TABLE 4-3: CURRENTLY APPROVED LAND USE TRIP GENERATION SUMMARY 75
TABLE 4-4: CURRENTLY APPROVED LAND USE TRIP GENERATION COMPARISON 77
TABLE 4-5: SUMMARY OF CUMULATIVE DEVELOPMENT PROJECTS 89
TABLE 5-1: INTERSECTION ANALYSIS FOR E+P CONDITIONS 97
TABLE 5-2: PEAK HOUR FREEWAY OFF-RAMP QUEUING SUMMARY FOR E+P CONDITIONS 105
TABLE 5-3: BASIC FREEWAY SEGMENT ANALYSIS FOR E+P CONDITIONS 106
TABLE 5-4: FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS FOR E+P CONDITIONS 108
TABLE 5-5: INTERSECTION ANALYSIS FOR E+P CONDITIONS WITH IMPROVEMENTS 109
TABLE 6-1: INTERSECTION ANALYSIS FOR EA AND EAP (2020) CONDITIONS 117
TABLE 6-2: PEAK HOUR FREEWAY OFF-RAMP QUEUING SUMMARY FOR EA AND EAP (2020) CONDITIONS 118
TABLE 6-3: BASIC FREEWAY SEGMENT ANALYSIS FOR EA AND EAP (2020) CONDITIONS 119
TABLE 6-4: FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS FOR EA AND EAP (2020) CONDITIONS 125
TABLE 6-5: INTERSECTION ANALYSIS FOR EA AND EAP (2020) CONDITIONS WITH IMPROVEMENTS . 126
TABLE 7-1: INTERSECTION ANALYSIS FOR EA AND EAP (2021) CONDITIONS 131
TABLE 7-2: PEAK HOUR FREEWAY OFF-RAMP QUEUING SUMMARY FOR EA AND EAP (2021) CONDITIONS 132
TABLE 7-3: BASIC FREEWAY SEGMENT ANALYSIS FOR EA AND EAP (2021) CONDITIONS 138
TABLE 7-4: FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS FOR EA AND EAP (2021) CONDITIONS 139
TABLE 7-5: INTERSECTION ANALYSIS FOR EA AND EAP (2021) CONDITIONS WITH IMPROVEMENTS . 140
TABLE 8-1: INTERSECTION ANALYSIS FOR EA AND EAP (2024) CONDITIONS 147
TABLE 8-2: PEAK HOUR FREEWAY OFF-RAMP QUEUING SUMMARY FOR EA AND EAP (2024) CONDITIONS 148
TABLE 8-3: BASIC FREEWAY SEGMENT ANALYSIS FOR EA AND EAP (2024) CONDITIONS 154

TABLE 8-4: FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS FOR EA AND EAP (2024) CONDITIONS 155
TABLE 8-5: INTERSECTION ANALYSIS FOR EA AND EAP (2024) CONDITIONS WITH IMPROVEMENTS . 156
TABLE 8-6: PEAK HOUR OFF-RAMP QUEUING SUMMARY FOR EAP CONDITIONS WITH IMPROVEMENTS 159
TABLE 9-1: INTERSECTION ANALYSIS FOR EAPC CONDITIONS 166
TABLE 9-2: PEAK HOUR FREEWAY OFF-RAMP QUEUING SUMMARY FOR EAPC CONDITIONS 171
TABLE 9-3: BASIC FREEWAY SEGMENT ANALYSIS FOR EAPC CONDITIONS 172
TABLE 9-4: FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS FOR EAPC CONDITIONS 173
TABLE 9-5: INTERSECTION ANALYSIS FOR EAPC CONDITIONS WITH IMPROVEMENTS 178
TABLE 9-6: PEAK HOUR OFF-RAMP QUEUING SUMMARY FOR EAPC CONDITIONS WITH IMPROVEMENTS 186

LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
CA MUTCD	California Manual on Uniform Traffic Control Devices
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CMP	Congestion Management Program
E+P	Existing Plus Project
EA	Existing Plus Ambient Growth
EAP	Existing Plus Ambient Growth Plus Project
EAPC	Existing Plus Ambient Growth Plus Project Plus Cumulative
HCM	Highway Capacity Manual
HCS	Highway Capacity Software
ITE	Institute of Transportation Engineers
LOS	Level of Service
N/A	Not Applicable
PAED	Project Approval and Environmental Document
PCE	Passenger Car Equivalent
PeMS	Caltrans Performance Measurement System
PHF	Peak Hour Factor
Project	Nichols Ranch
RTA	Riverside Transit Authority
RTP	Regional Transportation Plan
SCAG	Southern California Association of Governments
SCS	Sustainable Communities Strategy
sf	Square Feet
SHS	State Highway System
TIA	Traffic Impact Analysis
TIF	Traffic Infrastructure Fee
TUMF	Transportation Uniform Mitigation Fee
WRCOG	Western Riverside Council of Governments

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1 INTRODUCTION

This report presents the results of the traffic impact analysis (TIA) for the proposed Nichols Ranch (referred to as "Project") located south of Nichols Road and east 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 (April 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

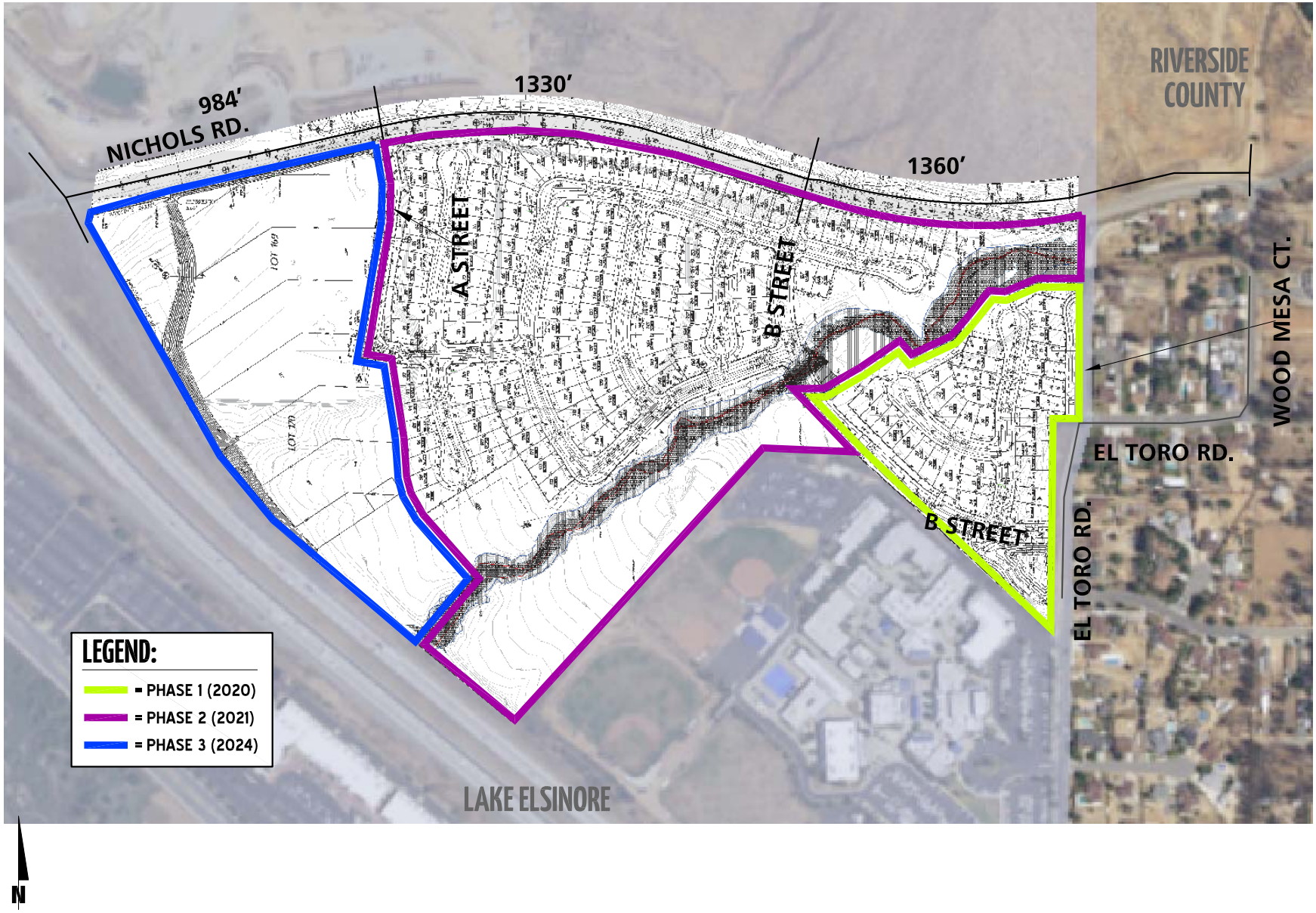
The proposed Project is located within the Alberhill Ranch Specific Plan and a portion (southern parcel) lies outside of the Specific Plan. For purposes of the traffic analysis it is anticipated that the Project will be evaluated in 3 phases, with Phase 1 having a projected Opening Year of 2020, Phase 2 having a project Opening Year of 2021, and Project Buildout anticipated to occur in 2024.

- Phase 1 (2020): 34 low-medium density residential dwelling units
- Phase 2 (2021): Phase 1 (2020) development plus 134 additional low-medium density residential dwelling units (buildout of residential) and an 8.3-acre park
- Phase 3 (2024): Phase 1 (2020) and Phase 2 (2021) development plus 6,000 square feet (sf) of fast-food restaurant with drive-through window use, 9,400 sf of high turnover (sit-down) restaurant use, 8,000 sf of health and fitness club use, 43,000 sf of office use, 5,500 sf of fast food without drive-through, a 16-vehicle fueling position gas station with convenience store and car wash, and 130 room hotel

As indicated on Exhibit 1-1, access to the Project site is proposed to be provided by Nichols Road via A Street and B Street and El Toro Road via B Street. The Project will construct B Street between El Toro Road and Nichols Road in Phase 1 (2020). Regional access to the Project site is provided via the I-15 Freeway at Nichols Road interchange.

Trips generated by the Project's proposed land uses have been estimated based on trip generation rates collected by the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, 2017. (3) The Project is estimated to generate a net total of 6,900 trip-ends per day on a typical weekday with approximately 734 AM peak hour trips, and 622 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.

EXHIBIT 1-1: PRELIMINARY SITE PLAN



1.2 ANALYSIS SCENARIOS

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

1. Existing (2018) Conditions (Baseline)
2. Existing plus Phase 1 Project (E+P) Conditions
3. Existing plus Phase 2 Project (E+P) Conditions
4. Existing plus Project Buildout (E+P) Conditions
5. Existing plus Ambient Growth (EA) (2020) Conditions
6. Existing plus Ambient Growth plus Project (EAP) (2020) Conditions
7. Existing plus Ambient Growth (EA) (2021) Conditions
8. Existing plus Ambient Growth plus Project (EAP) (2021) Conditions
9. Existing plus Ambient Growth (EA) (2024) Conditions
10. Existing plus Ambient Growth plus Project (EAP) (2024) Conditions
11. Existing plus Ambient Growth plus Project plus Cumulative (EAPC) (2020) Conditions
12. Existing plus Ambient Growth plus Project plus Cumulative (EAPC) (2021) Conditions
13. Existing plus Ambient Growth plus Project plus Cumulative (EAPC) (2024) Conditions

The proposed Project is anticipated to generate fewer trips than the currently approved land use (commercial retail) or less than 50 peak hour trips over the trip generation for the currently approved land use (see Table 4-4 of this report). As such, Horizon Year traffic conditions has not been evaluated for the purposed of this TIA.

1.2.1 EXISTING (2018) CONDITIONS

Information for Existing (2018) 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. This analysis scenario has also been provided for informational purposes only as Project impacts have been discerned from a comparison of Existing (2018) to EAP (2020), EAP (2021), and EAP (2024) traffic conditions (per the County's traffic study guidelines).

1.2.3 EXISTING PLUS AMBIENT GROWTH

The Existing plus Ambient Growth (EA) conditions includes 4.04% (for 2020 conditions), 6.12% (for 2021 conditions), and 12.62% (for 2024 conditions) of ambient growth traffic. Cumulative development projects are not included as part of the EA analysis.

1.2.4 EXISTING PLUS AMBIENT GROWTH PLUS PROJECT CONDITIONS

The Existing plus Ambient Growth plus Project (EAP) conditions analysis determines the cumulative traffic impacts based on a comparison of the EAP traffic conditions to EA conditions (i.e., baseline conditions). To account for background traffic growth, ambient growths from Existing conditions of 4.04% (for 2020 conditions), 6.12% (for 2021 conditions), and 12.62% (for 2024 conditions) are included for EAP traffic conditions. Cumulative development projects are not included as part of the EAP analysis.

1.2.5 EXISTING PLUS AMBIENT GROWTH PLUS PROJECT PLUS CUMULATIVE CONDITIONS

The Existing plus Ambient Growth plus Project plus Cumulative (EAPC) conditions analysis will be 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 City of Lake Elsinore General Plan. (4) 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 4.04% (for 2020 conditions), 6.12% (for 2021 conditions), and 12.62% (for 2024 conditions) of ambient growth for EAPC traffic conditions in conjunction with traffic associated with the proposed Project.

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.

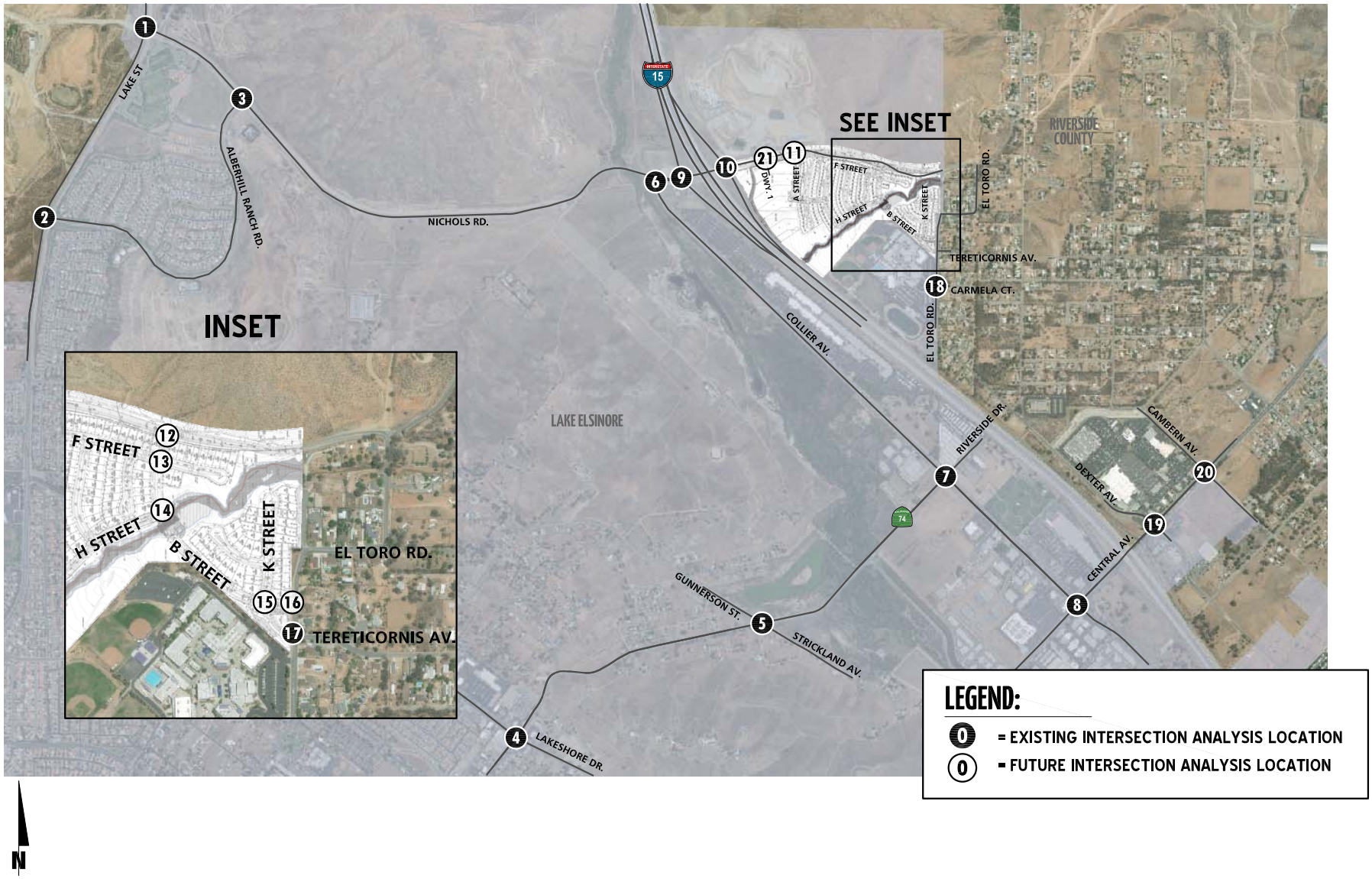
1.3.1 INTERSECTIONS

The following 21 study area intersections shown on Exhibit 1-2 and listed in Table 1-1 were selected for this TIA based on consultation with City of Lake Elsinore staff. 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 (April 2008) as the City does not have their own guidelines. (1) 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. 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.

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction
1	Lake St. & Nichols Rd.	Lake Elsinore
2	Lake St. & Alberhill Ranch Rd.	Lake Elsinore
3	Alberhill Ranch Rd. & Nichols Rd.	Lake Elsinore
4	Lakeshore Dr. & Riverside Dr. (SR-74)	Caltrans
5	Gunnerson St./Strickland Av. & Riverside Dr. (SR-74)	Caltrans
6	Collier Av. & Nichols Rd.	Lake Elsinore
7	Collier Av. & Riverside Dr. (SR-74)	Caltrans
8	Collier Av. & Central Av. (SR-74)	Caltrans
9	I-15 Southbound Ramps & Nichols Rd.	Caltrans
10	I-15 Northbound Ramps & Nichols Rd.	Caltrans
11	A Street & Nichols Rd.	Lake Elsinore
12	B Street & Nichols Rd.	Lake Elsinore
13	B Street & F Street – Future Intersection	Lake Elsinore
14	B Street & H Street – Future Intersection	Lake Elsinore
15	K Street & B Street – Future Intersection	Lake Elsinore
16	El Toro Rd. & B Street – Future Intersection	Lake Elsinore, County of Riverside
17	El Toro Rd. & Tereticornis Av.	County of Riverside
18	El Toro Rd. & Carmela Ct.	County of Riverside
19	Dexter Av. & Central Av. (SR-74)	Lake Elsinore
20	Cambern Av. & Central Av. (SR-74)	Lake Elsinore
21	Driveway 1 & Nichols Rd.	Lake Elsinore

EXHIBIT 1-2: LOCATION MAP



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) The Project is anticipated to contribute more than 50 peak hour trips to the State Highway System (SHS), as such, 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 – Southbound, North of Nichols Road
2	I-15 Freeway – Southbound, South of Nichols Road
3	I-15 Freeway – Northbound, North of Nichols Road
4	I-15 Freeway – Northbound, South of Nichols Road

1.3.3 FREEWAY MERGE/DIVERGE RAMP JUNCTIONS

Similarly, the Project is anticipated to contribute more than 50 peak hour trips to the study area freeway merge/diverge ramp junction analysis locations, as such, the following freeway ramp junctions for each direction of flow as shown in 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 – Southbound, Off-Ramp at Nichols Road (Diverge)
2	I-15 Freeway – Southbound, On-Ramp at Nichols Road (Merge)
3	I-15 Freeway – Northbound, On-Ramp at Nichols Road (Merge)
4	I-15 Freeway – Northbound, Off-Ramp at Nichols Road (Diverge)

1.4 ANALYSIS FINDINGS

This section provides a summary of the analysis results for Existing (2018), E+P (Phase 1), E+P (Phase 2), E+P (Project Buildout), EAP (2020), EAP (2021), EAP (2024), EAPC (2020), EAPC (2021), and EAPC (2024) traffic conditions.

1.4.1 EXISTING (2018) CONDITIONS

Intersection Operations

For Existing traffic conditions, the following study area intersections are anticipated to operate at an unacceptable LOS (see Exhibit 1-3):

- Gunnerson Street/Strickland Avenue & Riverside Drive (#5) – LOS F AM and PM peak hours
- I-15 Northbound Ramps & Nichols Road (#10) – LOS F AM peak hour only
- El Toro Road & Tereticornis Avenue (#17) – LOS F AM peak hour only

- El Toro Road & Carmela Court (#18) – LOS F AM peak hour only

The intersection of El Toro Road and Tereticornis Avenue is located in close proximity to the existing Temescal Canyon High School. When evaluating the AM peak hour with a normalized peak hour factor (PHF) of 0.92, then acceptable peak hour operations are anticipated during the morning peak hour. In other words, the deficiency listed above is due to the peak 10-15 minute traffic flows during the AM peak hour that are associated with morning drop-offs at the school and the intersection is anticipated to operate at acceptable LOS outside of that 10-15 minute peak period. There are no movements that are currently experiencing off-ramp queuing issues during the weekday AM or PM peak hours based on the existing 95th percentile traffic flows at the Nichols Road and I-15 Freeway interchange.

Freeway Facilities

The I-15 Freeway basic freeway segments and merge and diverge ramp junction areas are currently operating at an acceptable LOS under Existing (2018) traffic conditions during the peak hours.

Recommended Improvements

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal.
- Add a northbound right turn lane.

El Toro Road & Carmela Court (#18)

- Install stop signs along El Toro Road to implement an all-way stop control.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.

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

#	Intersection	Existing (2018)	E+P (Phase 1)	E+P (Phase 2)	E+P (Buildout)	EA (2020)	EA (2021)	EA (2024)	EAP (2020)	EAP (2021)	EAP (2024)	EAPC (2020)	EAPC (2021)	EAPC (2024)
1	Lake St. & Nichols Rd.													
2	Lake St. & Alberhill Ranch Rd.													
3	Alberhill Ranch Rd. & Nichols Rd.													
4	Lakeshore Dr. & Riverside Dr. (SR-74)													
5	Gunnerson St./Strickland Av. & Riverside Dr. (SR-74)													
6	Collier Av. & Nichols Rd.													
7	Collier Av. & Riverside Dr. (SR-74)													
8	Collier Av. & Central Av. (SR-74)													
9	I-15 SB Ramps & Nichols Rd.													
10	I-15 NB Ramps & Nichols Rd.													
11	A St. & Nichols Rd.	NA	NA			NA	NA	NA	NA			NA		
12	B St. & Nichols Rd.	NA				NA	NA	NA						
13	B St. & F St.	NA	NA			NA	NA	NA	NA			NA		
14	B St. & H St.	NA	NA			NA	NA	NA	NA			NA		
15	K St. & B St.	NA				NA	NA	NA						
16	El Toro Rd. & B St.	NA				NA	NA	NA						
17	El Toro Rd. & Tereticornis Av.				*					*	*	*	*	*
18	El Toro Rd. & Carmela Ct.	*	*	*	*				*	*	*	*	*	*
19	Dexter Av. & Central Av. (SR-74)													
20	Cambern Av. & Central Av. (SR-74)													
21	Dwy. 1 & Nichols Rd.	NA	NA	NA		NA	NA	NA	NA	NA		NA	NA	

LEGEND:

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

* NOTE: INTERSECTION ALSO IS ANTICIPATED TO HAVE AN IMPACT WITH THE NORMALIZED PHF.

1.4.2 E+P (PHASE 1) CONDITIONS

Intersection Operations

For E+P (Phase 1) traffic conditions, the same 4 study area intersections are anticipated to operate at an unacceptable LOS, consistent with Existing (2018) conditions (see Exhibit 1-3).

Consistent with Existing (2018) traffic conditions, there are no movements that are anticipated to experience off-ramp queuing issues during the weekday AM or PM peak hours based on the 95th percentile traffic flows at the Nichols Road and I-15 Freeway interchange for E+P (Phase 1) traffic conditions.

The intersection of El Toro Road and Tereticornis Avenue is located in close proximity to the existing Temescal Canyon High School. When evaluating the AM peak hour with a normalized peak hour factor (PHF) of 0.92, then acceptable peak hour operations are anticipated during the morning peak hour. In other words, the deficiency listed above is due to the peak 10-15 minute traffic flows during the AM peak hour that are associated with morning drop-offs at the school and the intersection is anticipated to operate at acceptable LOS outside of that 10-15 minute peak period. There are no movements that are currently experiencing off-ramp queuing issues during the weekday AM or PM peak hours based on the existing 95th percentile traffic flows at the Nichols Road and I-15 Freeway interchange.

Freeway Facilities

The I-15 Freeway basic freeway segments and merge and diverge ramp junction areas are anticipated to continue to operate at an acceptable LOS under E+P (Phase 1) traffic conditions during the peak hours.

Recommended Improvements

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal.
- Add a northbound right turn lane.

El Toro Road & Carmela Court (#18)

- Install stop signs along El Toro Road to implement an all-way stop control.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.

1.4.3 E+P (PHASE 2) CONDITIONS

Intersection Operations

For E+P (Phase 2) traffic conditions, the addition of Phase 2 Project traffic is not anticipated to result in additional LOS deficiencies during the peak hours, in addition to the locations previously identified under Existing (2018) traffic conditions.

There are no movements anticipated to experience off-ramp queuing issues during the weekday AM or PM peak hours based on the 95th percentile traffic flows at the Nichols Road and I-15 Freeway interchange for E+P (Phase 2) traffic conditions.

The intersection of El Toro Road and Tereticornis Avenue is located in close proximity to the existing Temescal Canyon High School. When evaluating the AM peak hour with a normalized peak hour factor (PHF) of 0.92, then acceptable peak hour operations are anticipated during the morning peak hour. In other words, the deficiency listed above is due to the peak 10-15 minute traffic flows during the AM peak hour that are associated with morning drop-offs at the school and the intersection is anticipated to operate at acceptable LOS outside of that 10-15 minute peak period. There are no movements that are currently experiencing off-ramp queuing issues during the weekday AM or PM peak hours based on the existing 95th percentile traffic flows at the Nichols Road and I-15 Freeway interchange.

Freeway Facilities

The I-15 Freeway basic freeway segments and merge and diverge ramp junction areas are anticipated to continue to operate at an acceptable LOS under E+P (Phase 2) traffic conditions during the peak hours.

Recommended Improvements

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal.
- Add a northbound right turn lane.

El Toro Road & Carmela Court (#18)

- Install stop signs along El Toro Road to implement an all-way stop control.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.

1.4.4 E+P (PROJECT BUILDOUT) CONDITIONS

Intersection Operations

For E+P (Project Buildout) traffic conditions, the following intersections are anticipated to operate at unacceptable LOS with the addition of Project Buildout traffic, in addition to those previously identified under E+P (Phase 2) traffic conditions:

- Collier Avenue & Nichols Road (#6) – LOS E AM peak hour; LOS F PM peak hour
- I-15 Southbound Ramps & Nichols Road (#9) – LOS E AM peak hour only
- El Toro Road & Tereticornis Avenue (#17) – LOS D AM peak hour (with normalized PHF)

There are no movements anticipated to experience off-ramp queuing issues during the weekday AM or PM peak hours based on the 95th percentile traffic flows at the Nichols Road and I-15 Freeway interchange for E+P (Project Buildout) traffic conditions.

Freeway Facilities

The I-15 Freeway basic freeway segments and merge and diverge ramp junction areas are anticipated to continue to operate at an acceptable LOS under E+P (Project Buildout) traffic conditions during the peak hours.

Recommended Improvements

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal.

Collier Avenue & Nichols Road (#6)

- Install stop signs along Nichols Road to implement an all-way stop control.

I-15 Southbound Ramps & Nichols Road (#9)

- Install a traffic signal.
- Construct a southbound left turn lane.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal.
- Add a northbound right turn lane.

El Toro Road & Tereticornis Avenue (#17)

- Install stop signs along El Toro Road to implement an all-way stop control.

El Toro Road & Carmela Court (#18)

- Install stop signs along El Toro Road to implement an all-way stop control.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.

- Remove a portion of on-street parking on the northbound approach to allow restriping for a dedicated 100-foot left turn pocket.

1.4.5 EA (2020) CONDITIONS

Intersection Operations

The intersection analysis results indicate that there are no additional intersections anticipated to operate at an unacceptable LOS, in addition to those previously identified in Existing (2018) conditions (see Exhibit 1-3).

There are no movements anticipated to experience off-ramp queuing issues during the weekday AM or PM peak hours based on the 95th percentile traffic flows at the Nichols Road and I-15 Freeway interchange for EA (2020) traffic conditions.

Freeway Facilities

The following basic freeway segment is anticipated to operate at an unacceptable LOS during the peak hours for EA (2020) traffic conditions:

- I-15 Freeway Southbound, South of Nichols Road (#2) – LOS E PM peak hour only

The following merge and diverge ramp junction area is anticipated to operate at an unacceptable LOS during the peak hours for EA (2020) traffic conditions:

- I-15 Freeway Southbound, Off-Ramp at Nichols Road (#1) – LOS E PM peak hour only

Recommended Improvements

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal.
- Add a northbound right turn lane.

El Toro Road & Carmela Court (#18)

- Install stop signs along El Toro Road to implement an all-way stop control.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.

1.4.6 EAP (2020) CONDITIONS

Intersection Operations

The intersection analysis results indicate that there are no additional intersections anticipated to operate at an unacceptable LOS, in addition to those previously identified in Existing (2018) and EA (2020) traffic conditions (see Exhibit 1-3).

There are no movements anticipated to experience off-ramp queuing issues during the weekday AM or PM peak hours based on the 95th percentile traffic flows at the Nichols Road and I-15 Freeway interchange for EAP (2020) traffic conditions.

Freeway Facilities

There are no additional basic freeway segments or merge and diverge ramp junction areas anticipated to operate at an unacceptable LOS during the peak hours for EAP (2020) traffic conditions, in addition to the location previously identified under EA (2020) traffic conditions.

Recommended Improvements

Cumulative traffic impacts are deficiencies that are not directly caused by the Project, but occur as a result of regional growth or if the Project is anticipated to contribute traffic to a deficient intersection under pre-project conditions. The Project's contribution to a particular cumulative transportation deficiency is deemed cumulatively considerable if the Project adds significant traffic to the forecasted deficiency.

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal (same as EA (2020)).

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal (same as EA (2020)).
- Add a northbound right turn lane (same as EA (2020)).

El Toro Road & Carmela Court (#18)

- Install stop signs along El Toro Road to implement an all-way stop control (same as EA (2020)).
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket (same as EA (2020)).

1.4.7 EA (2021) CONDITIONS

Intersection Operations

The intersection analysis results indicate that the following additional intersection is anticipated to operate at unacceptable LOS for EA (2021) traffic conditions, in addition to those previously identified under EA (2020) traffic conditions:

- El Toro Road & Tereticornis Avenue (#17) – LOS D AM peak hour only (with normalized PHF)

There are no movements anticipated to experience off-ramp queuing issues during the weekday AM or PM peak hours based on the 95th percentile traffic flows at the Nichols Road and I-15 Freeway interchange for EA (2021) traffic conditions.

Freeway Facilities

The following basic freeway segment is anticipated to operate at an unacceptable LOS during the peak hours for EA (2021) traffic conditions, in addition to the location previously identified under

EA (2020) traffic conditions:

- I-15 Freeway Southbound, North of Nichols Road (#1) – LOS E PM peak hour only

There are no additional merge and diverge ramp junction areas anticipated to operate at an unacceptable LOS during the peak hours for EA (2021) traffic conditions, in addition to the location previously identified under EA (2020) traffic conditions.

Recommended Improvements

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal.
- Add a northbound right turn lane.

El Toro Road & Tereticornis Avenue (#17)

- Install stop signs along El Toro Road to implement an all-way stop control.

El Toro Road & Carmela Court (#18)

- Install stop signs along El Toro Road to implement an all-way stop control.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.

1.4.8 EAP (2021) CONDITIONS

Intersection Operations

The intersection analysis results indicate that the following additional intersection is anticipated to operate at unacceptable LOS for EAP (2021) traffic conditions, in addition to those previously identified under EA (2021) traffic conditions:

- Collier Avenue & Nichols Road (#6) – LOS E PM peak hour only

There are no movements anticipated to experience off-ramp queuing issues during the weekday AM or PM peak hours based on the 95th percentile traffic flows at the Nichols Road and I-15 Freeway interchange for EAP (2021) traffic conditions.

Freeway Facilities

There are no additional basic freeway segments or merge and diverge ramp junction areas anticipated to operate at an unacceptable LOS during the peak hours for EAP (2021) traffic conditions, in addition to the location previously identified under EA (2021) traffic conditions.

Recommended Improvements

Cumulative traffic impacts are deficiencies that are not directly caused by the Project, but occur as a result of regional growth or if the Project is anticipated to contribute traffic to a deficient

intersection under pre-project conditions. The Project's contribution to a particular cumulative transportation deficiency is deemed cumulatively considerable if the Project adds significant traffic to the forecasted deficiency.

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal (same as EA (2021)).

Collier Avenue & Nichols Road (#6)

- Install stop signs along Nichols Road to implement an all-way stop control.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal (same as EA (2021)).
- Add a northbound right turn lane (same as EA (2021)).

El Toro Road & Tereticornis Avenue (#17)

- Install stop signs along El Toro Road to implement an all-way stop control (same as EA (2021)).

El Toro Road & Carmela Court (#18)

- Install stop signs along El Toro Road to implement an all-way stop control (same as EA (2021)).
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket (same as EA (2021)).

1.4.9 EA (2024) CONDITIONS

Intersection Operations

The intersection analysis results indicate that the following additional intersection is anticipated to operate at unacceptable LOS for EA (2024) traffic conditions, in addition to those previously identified under EA (2021) traffic conditions:

- Lakeshore Drive & Riverside Drive (SR-74) (#4) – LOS E AM peak hour only

There are no movements anticipated to experience off-ramp queuing issues during the weekday AM or PM peak hours based on the 95th percentile traffic flows at the Nichols Road and I-15 Freeway interchange for EA (2024) traffic conditions.

Freeway Facilities

There are no additional basic freeway segments or merge and diverge ramp junction areas anticipated to operate at an unacceptable LOS during the peak hours for EA (2024) traffic conditions, in addition to the locations previously identified under EA (2021) traffic conditions.

Recommended Improvements

Lakeshore Drive & Riverside Drive (SR-74) (#4)

- Restripe the westbound right turn lane to a shared through-right lane.

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal.

Collier Avenue & Nichols Road (#6)

- Install a traffic signal.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal.
- Add a northbound right turn lane.

El Toro Road & Tereticornis Avenue (#17)

- Install stop signs along El Toro Road to implement an all-way stop control.

El Toro Road & Carmela Court (#18)

- Implementation of a traffic guard during the AM peak hour only.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.
- Remove a portion of on-street parking on the northbound approach to allow restriping for a dedicated 100-foot left turn pocket.

1.4.10 EAP (2024) CONDITIONS

Intersection Operations

The intersection analysis results indicate that the following additional intersection is anticipated to operate at unacceptable LOS for EAP (2024) traffic conditions, in addition to those previously identified under EA (2024) traffic conditions:

- I-15 Northbound Ramps & Nichols Road (#9) – LOS F AM peak hour, LOS E PM peak hour

The following movement is anticipated to experience queuing issues based on the existing 95th percentile traffic flows at the Nichols Road and I-15 Freeway interchange during the peak hours:

- I-15 Freeway Northbound Off-Ramp at Nichols Road (#2): Shared northbound left-through-right turn lane during the AM peak hour only

With the proposed intersection improvements at the study area freeway ramp-to-arterial intersections, the analysis indicates there are no queuing issues anticipated that may potentially "spill back" onto the I-15 Freeway mainline during the peak hours for EAP (2024) traffic conditions.

Freeway Facilities

There are no additional basic freeway segments or merge and diverge ramp junction areas anticipated to operate at an unacceptable LOS during the peak hours for EAP (2024) traffic conditions, in addition to the locations previously identified under EA (2024) traffic conditions.

Recommended Improvements

Cumulative traffic impacts are deficiencies that are not directly caused by the Project, but occur as a result of regional growth or if the Project is anticipated to contribute traffic to a deficient intersection under pre-project conditions. The Project's contribution to a particular cumulative transportation deficiency is deemed cumulatively considerable if the Project adds significant traffic to the forecasted deficiency.

Lakeshore Drive & Riverside Drive (SR-74) (#4)

- Restripe the westbound right turn lane to a shared through-right lane (same as EA (2024)).

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal (same as EA (2024)).

Collier Avenue & Nichols Road (#6)

- Install a traffic signal (same as EA (2024)).

I-15 Southbound Ramps & Nichols Road (#9)

- Install a traffic signal.
- Add a southbound left turn lane.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal (same as EA (2024)).
- Add a northbound right turn lane (same as EA (2024)).

El Toro Road & Tereticornis Avenue (#17)

- Install stop signs along El Toro Road to implement an all-way stop control (same as EA (2024)).

El Toro Road & Carmela Court (#18)

- Implementation of a traffic guard during the AM peak hour only (same as EA (2024)).
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket (same as EA (2024)).
- Remove a portion of on-street parking on the northbound approach to allow restriping for a dedicated 100-foot left turn pocket (same as EA (2024)).

Although the intersection of El Toro Road and Carmela Court operates at an unacceptable LOS and meets the traffic signal warrant under EAP (2024) traffic conditions, the installation of a traffic signal may not be appropriate for the character of the surrounding residential neighborhood. As such, to mitigate the impacts, it is recommended that a traffic guard be utilized during the AM peak hour only to direct traffic similar to the way a signalized intersection would operate.

1.4.11 EAPC (2020) CONDITIONS

Intersection Operations

The intersection analysis results indicate that the following study area intersections are anticipated to operate at unacceptable LOS for EAPC (2020) traffic conditions:

- Lake Street & Nichols Road (#1) – LOS F PM peak hour only
- Gunnerson Street/Strickland Avenue (#5) – LOS F AM and PM peak hours
- Collier Avenue & Nichols Road (#6) – LOS F PM peak hour only
- I-15 Northbound Ramps & Nichols Road (#10) – LOS F AM and PM peak hours
- El Toro Road & Tereticornis Avenue (#17) – LOS D AM peak hour only (with normalized PHF)
- El Toro Road & Carmela Court (#18) – LOS E PM peak hour only (with normalized PHF)
- Dexter Avenue & Central Avenue (SR-74) (#19) – LOS E PM peak hour only

There are no movements anticipated to experience off-ramp queuing issues during the weekday AM or PM peak hours based on the 95th percentile traffic flows at the Nichols Road and I-15 Freeway interchange for EAPC (2020) traffic conditions.

Freeway Facilities

The following basic freeway segments are anticipated to operate at an unacceptable LOS for EAPC (2020) traffic conditions:

- I-15 Freeway Southbound, North of Nichols Road (#1) – LOS E PM peak hour only
- I-15 Freeway Southbound, South of Nichols Road (#2) – LOS E PM peak hour only

The following merge and diverge ramp junction area is anticipated to operate at an unacceptable LOS during one or more peak hours under EAPC (2020) traffic conditions:

- I-15 Freeway Southbound, Off-Ramp at Nichols Road (#1) – LOS E PM peak hour only

Recommended Improvements

Cumulative traffic impacts are deficiencies that are not directly caused by the Project, but occur as a result of regional growth combined with that or other nearby cumulative development projects or if the Project is anticipated to contribute traffic to a deficient intersection under pre-project conditions. The Project's contribution to a particular cumulative transportation deficiency is deemed cumulatively considerable if the Project adds significant traffic to the forecasted deficiency.

Lake Street & Nichols Street (#1)

- Add a 2nd northbound through lane.
- Add a 2nd southbound through lane.
- Add an eastbound left turn lane.
- Add a westbound left lane.

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal.

Collier Avenue & Nichols Road (#6)

- Install stop signs along Nichols Road to implement an all-way stop control.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal.
- Add a northbound right turn lane.

El Toro Road & Tereticornis Avenue (#17)

- Install stop signs along El Toro Road to implement an all-way stop control.

El Toro Road & Carmela Court (#18)

- Install stop signs along El Toro Road to implement an all-way stop control.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.

Dexter Avenue & Central Avenue (SR-74) (#19)

- Modify the intersection to its ultimate design by restricting the northbound and southbound approaches to right turn only, and removing the left turns on the eastbound and westbound approaches. The future I-15 Freeway and Central Avenue (SR-74) interchange project is currently in the Project Approval and Environmental Document (PAED) phase and a preferred alternative has not been selected. As such, the intersection was also evaluated assuming full access. The full access intersection would need a 2nd eastbound left turn lane for EAPC (2020) traffic conditions for acceptable peak hour operations.

1.4.12 EAPC (2021) CONDITIONS

Intersection Operations

The intersection analysis results indicate that there are no additional intersections are anticipated to operate at unacceptable LOS for EAPC (2021) traffic conditions, in addition to those previously identified under EAPC (2020) traffic conditions.

There are no movements anticipated to experience off-ramp queuing issues during the weekday AM or PM peak hours based on the 95th percentile traffic flows at the Nichols Road and I-15 Freeway interchange for EAPC (2021) traffic conditions.

Freeway Facilities

There are no additional basic freeway segments anticipated to operate at an unacceptable LOS for EAPC (2021) traffic conditions, in addition to those previously identified for EAPC (2020) traffic conditions.

There are no additional ramp merge and diverge segments anticipated to operate at an unacceptable LOS during one or more peak hours under EAPC (2021) traffic conditions, in addition to those previously identified under EAPC (2020) traffic conditions.

Recommended Improvements

Cumulative traffic impacts are deficiencies that are not directly caused by the Project, but occur as a result of regional growth combined with that or other nearby cumulative development projects or if the Project is anticipated to contribute traffic to a deficient intersection under pre-project conditions. The Project's contribution to a particular cumulative transportation deficiency is deemed cumulatively considerable if the Project adds significant traffic to the forecasted deficiency.

Lake Street & Nichols Street (#1)

- Add a 2nd northbound through lane.
- Add a 2nd southbound through lane.
- Add an eastbound left turn lane.
- Add a westbound left lane.

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal.

Collier Avenue & Nichols Road (#6)

- Install a traffic signal.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal.
- Add a northbound right turn lane.

El Toro Road & Tereticornis Avenue (#17)

- Install stop signs along El Toro Road to implement an all-way stop control.

El Toro Road & Carmela Court (#18)

- Install stop signs along El Toro Road to implement an all-way stop control.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.

Dexter Avenue & Central Avenue (SR-74) (#19)

- Modify the intersection to its ultimate design by restricting the northbound and southbound approaches to right turn only, and removing the left turns on the eastbound and westbound approaches. The future I-15 Freeway and Central Avenue (SR-74) interchange project is currently in the PAED phase and a preferred alternative has not been selected. As such, the intersection was also evaluated assuming full access. The full access intersection would need a 2nd eastbound

left turn lane and 2nd westbound left turn lane for EAPC (2021) traffic conditions for acceptable peak hour operations.

1.4.13 EAPC (2024) CONDITIONS

Intersection Operations

The intersection analysis results indicate that the following study area intersections are anticipated to operate at unacceptable LOS for EAPC (2024) traffic conditions, in addition to those previously identified under EAPC (2020) and EAPC (2021) traffic conditions:

- Alberhill Ranch Road & Nichols Road (#3) – LOS F AM and PM peak hours
- Lakeshore Drive & Riverside Drive (SR-74) (#4) – LOS E AM and PM peak hours
- Collier Avenue & Riverside Drive (SR-74) (#7) – LOS E PM peak hour only
- I-15 Southbound Ramps & Nichols Road (#9) – LOS F AM and PM peak hours
- Cambern Avenue & Central Avenue (SR-74) (#20) – LOS E AM and PM peak hours

The following movements are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for EAPC (2024) traffic conditions:

- I-15 Freeway Southbound Off-ramp at Nichols Road (#1): Shared southbound left-through-right turn lane during the AM peak hour only
- I-15 Freeway Northbound Off-ramp at Nichols Road (#2): Shared northbound left-through-right turn lane during the AM peak hour only

With the proposed intersection improvements at the study area freeway ramp-to-arterial intersections, the analysis indicates there are no queuing issues anticipated that may potentially "spill back" onto the I-15 Freeway mainline during the peak hours for EAPC (2024) traffic conditions.

Freeway Facilities

There are no additional freeway segments anticipated to operate at an unacceptable LOS under EAPC (2024) traffic conditions, in addition to those previously identified under EAPC (2020) and EAPC (2021) traffic conditions.

The following ramp merge and diverge segment is anticipated to operate at an unacceptable LOS during one or more peak hours under EAPC (2024) traffic conditions, in addition to the segment previously identified under EAPC (2020) and EAPC (2021) traffic conditions:

- I-15 Freeway Southbound, On-Ramp at Nichols Road (#2) – LOS E PM peak hour only

Recommended Improvements

Cumulative traffic impacts are deficiencies that are not directly caused by the Project, but occur as a result of regional growth combined with that or other nearby cumulative development projects or if the Project is anticipated to contribute traffic to a deficient intersection under pre-project conditions. The Project's contribution to a particular cumulative transportation deficiency

is deemed cumulatively considerable if the Project adds significant traffic to the forecasted deficiency.

Lake Street & Nichols Street (#1)

- Add a 2nd northbound through lane.
- Add a 2nd southbound through lane.
- Add an eastbound left turn lane.
- Add a westbound left lane.
- Add a southbound left lane.
- Add an eastbound right turn lane.

Alberhill Ranch Road & Nichols Road (#3)

- Install a traffic signal.

Lakeshore Drive & Riverside Drive (SR-74) (#4)

- Restripe the westbound right turn lane to a shared through-right lane.

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal.

Collier Avenue & Nichols Road (#6)

- Install a traffic signal.

Collier Avenue & Riverside Drive (SR-74) (#7)

- Add a 2nd northbound left turn lane.

I-15 Southbound Ramps & Nichols Road (#9)

- Install a traffic signal.
- Add a southbound left turn lane.
- Add a southbound right turn lane.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal
- Add a northbound right turn lane.
- Add a 2nd eastbound left turn lane
- Add a 2nd eastbound through lane
- Add a 2nd westbound through lane

El Toro Road & Tereticornis Avenue (#17)

- Install stop signs along El Toro Road to implement an all-way stop control.

El Toro Road & Carmela Court (#18)

- Implementation of a traffic guard during the AM peak hour only.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.
- Remove a portion of on-street parking on the northbound approach to allow restriping for a dedicated 100-foot left turn pocket.

Although the intersection of El Toro Road and Carmela Court operates at an unacceptable LOS and meets the traffic signal warrant under EAPC (2024) traffic conditions, the installation of a traffic signal may not be appropriate for the character of the surrounding residential neighborhood. As such, to mitigate the impacts, it is recommended that a traffic guard be utilized during the AM peak hour only to direct traffic similar to the way a signalized intersection would operate.

Dexter Avenue & Central Avenue (SR-74) (#19)

- Modify the intersection to its ultimate design by restricting the northbound and southbound approaches to right turn only, and removing the left turns on the eastbound and westbound approaches. The future I-15 Freeway and Central Avenue (SR-74) interchange project is currently in the PAED phase and a preferred alternative has not been selected. As such, the intersection was also evaluated assuming full access. The full access intersection would need a 2nd eastbound left turn lane, 4th eastbound through lane, and 2nd westbound left turn lane for EAPC (2024) traffic conditions for acceptable peak hour operations.

Cambern Avenue & Central Avenue (SR-74) (#20)

- Add dual southbound left turn lanes.
- Add a 3rd eastbound through lane.
- Add a 3rd westbound through lane.

1.5 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 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.

Table 1-4 lists the recommended improvements necessary to reduce the identified intersection LOS deficiencies by traffic condition. For recommended improvements that are not included in TUMF or TIF, fair share contribution based on the Project's percentage contribution has been provided in Table 1-5. 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. 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.

1.5.1 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 2016 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

#	Intersection Location	Jurisdiction	Existing (2018)	E+P (Phase 1)	E+P (Phase 2)	E+P (Project Buildout)	EA (2020)	EAP (2020)	EA (2021)	EAP (2021)	EA (2024)	EAP (2024)	EAPC (2020)	EAPC (2021)	EAPC (2024)	Project Responsibility[1]	Improvements in TUMF or TIF?[2]	2020 Fair Share %[3]	2021 Fair Share %[3]	2024 Fair Share %[3]
1	Lake St. & Nichols Rd.	Lake Elsinore	None	None	None	None	None	None	None	None	None	None	Add a 2nd NB through lane Add a 2nd SB through lane Add an EB left turn lane Add a WB left turn lane	Same Same Same Same	Add a SB right turn lane Add an EB right turn lane	TUMF TUMF Fair Share Fair Share Fair Share Fair Share	No	0.3%	1.2%	6.8%
3	Alberhill Ranch Rd. & Nichols Rd.	Lake Elsinore	None	None	None	None	None	None	None	None	None	None	None	None	Install a traffic signal	Fair Share	No	1.1%	3.1%	17.7%
4	Lakeshore Dr. & Riverside Dr. (SR-74)	Caltrans	None	None	None	None	None	None	None	None	None	Restripe the WB right turn lane to a WB shared through-right turn lane	None	None	Same as EAP (2024)	Construct	Yes (TIF Intersection)	--	--	--
5	Gunnerson St./Strickland Av. & Riverside Dr. (SR-74)	Caltrans	Install a traffic signal	Same	Same	Same	Same	Same	Same	Same	Same	Same	Same	Same	Same	Fair Share	Yes (TIF Intersection)	0.2%	0.8%	5.2%
6	Collier Av. & Nichols Rd.	Lake Elsinore	None	None	None	Convert to AWS control	None	None	None	Same as E+P (Project Buildout)	Install a traffic signal	Same	Same as E+P (Project Buildout)	Same as EAP (2024)	Same as EAP (2024)	Construct (AWS); Fair Share (TS)	Yes (TIF Intersection)	3.0%	9.6%	32.8%
7	Collier Av. & Riverside Dr. (SR-74)	Caltrans	None	None	None	None	None	None	None	None	None	None	None	None	Add a 2nd NB left turn lane	Fee Payment	Yes (TIF Intersection)	--	--	--
9	I-15 Southbound Ramps & Nichols Rd.	Caltrans	None	None	None	Install a traffic signal Add a SB left turn lane	None None	None None	None None	None None	None None	Same as E+P (Project Buildout) Same as E+P (Project Buildout)	None None	None None	Same as E+P (Project Buildout) Same as E+P (Project Buildout) Add a SB right turn lane	Construct Construct Fee Payment	Yes (TUMF/TIF Interchange)	--	--	--
10	I-15 Northbound Ramps & Nichols Rd.	Caltrans	Install a traffic signal Add a NB right turn lane	Same Same	Same Same	Same Same	Same Same	Same Same	Same Same	Same Same	Same Same	Same Same	Same Same	Same Same	Same Same Add a 2nd EB left turn lane Add a 2nd EB through lane Add a 2nd WB through lane	Fee Payment Fee Payment Fee Payment Fee Payment Fee Payment	Yes (TUMF/TIF Interchange)	--	--	--
17	El Toro Rd. & Tereticornis Av.	County of Riverside	None	None	None	Convert to AWS control	None	None	Same as E+P (Project Buildout)	Same as E+P (Project Buildout)	Same as E+P (Project Buildout)	Same as E+P (Project Buildout)	Same as E+P (Project Buildout)	Same as E+P (Project Buildout)	Same as E+P (Project Buildout)	Construct	No	--	--	--
18	El Toro Rd. & Carmela Ct.	County of Riverside	Convert to AWS control Remove a portion of on-street parking to provide a SB right turn lane	Same Same	Same Same	Same Same Remove a portion of on-street parking to provide a NB left turn lane	Same Same None	Same Same None	Same Same None	Same Same None	Same Same None	Implement a traffic guard during the AM peak hour only Same Same as E+P (Project Buildout)	Same as Existing (2018) Same None	Same as Existing (2018) Same None	Same as EAP (2024) Same Same as E+P (Project Buildout)	Fair Share Fair Share Fair Share	No	1.3%	6.0%	17.9%
19	Dexter Av. & Central Av. (SR-74)	Lake Elsinore	None	None	None	None	None	None	None	None	None	None	Modify intersection to its ultimate buildout by removing the NB left turn, NB through, SB left turn, SB through, EB left turn, and WB left turn. Alternative: 2nd EB left turn lane	Same Alternative: 2nd EB left turn lane; 2nd WB left turn lane	Same Alternative: 2nd EB left turn lane, 4th EB through lane, 2nd WB left turn lane	Fee Payment Fee Payment	Yes (TIF Intersection)	--	--	--

Table 1-4

Summary of Improvements by Analysis Scenario

#	Intersection Location	Jurisdiction	Existing (2018)	E+P (Phase 1)	E+P (Phase 2)	E+P (Project Buildout)	EA (2020)	EAP (2020)	EA (2021)	EAP (2021)	EA (2024)	EAP (2024)	EAPC (2020)	EAPC (2021)	EAPC (2024)	Project Responsibility[1]	Improvements in TUMF or TIF?[2]	2020 Fair Share %[3]	2021 Fair Share %[3]	2024 Fair Share %[3]
20	Cambern Av. & Central Av. (SR-74)	Lake Elsinore	None	None	None	None	None	None	None	None	None	None	None	None	Add a SB left turn lane Add a 2nd SB left turn lane Add a 3rd EB through lane Add a 3rd WB through lane	Fee Payment Fee Payment Fee Payment Fee Payment	Yes (TUMF, through lanes only) (TIF Intersection)	--	--	--

[1] Identifies the Project's responsibility to construct an improvement or contribute fair share or fee payment towards the implementation of the improvements shown.

[2] 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.

[3] Fair share percentage is not shown as the recommended improvements at this location are included in a pre-existing fee program.

Table 1-5

Project Fair Share Calculations for Intersections

#	Intersection		Existing (2018)	Project Phase 1	Project Phase 2	Project Buildout	EAPC (2020) Volume	EAPC (2021) Volume	EAPC (2024) Volume	2020 Total New Traffic	2021 Total New Traffic	2024 Total New Traffic	2020 Project % of New Traffic	2021 Project % of New Traffic	2024 Project % of New Traffic
1	Lake St. & Nichols Rd.														
		AM:	1,553	1	10	93	1,979	2,702	2,929	426	1,149	1,376	0.2%	0.9%	**6.8%**
		PM:	1,655	2	11	76	2,258	2,568	3,542	603	913	1,887	**0.3%**	**1.2%**	4.0%
3	Alberhill Ranch Rd. & Nichols Rd.														
		AM:	698	1	9	123	888	991	1,392	190	293	694	0.5%	**3.1%**	**17.7%**
		PM:	582	3	11	98	850	991	1,478	268	409	896	**1.1%**	2.7%	10.9%
5	Gunnerson St./Strickland Av. & Riverside Dr. (SR-74)														
		AM:	1,554	3	13	107	1,686	1,761	2,056	--	--	--	**0.2%**	0.7%	**5.2%**
		PM:	1,852	3	17	88	2,020	2,117	2,444	--	--	--	0.1%	**0.8%**	3.6%
6	Collier Av. & Nichols Rd.														
		AM:	840	5	32	294	1,045	1,172	1,737	205	332	897	2.4%	**9.6%**	**32.8%**
		PM:	1,044	9	41	240	1,342	1,520	2,157	298	476	1,113	**3.0%**	8.6%	21.6%
18	El Toro Rd. & Carmela Ct.														
		AM:	1,268	4	19	108	1,324	1,366	1,540	--	--	--	0.3%	1.4%	7.0%
		PM:	363	5	25	91	385	414	508	--	--	--	**1.3%**	**6.0%**	**17.9%**

BOLD = Denotes highest peak hour.

1.5.2 City of Lake Elsinore Traffic Infrastructure Fee (TIF) Program

The City of Lake Elsinore has created its own local 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 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.

1.5.3 Fair Share Contribution

Project mitigation may include a combination of fee payments to established programs, construction of specific improvements, payment of a fair share contribution toward future improvements or a combination of these approaches. Table 1-4 lists the incremental improvements that are required by EAPC (2024) traffic conditions to mitigate the near-term cumulative impacts. After review of the local and regional transportation impact fee programs as compared to the recommended improvements for each impacted facility, if it is found that the impacted facilities which require improvements beyond those already identified within one of the City's fee programs, the Project may be required to contribute to the associated intersection or roadway fair-share percentage toward the costs of the recommended improvements.

Detailed fair share calculations, for each analysis peak hour, has been provided in Table 1-5 for each of the cumulatively impacted intersections for EAPC (2024) traffic conditions. Improvements included in a defined program and constructed by development may be eligible

for a fee credit or reimbursement through the program where appropriate. The fair-share calculations, also presented in Table 1-5, indicate that the Project contributes between 0.1% and 32.8% of new vehicle trips to the cumulatively impacted intersections throughout the study area.

For improvements that do not appear to be in TIF, a fair share contribution based on the Project's percentage contribution may be imposed in order to mitigate the Project's share of impacts in lieu of construction. 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. Alternatively, minor fair share responsibilities may be waived when collection is infeasible or where other mitigation assignments substantially exceed the Project's demonstrated impacts.

1.6 ON-SITE ROADWAY AND SITE ACCESS IMPROVEMENTS

The Project is proposed to have access to Nichols Road via A Street, B Street, and El Toro Road. As part of the development, the Project will construct improvements on the site adjacent roadways of Nichols Road, A Street, B Street, and El Toro Road. Regional access to the Project site is provided via the I-15 Freeway at Nichols Road interchange. Roadway improvements necessary to provide site access and on-site circulation are assumed to be constructed in conjunction with site development and are described below. These improvements should be in place prior to occupancy.

1.6.1 SITE ADJACENT ROADWAY IMPROVEMENTS

The recommended site-adjacent roadway improvements for the Project are described below. These improvements need to be incorporated into the Project description prior to Project approval or imposed as conditions of approval as part of the Project approval.

Phase 1 (2020)

Exhibit 1-4 illustrates the site-adjacent roadway improvement recommendations for Phase 1 (2020).

B Street – B Street is a north-south oriented roadway located within the Project. Construct B Street from Nichols Road to its southern terminus at El Toro Road at its ultimate full-section width as a Local Street (60-foot right-of-way) in compliance with the applicable City of Lake Elsinore standards.

El Toro Road – El Toro Road is a north-south oriented roadway located along the Project's eastern boundary. Construct El Toro Road from the intersection of El Toro Road & El Toro Road/Wood Mesa Court to the Project's southern boundary at its ultimate half-section width as a Local Street (60-foot right-of-way) in compliance with the applicable City of Lake Elsinore standards.

Wood Mesa Court – Wood Mesa Court is a north-south oriented roadway located along the Project's eastern boundary. Construct Wood Mesa Court from El Toro Road to the drainage basin in the northern portion of the Project site at its ultimate half-section width as a Local Street (60-foot right-of-way) in compliance with the applicable City of Lake Elsinore standards.

Phase 2 (2021)

Exhibit 1-5 illustrates the site-adjacent roadway improvement recommendations for Project Phase 2 (2021).

Nichols Road – Nichols Road is an east-west oriented roadway located along the Project's northern boundary. Construct Nichols Road from A Street to the Project's eastern boundary at its ultimate half-section width as an Urban Arterial (120-foot right-of-way) in compliance with the applicable City of Lake Elsinore standards.

Project Buildout (2024)

Exhibit 1-6 illustrates the site-adjacent roadway improvement recommendations for Project Buildout (2024). Exhibit 1-7 shows the conceptual striping improvements along the Project's frontage on Nichols Road.

Nichols Road – Nichols Road is an east-west oriented roadway located along the Project's northern boundary. Construct Nichols Road from the Project's western boundary to A Street at its ultimate half-section width as an Urban Arterial (120-foot right-of-way) in compliance with the applicable City of Lake Elsinore standards.

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

1.6.2 SITE ACCESS IMPROVEMENTS

The recommended site access driveway improvements for the Project are described below. Construction of on-site and site adjacent improvements are recommended to occur in conjunction with adjacent Project development activity or as needed for Project access purposes. The site adjacent roadways will be improved consistent with Section 1.6.1 *Site Adjacent Roadway Improvements* of this report.

Phase 1 (2020)

Exhibit 1-4 illustrates the on-site and site adjacent recommended site access improvements for Phase 1 (2020).

B Street & Nichols Road (#12) – Install a stop control on the northbound approach of the intersection and construct the intersection to provide the following geometrics:

Northbound Approach: One shared left-right turn lane.

Southbound Approach: Not Applicable (N/A)

Eastbound Approach: One through lane and one right turn lane.

Westbound Approach: One left turn lane with a minimum of 100-feet of storage and one through lane.

EXHIBIT 1-4: SITE ADJACENT ROADWAY AND SITE ACCESS RECOMMENDATIONS FOR PHASE 1 (2020)

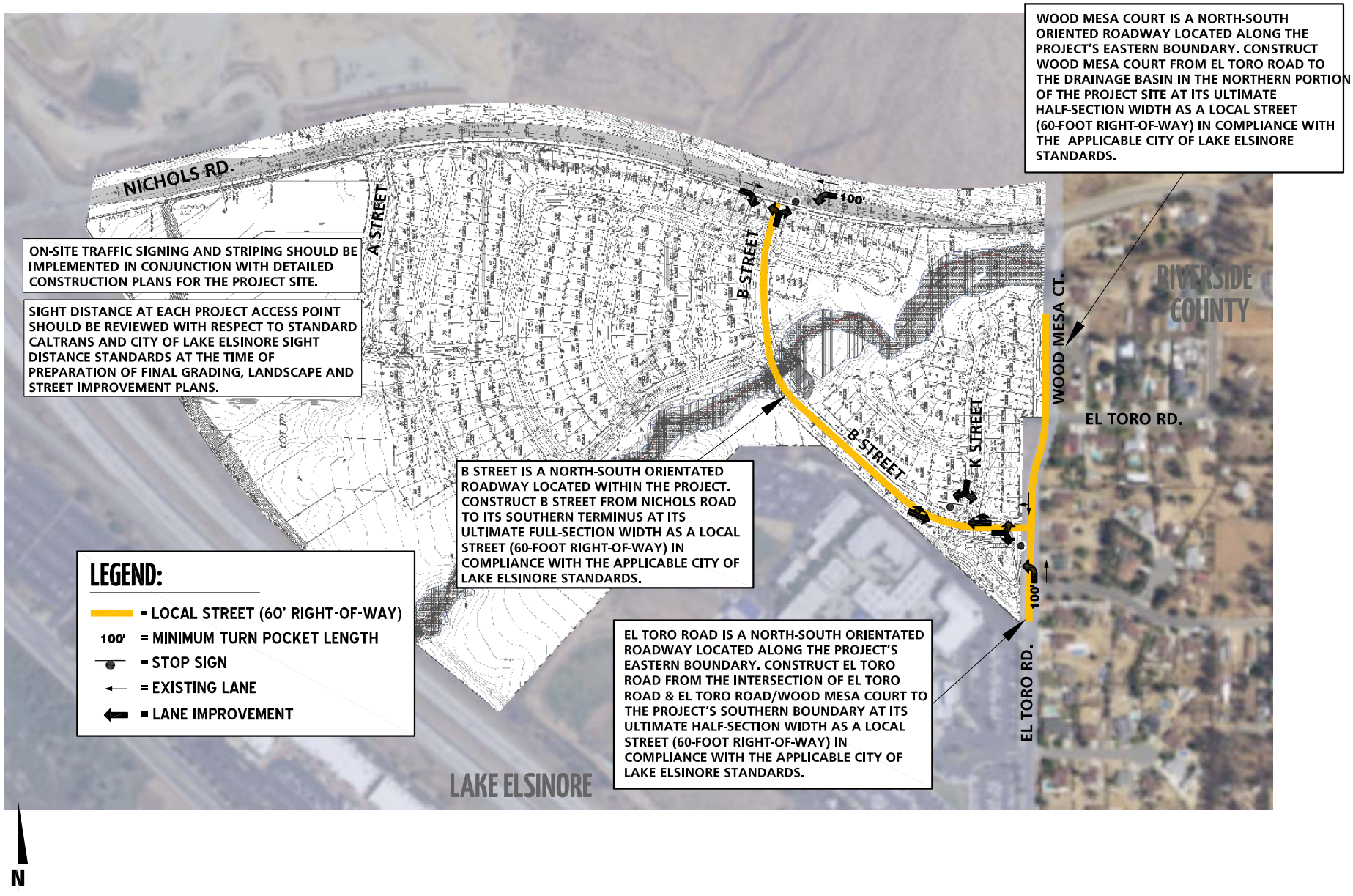


EXHIBIT 1-5: SITE ADJACENT ROADWAY AND SITE ACCESS RECOMMENDATIONS FOR PHASE 2 (2021)

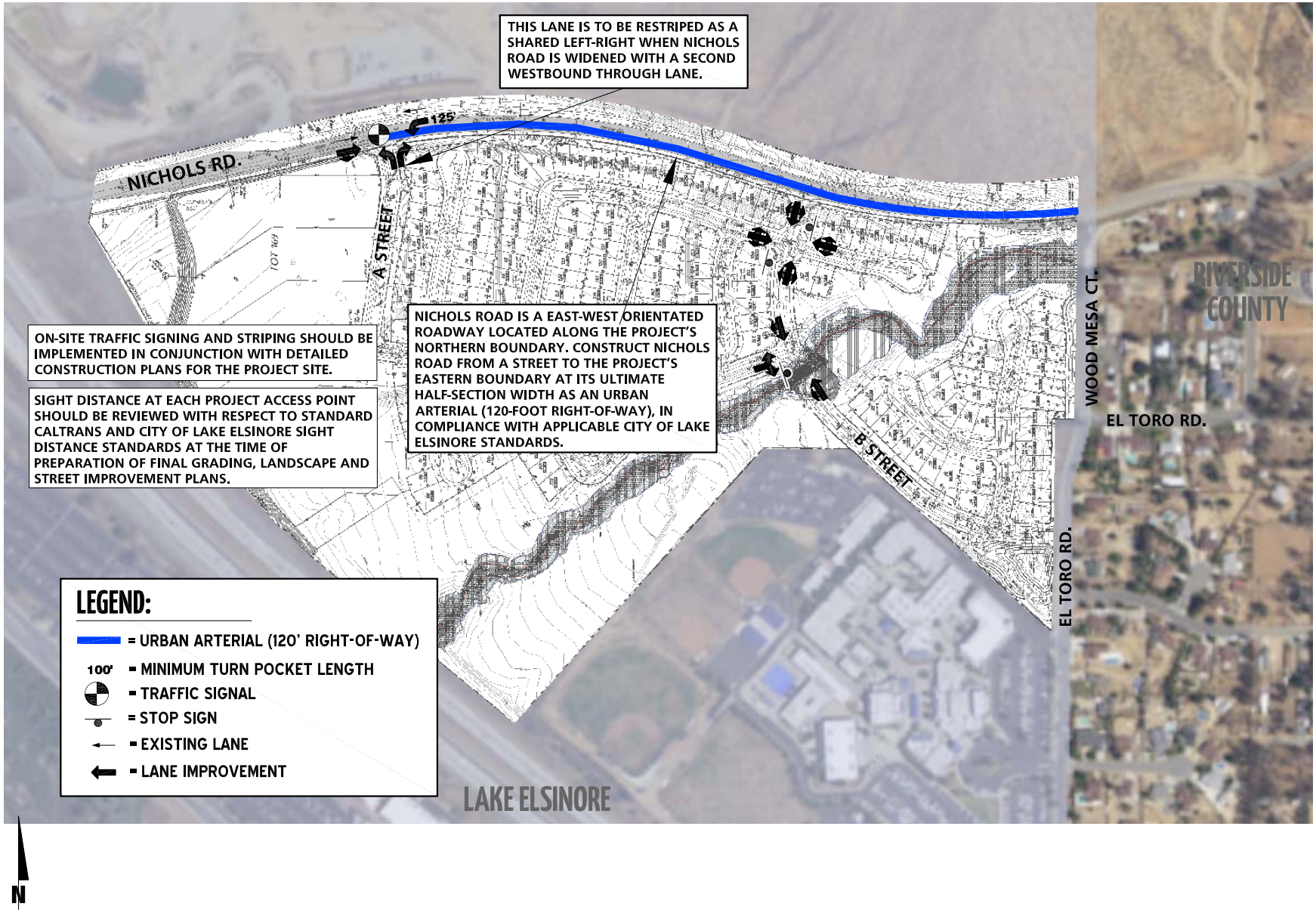


EXHIBIT 1-6: SITE ADJACENT ROADWAY AND SITE ACCESS RECOMMENDATIONS FOR BUILDOUT (2024)

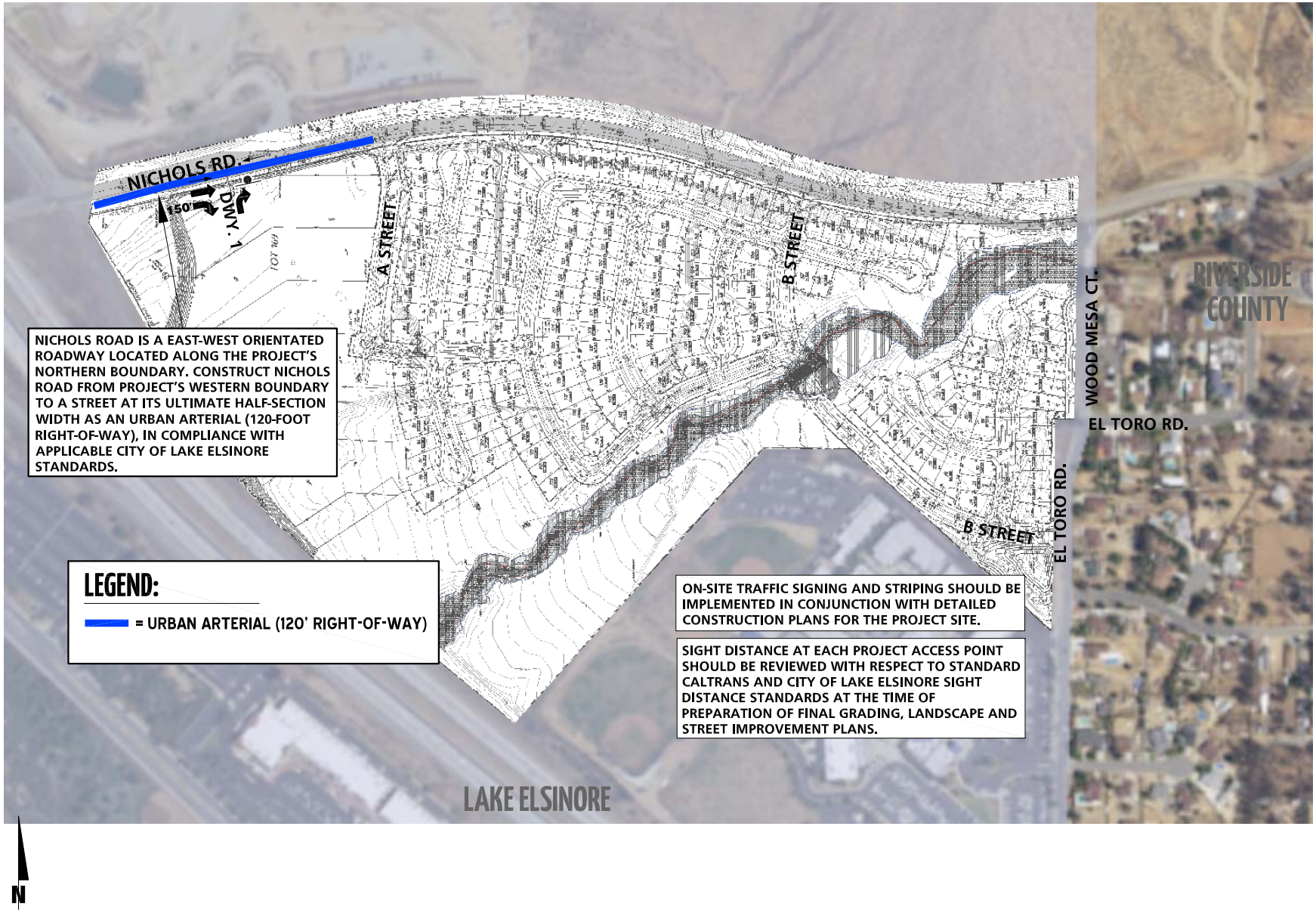
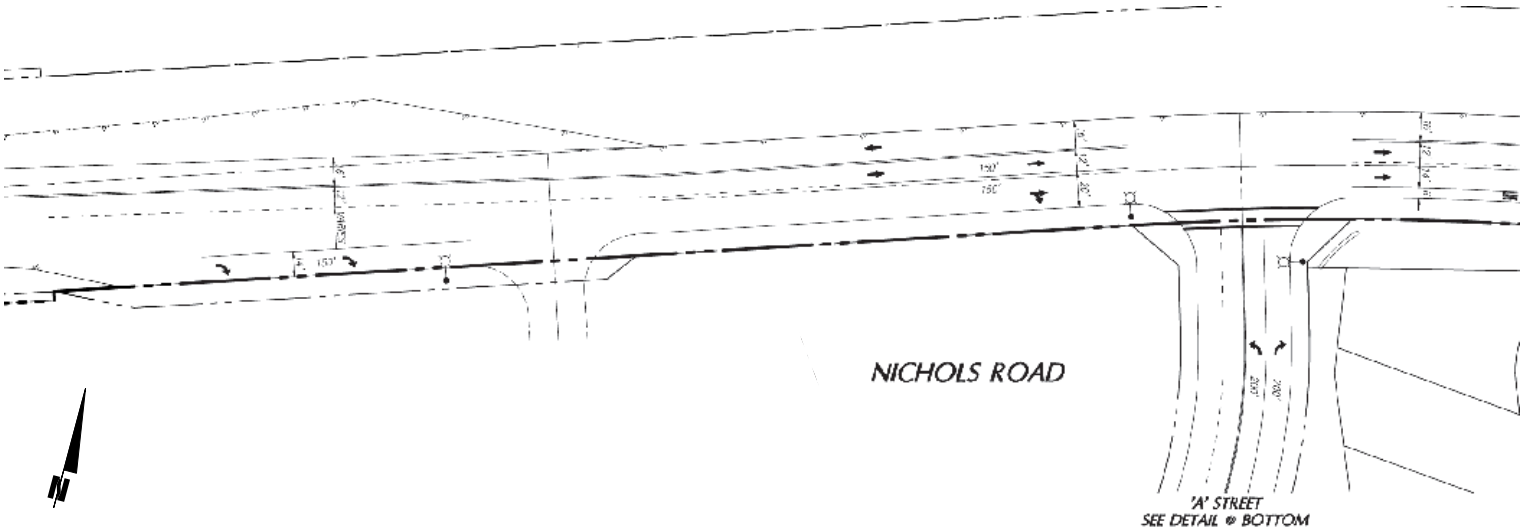
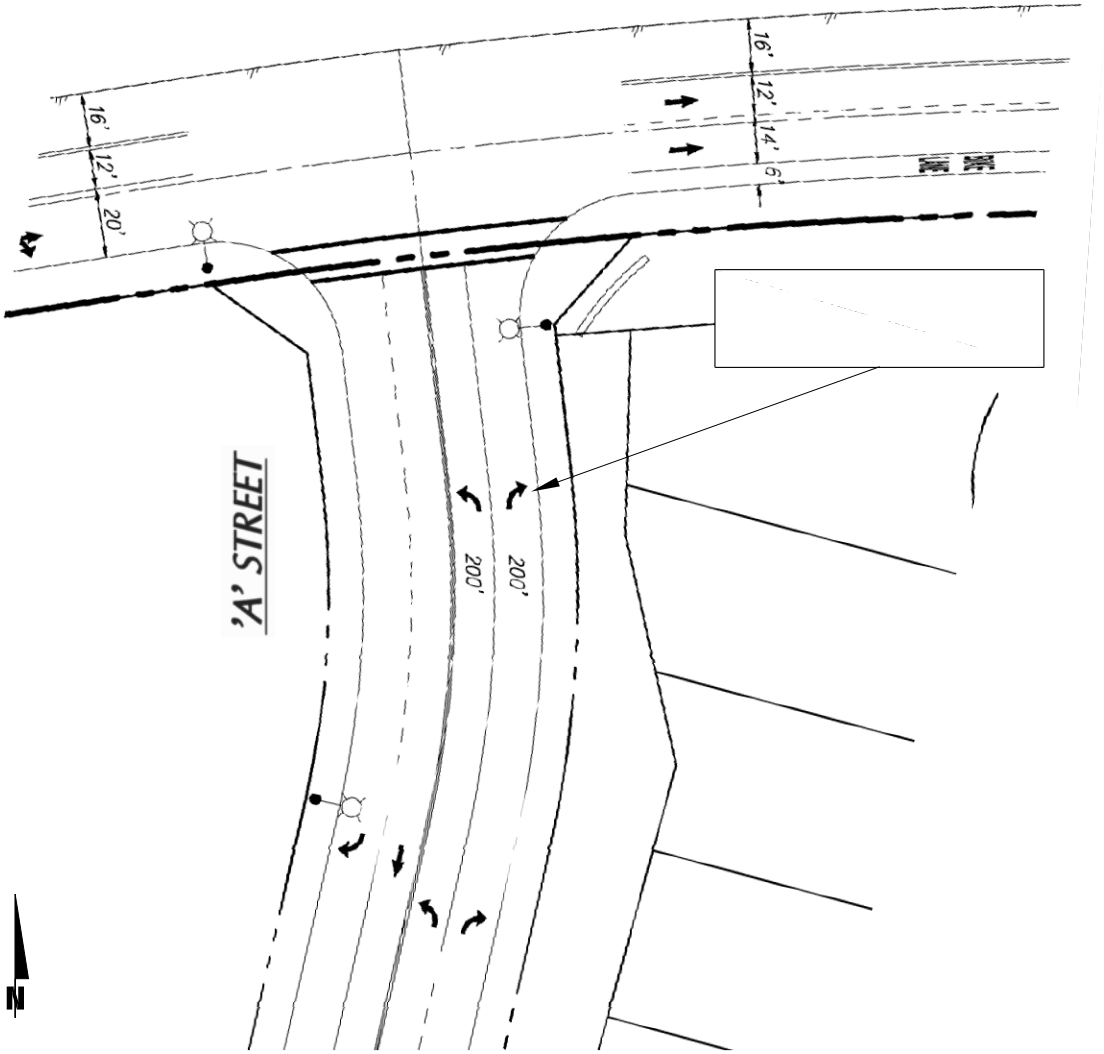


EXHIBIT 1-7: CONCEPTUAL STRIPING FOR NICHOLS ROAD AND A STREET





K Street & B Street (#15) – Install a stop control on the southbound approach of the intersection and construct the intersection to provide the following geometrics:

Northbound Approach: N/A

Southbound Approach: One shared left-right turn lane.

Eastbound Approach: One shared left-through lane.

Westbound Approach: One shared through-right turn lane.

El Toro Road & B Street (#16) – Install a stop control on the eastbound approach of the intersection and construct the intersection to provide the following geometrics:

Northbound Approach: One left turn lane with a minimum of 100-feet of storage and one through lane.

Southbound Approach: One shared through-right turn lane.

Eastbound Approach: One shared left-right turn lane.

Westbound Approach: N/A

Phase 2 (2021)

Exhibit 1-5 illustrates the on-site and site adjacent recommended site access improvements for Phase 2 (2021).

A Street at Nichols Road (#11) – Install a traffic signal and construct the intersection with the following geometrics:

Northbound Approach: One left turn lane and one right turn lane. The northbound right turn lane is to be restriped as a shared left-right turn lane in the future when Nichols Road is widened with a 2nd westbound through lane.

Southbound Approach: N/A

Eastbound Approach: One through lane and one shared through-right turn lane.

Westbound Approach: One left turn lane with a minimum of 125-feet of storage and one through lane.

B Street & F Street (#13) – Install a stop control on the eastbound and westbound approaches of the intersection and construct the intersection to provide the following geometrics:

Northbound Approach: One shared left-through-right turn lane.

Southbound Approach: One shared left-through-right turn lane.

Eastbound Approach: One shared left-through-right turn lane.

Westbound Approach: One shared left-through-right turn lane.

B Street & H Street (#14) – Install a stop control on the eastbound approach of the intersection and construct the intersection to provide the following geometrics:

Northbound Approach: One shared left-through lane.

Southbound Approach: One shared through-right turn lane.

Eastbound Approach: One shared left-right turn lane.

Westbound Approach: N/A

Project Buildout (2024)

Exhibit 1-6 illustrates the on-site and site adjacent recommended site access improvements for Project Buildout (2024).

Driveway 1 & Nichols Road (#21) – Install a stop control on the northbound approach of the intersection and construct the intersection to provide the following geometrics:

Northbound Approach: One right turn lane.

Southbound Approach: N/A

Eastbound Approach: Two through lanes and one right turn lane with a minimum of 150-feet of storage.

Westbound Approach: One through lane.

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

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.

1.6.3 QUEUING ANALYSIS AT THE PROJECT DRIVEWAYS AND SITE ADJACENT INTERSECTIONS

A queuing analysis was conducted at the Project driveways and site adjacent intersections to determine the turn pocket length necessary to accommodate long-range 95th percentile peak hour volumes. The analysis was conducted for the weekday AM and weekday PM peak hours.

The recommended turn pocket lengths on the site adjacent roadways are shown on Exhibits 1-4, 1-5, and 1-6. Queuing analysis summary and worksheets for EAPC (2024) are provided in Appendix 1.2. The traffic modeling and signal timing optimization software package Synchro (Version 10) has been utilized to assess queues at the Project driveways and site adjacent intersections. Synchro is a macroscopic traffic software program that is based on the signalized and unsignalized intersection capacity analyses as specified in the Highway Capacity Manual (HCM) (6th Edition). 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 in Synchro. The LOS and capacity analysis

performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

SimTraffic is designed to model networks of signalized and unsignalized intersections, with the primary purpose of checking and fine-tuning signal operations. SimTraffic uses the input parameters from Synchro to generate random simulations. The 95th percentile queue is not necessarily ever observed; it is simply based on statistical calculations (or Average Queue plus 1.65 standard deviations).

The random simulations generated by SimTraffic have been utilized to determine the 50th and 95th percentile queue lengths observed for each turn lane. A SimTraffic simulation has been recorded up to 5 times, during the weekday AM and weekday PM peak hours, and has been seeded for 60-minute periods with 60-minute recording intervals.

Although only the 95th percentile volume-based queue has been utilized for purposes of determining the necessary turn pocket storage lengths, the 50th percentile volume-based queues are also reported and can be found in Appendix 1.2. The 50th percentile 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. 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. However, many jurisdictions utilize the 95th percentile queues for design purposes.

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 6th Edition Highway Capacity Manual (HCM) methodology expresses the LOS at an intersection in terms of delay time for the various intersection approaches. (5) The HCM uses different procedures depending on the type of intersection control.

2.2.1 SIGNALIZED INTERSECTIONS

City of Lake Elsinore

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

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

TABLE 2-1: SIGNALIZED INTERSECTION LOS THRESHOLDS

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

Source: HCM (6th Edition)

The peak hour traffic volumes have been adjusted using a peak hour factor (PHF) to reflect peak 15-minute volumes. Common practice for LOS analysis is to use a peak 15-minute rate of flow. However, flow rates are typically expressed in vehicles per hour. The PHF is the relationship between the peak 15-minute flow rate and the full hourly volume (e.g. PHF = [Hourly Volume] / [4 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 10) has also been utilized to analyze signalized intersections under Caltrans' jurisdiction, which include interchange to arterial ramps (i.e. I-15 Freeway ramps at Nichols Road). (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 (6th Edition)

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

2.3 FREEWAY OFF-RAMP QUEUING ANALYSIS

The study area for this TIA includes the freeway-to-arterial interchange of the I-15 Freeway at Nichols Road 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 Nichols Road. 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.

There are two footnotes which appear on the Synchro outputs. One footnote indicates if the 95th percentile cycle exceeds capacity. Traffic is simulated for two complete cycles of the 95th percentile traffic in Synchro in order to account for the effects of spillover between cycles. In practice, the 95th percentile queue shown will rarely be exceeded and the queues shown with the footnote are acceptable for the design of storage bays. The other footnote indicates whether or not the volume for the 95th percentile queue is metered by an upstream signal. In many cases, the 95th percentile queue will not be experienced and may potentially be less than the 50th

percentile queue due to upstream metering. If the upstream intersection is at or near capacity, the 50th percentile queue represents the maximum queue experienced.

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. 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 Caltrans California Manual on Uniform Traffic Control Devices (CA MUTCD). (6)

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

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

TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction
3	Alberhill Ranch Rd. & Nichols Rd.	Lake Elsinore
5	Gunnerson St./Strickland Av. & Riverside Dr. (SR-74)	Caltrans
6	Collier Av. & Nichols Rd.	Lake Elsinore
9	I-15 Southbound Ramps & Nichols Rd.	Caltrans
10	I-15 Northbound Ramps & Nichols Rd.	Caltrans
11	A Street & Nichols Rd.	Lake Elsinore
12	B Street & Nichols Rd.	Lake Elsinore
13	B Street & F Street – Future Intersection	Lake Elsinore
14	B Street & H Street – Future Intersection	Lake Elsinore
15	K Street & B Street – Future Intersection	Lake Elsinore
16	El Toro Rd. & B Street – Future Intersection	Lake Elsinore, County of Riverside
17	El Toro Rd. & Tereticornis Av.	County of Riverside
18	El Toro Rd. & Carmela Ct.	County of Riverside

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 *EA and EAP (2020) Traffic Analysis,* Section 7 *EA and EAP (2021) Traffic Analysis,* Section 8 *EA and EAP (2024) Traffic Analysis,* and Section 9 *EAPC Traffic Analysis*.

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 Highway Capacity Software (HCS) 7 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 April 2018. These existing freeway geometrics have been utilized for Existing, E+P, EAP, and EAPC 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, north of Nichols Road. The data was obtained from February 2018. 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. (8)

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 (6th Edition)

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 HCS7 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 (6th Edition)

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 Nichols Road. 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 February 2018. 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. (8) As such, actual vehicles (as opposed to passenger car equivalent (PCE) volumes) have been utilized for the purposes of the freeway ramp junction (merge/diverge) analysis.

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

2.7.2 COUNTY OF RIVERSIDE

Riverside County General Plan Policy C 2.1 states that the County will maintain the following County-wide target LOS:

The following minimum target levels of service have been designated for the review of development proposals in the unincorporated areas of Riverside County with respect to transportation impacts on roadways designated in the Riverside County Circulation Plan which are currently County maintained, or are intended to be accepted into the County maintained roadway system:

- *LOS C shall apply to all development proposals in any area of the Riverside County not located within the boundaries of an Area Plan, as well as those areas located within the following Area Plans: REMAP, Eastern Coachella Valley, Desert Center, Palo Verde Valley, and those non-Community Development areas of the Elsinore, Lake Mathews/Woodcrest, Mead Valley and Temescal Canyon Area Plans.*
- *LOS D shall apply to all development proposals located within any of the following Area Plans: Eastvale, Jurupa, Highgrove, Reche Canyon/Badlands, Lakeview/Nuevo, Sun City/Menifee Valley, Harvest Valley/Winchester, Southwest Area, The Pass, San Jacinto Valley, Western Coachella Valley and those Community Development Areas of the Elsinore, Lake Mathews/Woodcrest, Mead Valley and Temescal Canyon Area Plans.*
- *LOS E may be allowed by the Board of Supervisors within designated areas where transit-oriented development and walkable communities are proposed.*

Notwithstanding the forgoing minimum LOS targets, the Board of Supervisors may, on occasion by virtue of their discretionary powers, approve a project that fails to meet these LOS targets in order to balance congestion management considerations in relation to benefits, environmental impacts and costs, provided an Environmental Impact Report, or equivalent, has been completed to fully evaluate the impacts of such approval. Any such approval must incorporate all feasible mitigation measures, make specific findings to support the decision, and adopt a statement of overriding considerations.

2.7.3 CALTRANS

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

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.

2.9 PROJECT FAIR SHARE CALCULATION METHODOLOGY

In cases where this TIA identifies that the proposed Project would have a significant cumulative impact to a roadway facility, and the recommended mitigation measure is a fair share monetary contribution, the following methodology was applied to determine the fair share contribution. A project's fair share contribution at an off-site study area intersection is determined based on the following equation, which is the ratio of Project traffic to new traffic, and new traffic is total future traffic subtracts existing baseline traffic:

Project Fair Share % = Project Traffic / (EAPC 2024 Total Traffic – Existing Baseline Traffic)

The Project fair share contribution calculations are presented in Section 1.5 *Local and Regional Funding Mechanisms* of this TIA.

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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 21 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.

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 3-2 shows the City of Lake Elsinore General Plan Circulation Element, and Exhibit 3-3 illustrates the City of Lake Elsinore General Plan roadway cross-sections. Exhibit 3-4 shows the Riverside County General Plan Circulation Element, and Exhibit 3-5 illustrates the Riverside County General Plan roadway cross-sections.

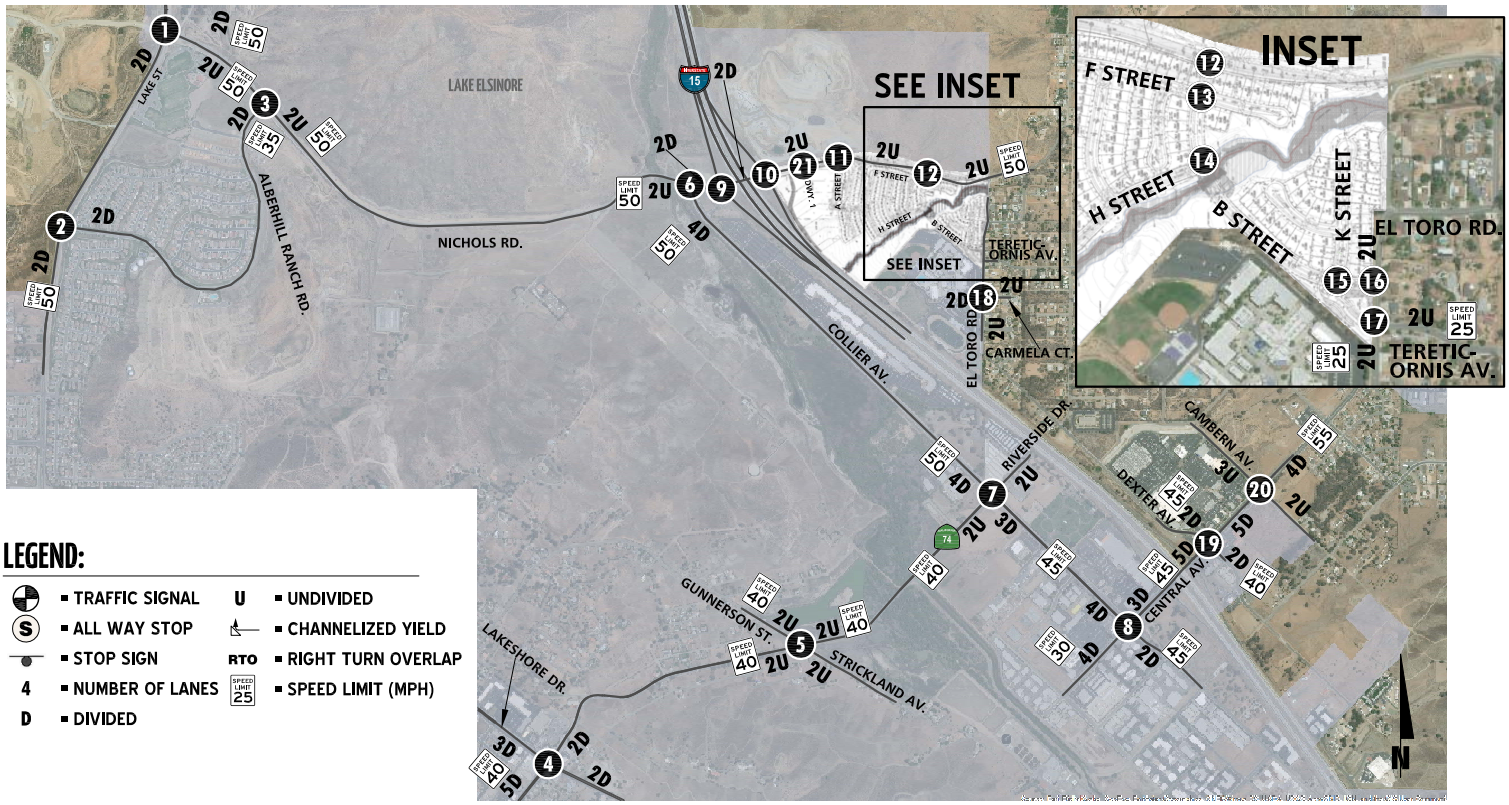
Augmented Urban Arterials are 8 lanes with a minimum right-of-way of 134-feet. These highways are primarily for through traffic where traffic volumes exceed six-lane capacities. Access from other streets or highways shall be limited to approximately one-quarter mile intervals. The following study area roadways within the City of Lake Elsinore are classified as an Augmented Urban Arterial:

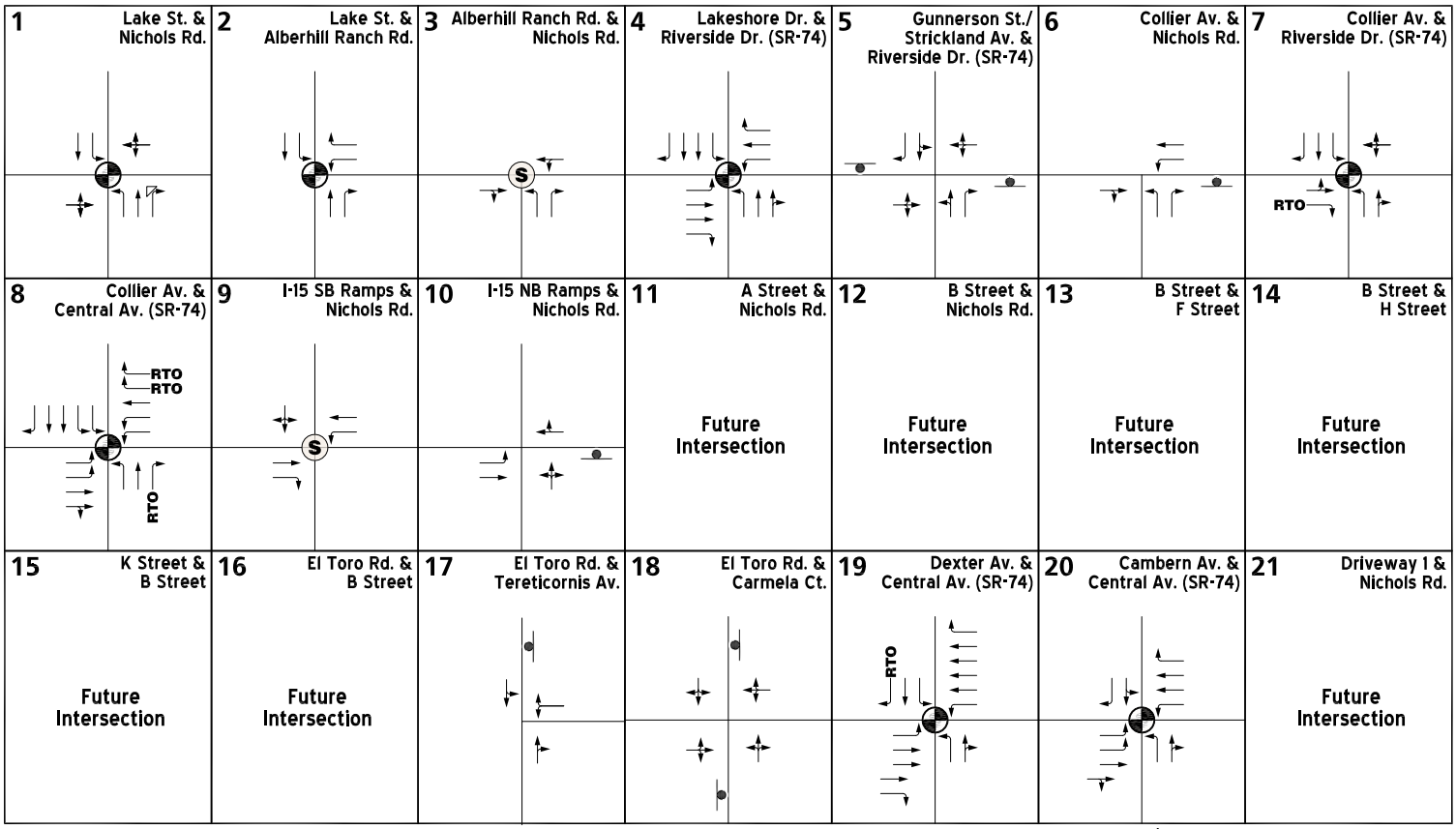
- Central Avenue (SR-74)

Urban Arterial Highways are 6 lanes with a minimum right-of-way of 120-feet. 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 roadways within the City of Lake Elsinore are classified as an Urban Arterial Highway:

- Nichols Road (between Collier Avenue and El Toro Road)
- Riverside Drive (SR-74) (between Lincoln Street and Collier Avenue)
- Lake Street

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





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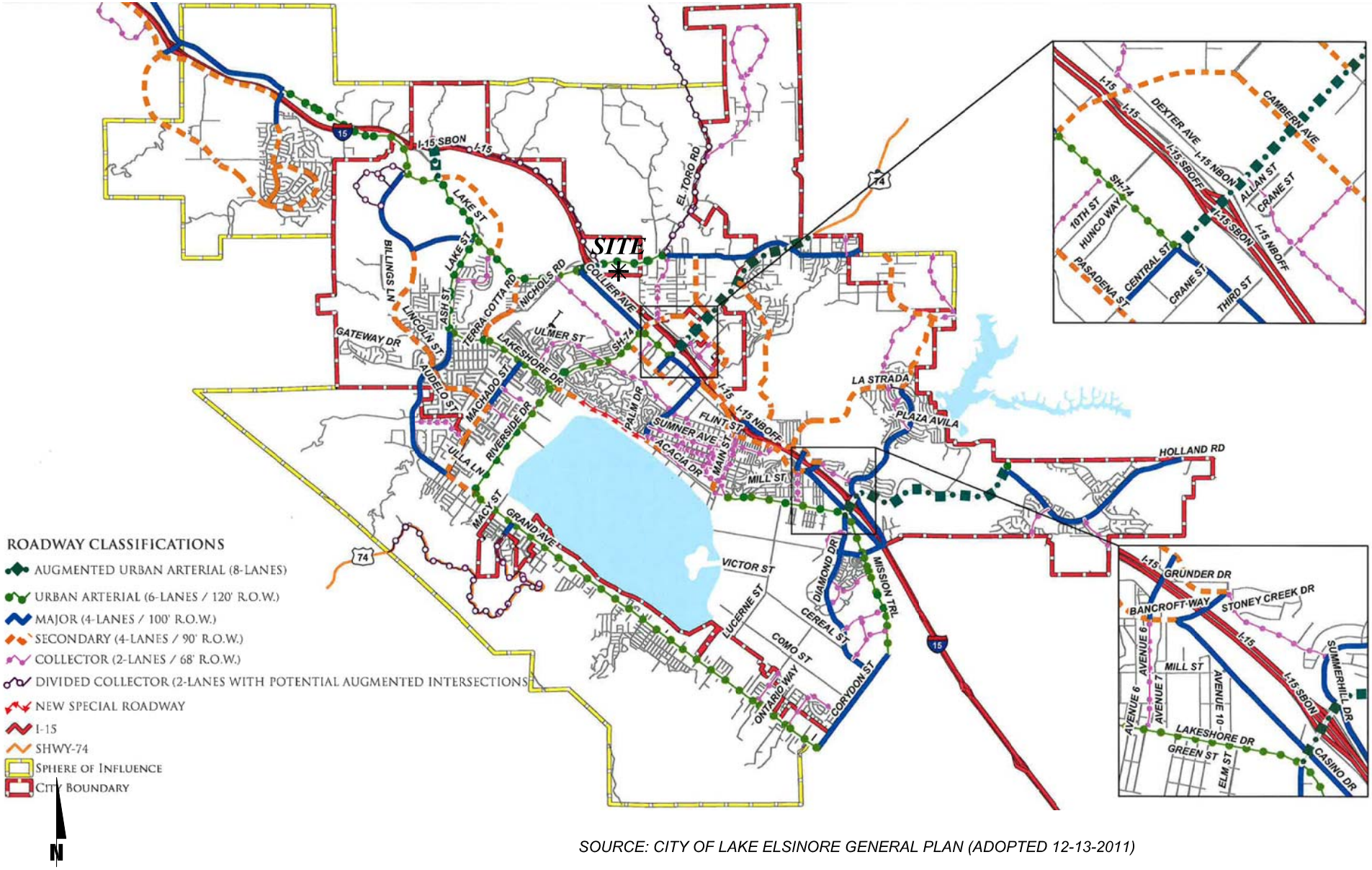
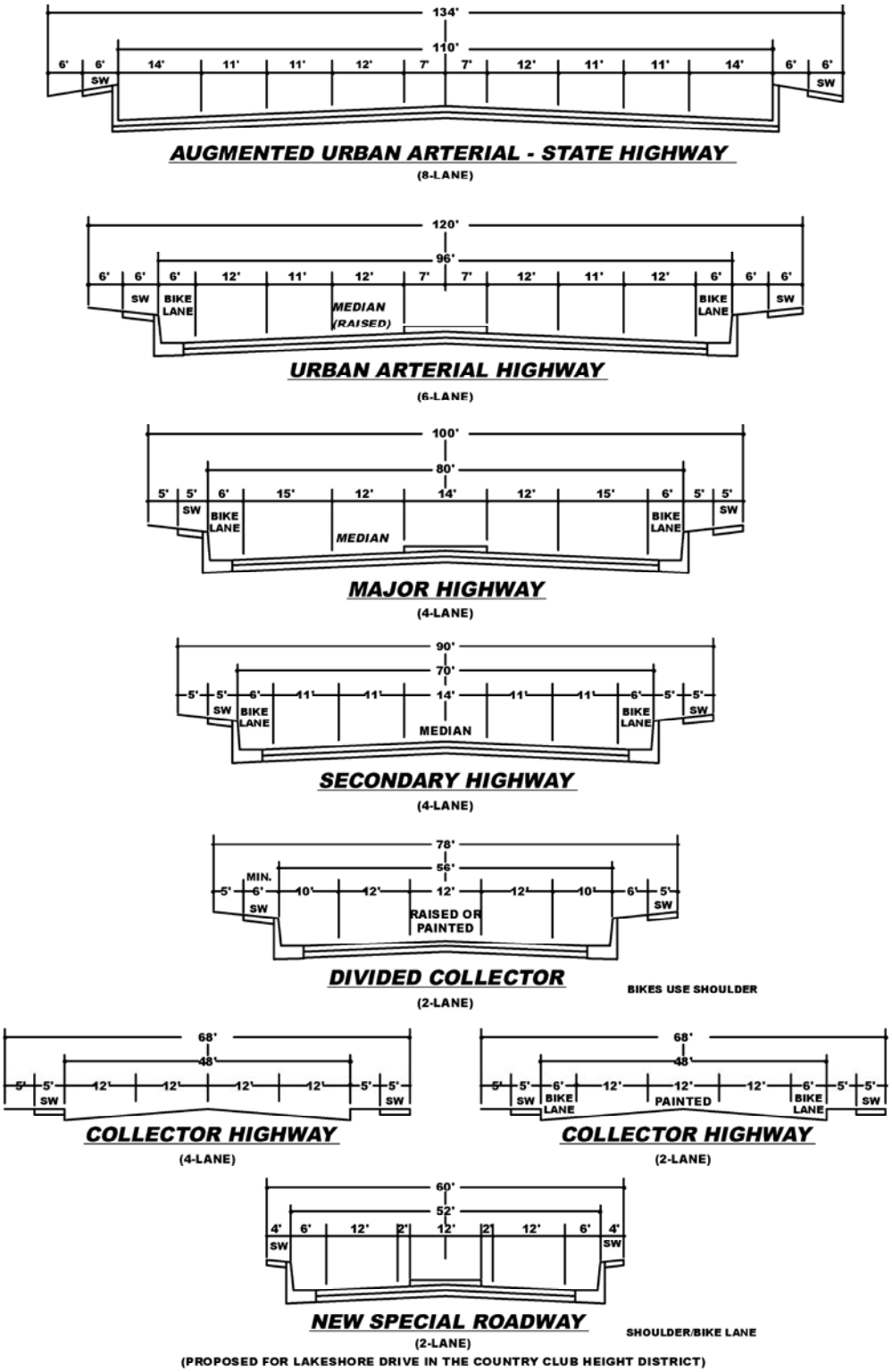
URBAN CROSSROADS

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



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

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

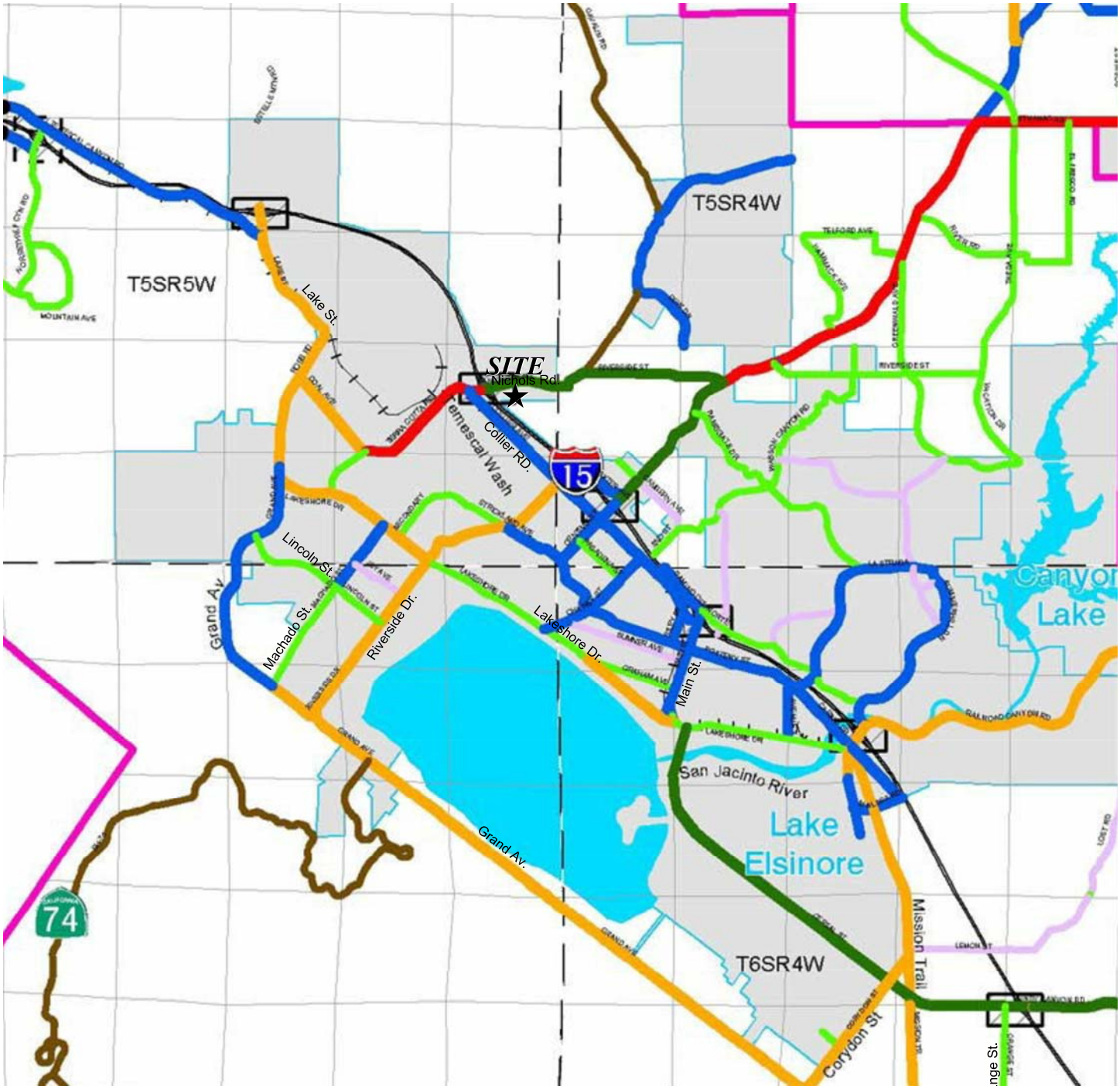


* BIKE LANES ARE NOT MANDATORY UNLESS SHOWN ON THE BIKEWAY CIRCULATION ELEMENT PLAN
PRECISE SIDEWALK LOCATION SUBJECT TO CITY ENGINEER APPROVAL
NOTE: CHECK THE DISTRICT PLAN OF YOUR AREA FOR ANY REQUIRED SPECIAL ROADWAY CROSS-SECTION, ESPECIALLY THE LAKE EDGE AND COUNTRY CLUB HEIGHTS DISTRICT PLANS.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

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

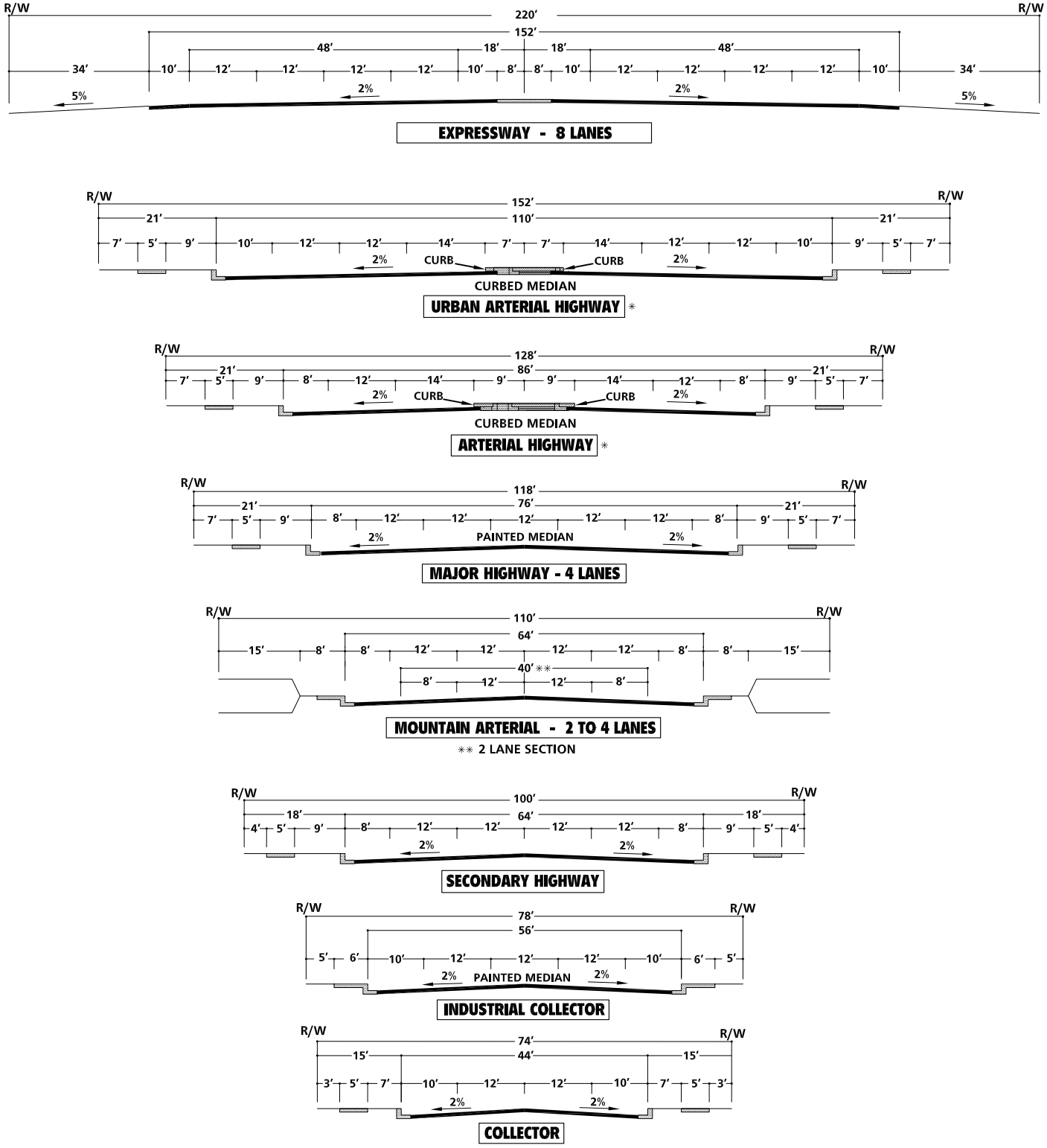
10878 - elsinore-xs.dwg

EXHIBIT 3-4: COUNTY OF RIVERSIDE GENERAL PLAN CIRCULATION ELEMENT



SOURCE: RIVERSIDE COUNTY INTEGRATED PROJECT (RCIP) (OCTOBER 7, 2003)

EXHIBIT 3-5: 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.

NOT TO SCALE

SOURCE: COUNTY OF RIVERSIDE

Major Highways are 4 lanes with a minimum right-of-way of 100-feet. These highways are intended to serve property zoned for major industrial and commercial uses, or to serve through traffic. Intersections with other streets or highways may be limited to approximately 660-foot intervals. The following study area roadway within the City of Lake Elsinore is classified as a Major Highway:

- Collier Avenue (between Nichols Road and Riverside Drive)
- Nichols Road (between Lake Street and Collier Avenue)

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 3-6 and 3-7, shows the proposed trails are connected with major features within the City and County. There is a regional trail along the east side of the I-15 Freeway and a community trail along Nichols Road within the study area. Class II bike lanes are proposed for Nichols Road within the study area.

Field observations conducted in April 2018 indicate nominal pedestrian and bicycle activity within the study area. There are limited pedestrian and bicycle facilities within the study area. The only sidewalk provided is along Nichols Road to the west of the I-15 Freeway.

3.4 TRANSIT SERVICE

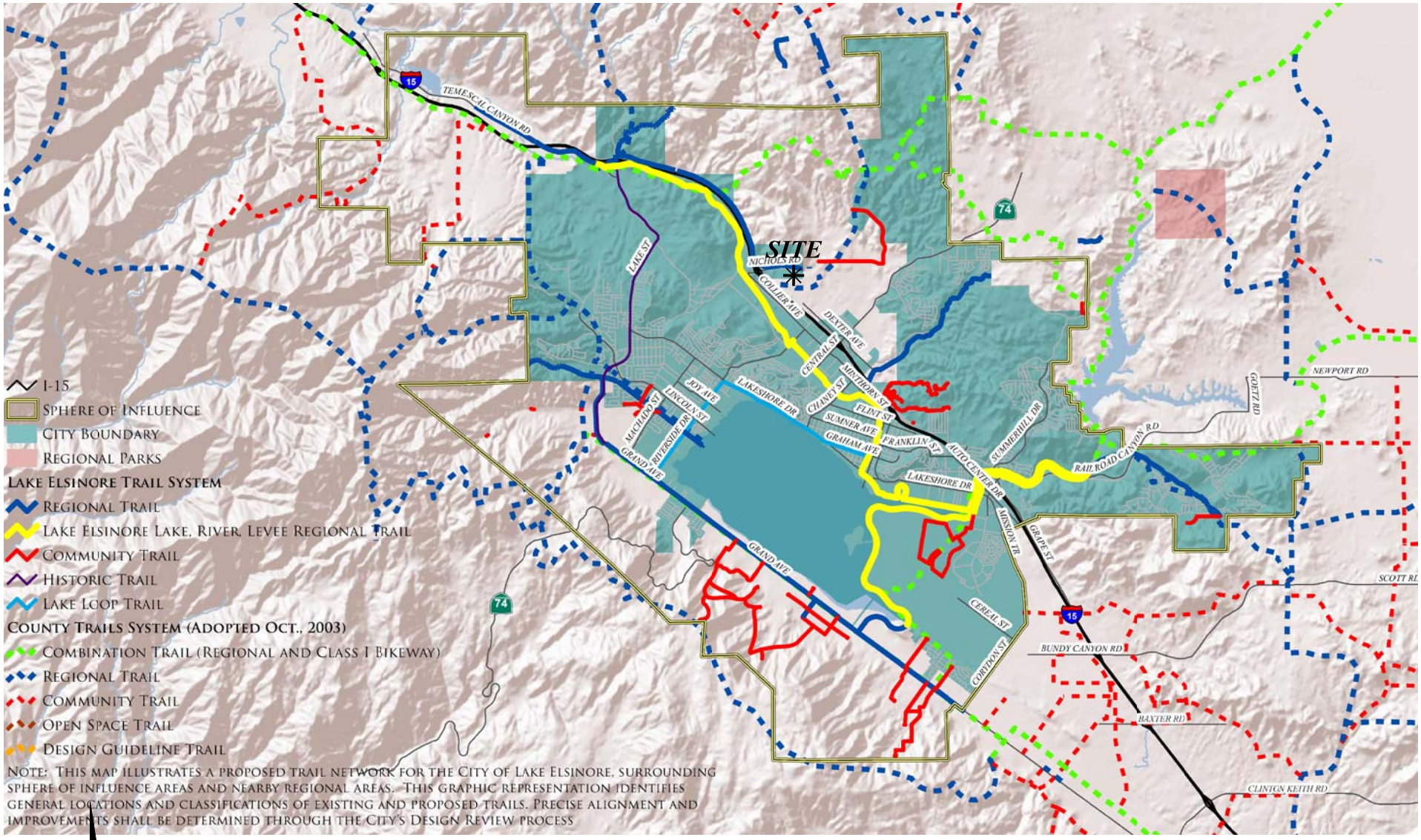
The study area is currently served by the Riverside Transit Authority (RTA), a public transit agency serving the unincorporated Riverside County region. There are currently no existing bus routes that serve the roadways within the study area in close proximity to the proposed Project (see Exhibit 3-8). The closest transit lines run along the I-15 Freeway, Nichols Road to the west of the I-15 Freeway, Collier Avenue, Riverside Avenue (SR-74), and Central Avenue (SR-74). 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. As such, it is recommended that the applicant work in conjunction with RTA to potentially provide bus service to the site.

3.5 EXISTING (2018) TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in February and April 2018. The following peak hours were selected for analysis:

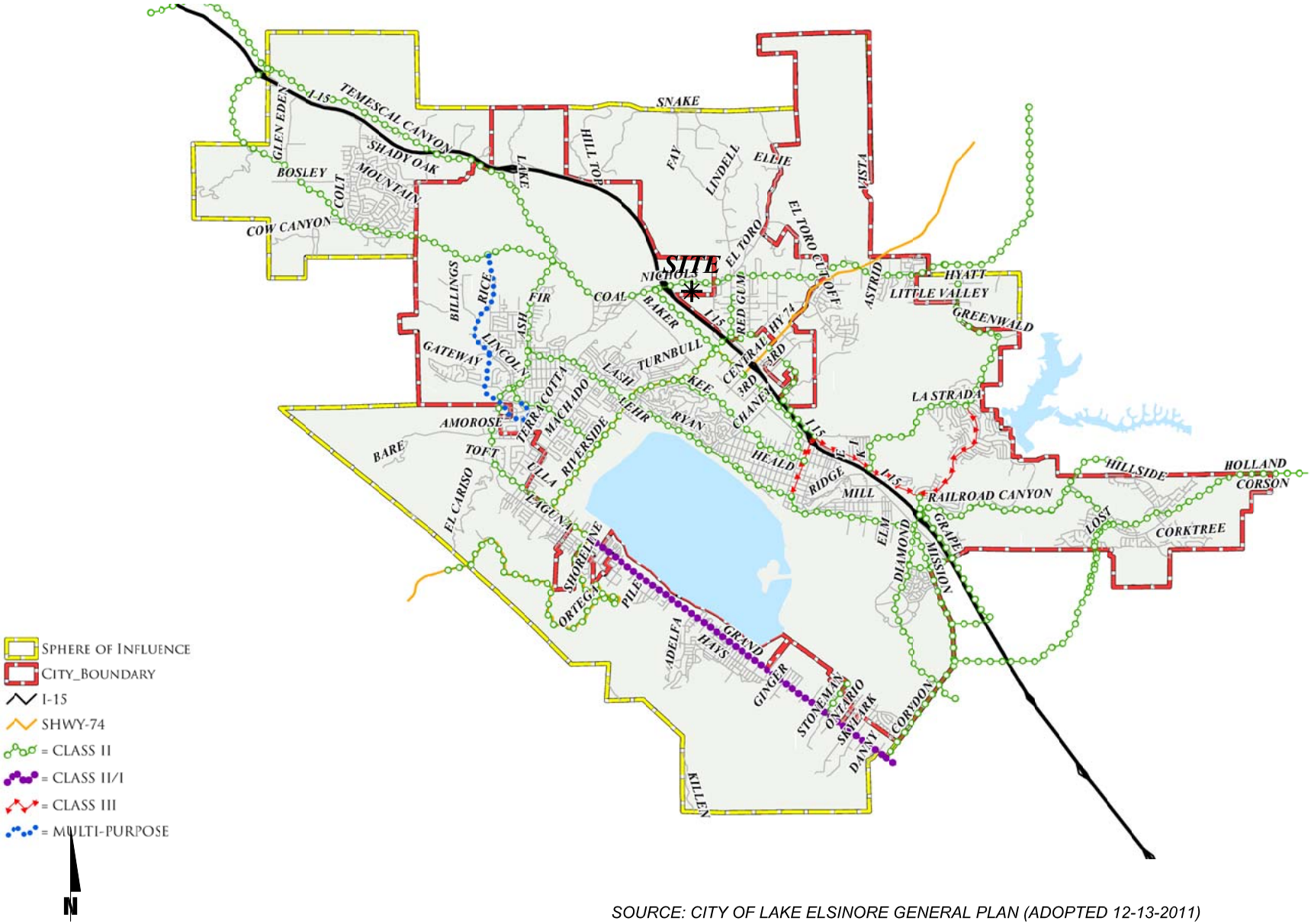
- Weekday AM Peak Hour (peak hour between 7:00 AM and 9:00 AM)
- Weekday PM Peak Hour (peak hour between 4:00 PM and 6:00 PM)

EXHIBIT 3-6: CITY OF LAKE ELSINORE AREA TRAILS SYSTEM



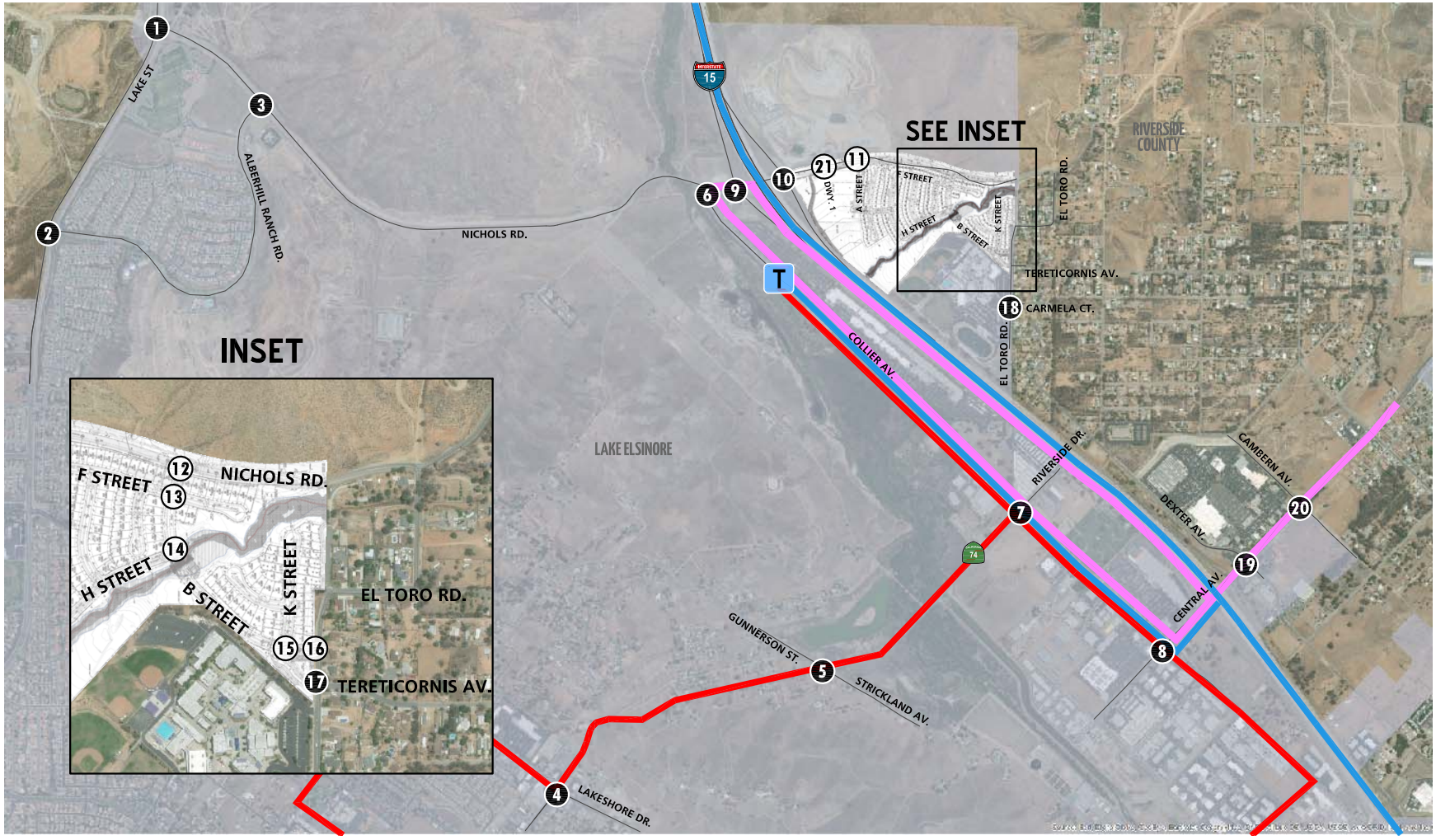
SOURCE: CITY OF LAKE ELSINORE GENERAL PLAN (ADOPTED 12-13-2011)

EXHIBIT 3-7: CITY OF LAKE ELSINORE BIKEWAY PLAN



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

EXHIBIT 3-8: EXISTING TRANSIT ROUTES



LEGEND:

- = RTA ROUTE 8
- = RTA ROUTE 9
- = RTA COMMUTER ROUTE 205/206
- T = LAKE ELSINORE OUTLET CENTER PARK AND RIDE

N

The weekday AM and weekday PM peak hour count data is representative of typical weekday peak hour traffic conditions in the study area. There were no observations made in the field that would indicate atypical traffic conditions on the count dates, such as construction activity or detour routes and near-by schools were in session and operating on normal schedules. The raw manual peak hour turning movement traffic count data sheets are included in Appendix 3.1. 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 February and April 2018. Existing weekday average daily traffic (ADT) volumes on arterial highways throughout the study area are shown on Exhibit 3-9. 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 11.1793 = Leg Volume

A comparison of the PM peak hour and daily traffic volumes of various roadway segments within the study area indicated that the peak-to-daily relationship is approximately 8.945 percent. As such, the above equation utilizing a factor of 11.1793 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 8.945 percent (i.e., 1/0.08945 = 11.1793) and was assumed to sufficiently estimate average daily traffic (ADT) volumes for planning-level analyses. Existing weekday AM and weekday PM peak hour intersection volumes are also shown on Exhibit 3-9.

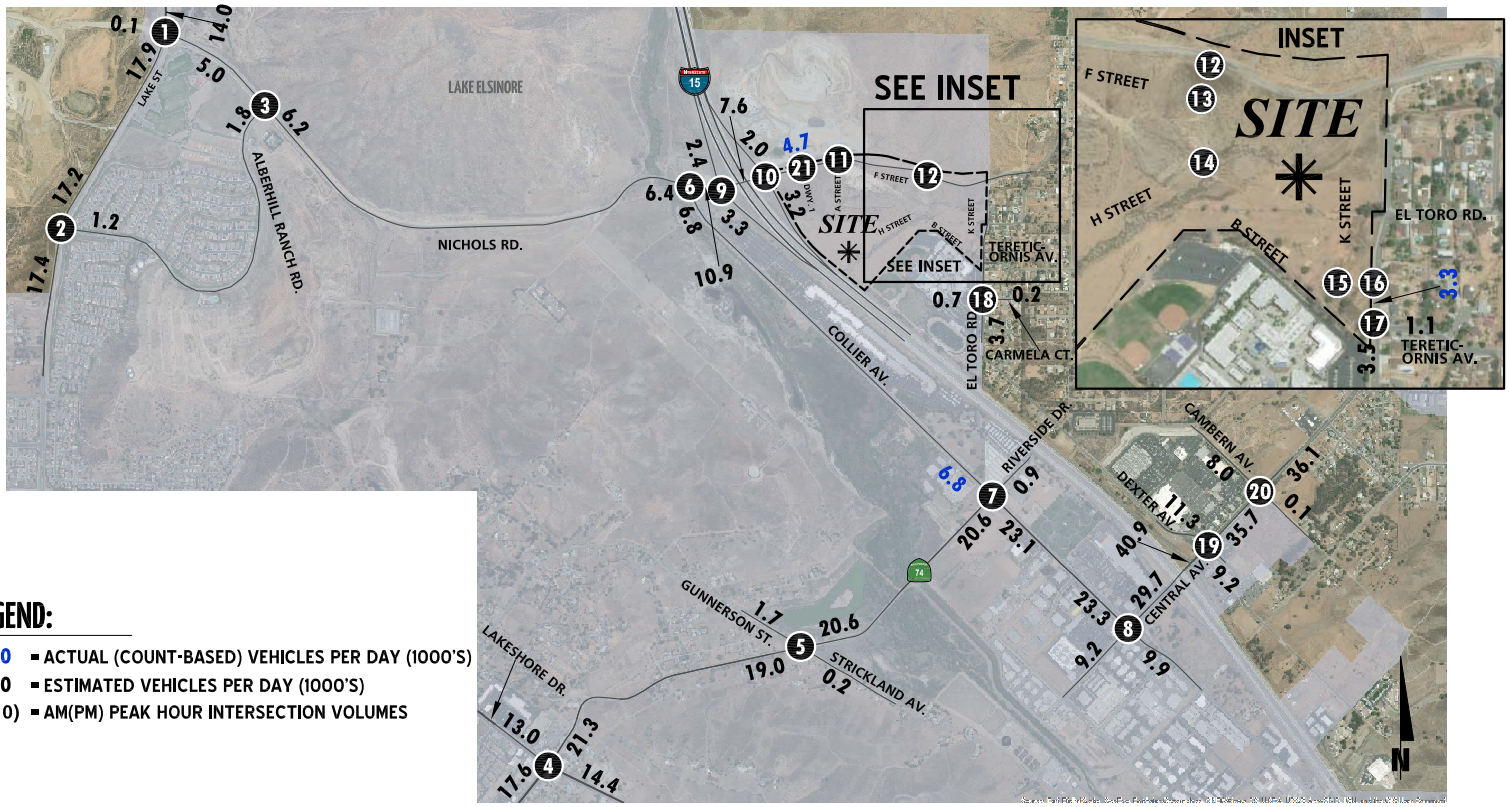
3.6 INTERSECTION OPERATIONS ANALYSIS

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 following existing study area intersections are currently operating at an unacceptable LOS during the peak hours:

- Gunnerson Street/Strickland Avenue & Riverside Drive (#5) – LOS F AM and PM peak hours
- I-15 Northbound Ramps & Nichols Road (#10) – LOS F AM peak hour only
- El Toro Road & Tereticornis Avenue (#17) – LOS F AM peak hour only
- El Toro Road & Carmela Court (#18) – LOS F AM peak hour only

The two intersections of Tereticornis Avenue and Carmela Court are in close proximity to the existing Temescal Canyon High School on El Toro Road and have been evaluated with the AM existing PHF from the raw count worksheet and also with a normalized peak hour factor of 0.92. Lower peak hour factors during the AM peak hour (morning drop-off) occur near schools due to the peak 10-15 minute traffic flows during the AM peak hour, which are much higher in comparison to the other 15-minute periods within the hour.

EXHIBIT 3-9: EXISTING (2018) TRAFFIC VOLUMES



LEGEND:

- 10.0 = ACTUAL (COUNT-BASED) VEHICLES PER DAY (1000'S)
- 10.0 = ESTIMATED VEHICLES PER DAY (1000'S)
- 10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

1 Lake St. & Nichols Rd. 4(1) 272(845) 17(29) 38(18) 5(0) 177(227) 15(1) 4(6) 0(1) 0(1) 674(362) 347(164)	**2** Lake St. & Alberhill Ranch Rd. 414(1012) 18(23) 47(19) 57(35) 1013(481) 48(30)	**3** Alberhill Ranch Rd. & Nichols Rd. 181(237) 35(74) 359(183) 16(18) 38(9) 69(61)	**4** Lakeshore Dr. & Riverside Dr. (SR-74) 9(15) 171(308) 199(265) 337(298) 529(593) 129(117) 19(29) 443(476) 141(263) 266(194) 293(251) 109(156)	**5** Gunnerson St./ Strickland Av. & Riverside Dr. (SR-74) 5(2) 3(1) 46(28) 35(115) 620(855) 2(6) 0(2) 827(833) 3(4) 0(0) 2(0) 11(6)	**6** Collier Av. & Nichols Rd. 184(249) 93(222) 403(187) 32(54) 37(78) 91(254)	**7** Collier Av. & Riverside Dr. (SR-74) 45(92) 52(178) 1(3) 2(7) 1(17) 5(20) 74(99) 10(11) 800(757) 611(867) 71(222) 10(19)
8 Collier Av. & Central Av. (SR-74) 11(31) 57(132) 757(902) 591(712) 275(191) 499(203) 33(187) 87(315) 29(50) 29(49) 53(117) 274(336)	**9** I-15 SB Ramps & Nichols Rd. 62(132) 6(2) 164(78) 215(339) 56(25) 228(239) 267(268)	**10** I-15 NB Ramps & Nichols Rd. 89(39) 131(112) 74(140) 318(177) 140(252) 3(1) 108(30)	**11** A Street & Nichols Rd. Future Intersection	**12** B Street & Nichols Rd. Future Intersection	**13** B Street & F Street Future Intersection	**14** B Street & H Street Future Intersection
15 K Street & B Street Future Intersection	**16** El Toro Rd. & B Street Future Intersection	**17** El Toro Rd. & Tereticornis Av. 413(150) 18(48) 23(17) 166(12) 183(126) 65(24)	**18** El Toro Rd. & Carmela Ct. 228(10) 343(146) 8(6) 15(1) 0(0) 6(5) 129(14) 0(0) 263(29) 166(13) 104(135) 6(4)	**19** Dexter Av. & Central Av. (SR-74) 372(315) 141(91) 68(67) 186(67) 1373(1112) 121(156) 227(338) 886(1617) 124(161) 99(119) 251(130) 87(168)	**20** Cambern Av. & Central Av. (SR-74) 86(83) 4(3) 126(230) 111(143) 1605(1119) 1(0) 123(252) 1023(1736) 1(1) 3(1) 2(3) 1(1)	**21** Driveway 1 & Nichols Rd. Future Intersection

Table 3-1

Intersection Analysis for Existing (2018) Conditions

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1] Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Delay[2] (secs.) AM	Delay[2] (secs.) PM	LOS[4] AM	LOS[4] PM
1	Lake St. & Nichols Rd.	TS	1	1	1	1	1	0	0	1	0	0	1	0	16.3	25.4	B	C
2	Lake St. & Alberhill Ranch Rd.	TS	0	1	1	1	1	0	0	0	0	1	0	1	12.4	7.4	B	A
3	Alberhill Ranch Rd. & Nichols Rd.	AWS	1	0	1	0	0	0	0	1	0	0	1	0	11.4	9.7	B	A
4	Lakeshore Dr. & Riverside Dr. (SR-74)	TS	1	2	0	1	2	1	1	2	1	1	1	1	44.9	42.5	D	D
5	Gunnerson St./Strickland Av. & Riverside Dr. (SR-74)	CSS	0	1	1	0	1	1	0	1	0	0	1	0	**81.0**	**120.2**	**F**	**F**
6	Collier Av. & Nichols Rd.	CSS	1	0	1	0	0	0	0	1	0	1	1	0	20.5	28.9	C	D
7	Collier Av. & Riverside Dr. (SR-74)	TS	1	1	0	1	1	1	0	1	1>	0	1	0	14.9	24.7	B	C
8	Collier Av. & Central Av. (SR-74)	TS	1	1	1>	2	2	1	2	2	0	2	1	2>	34.2	33.0	C	D
9	I-15 Southbound Ramps & Nichols Rd.	AWS	0	0	0	0	1	0	0	1	1	1	1	0	15.4	13.4	C	B
10	I-15 Northbound Ramps & Nichols Rd.	CSS	0	1	0	0	0	0	1	1	0	0	1	0	**>100.0**	29.9	**F**	D
11	A St. & Nichols Rd.		Future Intersection															
12	B St. & Nichols Rd.		Future Intersection															
13	B St. & F St.		Future Intersection															
14	B St. & H St.		Future Intersection															
15	K St. & B St.		Future Intersection															
16	El Toro Rd. & B St.		Future Intersection															
17	El Toro Rd. & Tereticornis Av.	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	10.2	**F**	B
	With Normalized PHF[5,6]	CSS	0	1	0	0	1	0	0	0	0	0	1	0	22.4	--	C	--
18	El Toro Rd. & Carmela Ct.	CSS	0	1	0	0	1	0	0	1	0	0	1	0	**>100.0**	11.5	**F**	B
	With Normalized PHF[5,6]	CSS	0	1	0	0	1	0	0	1	0	0	1	0	**>100.0**	--	**F**	--
19	Dexter Av. & Central Av. (SR-74)	TS	1	1	0	1	1	1>	1	3	1	1	4	1	39.6	46.5	D	D
20	Cambern Av. & Central Av. (SR-74)	TS	1	1	0	0	1	1	2	2	0	1	2	1	26.3	27.2	C	C
21	Driveway 1 & Nichols Rd.		Future Intersection															

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

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; d = Defacto Right Turn Lane; > = Right Turn Overlap Phasing

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

3 CSS = Cross-street Stop; AWS = All-way Stop; TS = Traffic Signal

4 LOS = Level of Service

5 The two intersections of Tereticornis Avenue and Carmela Court are in close proximity to the existing Temescal Canyon High School on El Toro Road and have been evaluated with the AM existing peak hour factor from the raw count worksheet and also with a normalized peak hour factor of 0.92. Lower peak hour factors during the AM peak hour (morning drop-off) occur near schools due to the peak 10-15 minute traffic flows during the AM peak hour, which are much higher in comparison to the other 15-minute periods within the hour.

6 PHF = Peak Hour Factor

Although the intersection of El Toro Road and Tereticornis Avenue is anticipated to operate at an unacceptable LOS during the AM peak hour, it is anticipated to operate at an acceptable LOS with a normalized PHF. Consistent with Table 3-1, a summary of the peak hour intersection LOS for Existing conditions are shown on Exhibit 3-10. 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. The following study area intersections currently warrant a traffic signal for Existing traffic conditions:

- Collier Avenue & Nichols Road (#6)
- I-15 Southbound Ramps & Nichols Road (#9)
- I-15 Northbound Ramps & Nichols Road (#10)
- El Toro Road & Carmela Court (#18)

Existing conditions traffic signal warrant analysis worksheets are provided in Appendix 3.3.

3.8 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-15 Freeway and Nichols Road interchange to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-15 Freeway mainline. Queuing analysis findings are presented in Table 3-2. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 3-2, there are no movements that are currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows. Worksheets for Existing traffic conditions off-ramp queuing analysis are provided in Appendix 3.4.

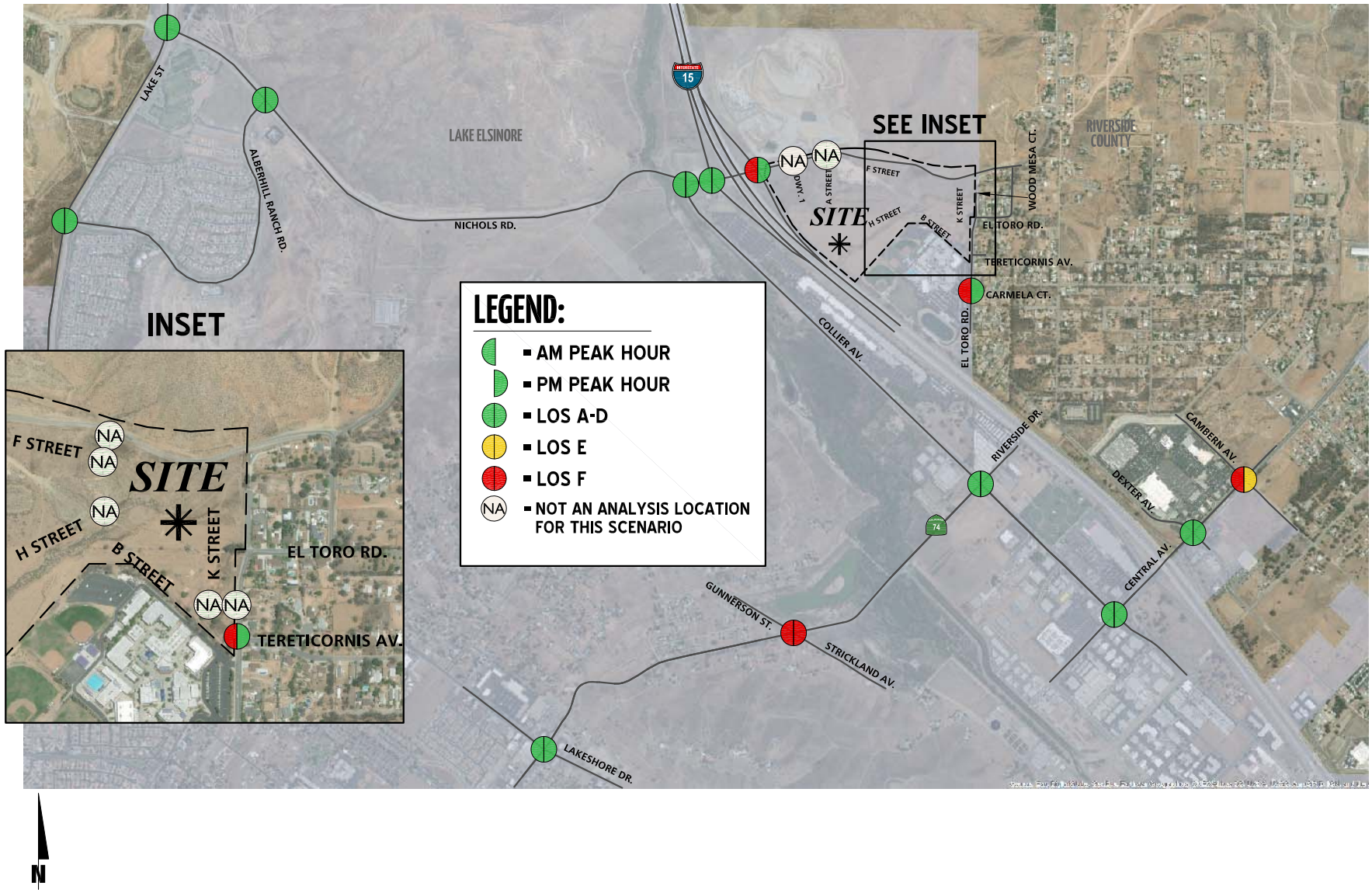
3.9 BASIC FREEWAY SEGMENT ANALYSIS

Existing mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibit 3-11. As shown in Table 3-3, 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 3.5.

3.10 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 3-4. As shown in Table 3-4, 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 3.6.

EXHIBIT 3-10: EXISTING (2018) SUMMARY OF LOS



URBAN CROSSROADS

EXHIBIT 3-11: EXISTING (2018) FREEWAY MAINLINE VOLUMES

LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

N

Table 3-2

Peak Hour Freeway Off-Ramp Queuing Summary for Existing (2018) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)[2]		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM
I-15 SB Off-Ramp & Nichols Rd.	SBL/T/R	1,600	80	43	Yes	Yes
I-15 NB Off-Ramp & Nichols Rd.	NBL/T/R	1,530	495	128	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided.
[2] Maximum queue length for the approach reported.

Table 3-3

Basic Freeway Segment Analysis for Existing (2018) Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	Density[2]		LOS[3]	
				AM	PM	AM	PM
I-15 Freeway	Southbound	North of Nichols Rd.	3	26.7	32.4	D	D
		South of Nichols Rd.	3	27.4	33.2	D	D
	Northbound	North of Nichols Rd.	3	21.9	16.7	C	B
		South of Nichols Rd.	3	22.4	17.1	C	B

[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] LOS = Level of Service

Table 3-4

Freeway Ramp Junction Merge/Diverge Analysis for Existing (2018) Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	AM Peak Hour		PM Peak Hour	
				Density[2]	LOS[3]	Density[2]	LOS[3]
I-15 Freeway	Southbound	Off-Ramp at Nichols Rd.	3	31.2	D	34.1	D
		On-Ramp at Nichols Rd.	3	27.5	C	30.8	D
	Northbound	On-Ramp at Nichols Rd.	3	22.5	C	17.9	B
		Off-Ramp at Nichols Rd.	3	27.9	C	17.9	B

[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] LOS = Level of Service

3.11 RECOMMENDED IMPROVEMENTS

3.11.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as deficient to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS C / LOS D or better). The effectiveness of the proposed recommended improvements is presented in Table 3-5 for Existing traffic conditions. Recommended improvements to address deficiencies for Existing traffic conditions are described below.

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal.

Eastbound and westbound left turn lanes are currently under construction and are anticipated to be in place by summer 2018. However, the intersection is anticipated to continue to operate at an unacceptable LOS without the installation of a traffic signal.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal.
- Add a northbound right turn lane.

El Toro Road & Carmela Court (#18)

- Install stop signs along El Toro Road to implement an all-way stop control.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.

As previously mentioned in Section 3.6 *Intersection Operations Analysis*, the intersection of El Toro Road and Tereticornis Avenue operates at an acceptable LOS with a normalized PHF. Recommending improvements for this intersection due to a low PHF means the intersection is being improved only for the congested 15-minute period, which is due to the morning drop-off of the nearby schools. As such, no improvements have been recommended at this intersection. The Existing (2018) intersection operations analysis worksheets, with improvements, are included in Appendix 3.7 of this TIA.

3.11.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

All freeway off-ramp storage lanes, mainline segments, and merge-diverge junctions were found to operate at acceptable LOS (LOS D or better) under Existing traffic conditions. As such, no improvements have been recommended for Existing (2018) traffic conditions.

Table 3-5

Intersection Analysis for Existing (2018) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
5	Gunnerson St./Strickland Av. & Riverside Dr. (SR-74)																	
	- Without Improvements	CSS	0	1	1	0	1	1	0	1	0	0	1	0	**81.0**	**120.2**	**F**	**F**
	- With Improvements[4,5]	**TS**	0	1	1	0	1	1	**1**	1	0	**1**	1	0	9.2	9.1	A	A
10	I-15 Northbound Ramps & Nichols Rd.																	
	- Without Improvements	CSS	0	1	0	0	0	0	1	1	0	0	1	0	**>100.0**	29.9	**F**	D
	- With Improvements	**TS**	0	1	**1**	0	0	0	1	1	0	0	1	0	13.4	13.4	B	B
18	El Toro Rd. & Carmela Ct.																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	11.5	**F**	B
	- With Improvements[7]	**AWS**	0	1	0	0	1	**1**	0	1	0	0	1	0	**61.2**	8.6	**F**	A
	- Without Improvements[6]	CSS	0	1	0	0	1	0	0	1	0	0	1	0	**>100.0**	11.5	**F**	B
	- With Improvements[6,7]	**AWS**	0	1	0	0	1	**1**	0	1	0	0	1	0	19.1	8.6	C	A

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

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** = Improvement

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

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

4 Eastbound and westbound left turn lanes are currently under construction and are anticipated to be in place by summer 2018. However, the intersection is anticipated to continue to operate at an unacceptable LOS without the installation of a traffic signal.

5 Although the intersection is not anticipated to warrant a traffic signal under Existing conditions, the addition of lane geometric improvements alone is not anticipated to improve the peak hour delays. As such, the intersection should be monitored and a traffic signal should be installed at the City Traffic Engineer's discretion.

6 A normalized AM PHF of 0.92 is used to determine improvements.

7 Remove on-street parking to allow restriping for a 100 foot right turn pocket.

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4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project, as well as the Project's trip assignment onto the study area roadway network. The proposed Project is located within the Alberhill Ranch Specific Plan and a portion (southern parcel) lies outside of the Specific Plan. For purposes of the traffic analysis it is anticipated that the Project will be evaluated in 3 phases, with Phase 1 having a projected Opening Year of 2020, Phase 2 having a project Opening Year of 2021, and Project Buildout anticipated to occur in 2024.

- Phase 1 (2020): 34 low-medium density residential dwelling units
- Phase 2 (2021): Phase 1 (2020) development plus 134 additional low-medium density residential dwelling units (buildout of residential) and an 8.3-acre park
- Phase 3 (2024): Phase 1 (2020) and Phase 2 (2021) development plus 6,000 square feet (sf) of fast-food restaurant with drive-through window use, 9,400 sf of high turnover (sit-down) restaurant use, 8,000 sf of health and fitness club use, 43,000 sf of office use, 5,500 sf of fast food without drive-through, a 16-vehicle fueling position gas station with convenience store and car wash, and 130 room hotel

Access to the Project site is proposed to be provided by Nichols Road via A Street and B Street and El Toro Road via B Street. The Project will construct B Street between El Toro Road and Nichols Road in Phase 1 (2020). Regional access to the Project site is provided via the I-15 Freeway at Nichols Road 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.

4.1.1 PROPOSED PROJECT

Trips generated by the Project's proposed land uses have been estimated based on trip generation rates collected by the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, 2017 for the following ITE land use codes (3):

- Single Family Detached Residential (ITE Code 210)
- Hotel (ITE Code 310)
- Park (ITE Code 411)
- Health & Fitness Club (ITE Code 492)
- General Office (ITE Code 710)
- Shopping Center (ITE Code 820)
- High Turnover (Sit-Down) Restaurant (ITE Code 932)
- Fast Food without Drive-Through (ITE Code 933)

- Fast Food with Drive-Through (ITE Code 934)
- Gasoline/Service Station with Convenience Market (ITE Code 945)

Table 4-1 presents the trip generation rates for these land uses. Table 4-2 summarizes the trip generation based on the mix of land uses proposed for the Project. As the project is proposed to include shopping center and gas station uses, pass-by percentages have been obtained from Tables F.9, F.37, and F.38 of the ITE Trip Generation Handbook (3rd Edition, 2014). (9) Patrons of the hotel and future residents may also visit other uses on-site, including the gas station and retail uses, without leaving the site. The ITE Trip Generation Handbook has been utilized to determine the internal capture for the proposed mix of uses, for each phase of development.

Internal capture is a percentage reduction that can be applied to the trip generation estimates for individual land uses to account for trips internal to the site. In other words, trips may be made between individual retail uses on-site and can be made either by walking or using internal roadways without using external streets. As the trip generation for the site was conservatively estimated based on individual land uses as opposed to the overall ITE Shopping Center rate, an internal capture reduction of 10% was applied to recognize the interactions that would occur between the various complimentary land uses. As shown in Table 7.1 of the ITE Trip Generation Handbook, the internal capture percentage between retail-to-retail land uses is approximately 29% during the weekday mid-day peak hour and approximately 20% during the weekday PM peak hour. (9) The internal capture reduction percentage applied has been reviewed and approved by City staff.

As shown in Table 4-1, the Project is estimated to generate a net total of 6,900 trip-ends per day on a typical weekday with approximately 734 AM peak hour trips, and 622 PM peak hour trips.

4.1.2 CURRENTLY APPROVED LAND USE: COMMERCIAL RETAIL (ALBERHILL RANCH SPECIFIC PLAN)

The northern portion of the Project site is located within Area C of the Alberhill Ranch Specific Plan. The Alberhill Ranch Specific Plan Amendment No. 3 identifies Area C of the Specific Plan with the development of up to 380,000 square feet of commercial retail use on approximately 45.4 acres. The southern portion of the Project site lies outside of the Alberhill Ranch Specific Plan on approximately 27.1 acres. Based on the City's General Plan land use designation for commercial retail, the site could be developed with up to 472,190 square feet of commercial retail use (i.e., 27.1 acres x 17,424 SF/acre (equates to 0.40 floor-to-area ratio). Table 4-2 summarizes the resulting trip generation estimates based on the currently approved land use (Commercial Retail).

Pass-by trips are defined as intermediate stops on the way from an origin to a primary trip destination without a route diversion. Pass-by trips are attracted from traffic passing the site on an adjacent street or roadway that offers direct access to the generator. These types of trips are many times associated with retail uses. As the Project is proposed to include retail use, pass-by reduction percentages have been obtained and applied from Table F.9 from the ITE Trip Generation Handbook. To be conservative an internal capture assumption of 10% has been utilized for the currently adopted commercial retail land use.

Table 4-1

Project Trip Generation Rates

Land Use[1]	Units[2]	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Trip Generation Rates									
Single Family Detached Residential	DU	210	0.19	0.56	0.74	0.62	0.37	0.99	9.44
Hotel	Rooms	310	0.28	0.19	0.47	0.31	0.29	0.60	8.36
Park	AC	411	0.01	0.01	0.02	0.06	0.05	0.11	0.78
Health & Fitness Club	TSF	492	0.67	0.64	1.31	1.97	1.48	3.45	34.50
General Office[3]	TSF	710	1.34	0.22	1.56	0.19	1.00	1.19	10.88
Shopping Center[3]	TSF	820	21.70	13.30	35.00	5.88	6.37	12.25	163.35
High Turnover (Sit-Down) Restaurant	TSF	932	5.47	4.47	9.94	6.06	3.71	9.77	112.18
Fast Food w/o Drive-Through	TSF	933	15.06	10.04	25.10	14.17	14.17	28.34	346.23
Fast Food w/ Drive-Through	TSF	934	20.50	19.69	40.19	16.99	15.68	32.67	470.95
Gasoline Station w/ Market	VFP	945	10.14	10.14	20.27	11.18	11.18	22.36	198.16

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

[2] DU = Dwelling Units; TSF = thousand square feet; AC = Acres; VFP = Vehicle Fueling Position

[3] Regression equation utilized to determine the trip generation rates as opposed to average trip rates.

Table 4-2

Project Trip Generation Summary

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Phase 1 (2020)									
Single Family Detached Residential	34	DU	7	19	26	22	13	35	321
Phase 1 Total:			**7**	**19**	**26**	**22**	**13**	**35**	**321**
Phase 2 (2021)									
Single Family Detached Residential	168	DU	32	94	126	105	62	167	1,586
Park	8.3	AC	1	1	2	1	1	2	7
Phase 2 Total:			**33**	**95**	**128**	**106**	**63**	**169**	**1,593**
Project Buildout (2024)									
Single Family Detached Residential	168	DU	32	94	126	105	62	167	1,586
Park	8.3	AC	1	1	2	1	1	2	7
Internal Capture:			-3	-22	-25	-25	-20	-45	0
Residential Subtotal:			*30*	*73*	*103*	*81*	*43*	*124*	*1,593*
Hotel	130	Rooms	37	26	63	40	39	79	1,087
Internal Capture:			-1	-8	-9	-17	-13	-30	-413
Hotel Subtotal:			*36*	*18*	*54*	*23*	*26*	*49*	*674*
Fast Food With Drive-Through	6.000	TSF	123	118	241	102	94	196	2,826
Internal Capture:			-14	-6	-21	-17	-22	-39	-564
Pass-By (49% AM, 50% PM/Daily):			-55	-55	-110	-36	-36	-72	-1,131
Fast Food Without Drive-Through	5.500	TSF	83	55	138	78	78	156	1,904
Internal Capture:			-10	-4	-14	-11	-15	-26	-321
Pass-By (49% AM, 50% PM/Daily):			-25	-25	-50	-31	-31	-62	-791
High Turnover (Sit-Down) Restaurant	9.400	TSF	51	42	93	57	35	92	1,054
Internal Capture:			-5	-2	-8	-6	-8	-15	-167
Pass-By (43% PM/Daily):			0	0	0	-11	-11	-22	-381
Restaurant Subtotal:			*148*	*122*	*270*	*125*	*83*	*208*	*2,428*
Commercial Retail	4.400	TSF	95	59	154	26	28	54	719
Internal Capture:			-15	-11	-26	-19	-17	-36	-479
Pass-By (34% PM/Daily):			0	0	0	-2	-2	-4	-81
Health & Fitness Club	8.000	TSF	5	5	10	16	12	28	276
Gas Station w/ Market & Carwash	16	VFP	162	162	324	179	179	358	3,171
Pass-By (62% am, 56% PM/Daily):			-100	-100	-200	-100	-100	-200	-1,776
Retail Subtotal:			*147*	*115*	*262*	*100*	*100*	*200*	*1,829*
General Office	43.000	TSF	58	9	67	8	43	51	468
Internal Capture:			-14	-8	-22	-5	-5	-10	-92
Office Subtotal:			*44*	*1*	*45*	*3*	*38*	*41*	*376*
Project Buildout Total:			**405**	**329**	**734**	**332**	**290**	**622**	**6,901**

[1] DU = Dwelling Units; TSF = thousand square feet; VFP = Vehicle Fueling Position; AC = Acres

Table 4-3

Currently Approved Land Use Trip Generation Summary

Land Use	ITE Code	Units[2]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Weekday Daily
Trip Generation Rates[1]									
Shopping Center	820	TSF	0.58	0.36	0.94	1.83	1.98	3.81	37.75

Land Use	Quantity[2]		AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Weekday Daily
Northern Parcel:									
Commercial Retail[5]	380.000	TSF	221	136	357	695	753	1,448	14,345
Internal Trip Reduction[3]			-22	-14	-36	-70	-75	-145	-1,435
Pass-by Reduction (PM: 34%)[4]			-	-	-	-236	-236	-472	-4,877
Southern Parcel:									
Commercial Retail[6]	472.190	TSF	275	169	444	864	936	1,799	17,825
Internal Trip Reduction[3]			-28	-17	-45	-86	-94	-180	-1,783
Pass-by Reduction (PM: 34%)[4]			-	-	-	-294	-294	-588	-6,061
Total			***446***	***275***	***720***	***873***	***990***	***1,862***	***18,015***

[1] Source: ITE (Institute of Transportation Engineers) Trip Generation, 10th Edition, 2017.

[2] TSF = Thousand Square Feet

[3] Internal capture reduction of 10%.

[4] Pass-by reduction percentages are from the ITE Trip Generation Handbook (3rd Edition, 2014): Table F.9.

[5] Based on the Alberhill Ranch SP, the allowable commercial retail square footage permitted on 45.4 acres is 380,000 SF.

[6] Based on the City's General Plan, the allowable commercial retail square footage permitted on 27.1 acres is 472,190 SF.

As shown in Table 4-3, the approved land use is estimated to generate a net total of 18,015 trip-ends per day on a typical weekday with approximately 720 AM peak hour trips, and 1,862 PM peak hour trips.

4.1.3 TRIP GENERATION COMPARISON

Table 4-4 shows a comparison of trips generation by the currently approved land use and the proposed Project. As shown in Table 4-4, the development of the proposed Project is anticipated to generate 11,115 fewer trip-ends per day. Although the development of the proposed Project is anticipated to generate 14 more trips in the AM peak hour, the proposed Project is anticipated to generate 1,240 fewer trips in the PM peak hour.

4.2 PROJECT TRIP DISTRIBUTION

The Project trip distribution patterns were developed based on an understanding of existing travel patterns in the area, the geographical location of the site, and the site's proximity to the regional arterial and state highway system. Project travel patterns were derived for each of the proposed land uses. Exhibit 4-1 shows the residential trip distribution patterns for the Project for Phase 1, Phase 2, and Project Buildout. B Street will be fully constructed by the Project in Phase 1. Therefore, it is unlikely that existing through traffic would continue to utilize El Toro Road to Wood Mesa Court to access Nichols Road once B Street provides access to Nichols Road. As such, for the purposes of this analysis, 50 percent of the through traffic on El Toro Road will divert and use B Street to access Nichols Road, once available. The trip distribution for Phase 2 includes the buildout of A Street to Nichols Road.

Exhibit 4-2 shows the retail trip distribution patterns for the Project which will be utilized for the shopping center, office, and gas station uses. Exhibit 4-3 shows the hotel trip distribution patterns for the Project. Exhibits 4-2 and 4-3 will be utilized for Project Buildout conditions only.

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 (Phase 1) ADT and peak hour intersection turning movement volumes are shown on Exhibit 4-4. Project (Phase 2) ADT and peak hour intersection turning movement volumes are shown on Exhibit 4-5. Project (Buildout) ADT and peak hour intersection turning movement volumes are shown on Exhibit 4-6.

Table 4-4

Currently Approved Land Use Trip Generation Comparison

Land Use	AM Peak Hour			PM Peak Hour			Weekday
	In	Out	Total	In	Out	Total	Daily
Currently Approved	446	275	720	873	990	1,862	18,015
Proposed Project	405	329	734	332	290	622	6,901
VARIANCE (Proposed - Currently Approved)	**-41**	**55**	**14**	**-541**	**-700**	**-1,240**	**-11,114**

EXHIBIT 4-1: PROJECT (RESIDENTIAL) (PHASE 1, PHASE 2 AND PROJECT BUILDOUT) TRIP DISTRIBUTION

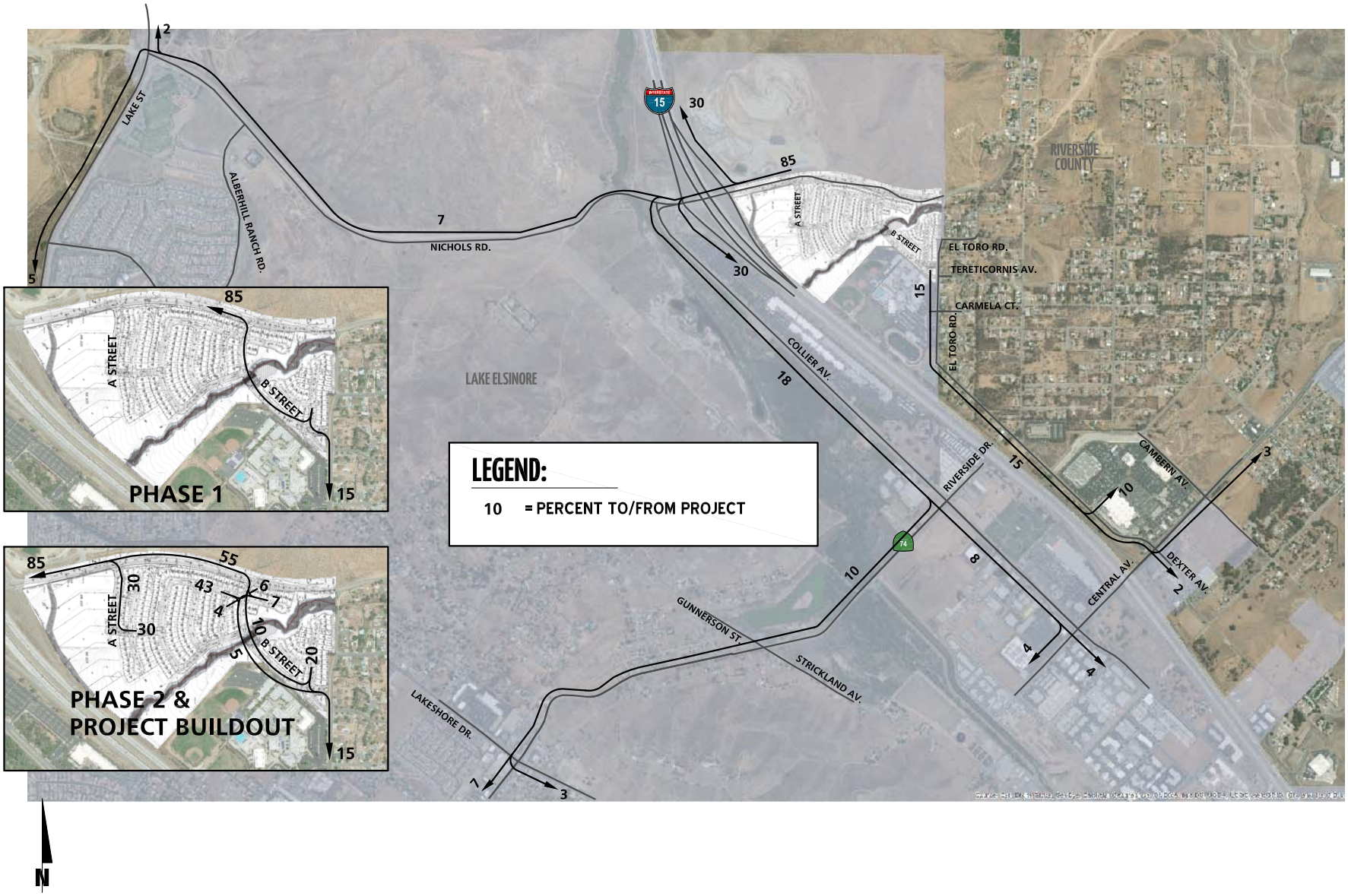


EXHIBIT 4-2: PROJECT (RETAIL/OFFICE/GAS STATION) (PROJECT BUILDOUT)TRIP DISTRIBUTION

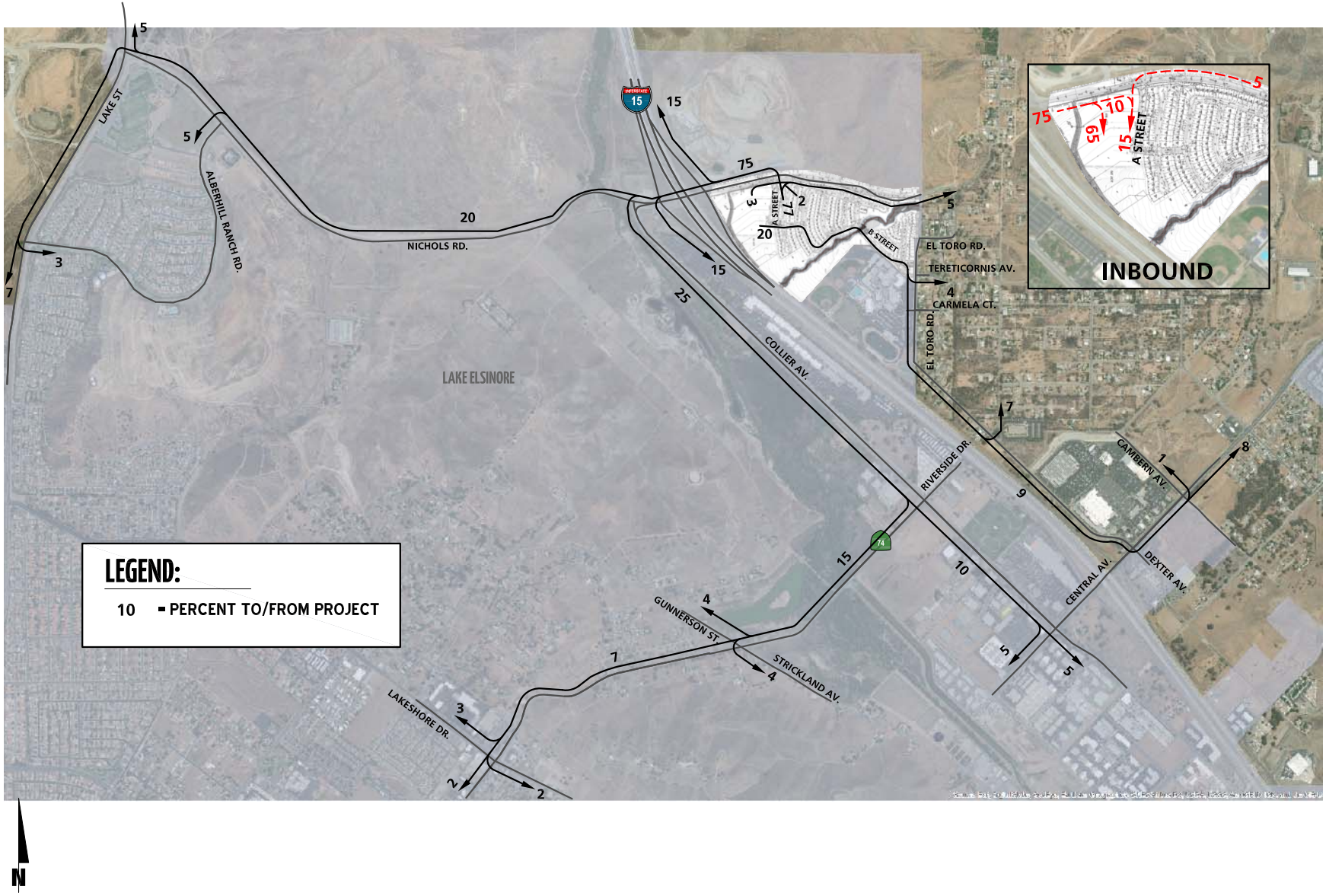


EXHIBIT 4-3: PROJECT (HOTEL) (PROJECT BUILDOUT) TRIP DISTRIBUTION

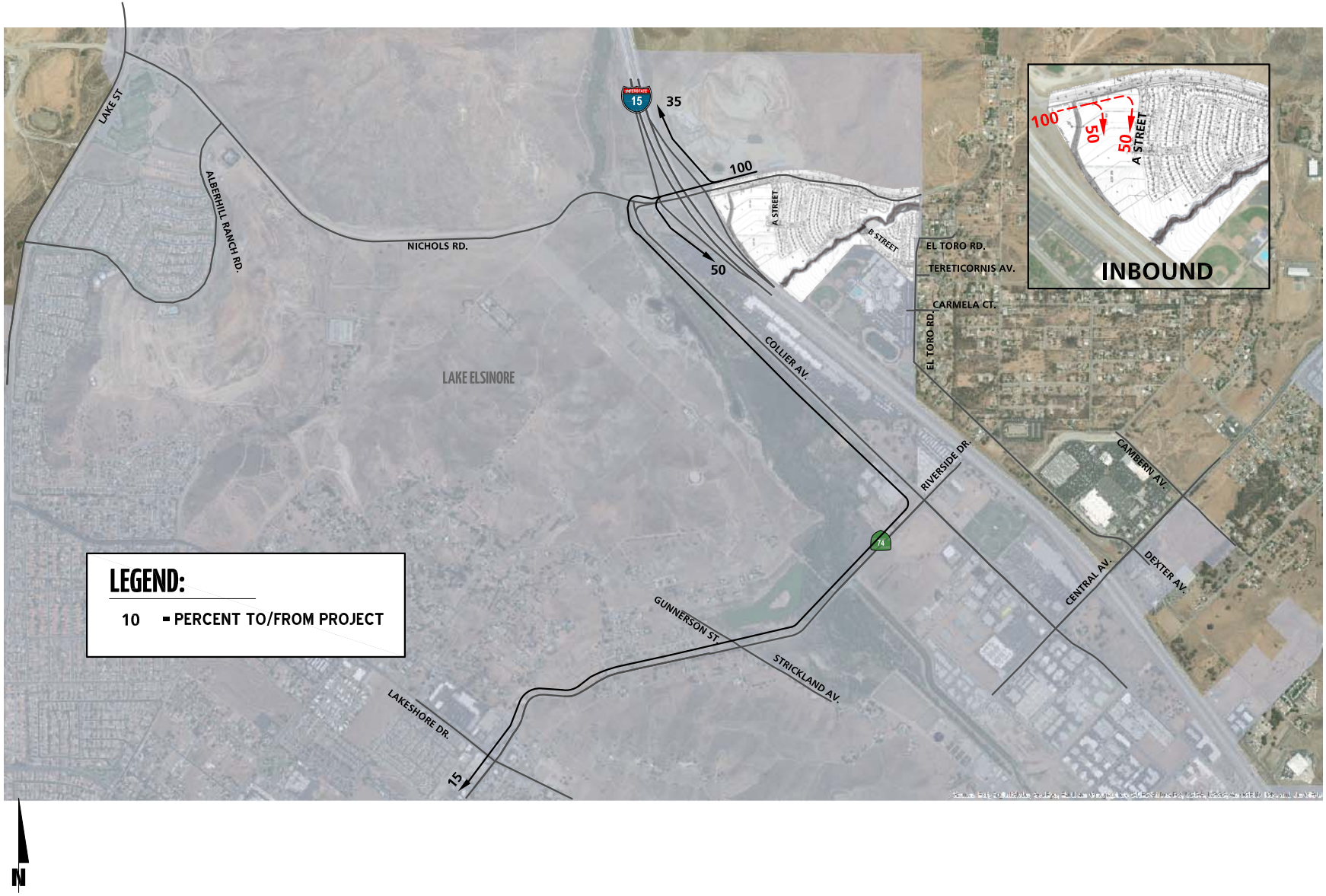
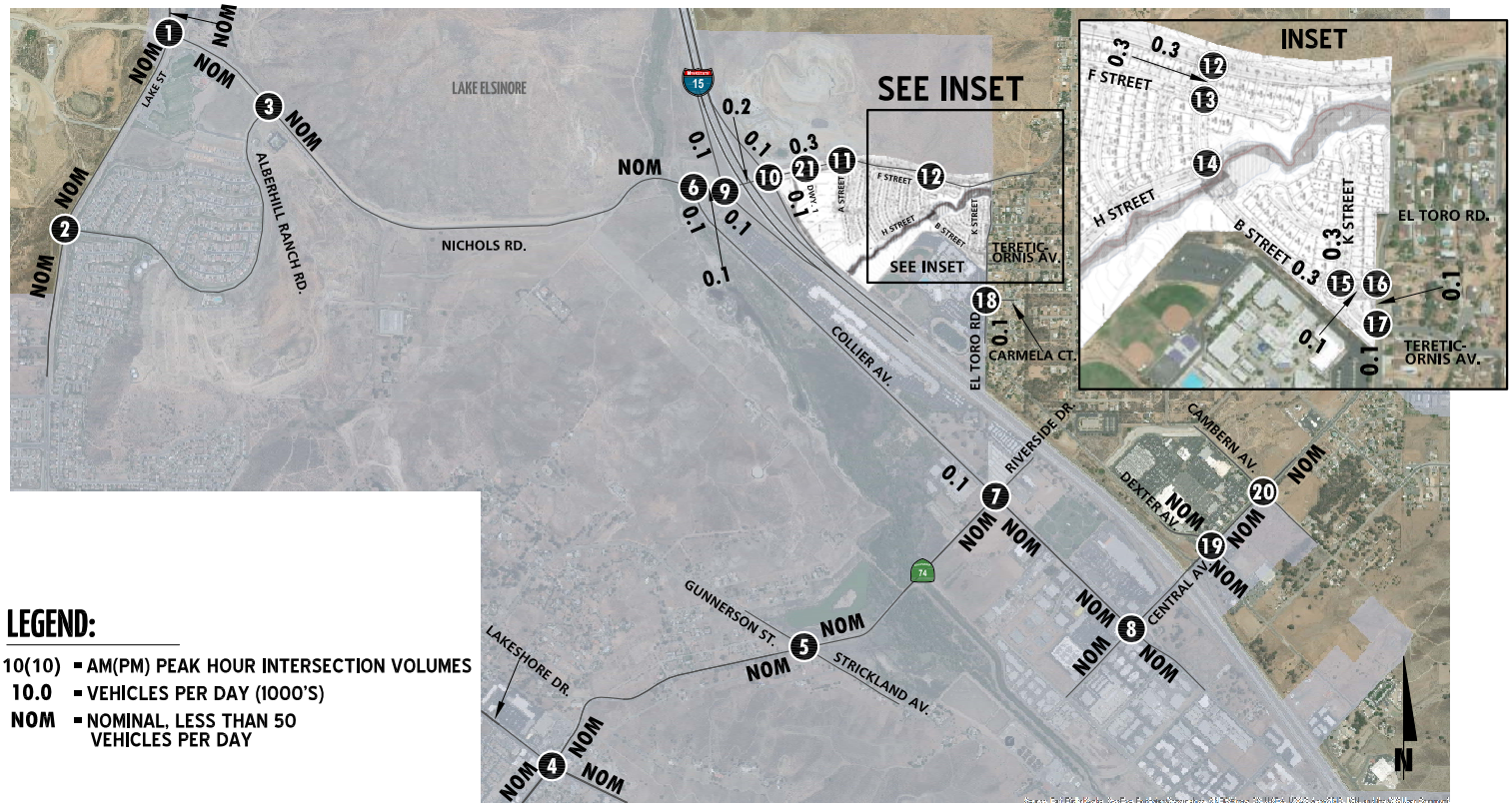


EXHIBIT 4-4: PROJECT ONLY (PHASE 1) TRAFFIC VOLUMES



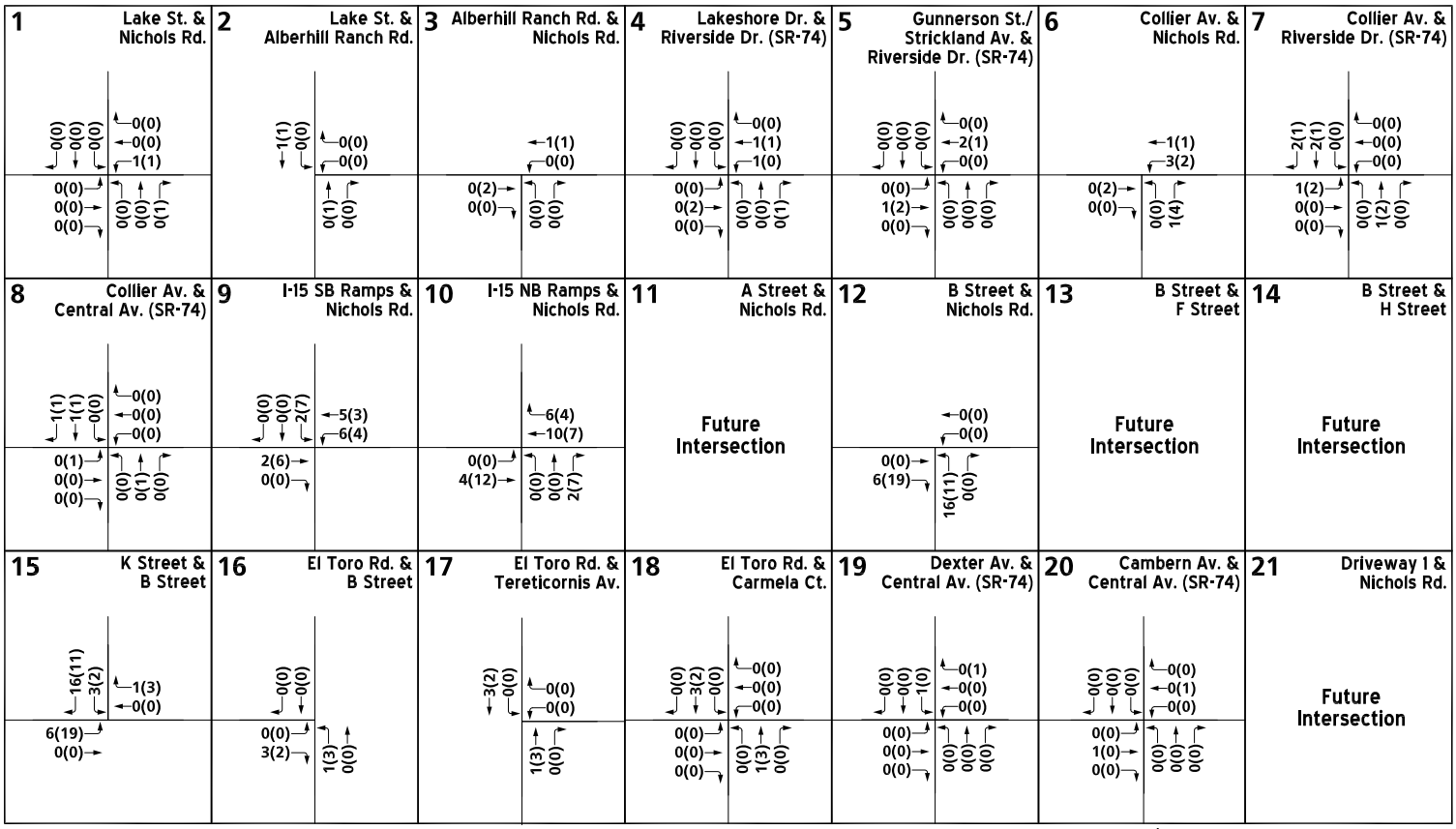
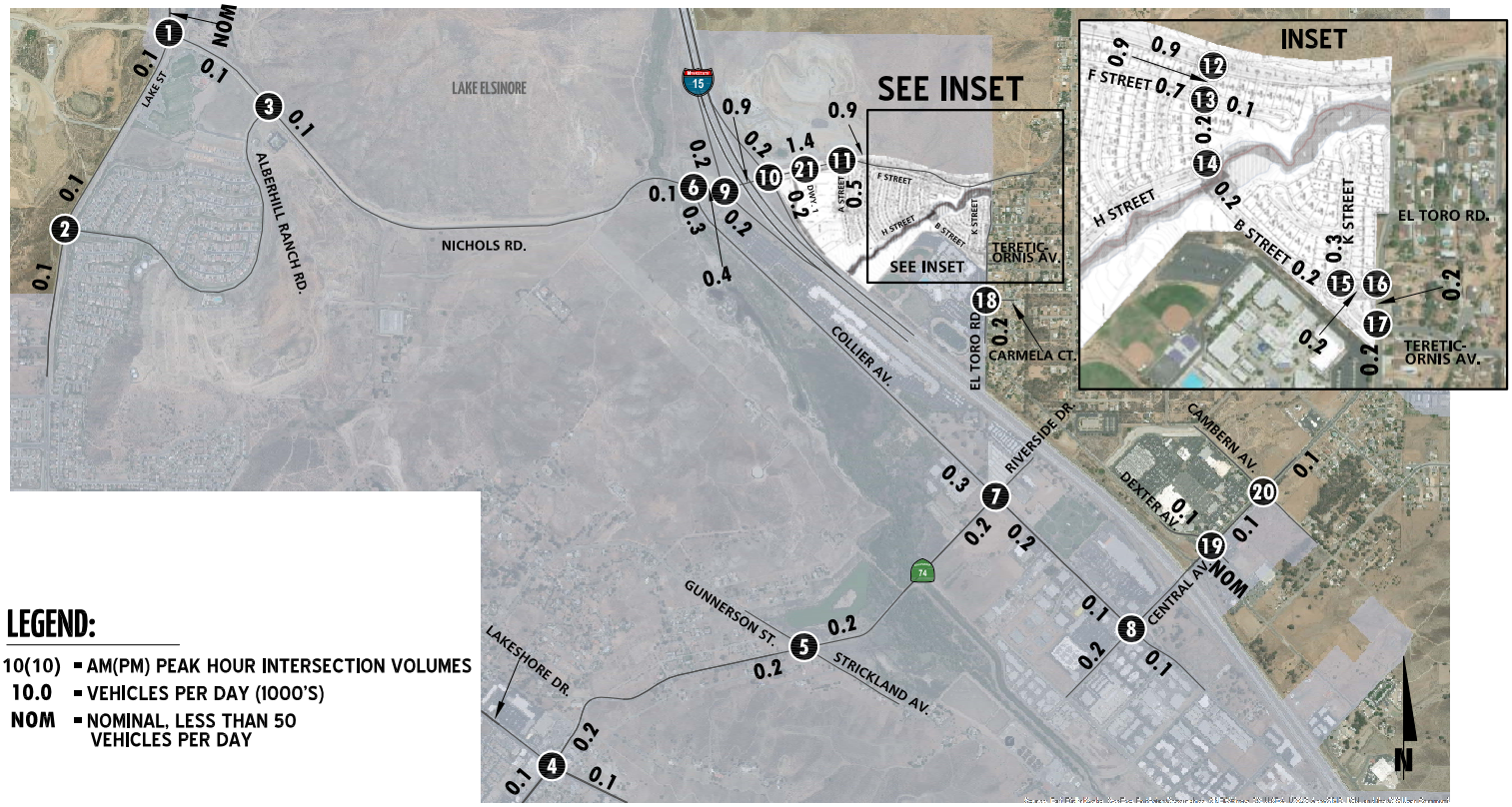


EXHIBIT 4-5: PROJECT ONLY (PHASE 2) TRAFFIC VOLUMES

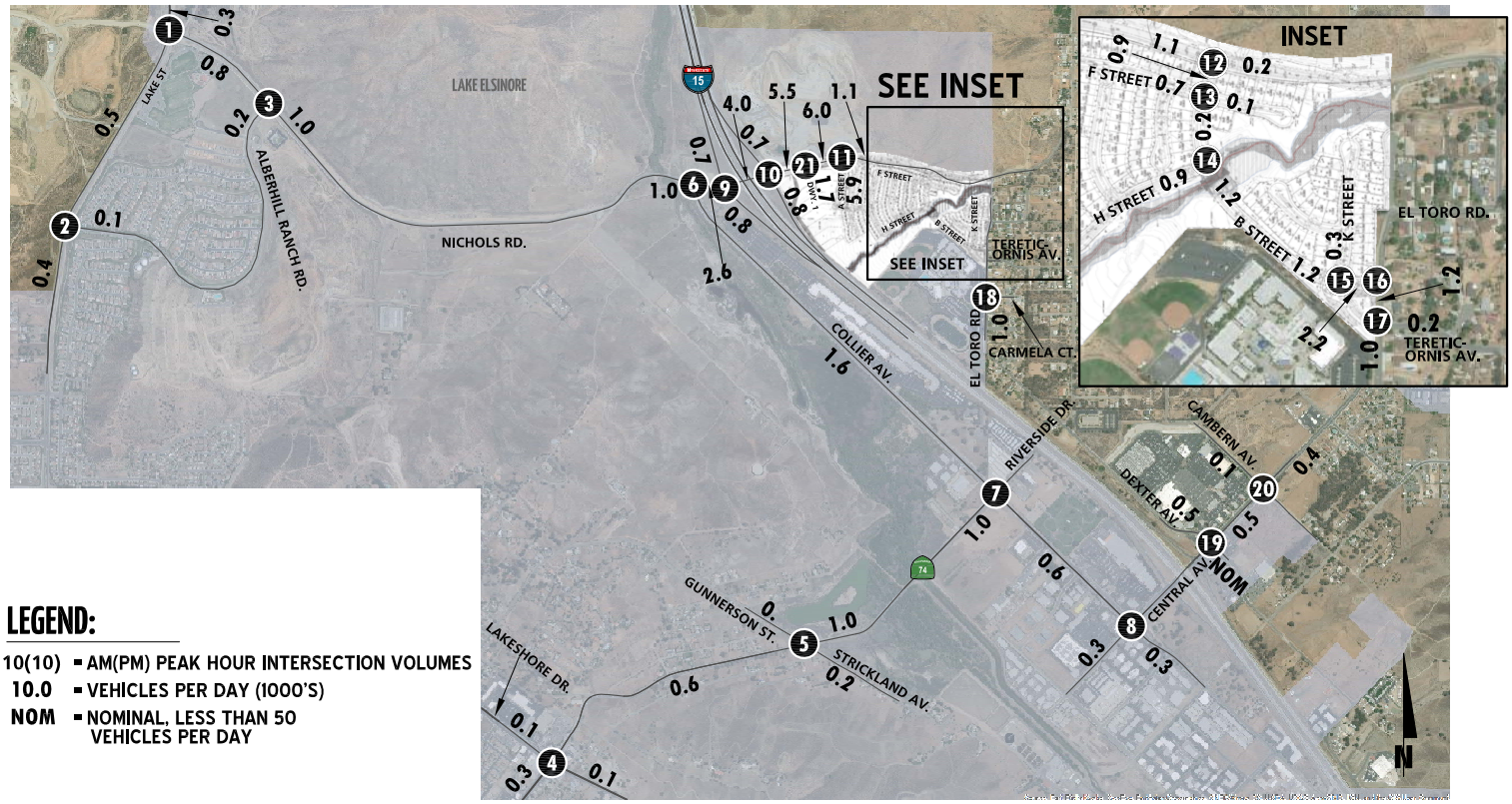


LEGEND:

- 10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
- 10.0 = VEHICLES PER DAY (1000'S)
- NOM = NOMINAL, LESS THAN 50 VEHICLES PER DAY

1 Lake St. & Nichols Rd. 0(0) 0(0) 1(2) ← 2(1) 0(0) 5(3) 0(0) 0(0) 0(0) → 0(0) 0(0) 2(5)	**2** Lake St. & Alberhill Ranch Rd. 5(3) 0(0) ← 0(0) 0(0) 2(5) 0(0)	**3** Alberhill Ranch Rd. & Nichols Rd. ← 7(4) 0(0) 2(7) 0(0) → 0(0) 0(0)	**4** Lakeshore Dr. & Riverside Dr. (SR-74) 0(0) 0(0) 0(0) ← 0(0) 7(4) 3(2) 0(0) 2(7) 0(0) → 0(0) 0(0) 1(3)	**5** Gunnerson St./ Strickland Av. & Riverside Dr. (SR-74) 0(0) 0(0) 0(0) ← 0(0) 10(6) 0(0) 0(0) 3(11) 0(0) → 0(0) 0(0) 0(0)	**6** Collier Av. & Nichols Rd. ← 7(4) 17(11) 2(7) 0(0) → 0(0) 6(19)	**7** Collier Av. & Riverside Dr. (SR-74) 10(6) 8(5) 0(0) ← 0(0) 0(0) 0(0) 3(11) 0(0) 0(0) → 0(0) 3(8) 0(0)
8 Collier Av. & Central Av. (SR-74) 4(3) 4(3) 0(0) ← 0(0) 0(0) 0(0) 1(4) 0(0) 0(0) → 0(0) 1(4) 0(0)	**9** I-15 SB Ramps & Nichols Rd. 0(0) 0(0) 10(32) ← 24(16) 29(19) 8(27) 0(0) →	**10** I-15 NB Ramps & Nichols Rd. ← 29(19) 52(35) 0(0) 18(58) → 0(0) 0(0) 10(32)	**11** A Street & Nichols Rd. ← 52(35) 0(0) 18(58) 10(32) → 29(19) 0(0)	**12** B Street & Nichols Rd. ← 0(0) 0(0) 0(0) 18(58) → 52(35) 0(0)	**13** B Street & F Street 13(41) 3(10) 2(6) ← 6(4) 0(0) 1(1) 37(25) 0(0) 4(3) → 1(4) 9(6) 0(1)	**14** B Street & H Street Future Intersection
15 K Street & B Street 9(6) 10(6) ← 3(11) 2(5) 3(10) 5(3) →	**16** El Toro Rd. & B Street 0(0) 0(0) 0(0) 14(9) → 5(16) 0(0)	**17** El Toro Rd. & Tereticornis Av. 14(9) 0(0) ← 0(0) 0(0) 5(16) 0(0)	**18** El Toro Rd. & Carmela Ct. 0(0) 14(9) 0(0) ← 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) → 0(0) 5(16) 0(0)	**19** Dexter Av. & Central Av. (SR-74) 0(0) 2(1) 3(2) ← 1(3) 0(0) 0(0) 0(0) 0(0) 0(0) → 0(0) 1(2) 0(0)	**20** Cambern Av. & Central Av. (SR-74) 0(0) 0(0) 0(0) ← 0(0) 1(3) 0(0) 0(0) 3(2) 0(0) → 0(0) 0(0) 0(0)	**21** Driveway 1 & Nichols Rd. Future Intersection

EXHIBIT 4-6: PROJECT ONLY (BUILDOUT) TRAFFIC VOLUMES



LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)
NOM = NOMINAL, LESS THAN 50 VEHICLES PER DAY

1 Lake St. & Nichols Rd.	**2** Lake St. & Alberhill Ranch Rd.	**3** Alberhill Ranch Rd. & Nichols Rd.	**4** Lakeshore Dr. & Riverside Dr. (SR-74)	**5** Gunnerson St./ Strickland Av. & Riverside Dr. (SR-74)	**6** Collier Av. & Nichols Rd.	**7** Collier Av. & Riverside Dr. (SR-74)
0(0) 0(0) 18(13) →	20(18) 7(7) →		0(0) 0(0) 10(7) →	0(0) 0(0) 14(9) →		46(41) 30(26) 0(0) →
← 13(12)	← 10(7)	← 41(36)	← 7(7)	← 10(9)	← 53(47)	← 0(0)
← 0(0)	← 0(0)	← 12(11)	← 13(11)	← 27(24)	← 75(67)	← 0(0)
← 27(24)			← 7(6)	← 10(9)		← 0(0)
0(0) →		53(40) →	0(0) →	0(0) →	70(51) →	59(46) →
0(0) →		0(0) →	14(14) →	32(28) →	0(0) →	0(0) →
0(0) →	25(20) →	0(0) →	0(0) →	0(0) →	0(0) →	0(0) →
0(0) 0(0) 35(27)	0(0)	17(11)	0(0) 0(0) 8(7)	0(0) 0(0) 14(9)	96(75)	0(0) 36(29) 0(0)

8 Collier Av. & Central Av. (SR-74)	**9** I-15 SB Ramps & Nichols Rd.	**10** I-15 NB Ramps & Nichols Rd.	**11** A Street & Nichols Rd.	**12** B Street & Nichols Rd.	**13** B Street & F Street	**14** B Street & H Street
15(13) 15(13) 0(0) →	0(0) 0(0) 72(67) →				12(32) 3(8) 2(5) →	0(0) 7(10) →
← 0(0)	← 128(114)	← 64(55)	← 40(24)	← 17(11)	← 4(3)	
← 0(0)	← 67(59)	← 195(173)	← 17(11)	← 0(0)	← 0(0)	
← 0(0)					← 1(0)	
18(15) →	165(126) →	0(0) →	-39(-11) →	12(11) →	29(17) →	0(0) →
0(0) →	0(0) →	238(193) →	126(122) →	17(45) →	0(0) →	48(44) →
0(0) →					3(2) →	
0(0) 18(15) 0(0)		0(0) 0(0) 78(70)	399(385) 5(4)	40(24) 0(0)	1(3) 7(4) 0(1)	68(46) 9(8)

15 K Street & B Street	**16** El Toro Rd. & B Street	**17** El Toro Rd. & Tereticornis Av.	**18** El Toro Rd. & Carmela Ct.	**19** Dexter Av. & Central Av. (SR-74)	**20** Cambern Av. & Central Av. (SR-74)	**21** Driveway 1 & Nichols Rd.
7(4) 7(4) →	0(0) 0(0) →	49(42) 10(9) →	0(0) 49(42) 0(0) →	0(0) 1(1) 24(21) →	3(2) 0(0) 0(0) →	
← 3(8)		← 14(9)	← 0(0)	← 31(23)	← 0(0)	
← 69(50)		← 0(0)	← 0(0)	← 0(0)	← 28(21)	← 79(49)
			← 0(0)	← 0(0)	← 0(0)	
3(8) →	0(0) →		0(0) →	0(0) →	2(2) →	-37(-13) →
51(46) →	59(51) →		0(0) →	0(0) →	21(19) →	354(276) →
			0(0) →	0(0) →	0(0) →	
	162(95) -90(-37)	59(49) 0(0)	0(0) 59(49) 0(0)	0(0) 1(2) 0(0)	0(0) 0(0) 0(0)	7(7)

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URBAN CROSSROADS

4.5 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. In addition, the County of Riverside was also contacted to obtain near-by cumulative projects that could potentially contribute traffic at the study area intersections.

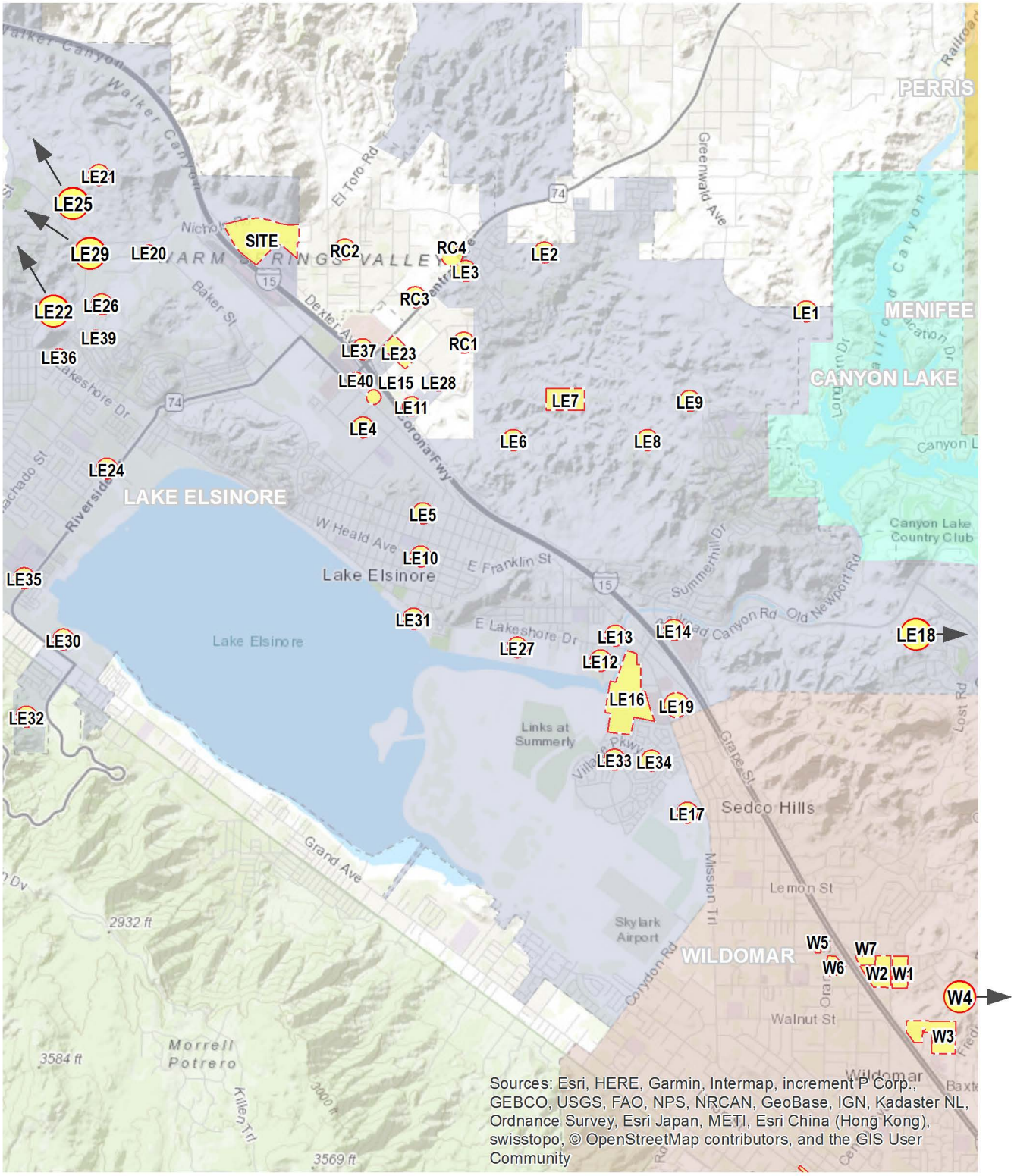
Where applicable, cumulative projects anticipated to contribute measurable traffic (i.e. 50 or more peak hour trips) to study area intersections have been manually added to the study area network to generate EAPC forecasts. In other words, this list of cumulative development projects has been reviewed 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 4-7 and listed in Table 4-5.

For the purposes of this study, absorption percentages have been applied to the cumulative development traffic. It is unlikely that each cumulative development project shown on Exhibit 4-7 will be fully constructed and occupied by the years 2020, 2021, and 2024. As such, 10% of the cumulative development traffic is added on top of EAP (2020) traffic volumes, 15% of the cumulative development traffic is added on top of EAP (2021) traffic volumes, and 30% of cumulative development traffic is added on top of EAP (2024) traffic volumes. Cumulative only ADT and peak hour intersection turning movement volumes for 2020, 2021, and 2024 are shown on Exhibits 4-8 through 4-10, respectively. Cumulative Project Trip Generation is available in Appendix 4.1 of this TIA.

4.6 BACKGROUND TRAFFIC

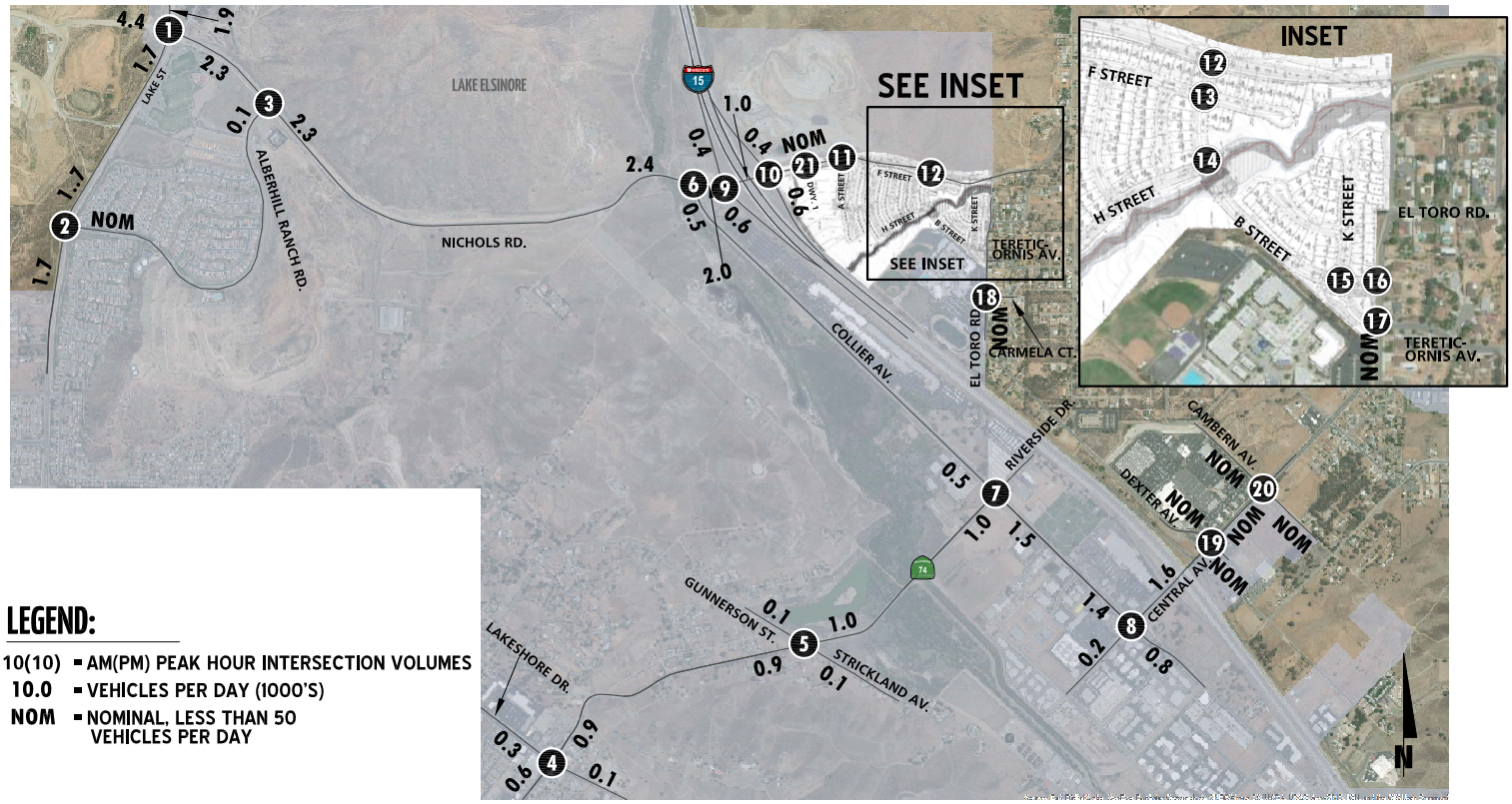
Future year traffic forecasts have been based upon background (ambient) growth at 4.04% for 2020, 6.12% for 2021, and 12.62% (for 2024 conditions) traffic conditions. The ambient growth factor is intended to approximate regional traffic growth. This ambient growth rate is added to existing traffic volumes 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.

EXHIBIT 4-7: CUMULATIVE DEVELOPMENT PROJECTS LOCATION MAP



N

EXHIBIT 4-8: CUMULATIVE ONLY (2020) TRAFFIC VOLUMES

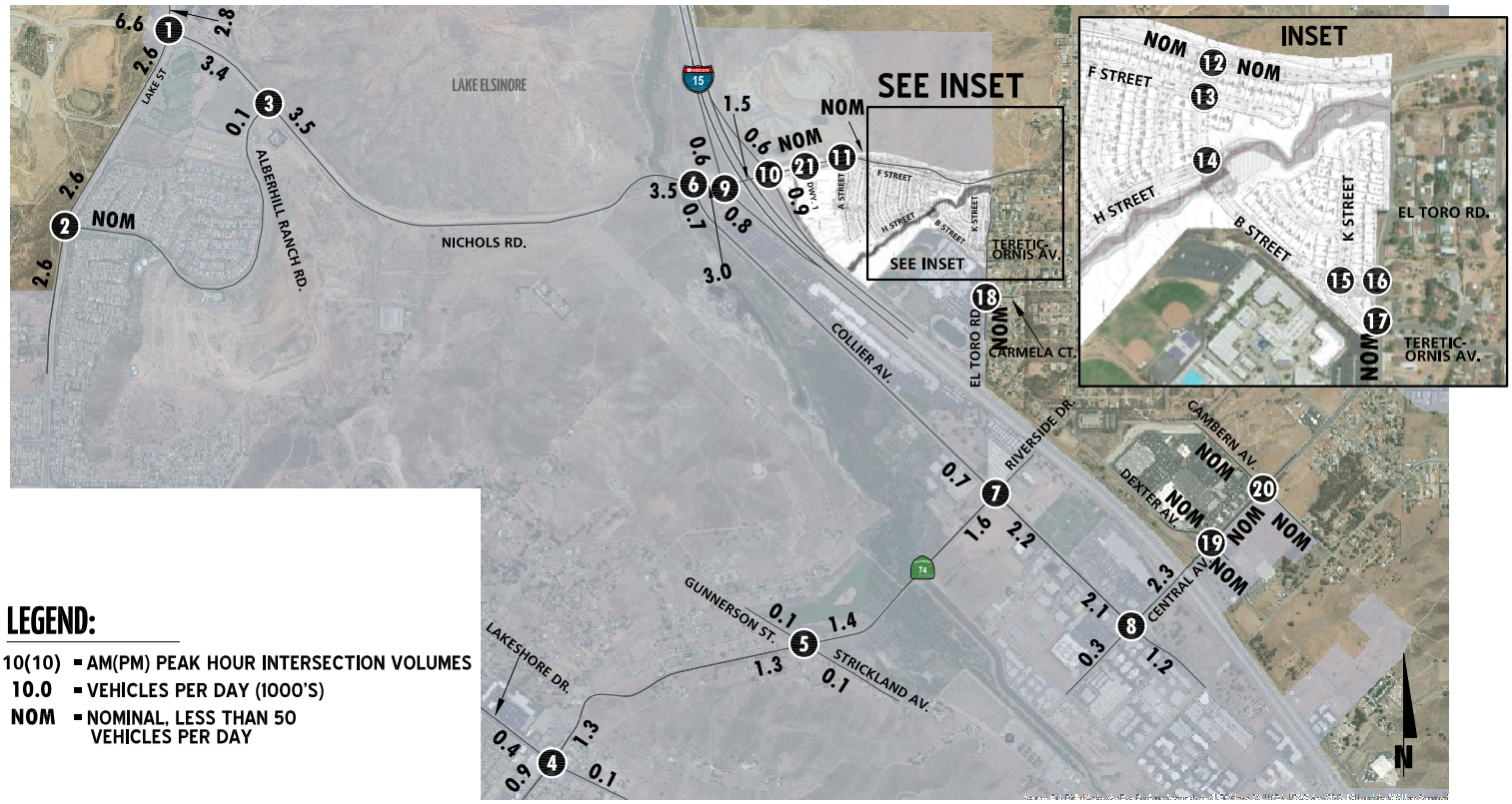


LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)
NOM = NOMINAL, LESS THAN 50 VEHICLES PER DAY

1 Lake St. & Nichols Rd.	2 Lake St. & Alberhill Ranch Rd.	3 Alberhill Ranch Rd. & Nichols Rd.	4 Lakeshore Dr. & Riverside Dr. (SR-74)	5 Gunnerson St./ Strickland Av. & Riverside Dr. (SR-74)	6 Collier Av. & Nichols Rd.	7 Collier Av. & Riverside Dr. (SR-74)
36(91) 6(20) 1(2) / 1(2) 43(109) 8(26)	50(100) 0(0) / 0(0) 1(1)	51(137) 1(3)	2(1) 1(1) 9(8) / 8(12) 19(29) 1(2)	1(1) 0(0) 2(2) / 1(2) 26(41) 1(2)	45(116) 1(2)	1(2) 18(19) 0(0) / 0(0) 0(0) 0(0)
71(69) 85(82) 36(54) / 38(52) 18(12) 22(16)	78(80) 1(1)	108(100) 0(0) / 0(0) 2(2)	1(2) 21(28) 1(1) / 1(1) 1(1) 2(2)	1(1) 31(36) 1(1) / 1(1) 0(0) 2(2)	92(85) 18(19) / 9(24) 1(1)	1(2) 0(0) 35(44) / 30(49) 9(24) 0(0)
8 Collier Av. & Central Av. (SR-74)	9 I-15 SB Ramps & Nichols Rd.	10 I-15 NB Ramps & Nichols Rd.	11 A Street & Nichols Rd.	12 B Street & Nichols Rd.	13 B Street & F Street	14 B Street & H Street
1(1) 15(17) 36(44) / 31(49) 5(5) 15(17)	17(44) 0(0) 0(0) / 28(73) 0(0)	0(0) 1(1)	Future Intersection	1(1) 0(0)	Future Intersection	Future Intersection
1(1) 3(7) 1(1) / 0(1) 8(21) 8(22)	36(33) 57(53)	35(33) 0(0) / 28(72) 0(0) 0(0)		0(0) 0(0) / 0(0) 0(0)		
15 K Street & B Street	16 El Toro Rd. & B Street	17 El Toro Rd. & Tereticornis Av.	18 El Toro Rd. & Carmela Ct.	19 Dexter Av. & Central Av. (SR-74)	20 Cambern Av. & Central Av. (SR-74)	21 Driveway 1 & Nichols Rd.
0(0) 0(0) / 0(0) 0(0)	0(0) 0(1)	0(1) 0(0) / 0(0) 0(1)	0(0) 1(1) 0(0) / 0(0) 0(0) 0(0)	3(5) 2(3) 3(11) / 9(8) 88(91) 0(0)	0(0) 1(2) 0(0) / 0(0) 82(78) 7(12)	Future Intersection
0(0) 0(0)	0(0) 0(0) / 0(0) 0(1)	0(1) 0(1)	0(0) 0(0) 0(0) / 0(0) 0(1) 0(0)	3(5) 52(117) 10(12) / 9(14) 2(2) 0(0)	0(0) 42(111) 6(10) / 12(17) 2(2) 13(13)	

EXHIBIT 4-9: CUMULATIVE ONLY (2021) TRAFFIC VOLUMES

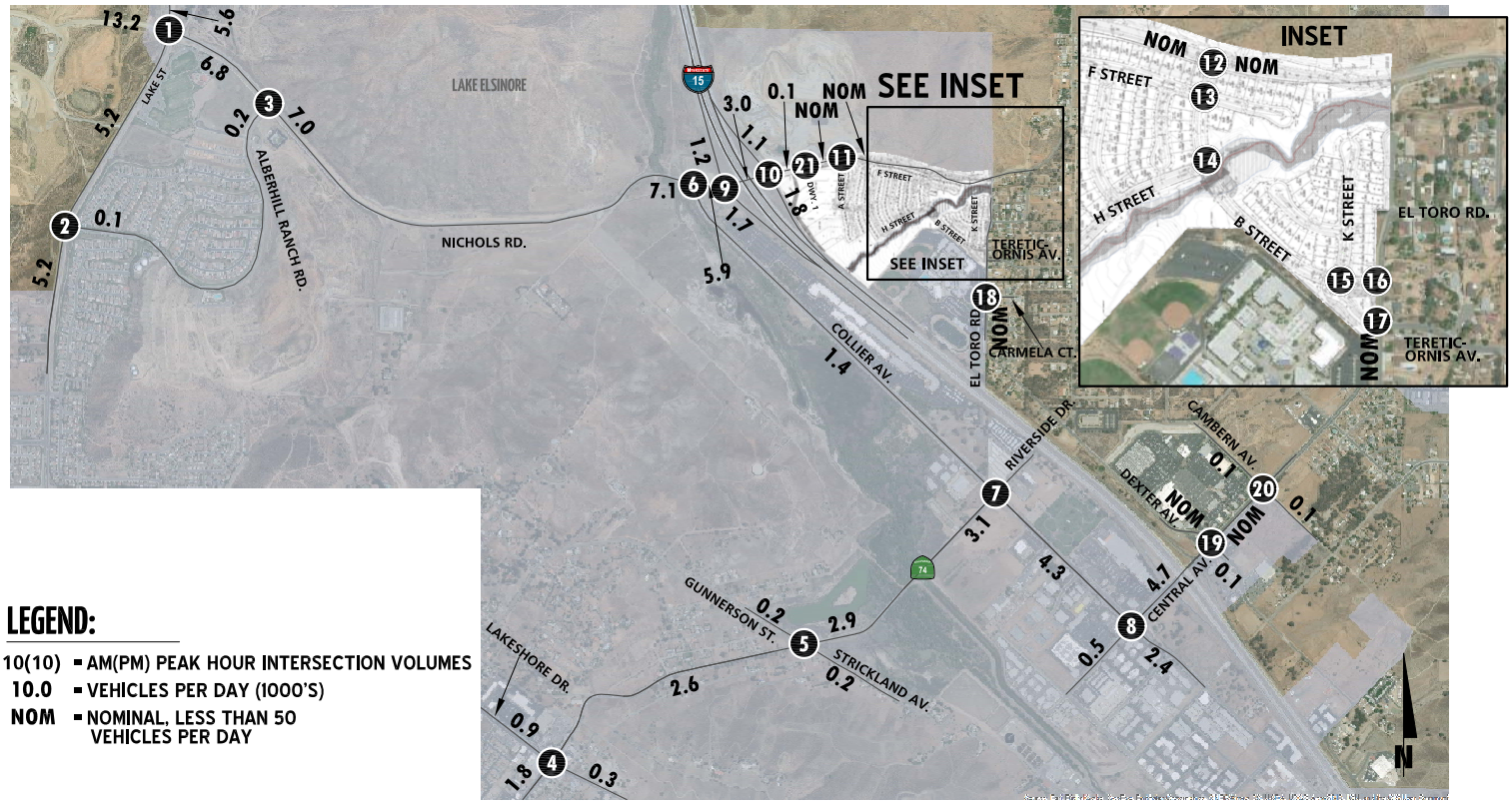


1 Lake St. & Nichols Rd.	2 Lake St. & Alberhill Ranch Rd.	3 Alberhill Ranch Rd. & Nichols Rd.	4 Lakeshore Dr. & Riverside Dr. (SR-74)	5 Gunnerson St./ Strickland Av. & Riverside Dr. (SR-74)	6 Collier Av. & Nichols Rd.	7 Collier Av. & Riverside Dr. (SR-74)
53(137) 9(30) 1(2) / 1(3) 64(164) 12(39)	75(150) 0(0) / 0(0) 1(1)	77(205) 1(4)	2(2) 1(1) 14(12) / 11(17) 29(44) 2(3)	1(1) 0(0) 3(3) / 2(4) 40(62) 2(4)	67(174) 2(3)	1(2) 27(29) 0(0) / 0(0) 0(0) 0(0)
106(103) 127(123) 54(81) / 57(78) 26(17) 33(24)	117(120) 1(1)	162(150) 0(0) / 0(0) 2(4)	2(3) 32(41) 1(1) / 1(1) 2(2) 2(3)	1(1) 47(54) 1(1) / 1(1) 0(0) 3(3)	138(127) 27(29) / 14(36) 2(2)	1(2) 0(0) 52(66) / 44(73) 14(36) 0(0)

8 Collier Av. & Central Av. (SR-74)	9 I-15 SB Ramps & Nichols Rd.	10 I-15 NB Ramps & Nichols Rd.	11 A Street & Nichols Rd.	12 B Street & Nichols Rd.	13 B Street & F Street	14 B Street & H Street
2(2) 22(25) 54(66) / 46(74) 8(7) 23(26)	26(67) 0(0) 0(0) / 42(109) 0(1)	/ 0(0) 1(2)	/ 1(1) 0(0)	/ 1(1) 0(0)	0(0) 0(0) 0(0) / 0(0) 0(0) 0(0)	Future Intersection
1(2) 4(10) 1(2) / 1(2) 11(31) 11(32)	54(50) 86(79)	53(49) 1(1) / 42(108) 0(0) 0(1)	1(1) 0(0) / 0(0) 0(0)	1(1) 0(0) / 0(0) 0(0)	0(0) 0(0) 0(0) / 0(0) 0(0) 0(0)	

15 K Street & B Street	16 El Toro Rd. & B Street	17 El Toro Rd. & Tereticornis Av.	18 El Toro Rd. & Carmela Ct.	19 Dexter Av. & Central Av. (SR-74)	20 Cambern Av. & Central Av. (SR-74)	21 Driveway 1 & Nichols Rd.
0(0) 0(0) / 0(0) 0(0)	0(0) 1(1)	1(1) 0(0) / 0(0) 1(1)	0(0) 1(2) 0(0) / 0(0) 0(0) 0(0)	4(8) 3(4) 5(17) / 13(11) 131(137) 0(0)	0(1) 2(4) 0(0) / 0(0) 122(117) 10(18)	Future Intersection
0(0) 0(0)	0(0) 0(0) / 0(0) 0(1)	0(1) 0(1)	0(0) 0(0) 0(0) / 0(0) 1(2) 0(0)	5(7) 78(176) 15(18) / 13(21) 3(4) 0(0)	0(1) 62(166) 9(14) / 18(26) 3(3) 20(19)	

EXHIBIT 4-10: CUMULATIVE ONLY (2024) TRAFFIC VOLUMES



LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)
NOM = NOMINAL, LESS THAN 50 VEHICLES PER DAY

1 Lake St. & Nichols Rd. 107(274) 19(59) 3(5) 2(5) 128(328) 24(77) 212(206) 254(247) 108(163) 114(157) 53(35) 67(48)	**2 Lake St. & Alberhill Ranch Rd.** 151(299) 0(0) 0(0) 2(2) 233(239) 2(2)	**3 Alberhill Ranch Rd. & Nichols Rd.** 153(411) 2(8) 323(299) 0(0) 0(0) 5(7)	**4 Lakeshore Dr. & Riverside Dr. (SR-74)** 5(4) 3(2) 28(23) 23(35) 58(87) 3(6) 4(5) 64(83) 2(2) 2(2) 3(4) 5(6)	**5 Gunnerson St./ Strickland Av. & Riverside Dr. (SR-74)** 2(3) 0(0) 5(7) 3(7) 79(124) 3(7) 2(2) 93(109) 2(2) 2(3) 0(0) 5(7)	**6 Collier Av. & Nichols Rd.** 134(347) 3(5) 276(254) 53(58) 28(73) 3(4)	**7 Collier Av. & Riverside Dr. (SR-74)** 2(5) 55(57) 0(0) 0(0) 0(0) 0(0) 2(5) 0(0) 104(132) 89(146) 28(73) 0(0)
8 Collier Av. & Central Av. (SR-74) 3(3) 44(50) 107(133) 92(148) 16(14) 46(51) 2(4) 8(21) 2(4) 1(4) 23(62) 23(65)	**9 I-15 SB Ramps & Nichols Rd.** 52(133) 0(0) 0(0) 85(218) 1(1) 107(99) 172(159)	**10 I-15 NB Ramps & Nichols Rd.** 0(0) 3(3) 106(98) 1(1) 83(216) 0(0) 1(1)	**11 A Street & Nichols Rd.** 2(2) 0(0) 1(1) 0(0) 0(0) 0(0)	**12 B Street & Nichols Rd.** 2(2) 0(0) 1(1) 0(0) 0(0) 0(0)	**13 B Street & F Street** 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0)	**14 B Street & H Street** 0(0) 0(0) 0(0) 0(0) 0(0) 0(0)
15 K Street & B Street 0(0) 0(0) 0(0) 0(0) 0(0) 0(0)	**16 El Toro Rd. & B Street** 0(0) 1(2) 0(0) 0(0) 0(0) 1(2)	**17 El Toro Rd. & Tereticornis Av.** 1(2) 0(0) 0(0) 1(2) 1(2) 1(2)	**18 El Toro Rd. & Carmela Ct.** 0(0) 2(4) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 0(0) 1(4) 0(0)	**19 Dexter Av. & Central Av. (SR-74)** 8(15) 6(8) 10(34) 26(23) 263(274) 1(1) 9(14) 156(352) 30(35) 26(43) 5(7) 0(1)	**20 Cambern Av. & Central Av. (SR-74)** 1(1) 4(7) 0(0) 0(0) 245(233) 21(35) 1(1) 125(332) 19(29) 37(51) 6(5) 39(39)	**21 Driveway 1 & Nichols Rd.** 2(2) 1(1) 0(0) 0(0)

Table 4-5

Summary of Cumulative Development Projects

No.	Project Name	Location	Land Use	Quantity[1]	
City of Lake Elsinore					
LE1	Greenwald[2]	Lake Elsinore	Shopping Center	104.450	TSF
LE2	Ramsgate	Lake Elsinore	Single Family Residential	1,306	DU
			Condo/Townhomes	120	DU
LE3	Trieste Residential (Tract 36624)	Lake Elsinore	Single Family Residential	75	DU
LE4	Fairway Business Park	Lake Elsinore	Warehouse	279.445	TSF
LE5	Ness Industrial Garage	Lake Elsinore	Warehouse	12.000	TSF
LE6	Spyglass Ranch[3]	Lake Elsinore	Single Family Residential	523	DU
			Condo/Townhomes	171	DU
			Shopping Center	145.00	TSF
LE7	South Shore I (Tract 31593)	Lake Elsinore	Single Family Residential	521	DU
	South Shore II (Tract 36567)	Lake Elsinore	Single Family Residential	147	DU
LE8	La Strada (Tract 32077)	Lake Elsinore	Single Family Residential	134	DU
LE9	Tuscany West (Tract 25473)	Lake Elsinore	Single Family Residential	164	DU
LE10	Marina Village Condos (Tract 33820)[6]	Lake Elsinore	Condo/Townhomes	94	DU
LE11	La Quinta Inn	Lake Elsinore	Hotel	64	RM
LE12	LE Sports Complex	Lake Elsinore	Recreational Community Center	525.000	TSF
LE13	TAG Property[4]	Lake Elsinore	New Car Sales	50.000	TSF
LE14	City Center Condos[4]	Lake Elsinore	Condo/Townhomes	144	DU
LE15	Central & Collier	Lake Elsinore	Shopping Center	75.000	TSF
LE16	Diamond Specific Plan[5]	Lake Elsinore	Condo/Townhomes	600	DU
			Hotel	150	RM
			General Office	425.000	TSF
			Shopping Center	472.000	TSF
LE17	The Colony[4]	Lake Elsinore	Apartments	211	DU
	Back Basin Specific Plan & East Lake Specific Plan	Lake Elsinore	Single Family Residential	2,407	DU
			Condo/Townhomes	324	DU
	John Laing Homes (Phase 2)	Lake Elsinore	Single Family Residential	506	DU
			Condo/Townhomes	1,141	DU
			Apartments	308	DU
			Shopping Center	117.000	TSF
LE18	Canyon Hills Estates (Tract 34249)	Lake Elsinore	Single Family Residential	302	DU
	Canyon Hills (Multiple Tracts)	Lake Elsinore	Single Family Residential	2,700	DU
			Apartments	1,575	DU
	Audie Murphy (Tract 36484)	Lake Elsinore	Single Family Residential	109	DU
	Audie Murphy (Tract 36485)	Lake Elsinore	Single Family Residential	1,003	DU

Table 4-5

Summary of Cumulative Development Projects

No.	Project Name	Location	Land Use	Quantity[1]	
LE19	Artisan Alley	Lake Elsinore	Shopping Center	95.100	TSF
LE20	Quikrete Plant	Lake Elsinore	Warehouse	163.900	TSF
LE21	Alberhill Ridge (Tract 35001)	Lake Elsinore	Single Family Residential	1,056	DU
			Apartments	345	DU
			Shopping Center	679.000	TSF
			General Office	679.000	TSF
LE22	Alberhill Ranch	Lake Elsinore	Single Family Residential	1,986	DU
LE23	Lake Elsinore Walmart	Lake Elsinore	Free-Standing Discount Superstore	154.487	TSF
			Specialty Retail	4.600	TSF
			Fast Food w/Drive Thru	6.800	TSF
			Fast Food w/o Drive Thru	4.600	TSF
LE24	Circle K	Lake Elsinore	Gas Station	4.500	TSF
LE25	Alberhill Villages	Lake Elsinore	Single Family Residential	9,536	DU
LE26	Terracina	Lake Elsinore	Single Family Residential	365	DU
LE27	Lakeshore Senior Apartments	Lake Elsinore	Senior Adult Housing Attached	121	DU
LE28	North Peak Plaza	Lake Elsinore	Condo/Townhomes	92	DU
			Shopping Center	92.000	TSF
LE29	Running Deer (TR 31957)		Single Family Residential	101	DU
LE30	Wake Rider Beach Resort	Lake Elsinore	Beach Resort	11.350	TSF
LE31	Lakeshore Town Center	Lake Elsinore	Town Center	237.400	TSF
LE32	Ortega	Lake Elsinore	Single Family Residential	105	DU
LE33	Summerly	Lake Elsinore	Single Family Residential	142	DU
LE34	Beazer, KB Homes, McMillin Homes, Richmond American	Lake Elsinore	Single Family Residential	395	DU
LE35	Village at Lake Elsinore SPA #1	Lake Elsinore	Single Family Residential	163	DU
LE36	Lakeview Manor	Lake Elsinore	Condo/Townhomes	104	DU
LE37	Golden Corral Restaurant	Lake Elsinore	Restaurant	7.798	TSF
LE38	Tige Watersports	Lake Elsinore	Shopping Center	34.500	TSF
LE39	Kassab Travel Center	Lake Elsinore	High Turnover (Sit-Down) Restaurant	17.200	TSF
LE40	Honda	Lake Elsinore	Automobile Sales	53.400	TSF
County of Riverside					
RC1	Lennar (Tract 31792)	County of Riverside	Single Family Residential	191	DU
RC2	PM33840	County of Riverside	Single Family Residential	4	DU
RC3	PP20158R1	County of Riverside	Storage Facility	103.727	TSF
RC4	CUP03651	County of Riverside	Recycling Facility	0.504	TSF

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

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

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

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

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

The currently adopted Southern California Association of Governments (SCAG) 2012 Regional Transportation Plan (RTP)/Sustainable Communities Strategy (SCS) (April 2016) growth forecasts for the City of Lake Elsinore identifies projected growth in population of 54,100 in 2012 to 111,400 in 2040, or a 105.91 percent increase over the 28-year period. (10) The change in population equates to roughly a 2.61 percent growth rate compounded annually. Similarly, growth over the same 28-year period in households is projected to increase by 130.26 percent, or 3.02 percent annual growth rate. Finally, growth in employment over the same 23-year period is projected to increase by 168.64 percent, or a 3.59 percent annual growth rate.

Based on a comparison of Existing traffic volumes to the EAPC forecasts, the average growth rate is estimated at approximately 7.78 percent compounded annually between Existing and EAPC traffic conditions. The annual growth rate at each individual intersection is not lower than 3.30 percent compounded annually to as high as 16.8 percent compounded annually over the same time period. Therefore, the annual growth rate utilized for the purposes of this analysis would appear to conservatively approximate the anticipated regional growth in traffic volumes in the City of Lake Elsinore for EAPC traffic conditions, especially when considered along with the addition of project-related traffic. As such, the growth in traffic volumes assumed in this traffic impact analysis would tend to overstate as opposed to understate the potential LOS deficiencies to traffic and circulation.

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.

4.7 NEAR-TERM TRAFFIC FORECASTS

To provide a comprehensive assessment of potential transportation network deficiencies, a type of analysis, “buildup”, was 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 both the existing and planned 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.

As noted previously, an analysis of the proposed Project at various development tiers has been assessed for the purposes of this traffic study. The near-term traffic analysis includes the following traffic conditions, with the various traffic components:

- EAP (2020)
    - Existing 2018 counts
    - Ambient growth traffic (4.04%)
    - Project (Phase 1) traffic

- EAP (2021)
    - Existing 2018 counts
    - Ambient growth traffic (6.12%)
    - Project (Phase 2) traffic
- EAP (2024)
    - Existing 2018 counts
    - Ambient growth traffic (12.62%)
    - Project Buildout traffic
- EAPC (2020)
    - Existing 2018 counts
    - Ambient growth traffic (4.04%)
    - Cumulative Development Project traffic (10% absorption)
    - Project (Phase 1) traffic
- EAPC (2021)
    - Existing 2018 counts
    - Ambient growth traffic (6.12%)
    - Cumulative Development Project traffic (15% absorption)
    - Project (Phase 2) traffic
- EAPC (2024)
    - Existing 2018 counts
    - Ambient growth traffic (12.62%)
    - Cumulative Development Project traffic (30% absorption)
    - Project Buildout traffic

5 E+P TRAFFIC CONDITIONS

This section discusses the traffic forecasts for E+P conditions and the resulting intersection operations, traffic signal warrant, and freeway mainline operations analyses. In an effort to satisfy the CEQA Guideline Section 15125(a), an analysis of existing traffic volumes plus traffic generated by the proposed Project (E+P) has been included in this report. This analysis scenario has been provided for informational purposes only as Project impacts have been discerned from a comparison of Existing (2018) to EAP (2020), EAP (2021), and EAP (2024) (per the County's traffic study guidelines).

5.1 ROADWAY IMPROVEMENTS

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

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for E+P conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways). This includes B Street between El Toro Road and Nichols Road as part of Phase 1.

5.2 E+P TRAFFIC VOLUME FORECASTS

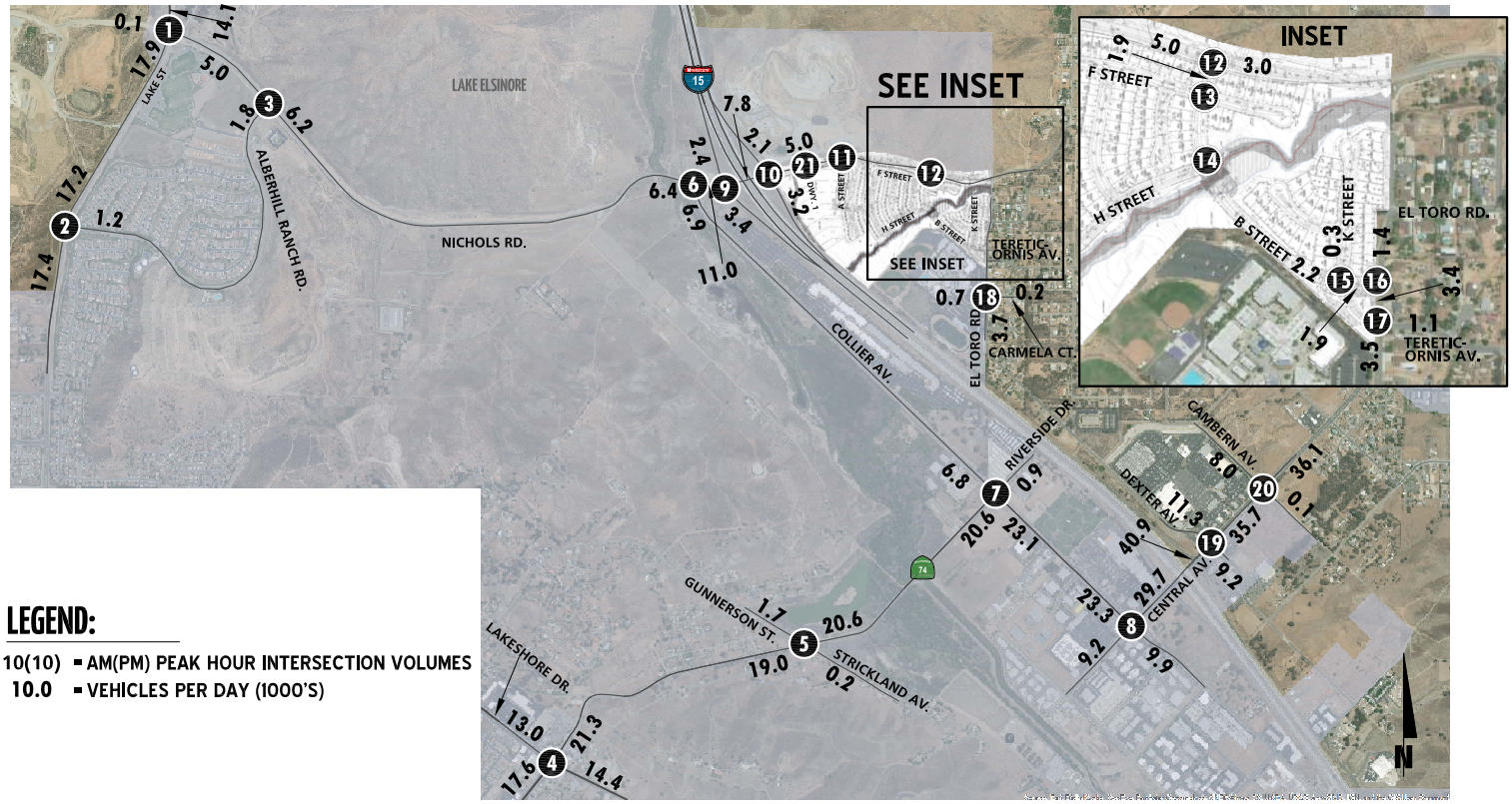
This scenario includes Existing traffic volumes plus Project traffic. Exhibit 5-1 shows the ADT and peak hour intersection turning movement volumes, which can be expected for E+P (Phase 1) traffic conditions. Exhibit 5-2 shows the ADT and peak hour intersection turning movement volumes, which can be expected for E+P (Phase 2) traffic conditions. Exhibit 5-3 shows the ADT and peak hour intersection turning movement volumes, which can be expected for E+P (Project Buildout) traffic conditions.

Starting with Phase 1 (2020), the Project will provide a connection between Nichols Road and El Toro Road via B Street. As such, it is unlikely that existing through traffic would continue to utilize El Toro Road to Wood Mesa Court to access Nichols Road once B Street provides access to Nichols Road. As such, the existing volumes at El Toro Road at Nichols Road and El Toro Road/Wood Mesa Court at El Toro Road will be reallocated to reflect the use of B Street starting in Phase 1. It is anticipated that 50% of the existing traffic will be reallocated to utilize B Street.

5.3 INTERSECTION OPERATIONS ANALYSIS

E+P peak hour traffic operations have been evaluated, for each phase of development, for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TIA. The intersection analysis results are summarized in Table 5-1, which indicates that no additional intersection deficiencies are anticipated with the addition of Project (Phase 1) traffic and Project (Phase 2) traffic, in addition to those previously identified under Existing traffic conditions.

EXHIBIT 5-1: E+P (PHASE 1) TRAFFIC VOLUMES



LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)

1 Lake St. & Nichols Rd.	**2** Lake St. & Alberhill Ranch Rd.	**3** Alberhill Ranch Rd. & Nichols Rd.	**4** Lakeshore Dr. & Riverside Dr. (SR-74)	**5** Gunnerson St./ Strickland Av. & Riverside Dr. (SR-74)	**6** Collier Av. & Nichols Rd.	**7** Collier Av. & Riverside Dr. (SR-74)
4(1) 272(845) 17(29) → 38(18) ← 5(0) ← 178(228)	415(1013) 18(23) → 47(19) ← 57(35)	← 182(238) ← 35(74)	9(15) 171(308) 199(265) → 337(298) ← 530(594) ← 130(117)	5(2) 3(1) 46(28) → 35(115) ← 622(856) ← 2(6)	← 185(250) ← 96(224)	47(93) 54(179) 1(3) → 2(7) ← 1(17) ← 5(20)
15(1) → 4(6) → 0(1) → 0(1) ↑ 674(362) ↑ 347(165) →	1013(482) ↑ 48(30) →	359(185) → 16(18) → 38(9) ↑ 69(61) →	19(29) → 443(478) → 141(263) → 266(194) ↑ 293(251) ↑ 109(157) →	0(2) → 828(835) → 3(4) → 0(0) ↑ 2(0) ↑ 11(6) →	403(189) → 32(54) → 37(78) ↑ 92(258) →	75(101) → 10(11) → 800(757) → 611(867) ↑ 72(224) ↑ 10(19) →
8 Collier Av. & Central Av. (SR-74)	**9** I-15 SB Ramps & Nichols Rd.	**10** I-15 NB Ramps & Nichols Rd.	**11** A Street & Nichols Rd.	**12** B Street & Nichols Rd.	**13** B Street & F Street	**14** B Street & H Street
12(32) 58(133) 757(902) → 591(712) ← 275(191) ← 499(203)	62(132) 6(2) 166(85) → 220(342) ← 62(29)	→ 95(43) ← 141(119)	Future Intersection	← 117(80) ← 0(0)	Future Intersection	Future Intersection
33(188) → 87(315) → 29(50) → 29(49) ↑ 53(118) ↑ 274(336) →	230(245) → 267(268) →	74(140) → 322(189) → 140(252) ↑ 3(1) ↑ 110(37) →		218(116) → 214(110) → 119(83) ↑ 0(0) →		
15 K Street & B Street	**16** El Toro Rd. & B Street	**17** El Toro Rd. & Tereticornis Av.	**18** El Toro Rd. & Carmela Ct.	**19** Dexter Av. & Central Av. (SR-74)	**20** Cambern Av. & Central Av. (SR-74)	**21** Driveway 1 & Nichols Rd.
16(11) 3(2) → 1(3) ← 103(72)	0(0) 223(107)	416(152) 18(48) → 23(17) ← 166(12)	228(10) 346(148) 8(6) → 15(1) ← 0(0) ← 6(5)	372(315) 141(91) 69(67) → 186(68) ← 1373(1112) ← 121(156)	86(83) 4(3) 126(230) → 111(143) ← 1605(1120) ← 1(0)	Future Intersection
6(19) → 208(91) →	0(0) → 211(93) → 104(75) ↑ 103(72)	184(129) ↑ 65(24) →	129(14) → 0(0) → 263(29) → 166(13) ↑ 105(138) ↑ 6(4) →	227(338) → 886(1617) → 124(161) → 99(119) ↑ 251(130) ↑ 87(168) →	123(252) → 1024(1736) → 1(1) → 3(1) ↑ 2(3) ↑ 1(1) →	

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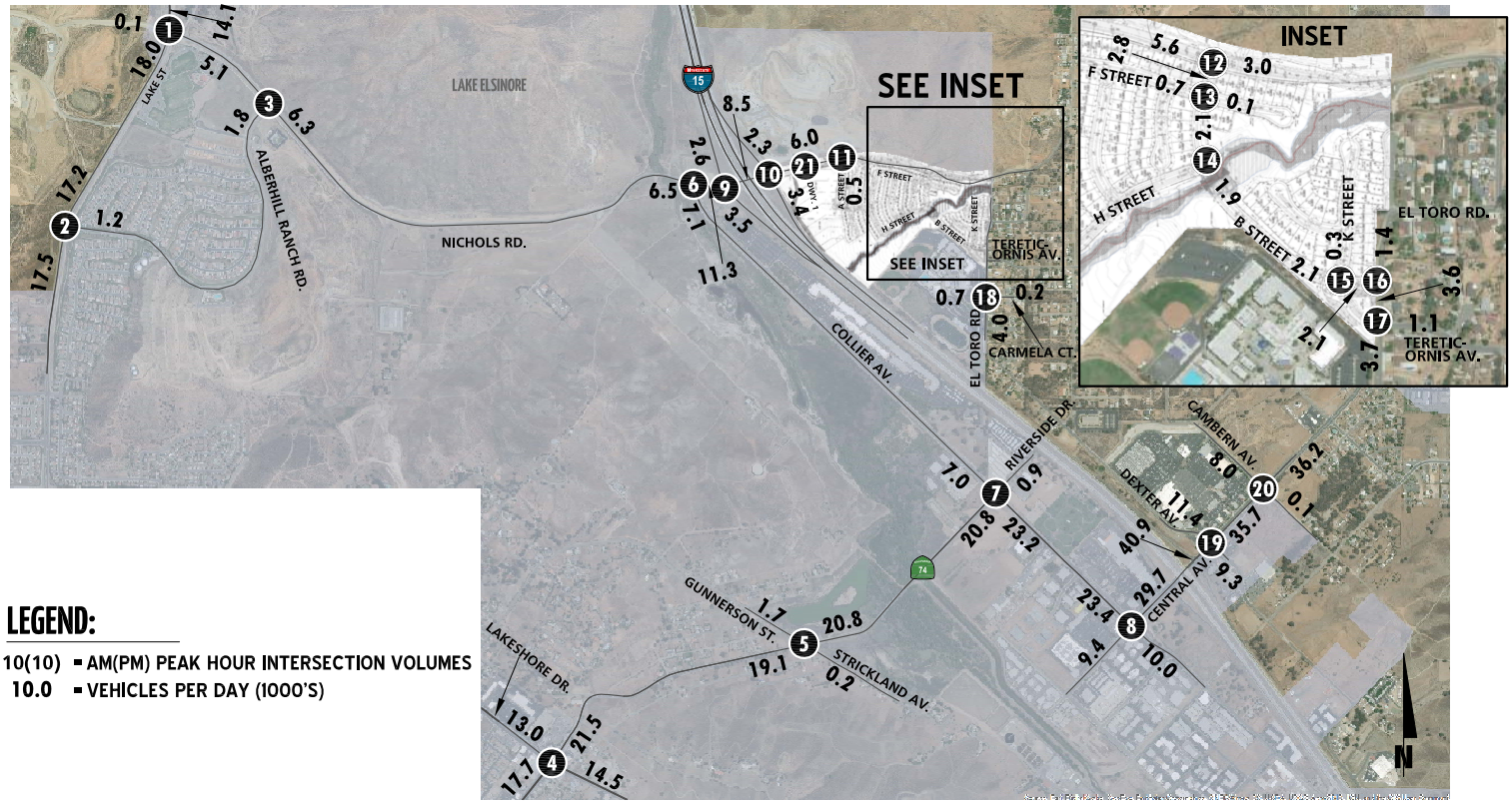
EXHIBIT 5-2: E+P (PHASE 2) TRAFFIC VOLUMES



LEGEND:

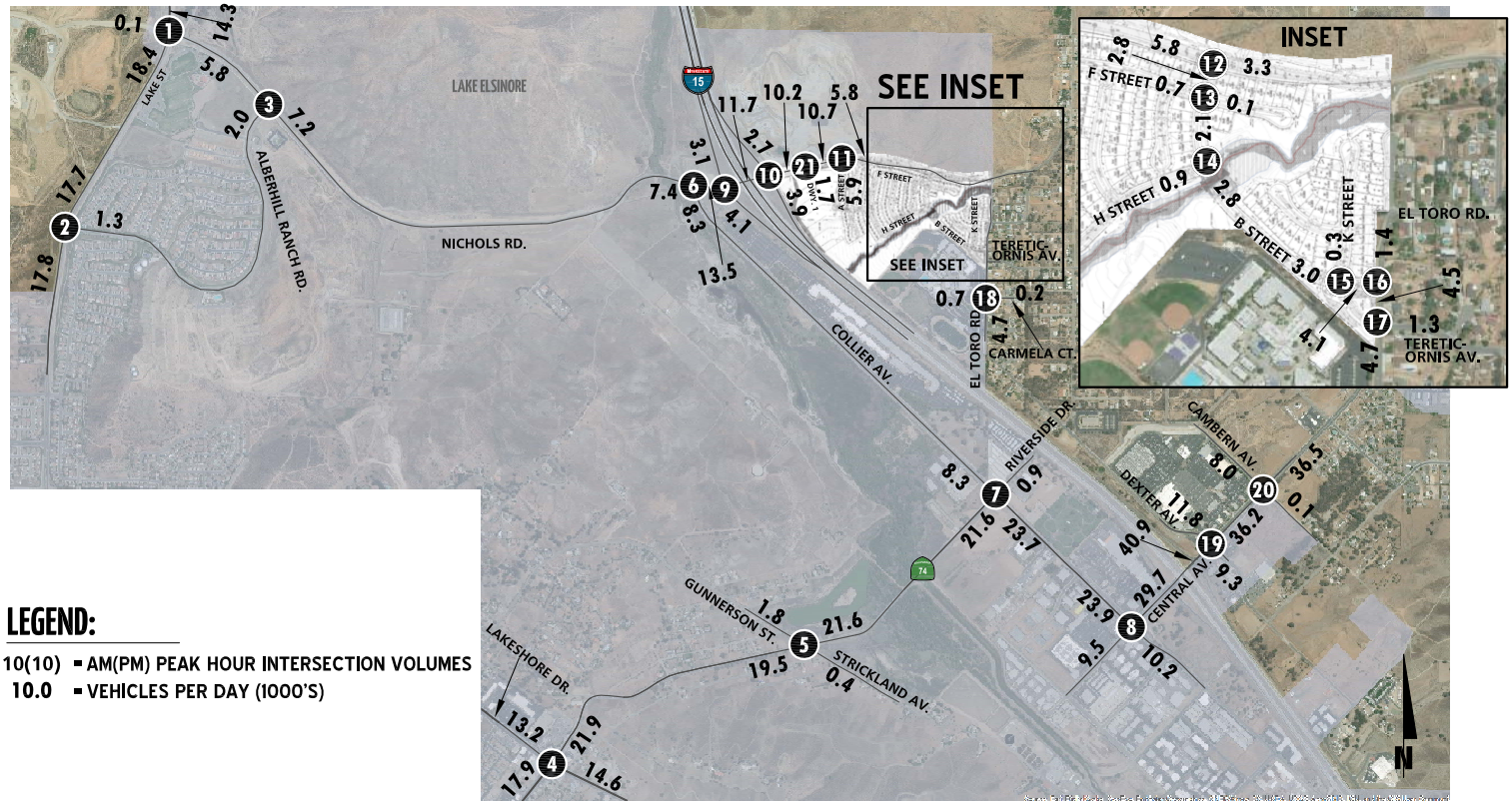
10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)

1 Lake St. & Nichols Rd.	**2** Lake St. & Alberhill Ranch Rd.	**3** Alberhill Ranch Rd. & Nichols Rd.	**4** Lakeshore Dr. & Riverside Dr. (SR-74)	**5** Gunnerson St./ Strickland Av. & Riverside Dr. (SR-74)	**6** Collier Av. & Nichols Rd.	**7** Collier Av. & Riverside Dr. (SR-74)
4(1) 272(845) 18(31)	419(1015) 18(23)		9(15) 171(308) 199(265)	5(2) 3(1) 46(28)		55(98) 60(183) 1(3)
40(19)	47(19)	188(241)	337(298)	35(115)	191(253)	2(7)
5(0)	57(35)	35(74)	536(597)	630(861)	110(233)	1(17)
182(230)			132(119)	2(6)		5(20)
15(1)		361(190)	19(29)	0(2)	405(194)	77(110)
4(6)		16(18)	445(483)	830(844)	32(54)	10(11)
0(1)			141(263)	3(4)		800(757)
0(1) 674(362) 349(169)	1015(486) 48(30)	38(9) 69(61)	266(194) 293(251) 110(159)	0(0) 2(0) 11(6)	37(78) 97(273)	611(867) 74(230) 10(19)

8 Collier Av. & Central Av. (SR-74)	**9** I-15 SB Ramps & Nichols Rd.	**10** I-15 NB Ramps & Nichols Rd.	**11** A Street & Nichols Rd.	**12** B Street & Nichols Rd.	**13** B Street & F Street	**14** B Street & H Street
15(34) 61(135) 757(902)	62(132) 6(2) 174(110)				13(41) 211(101) 2(6)	
591(712)	239(355)	118(58)	272(186)	117(80)	6(4)	Future Intersection
275(191)	85(44)	183(147)	0(0)	0(0)	0(0)	
499(203)					1(1)	
34(191)	236(266)	74(140)	444(265)	218(116)	37(25)	
87(315)	267(268)	336(235)	10(32)	226(149)	0(0)	
29(50)					4(3)	
29(49) 54(121) 274(336)		140(252) 3(1) 118(62)	29(19) 0(0)	155(107) 0(0)	1(4) 112(78) 0(1)	

15 K Street & B Street	**16** El Toro Rd. & B Street	**17** El Toro Rd. & Tereticornis Av.	**18** El Toro Rd. & Carmela Ct.	**19** Dexter Av. & Central Av. (SR-74)	**20** Cambern Av. & Central Av. (SR-74)	**21** Driveway 1 & Nichols Rd.
9(6) 10(6)	0(0) 223(107)	427(159) 18(48)	228(10) 357(155) 8(6)	372(315) 143(92) 71(69)	86(83) 4(3) 126(230)	
3(11)		23(17)	15(1)	187(70)	111(143)	Future Intersection
105(77)		166(12)	0(0)	1373(1112)	1606(1122)	
			6(5)	121(156)	1(0)	
3(10)	0(0)		129(14)	227(338)	123(252)	
213(94)	222(100)		0(0)	886(1617)	1026(1738)	
			263(29)	124(161)	1(1)	
	108(88) 103(72)	188(142) 65(24)	166(13) 109(151) 6(4)	99(119) 252(132) 87(168)	3(1) 2(3) 1(1)	

EXHIBIT 5-3: E+P (BUILDOUT) TRAFFIC VOLUMES



LEGEND:

10(10) ▪ AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 ▪ VEHICLES PER DAY (1000'S)

1	Lake St. & Nichols Rd.					2	Lake St. & Alberhill Ranch Rd.					3	Alberhill Ranch Rd. & Nichols Rd.					4	Lakeshore Dr. & Riverside Dr. (SR-74)				
4(1)	272(845)	35(42)	51(30)	5(0)	204(251)	434(1030)	25(30)		57(26)	57(35)				222(273)	47(85)			9(15)	171(308)	209(272)	344(305)	542(604)	136(123)
15(1)	4(6)	0(1)	0(1)	674(362)	382(191)			1038(501)	48(30)			412(223)	16(18)	38(9)	86(72)			19(29)	457(490)	141(263)	266(194)	293(251)	117(163)
5	Gunnerson St./ Strickland Av. & Riverside Dr. (SR-74)					6	Collier Av. & Nichols Rd.					7	Collier Av. & Riverside Dr. (SR-74)				
5(2)	3(1)	60(37)	45(124)	647(879)	12(15)				237(296)	168(289)		91(133)	82(204)	1(3)	2(7)	1(17)	5(20)
0(2)	859(861)	3(4)	0(0)	2(0)	25(15)	473(238)	32(54)		37(78)	187(329)		133(145)	10(11)	800(757)		611(867)	107(251)	10(19)
8	Collier Av. & Central Av. (SR-74)					9	I-15 SB Ramps & Nichols Rd.					10	I-15 NB Ramps & Nichols Rd.				
26(44)	72(145)	757(902)	591(712)	275(191)	499(203)	62(132)	6(2)	236(145)	343(453)	123(84)				153(94)	326(285)								
51(202)	87(315)	29(50)	29(49)	71(132)	274(336)	393(365)	267(268)					74(140)	556(370)	140(252)	3(1)	186(100)							
11	A Street & Nichols Rd.					12	B Street & Nichols Rd.					13	B Street & F Street					14	B Street & H Street				
			260(175)	17(11)					134(91)	0(0)		12(32)	211(99)	2(5)	4(3)	0(0)	1(0)			0(0)	215(101)		
387(196)	126(122)		399(385)	5(4)		230(127)	225(136)		143(96)	0(0)		29(17)	0(0)	3(2)	1(3)	110(76)	0(1)	0(0)	48(44)		68(46)	112(80)	
15	K Street & B Street					16	El Toro Rd. & B Street					17	El Toro Rd. & Tereticornis Av.				
7(4)	7(4)		3(8)	172(122)		0(0)	223(107)					462(192)	28(57)		37(26)	166(12)	
3(8)	259(137)					0(0)	267(142)		265(167)	13(35)				242(175)	65(24)		
18	El Toro Rd. & Carmela Ct.					19	Dexter Av. & Central Av. (SR-74)					20	Cambern Av. & Central Av. (SR-74)					21	Driveway 1 & Nichols Rd.				
228(10)	392(188)	8(6)	15(1)	0(0)	6(5)	372(315)	142(92)	92(88)	217(90)	1373(1112)	121(156)	89(85)	4(3)	126(230)	111(143)	1633(1140)	1(0)					299(200)	
129(14)	0(0)	263(29)	166(13)	163(184)	6(4)	227(338)	886(1617)	124(161)	99(119)	252(132)	87(168)	125(254)	1044(1755)	1(1)	3(1)	2(3)	1(1)	389(194)	354(276)		7(7)		

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Table 5-1

Intersection Analysis for E+P Conditions

#	Intersection	Traffic Control[2]	Existing (2018) Delay[1] (secs.) AM	Existing (2018) Delay[1] (secs.) PM	Existing (2018) LOS[3] AM	Existing (2018) LOS[3] PM	E+P (Phase 1) Delay[1] (secs.) AM	E+P (Phase 1) Delay[1] (secs.) PM	E+P (Phase 1) LOS[3] AM	E+P (Phase 1) LOS[3] PM	E+P (Phase 2) Delay[1] (secs.) AM	E+P (Phase 2) Delay[1] (secs.) PM	E+P (Phase 2) LOS[3] AM	E+P (Phase 2) LOS[3] PM	E+P (Buildout) Delay[1] (secs.) AM	E+P (Buildout) Delay[1] (secs.) PM	E+P (Buildout) LOS[3] AM	E+P (Buildout) LOS[3] PM
1	Lake St. & Nichols Rd.	TS	16.3	25.4	B	C	16.4	25.6	B	C	16.7	25.9	B	C	19.4	29.4	B	C
2	Lake St. & Alberhill Ranch Rd.	TS	12.4	7.4	B	A	12.4	7.4	B	A	12.4	7.4	B	A	13.6	8.2	B	A
3	Alberhill Ranch Rd. & Nichols Rd.	AWS	11.4	9.7	B	A	11.4	9.7	B	A	11.4	9.8	B	A	13.3	10.5	B	B
4	Lakeshore Dr. & Riverside Dr. (SR-74)	TS	44.9	42.5	D	D	45.0	42.5	D	D	45.5	42.7	D	D	46.4	43.8	D	D
5	Gunnerson St./Strickland Av. & Riverside Dr. (SR-74)	CSS	**81.0**	**>100.0**	**F**	**F**	**82.4**	**>100.0**	**F**	**F**	**84.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**
6	Collier Av. & Nichols Rd.	CSS	20.5	28.9	C	D	20.7	29.4	C	D	22.2	31.3	C	D	**35.5**	**54.0**	**E**	**F**
7	Collier Av. & Riverside Dr. (SR-74)	TS	14.9	24.7	B	C	15.0	24.8	B	C	15.4	25.5	B	C	18.2	29.5	B	C
8	Collier Av. & Central Av. (SR-74)	TS	34.2	33.0	C	D	34.2	33.0	C	D	34.1	33.1	C	D	34.1	33.1	C	D
9	I-15 Southbound Ramps & Nichols Rd.	AWS	15.4	13.4	C	B	15.6	13.7	C	B	16.9	14.9	C	B	**48.5**	25.0	**E**	C
10	I-15 Northbound Ramps & Nichols Rd.	CSS	**>100.0**	29.9	**F**	D	**>100.0**	32.3	**F**	D	**>100.0**	**46.8**	**F**	**E**	**>100.0**	**>100.0**	**F**	**F**
11	A St. & Nichols Rd.	**CSS/TS**	Future Intersection				Future Intersection				15.9	12.1	C	B	15.8	12.9	B	B
12	B St. & Nichols Rd.	**CSS**	Future Intersection				13.7	10.8	B	B	14.7	11.2	B	B	14.9	11.2	B	B
13	B St. & F St.	**CSS**	Future Intersection				Future Intersection				11.5	10.2	A	B	11.3	10.0	B	B
14	B St. & H St.	**CSS**	Future Intersection				Future Intersection				0.0	0.0	A	A	9.8	9.0	A	A
15	K St. & B St.	**CSS**	Future Intersection				9.2	8.9	A	A	9.9	9.3	A	A	10.5	9.7	B	A
16	El Toro Rd. & B St.	**CSS**	Future Intersection				11.3	9.3	B	A	11.5	9.4	B	A	12.1	9.6	B	A
17	El Toro Rd. & Tereticornis Av.	CSS	**>100.0**	10.2	**F**	B	**>100.0**	10.2	**F**	B	**>100.0**	10.4	**F**	B	**>100.0**	10.7	**F**	B
	With Normalized PHF[4,5]	CSS	22.4	--	C	--	22.6	--	C	--	23.3	--	C	--	**31.3**	--	**D**	--
18	El Toro Rd. & Carmela Ct.	CSS	**>100.0**	11.5	**F**	B	**>100.0**	11.5	**F**	B	**>100.0**	11.8	**F**	B	**>100.0**	12.6	**F**	B
	With Normalized PHF[4,5]	CSS	**>100.0**	--	**F**	--	**>100.0**	--	**F**	--	**>100.0**	--	**F**	--	**>100.0**	--	**F**	--
19	Dexter Av. & Central Av. (SR-74)	TS	39.6	46.5	D	D	39.7	46.5	D	D	39.8	46.7	D	D	41.6	48.3	D	D
20	Cambern Av. & Central Av. (SR-74)	TS	26.3	27.2	C	C	26.3	27.2	C	C	26.3	27.2	C	C	27.1	27.5	C	C
21	Driveway 1 & Nichols Rd.	**CSS**	Future Intersection				Future Intersection				Future Intersection				12.4	10.3	B	B

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

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

2 CSS = Cross-street Stop; AWS = All-way Stop; TS = Traffic Signal; **CSS** = Improvement

3 LOS = Level of Service

4 The two intersections of Tereticornis Avenue and Carmela Court are in close proximity to the existing Temescal Canyon High School on El Toro Road and have been evaluated with the AM existing peak hour factor from the raw count worksheet and also with a normalized peak hour factor of 0.92. Lower peak hour factors during the AM peak hour (morning drop-off) occur near schools due to the peak 10-15 minute traffic flows during the AM peak hour, which are much higher in comparison to the other 15-minute periods within the hour.

5 PHF = Peak Hour Factor

As shown in Table 5-1, the following intersections are anticipated to operate at unacceptable LOS with the addition of Project (Project Buildout) traffic, in addition to those previously identified under Existing, E+P (Phase 1), and E+P (Phase 2) traffic conditions:

- Collier Avenue & Nichols Road (#6) – LOS E AM peak hour; LOS F PM peak hour
- I-15 Southbound Ramps & Nichols Road (#9) – LOS E AM peak hour only
- El Toro Road & Tereticornis Avenue (#17) – LOS D AM peak hour (with normalized PHF)

A summary of the peak hour intersection LOS for E+P (Phase 1), E+P (Phase 2), and E+P (Project Buildout) conditions are shown on Exhibits 5-4, 5-5, and 5-6, respectively. The intersection operations analysis worksheets for E+P (Phase 1), E+P (Phase 2), and E+P (Project Buildout) traffic conditions are included in Appendices 5.1, 5.2, and 5.3 of this TIA, respectively.

5.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no additional intersections anticipated to meet traffic signal warrants for E+P (Phase 1 and Phase 2) traffic conditions (see Appendices 5.4 and 5.5, respectively). The intersection of A Street and Nichols Road is anticipated to meet the traffic signal warrant under E+P (Project Buildout) traffic conditions (see Appendix 5.6).

5.5 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-15 Freeway and Nichols Road interchange to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-15 Freeway mainline. Queuing analysis findings are presented in Table 5-2 for E+P traffic conditions. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 5-2, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for E+P traffic conditions.

Worksheets for E+P (Phase 1), E+P (Phase 2), and E+P (Project Buildout) traffic conditions off-ramp queuing analysis are provided in Appendices 5.7, 5.8, and 5.9 for E+P traffic conditions, respectively.

5.6 BASIC FREEWAY SEGMENT ANALYSIS

E+P (Phase 1), E+P (Phase 2), and E+P (Project Buildout) mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibits 5-7, 5-8, and 5-9, respectively. As shown in Table 5-3, 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 (Phase 1), E+P (Phase 2), and E+P (Project Buildout) basic freeway segment analysis worksheets are provided in Appendices 5.10, 5.11, and 5.12, respectively.

EXHIBIT 5-4: E+P (PHASE 1) SUMMARY OF LOS

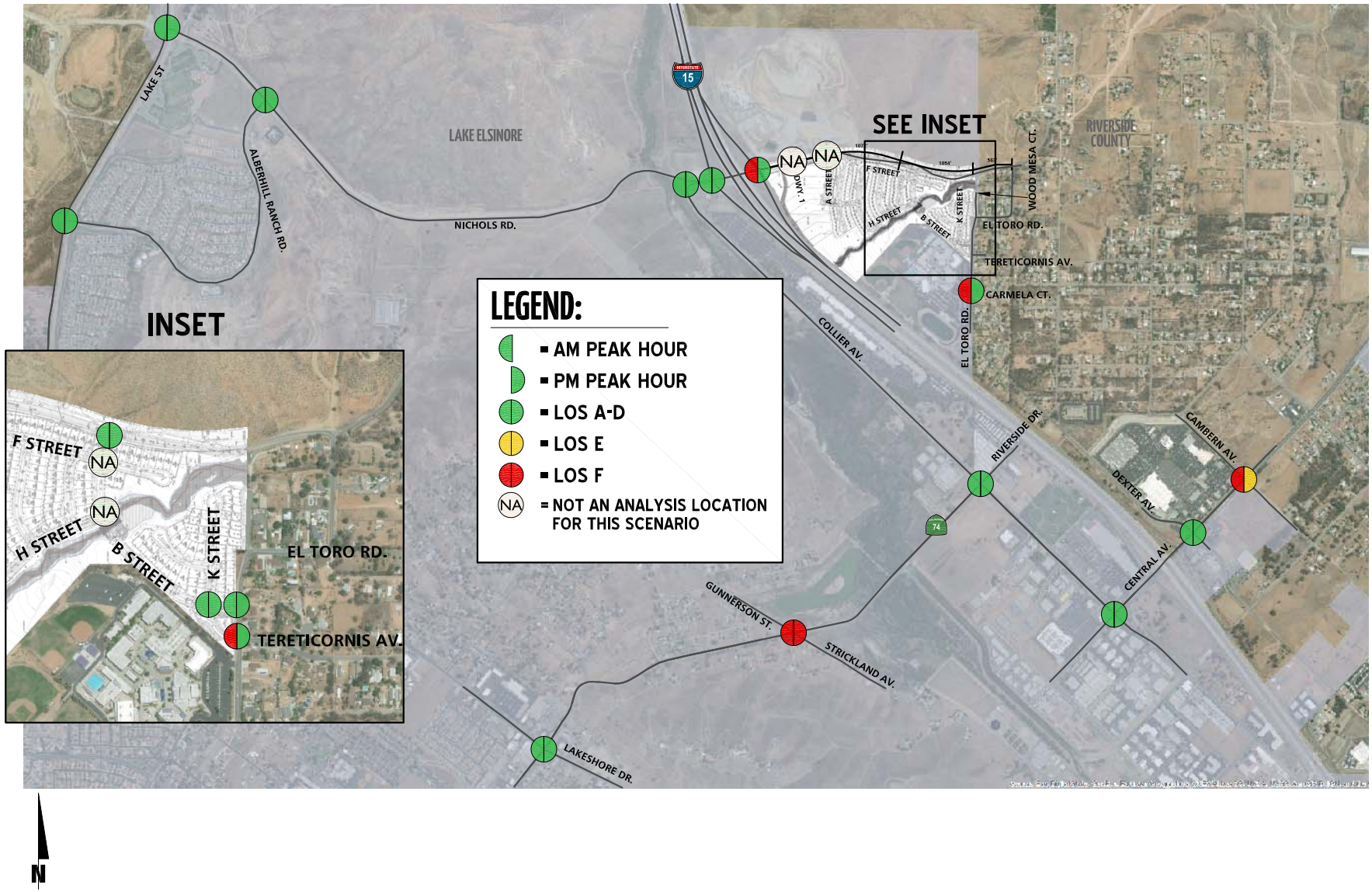

EXHIBIT 5-5: E+P (PHASE 2) SUMMARY OF LOS

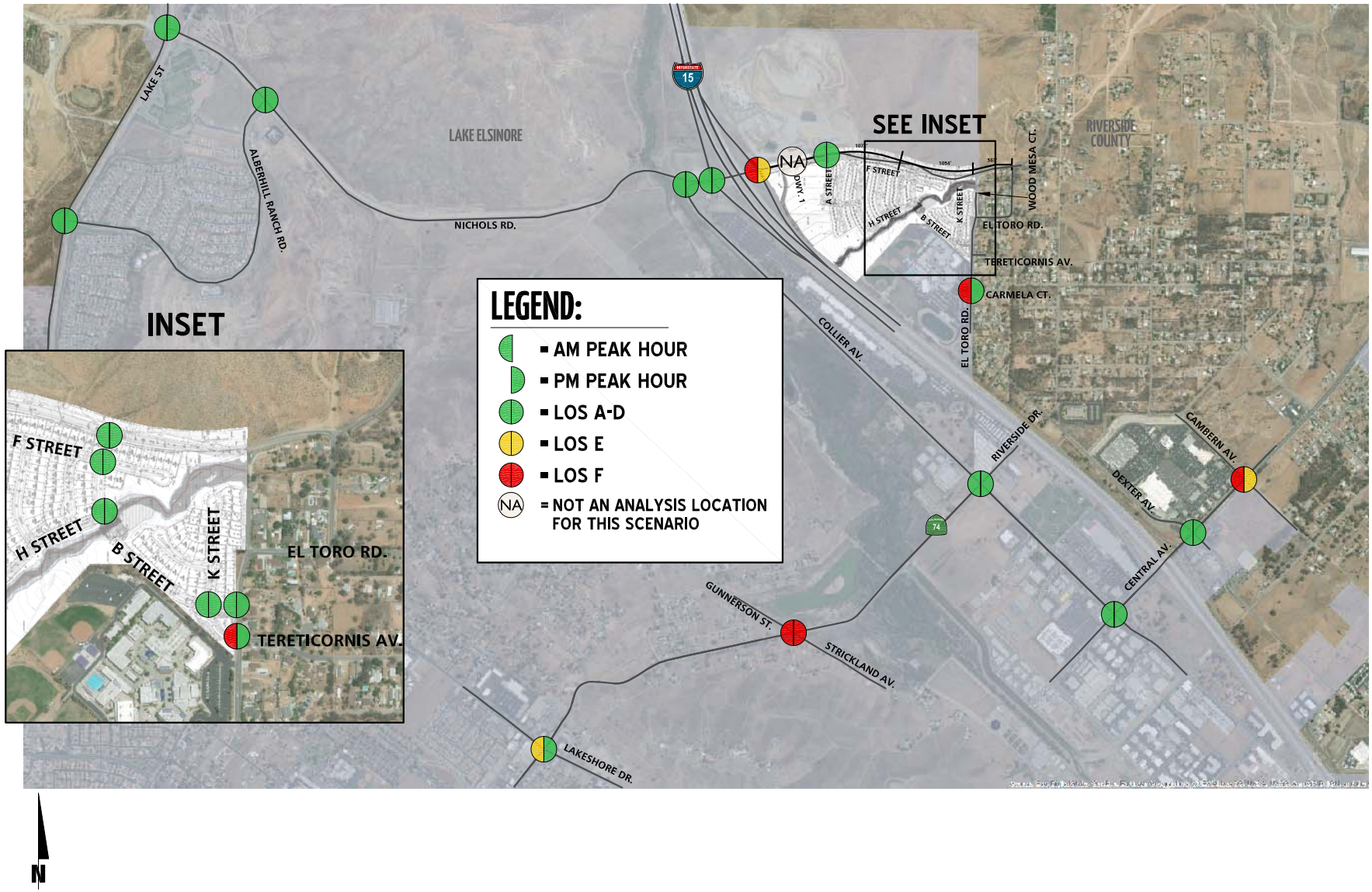

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EXHIBIT 5-6: E+P (BUILDOUT) SUMMARY OF LOS

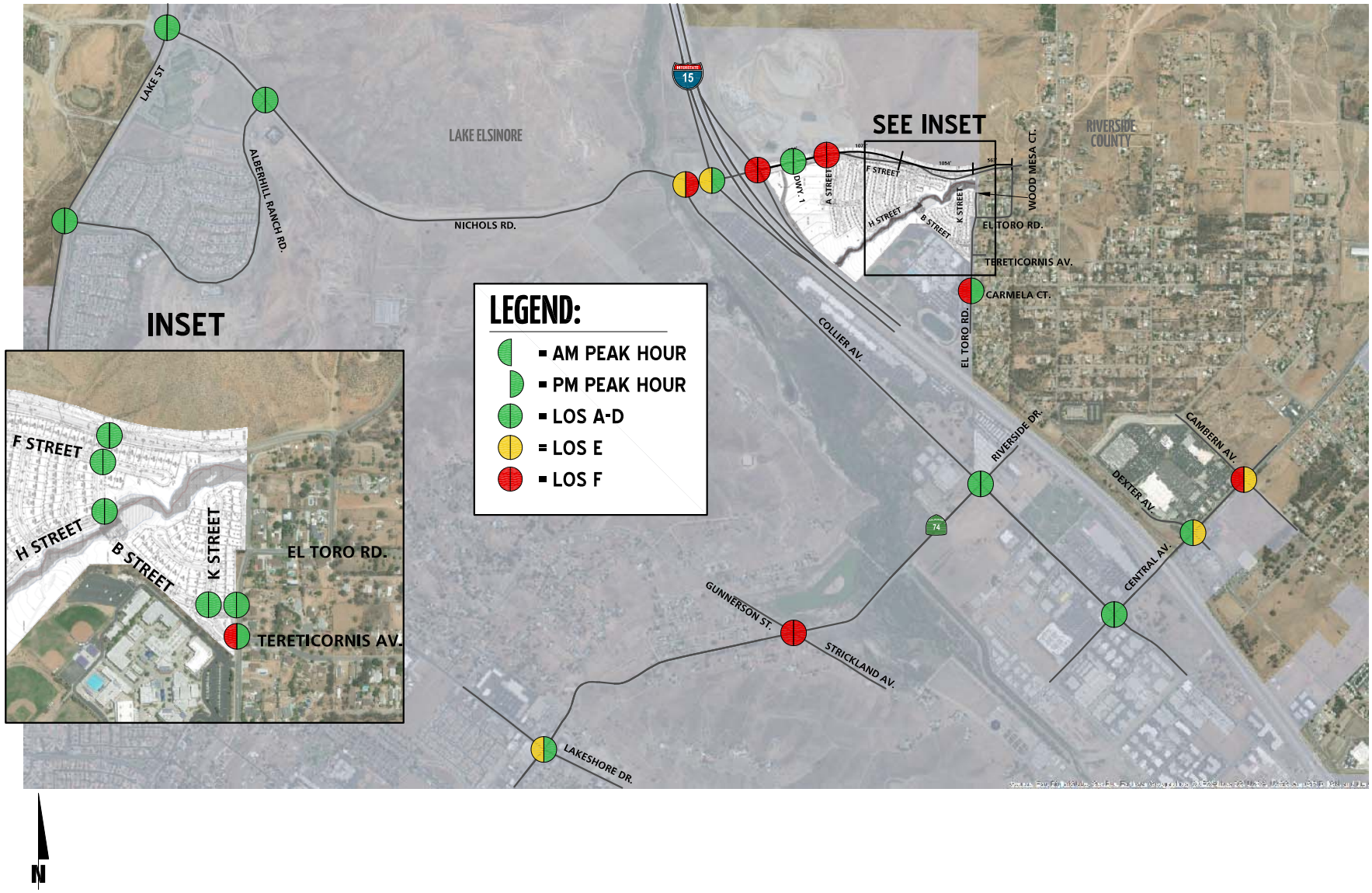

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EXHIBIT 5-7: E+P (PHASE 1) FREEWAY MAINLINE VOLUMES

LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

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EXHIBIT 5-8: E+P (PHASE 2) FREEWAY MAINLINE VOLUMES

LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

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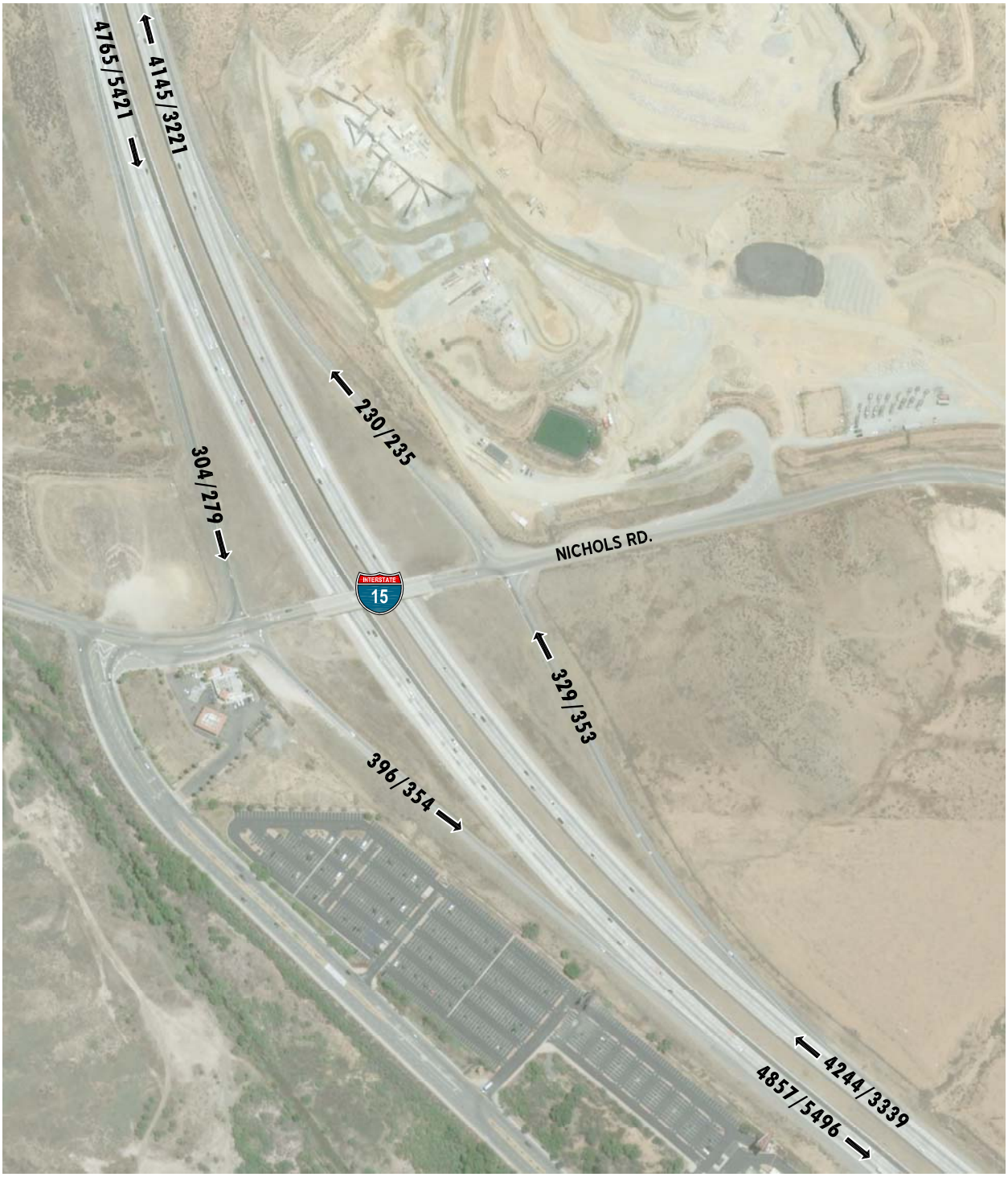
EXHIBIT 5-9: E+P (BUILDOUT) FREEWAY MAINLINE VOLUMES



LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

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Table 5-2

Peak Hour Freeway Off-Ramp Queuing Summary for E+P Conditions

Intersection	Movement	Available Stacking Distance (Feet)	Existing (2018)				E+P (Phase 1)				E+P (Phase 2)				E+P (Project Buildout)			
			95th Percentile Queue (Feet)		Acceptable?[1]		95th Percentile Queue (Feet)		Acceptable?[1]		95th Percentile Queue (Feet)		Acceptable?[1]		95th Percentile Queue (Feet)		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-15 SB Off-Ramp & Nichols Rd.	SBL/T/R	1,600	80	43	Yes	Yes	83	45	Yes	Yes	93	55	Yes	Yes	185	83	Yes	Yes
I-15 NB Off-Ramp & Nichols Rd.	NBL/T/R	1,530	495	128	Yes	Yes	520	138	Yes	Yes	640	195	Yes	Yes	1,328	465	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provide

Table 5-3

Basic Freeway Segment Analysis for E+P Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	Existing (2018)				E+P (Phase 1)				E+P (Phase 2)				E+P (Project Buildout)			
				Density[2]		LOS[3]		Density[2]		LOS[3]		Density[2]		LOS[3]		Density[2]		LOS[3]	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
I-15 Freeway	Southbound	North of Nichols Rd.	3	26.7	32.4	D	D	26.7	32.5	D	D	26.8	32.7	D	D	27.2	33.0	D	D
		South of Nichols Rd.	3	27.4	33.2	D	D	27.5	33.2	D	D	27.7	33.4	D	D	28.0	33.8	D	D
	Northbound	North of Nichols Rd.	3	21.9	16.7	C	B	21.9	16.7	C	B	22.1	16.8	C	B	22.3	17.0	C	B
		South of Nichols Rd.	3	22.4	17.1	C	B	22.4	17.1	C	B	22.5	17.3	C	B	22.9	17.5	C	B

[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] LOS = Level of Service

5.7 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for E+P (Phase 1), E+P (Phase 2) and E+P (Project Buildout) traffic conditions and the results of this analysis are presented in Table 5-4. As shown in Table 5-4, the freeway ramp merge and diverge areas are anticipated to operate at LOS D or better. E+P (Phase 1), E+P (Phase 2), and E+P (Project Buildout) freeway ramp junction operations analysis worksheets are provided in Appendices 5.13, 5.14 and 5.15.

5.8 RECOMMENDED IMPROVEMENTS

5.8.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as deficient to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS C / LOS D or better). The effectiveness of the proposed recommended improvements is presented in Table 5-5 for E+P (Phase 1), E+P (Phase 2), and E+P (Project Buildout) traffic conditions.

Recommended improvements to address deficiencies for E+P (Phase 1) traffic conditions are described below:

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal.

Eastbound and westbound left turn lanes are currently under construction and are anticipated to be in place by summer 2018. However, the intersection is anticipated to continue to operate at an unacceptable LOS without the installation of a traffic signal.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal.
- Add a northbound right turn lane.

El Toro Road & Carmela Court (#18)

- Install stop signs along El Toro Road to implement an all-way stop control.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.

Table 5-4

Freeway Ramp Junction Merge/Diverge Analysis for E+P Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	Existing (2018)				E+P (Phase 1)				E+P (Phase 2)				E+P (Project Buildout)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]
I-15 Freeway	Southbound	Off-Ramp at Nichols Rd.	3	31.2	D	34.1	D	31.1	D	34.1	D	31.2	D	34.3	D	31.6	D	34.5	D
		On-Ramp at Nichols Rd.	3	27.5	C	30.8	D	27.6	C	30.8	D	27.8	C	30.9	D	28.1	D	31.2	D
	Northbound	On-Ramp at Nichols Rd.	3	22.5	C	17.9	B	22.5	C	17.9	B	22.7	C	18.1	B	23.0	C	18.4	B
		Off-Ramp at Nichols Rd.	3	27.9	C	17.9	B	27.9	C	23.1	C	28.0	C	23.3	C	28.4	D	23.6	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] LOS = Level of Service

Table 5-5

Page 1 of 2

Intersection Analysis for E+P Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1] Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Delay[2] (secs.) AM	Delay[2] (secs.) PM	Level of Service AM	Level of Service PM
5	Gunnerson St./Strickland Av. & Riverside Dr. (SR-74)																	
	Existing:																	
	- Without Improvements	CSS	0	1	1	0	1	1	0	1	0	0	1	0	**81.0**	**120.2**	**F**	**F**
	- With Improvements[4,5]	**TS**	0	1	1	0	1	1	**1**	1	0	**1**	1	0	9.2	9.1	A	A
	E+P (Phase 1):																	
	- Without Improvements	CSS	0	1	1	0	1	1	0	1	0	0	1	0	**82.4**	**>100.0**	**F**	**F**
	- With Improvements[4,5]	**TS**	0	1	1	0	1	1	**1**	1	0	**1**	1	0	9.2	9.1	A	A
	E+P (Phase 2):																	
	- Without Improvements	CSS	0	1	1	0	1	1	0	1	0	0	1	0	**84.0**	**>100.0**	**F**	**F**
	- With Improvements[4,5]	**TS**	0	1	1	0	1	1	**1**	1	0	**1**	1	0	9.2	9.1	A	A
	E+P (Buildout):																	
	- Without Improvements	CSS	0	1	1	0	1	1	0	1	0	0	1	0	**>100.0**	**>100.0**	**F**	**F**
	- With Improvements[4,5]	**TS**	0	1	1	0	1	1	**1**	1	0	**1**	1	0	9.3	9.1	A	A
6	Collier Av. & Nichols Rd.																	
	Existing:																	
	- Without Improvements	CSS	1	0	1	0	0	0	0	1	0	1	1	0	20.5	28.9	C	D
	- With Improvements		Not Applicable															
	E+P (Phase 1):																	
	- Without Improvements	CSS	1	0	1	0	0	0	0	1	0	1	1	0	20.7	29.4	C	D
	- With Improvements		Not Applicable															
	E+P (Phase 2):																	
	- Without Improvements	CSS	1	0	1	0	0	0	0	1	0	1	1	0	22.2	31.3	C	D
	- With Improvements		Not Applicable															
	E+P (Buildout):																	
	- Without Improvements	CSS	1	0	1	0	0	0	0	1	0	1	1	0	**35.5**	**54.0**	**E**	**F**
	- With Improvements	**AWS**	1	0	1	0	0	0	0	1	0	1	1	0	27.9	20.6	D	C
9	I-15 Southbound Ramps & Nichols Rd.																	
	Existing:																	
	- Without Improvements	AWS	0	0	0	0	1	0	0	1	1	1	1	0	15.4	13.4	C	B
	- With Improvements		Not Applicable															
	E+P (Phase 1):																	
	- Without Improvements	AWS	0	0	0	0	1	0	0	1	1	1	1	0	15.6	13.7	C	B
	- With Improvements		Not Applicable															
	E+P (Phase 2):																	
	- Without Improvements	AWS	0	0	0	0	1	0	0	1	1	1	1	0	16.9	14.9	C	B
	- With Improvements		Not Applicable															
	E+P (Buildout):																	
	- Without Improvements	AWS	0	0	0	0	1	0	0	1	1	1	1	0	**48.5**	25.0	**E**	C
	- With Improvements	**TS**	0	0	0	**1**	1	0	0	1	1	1	1	0	18.4	17.6	B	B
10	I-15 Northbound Ramps & Nichols Rd.																	
	Existing:																	
	- Without Improvements	CSS	0	1	0	0	0	0	1	1	0	0	1	0	**>100.0**	29.9	**F**	D
	- With Improvements	**TS**	0	1	**1**	0	0	0	1	1	0	0	1	0	13.4	13.4	B	B
	E+P (Phase 1):																	
	- Without Improvements	CSS	0	1	0	0	0	0	1	1	0	0	1	0	**>100.0**	32.3	**F**	D
	- With Improvements	**TS**	0	1	**1**	0	0	0	1	1	0	0	1	0	13.6	16.9	B	B
	E+P (Phase 2):																	
	- Without Improvements	CSS	0	1	0	0	0	0	1	1	0	0	1	0	**>100.0**	**46.8**	**F**	**E**
	- With Improvements	**TS**	0	1	**1**	0	0	0	1	1	0	0	1	0	15.0	18.8	B	B
	E+P (Buildout):																	
	- Without Improvements	CSS	0	1	0	0	0	0	1	1	0	0	1	0	**>100.0**	**>100.0**	**F**	**F**
	- With Improvements	**TS**	0	1	**1**	0	0	0	1	1	0	0	1	0	27.5	30.5	C	C

Table 5-5

Page 2 of 2

Intersection Analysis for E+P Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1] Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Delay[2] (secs.) AM	Delay[2] (secs.) PM	Level of Service AM	Level of Service PM
17	El Toro Rd. & Tereticornis Av.																	
	Existing:																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	10.2	**F**	B
	- With Improvements							Not Applicable										
	- Without Improvements[6]	CSS	0	1	0	0	1	0	0	1	0	0	1	0	22.4	--	C	--
	- With Improvements[6]							Not Applicable										
	E+P (Phase 1):																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	10.2	**F**	B
	- With Improvements							Not Applicable										
	- Without Improvements[6]	CSS	0	1	0	0	1	0	0	0	0	0	1	0	22.6	--	C	--
	- With Improvements[6]							Not Applicable										
	E+P (Phase 2):																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	10.4	**F**	B
	- With Improvements							Not Applicable										
	- Without Improvements[6]	CSS	0	1	0	0	1	0	0	0	0	0	1	0	23.3	--	C	--
	- With Improvements[6]							Not Applicable										
	E+P (Buildout):																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	10.7	**F**	B
	- With Improvements	**AWS**	0	1	0	0	1	0	0	0	0	0	1	0	**76.1**	10.5	**F**	B
	- Without Improvements[6]	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**31.3**	--	**D**	--
	- With Improvements[6]	**AWS**	0	1	0	0	1	0	0	0	0	0	1	0	17.7	10.5	C	B
18	El Toro Rd. & Carmela Ct.																	
	Existing:																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	11.5	**F**	B
	- With Improvements[7]	**AWS**	0	1	0	0	1	**1**	0	1	0	0	1	0	**61.2**	8.6	**F**	A
	- Without Improvements[6]	CSS	0	1	0	0	1	0	0	1	0	0	1	0	**>100.0**	--	**F**	--
	- With Improvements[6,7]	**AWS**	0	1	0	0	1	**1**	0	1	0	0	1	0	19.1	8.6	C	A
	E+P (Phase 1):																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	11.5	**F**	B
	- With Improvements[7]	**AWS**	0	1	0	0	1	**1**	0	0	0	0	1	0	**40.2**	9.3	**E**	A
	- Without Improvements[6]	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	--	**F**	--
	- With Improvements[6,7]	**AWS**	0	1	0	0	1	**1**	0	0	0	0	1	0	14.1	9.3	B	A
	E+P (Phase 2):																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	11.8	**F**	B
	- With Improvements[7,8]	**AWS**	0	1	0	0	1	**1**	0	0	0	0	1	0	**64.8**	9.5	**F**	A
	- Without Improvements[6]	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	--	**F**	--
	- With Improvements[6,7,8]	**AWS**	0	1	0	0	1	**1**	0	0	0	0	1	0	19.9	9.5	C	A
	E+P (Buildout):																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	12.6	**F**	B
	- With Improvements[7,8]	**AWS**	**1**	1	0	0	1	**1**	0	0	0	0	1	0	**71.8**	10.3	**F**	B
	- Without Improvements[6]	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	--	**F**	--
	- With Improvements[6,7,8]	**AWS**	**1**	1	0	0	1	**1**	0	0	0	0	1	0	22.4	10.3	C	B

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

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; d = Defacto Right Turn Lane; **1** = Improvement

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

3 CSS = Cross-street Stop; AWS = All-way Stop; TS = Traffic Signal; **CSS** = Improvement

4 Eastbound and westbound left turn lanes are currently under construction and are anticipated to be in place by summer 2018. However, the intersection is anticipated to continue to operate at an unacceptable LOS without the installation of a traffic signal.

5 Although the intersection is not anticipated to warrant a traffic signal under Existing and E+P conditions, the addition of lane geometric improvements alone is not anticipated to improve the peak hour delays. As such, the intersection should be monitored and a traffic signal should be installed at the City Traffic Engineer's discretion.

6 A normalized AM PHF of 0.92 is used to determine peak hour operations outside of the 10-15 minute drop-off period.

7 Prohibit on-street parking to allow restriping for a 100 foot southbound right turn pocket.

8 Prohibit on-street parking to allow restriping for a 100 foot northbound left turn pocket.

Recommended improvements to address deficiencies for E+P (Phase 2) traffic conditions are described below:

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal.

Eastbound and westbound left turn lanes are currently under construction and are anticipated to be in place by summer 2018. However, the intersection is anticipated to continue to operate at an unacceptable LOS without the installation of a traffic signal.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal.
- Add a northbound right turn lane.

El Toro Road & Carmela Court (#18)

- Install stop signs along El Toro Road to implement an all-way stop control.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.

Recommended improvements to address deficiencies for E+P (Project Buildout) traffic conditions are described below:

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal.

Eastbound and westbound left turn lanes are currently under construction and are anticipated to be in place by summer 2018. However, the intersection is anticipated to continue to operate at an unacceptable LOS without the installation of a traffic signal.

Collier Avenue & Nichols Road (#6)

- Install stop signs along Nichols Road to implement an all-way stop control.

I-15 Southbound Ramps & Nichols Road (#9)

- Install a traffic signal.
- Construct a southbound left turn lane.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal.
- Add a northbound right turn lane.

El Toro Road & Tereticornis Avenue (#17)

- Install stop signs along El Toro Road to implement an all-way stop control.

El Toro Road & Carmela Court (#18)

- Install stop signs along El Toro Road to implement an all-way stop control.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.
- Remove a portion of on-street parking on the northbound approach to allow restriping for a dedicated 100-foot left turn pocket.

The E+P (Phase 1), E+P (Phase 2), and E+P (Project Buildout) intersection operations analysis worksheets, with improvements, are included in Appendices 5.16, 5.17, and 5.18 of this TIA, respectively.

5.8.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

All freeway off-ramp storage lanes, mainline segments, and merge-diverge junctions were found to operate at acceptable LOS (LOS D or better) under E+P traffic conditions. As such, no improvements have been recommended for E+P traffic conditions.

6 EA AND EAP (2020) TRAFFIC CONDITIONS

This section discusses the methods used to develop EA and EAP (2020) 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 EA and EAP (2020) conditions are consistent with those shown on Exhibit 3-1:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EAP conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways). This includes B Street between El Toro Road and Nichols Road as part of Phase 1.
- Subsequent to the traffic counts and field review conducted for this traffic study, improvements were implemented at the intersections of Gunnerson Street/Strickland Avenue at Riverside Drive (SR-74) and at the I-15 Northbound Ramps at Nichols Road. The recent improvements at Gunnerson Street/Strickland Avenue and Riverside Drive (SR-74) include eastbound and westbound left turn lanes. The I-15 Northbound Ramps at Nichols Road has recently been modified to an all-way stop controlled intersections. The operations analysis has been conducted for both Existing lanes and controls and these recently implemented improvements for EA and EAP (2020) traffic conditions.

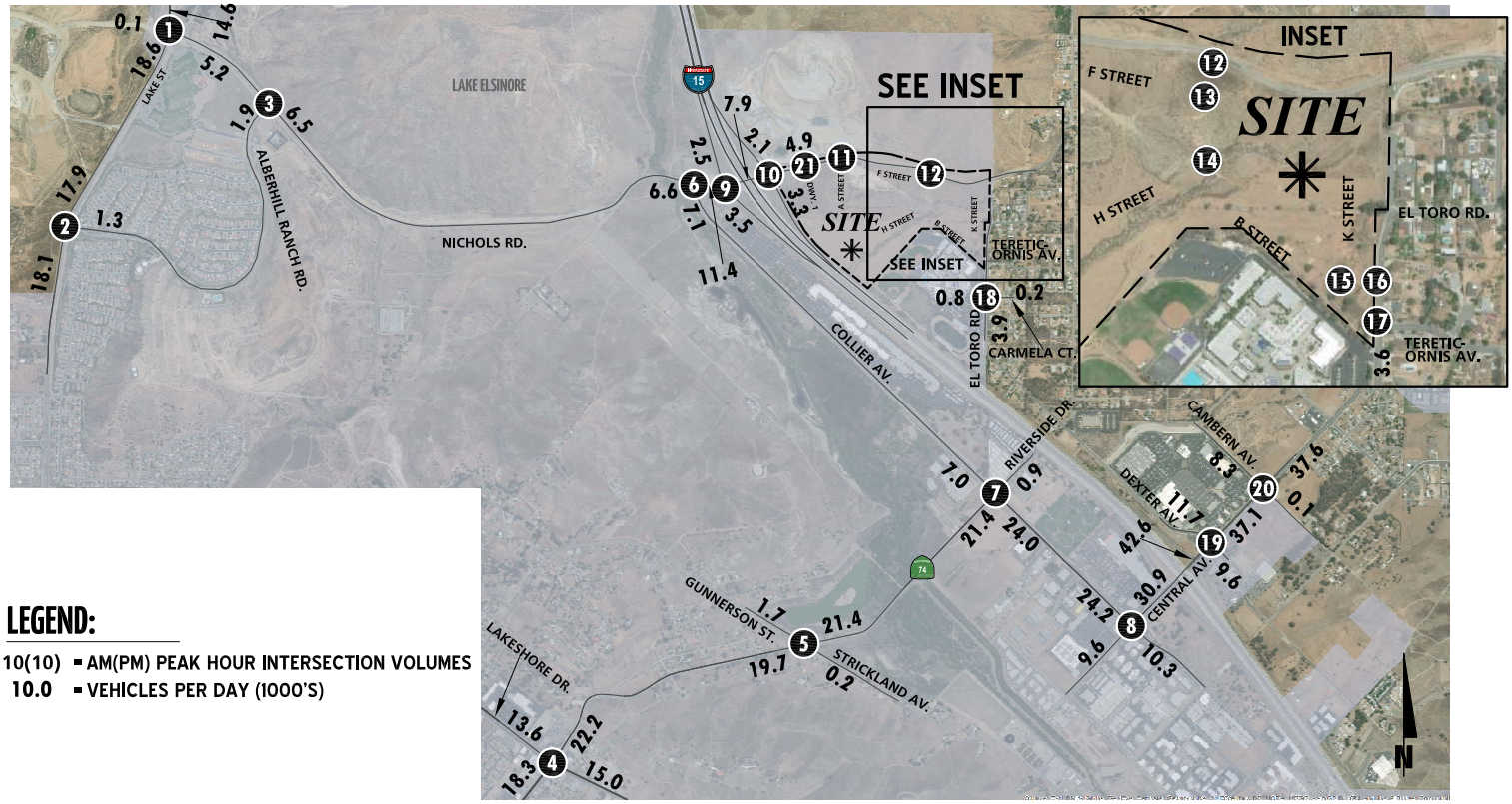
6.2 EA (2020) TRAFFIC VOLUME FORECASTS

To account for background traffic growth, an ambient growth from Existing conditions of 4.04% (2 percent per year compounded over 2 years) is included for EA (2020) traffic conditions. Cumulative development projects are not included as part of the EA analysis. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for EA (2020) traffic conditions are shown on Exhibit 6-1.

6.3 EAP (2020) TRAFFIC VOLUME FORECASTS

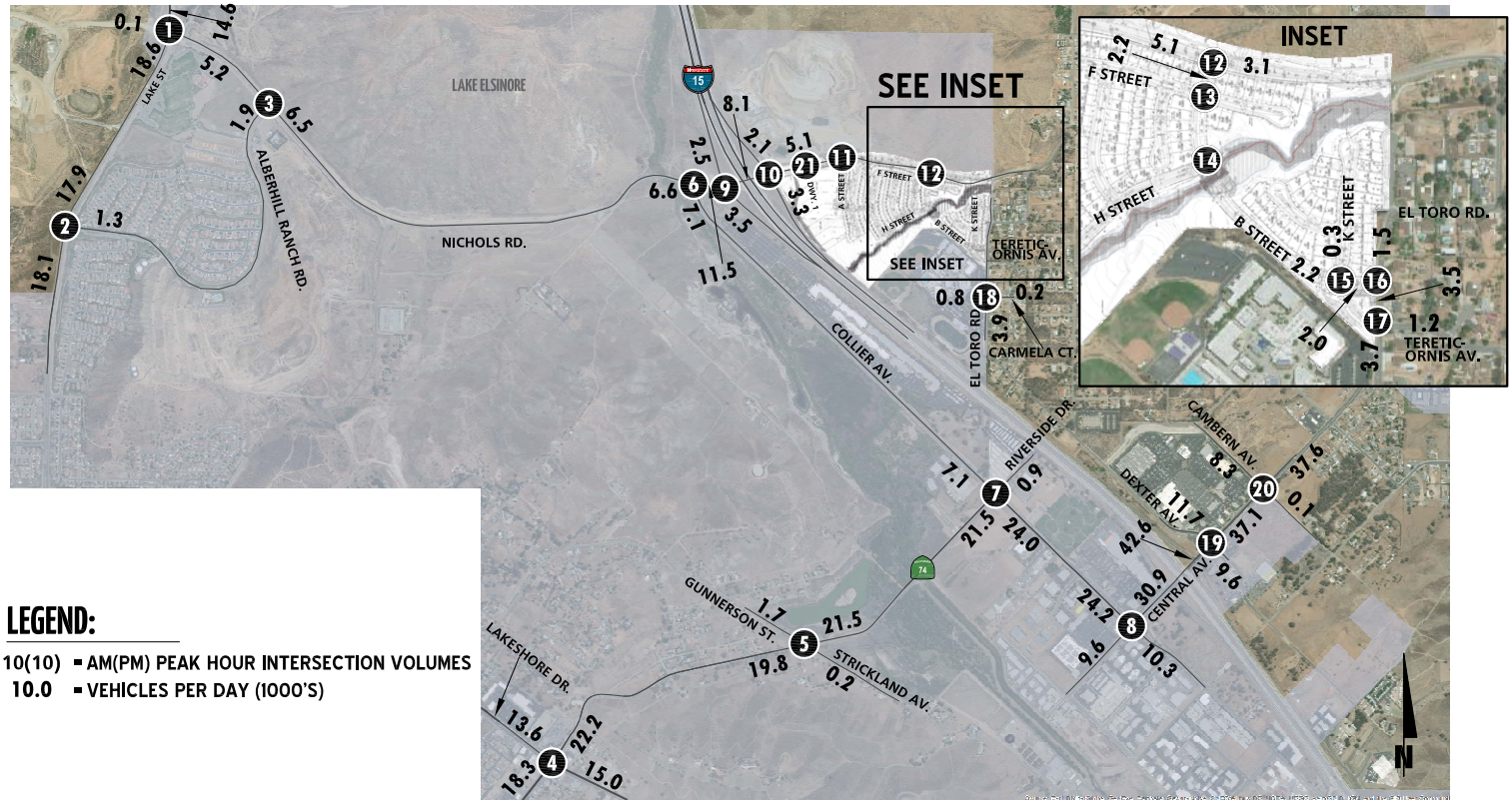
To account for background traffic growth, an ambient growth from Existing conditions of 4.04% (2 percent per year compounded over 2 years) is included for EAP (2020) traffic conditions, plus Phase 1 Project traffic. Cumulative development projects are not included as part of the EAP analysis. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for EAP (2020) traffic conditions are shown on Exhibit 6-2. Starting with Phase 1 (2020), the Project will provide a connection between Nichols Road and El Toro Road via B Street. As such, it is unlikely that existing through traffic would continue to utilize El Toro Road to Wood Mesa Court to access Nichols Road once B Street provides access to Nichols Road. As such, the existing volumes at El Toro Road at Nichols Road and El Toro Road/Wood Mesa Court at El Toro Road will be reallocated to reflect the use of B Street starting in Phase 1 (2020). It is anticipated that 50% of the existing traffic will be reallocated to utilize B Street.

EXHIBIT 6-1: EA (2020) TRAFFIC VOLUMES



1 Lake St. & Nichols Rd. 4(1) 283(879) 18(30) 40(19) 5(0) 184(236) 16(1) 4(6) 0(1) 0(1) 701(377) 361(171)	**2** Lake St. & Alberhill Ranch Rd. 431(1053) 19(24) 49(20) 59(36) 1054(500) 50(31)	**3** Alberhill Ranch Rd. & Nichols Rd. 188(247) 36(77) 374(190) 17(19) 40(9) 72(63)	**4** Lakeshore Dr. & Riverside Dr. (SR-74) 9(16) 178(320) 207(276) 351(310) 550(617) 134(122) 20(30) 461(495) 147(274) 277(202) 305(261) 113(162)	**5** Gunnerson St./ Strickland Av. & Riverside Dr. (SR-74) 5(2) 3(1) 48(29) 36(120) 645(890) 2(6) 0(2) 860(867) 3(4) 0(0) 2(0) 11(6)	**6** Collier Av. & Nichols Rd. 191(259) 97(231) 419(195) 33(56) 38(81) 95(264)	**7** Collier Av. & Riverside Dr. (SR-74) 47(96) 54(185) 1(3) 2(7) 1(18) 5(21) 77(103) 10(11) 832(788) 636(902) 74(231) 10(20)
8 Collier Av. & Central Av. (SR-74) 11(32) 59(137) 788(938) 615(741) 286(199) 519(211) 34(195) 91(328) 30(52) 30(51) 55(122) 285(350)	**9** I-15 SB Ramps & Nichols Rd. 65(137) 6(2) 171(81) 224(353) 58(26) 237(249) 278(279)	**10** I-15 NB Ramps & Nichols Rd. 93(41) 136(117) 77(146) 331(184) 146(262) 3(1) 112(31)	**11** A Street & Nichols Rd. Future Intersection	**12** B Street & Nichols Rd. 229(157) 0(0) 443(215) 0(0) 0(0) 0(0)	**13** B Street & F Street Future Intersection	**14** B Street & H Street Future Intersection
15 K Street & B Street 0(0) 0(0) 0(0) 0(0) 0(0) 0(0)	**16** El Toro Rd. & B Street 0(0) 448(206) 0(0) 0(0) 0(0) 214(149)	**17** El Toro Rd. & Tereticornis Av. 430(156) 19(50) 24(18) 173(12) 190(131) 68(25)	**18** El Toro Rd. & Carmela Ct. 237(10) 357(152) 8(6) 16(1) 0(0) 6(5) 134(15) 0(0) 274(30) 173(14) 108(140) 6(4)	**19** Dexter Av. & Central Av. (SR-74) 387(328) 147(95) 71(70) 194(70) 1428(1157) 126(162) 236(352) 922(1682) 129(168) 103(124) 261(135) 91(175)	**20** Cambern Av. & Central Av. (SR-74) 89(86) 4(3) 131(239) 115(149) 1670(1164) 1(0) 128(262) 1064(1806) 1(1) 3(1) 2(3) 1(1)	**21** Driveway 1 & Nichols Rd. Future Intersection

EXHIBIT 6-2: EAP (2020) TRAFFIC VOLUMES



LEGEND:

10(10) ▪ AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 ▪ VEHICLES PER DAY (1000'S)

1 Lake St. & Nichols Rd. 4(1) 283(879) 18(30) 40(19) 5(0) 185(237) 16(1) 4(6) 0(1) 0(1) 701(377) 361(172)	**2** Lake St. & Alberhill Ranch Rd. 432(1054) 19(24) 49(20) 59(36) 1054(501) 50(31)	**3** Alberhill Ranch Rd. & Nichols Rd. 189(248) 36(77) 374(192) 17(19) 40(9) 72(63)	**4** Lakeshore Dr. & Riverside Dr. (SR-74) 9(16) 178(320) 207(276) 351(310) 551(618) 135(122) 20(30) 461(497) 147(274) 277(202) 305(261) 113(163)	**5** Gunnerson St./ Strickland Av. & Riverside Dr. (SR-74) 5(2) 3(1) 48(29) 36(120) 647(891) 2(6) 0(2) 861(869) 3(4) 0(0) 2(0) 11(6)	**6** Collier Av. & Nichols Rd. 192(260) 100(233) 419(197) 33(56) 38(81) 96(268)	**7** Collier Av. & Riverside Dr. (SR-74) 49(97) 56(186) 1(3) 2(7) 1(18) 5(21) 78(105) 10(11) 832(788) 636(902) 75(233) 10(20)
8 Collier Av. & Central Av. (SR-74) 12(33) 60(138) 788(938) 615(741) 286(199) 519(211) 34(196) 91(328) 30(52) 30(51) 55(123) 285(350)	**9** I-15 SB Ramps & Nichols Rd. 65(137) 6(2) 173(88) 229(356) 64(30) 239(255) 278(279)	**10** I-15 NB Ramps & Nichols Rd. 99(45) 146(124) 77(146) 335(196) 146(262) 3(1) 114(38)	**11** A Street & Nichols Rd. Future Intersection	**12** B Street & Nichols Rd. 122(83) 0(0) 227(121) 222(114) 123(85) 0(0)	**13** B Street & F Street Future Intersection	**14** B Street & H Street Future Intersection
15 K Street & B Street 16(11) 3(2) 1(3) 107(74) 6(19) 216(95)	**16** El Toro Rd. & B Street 0(0) 232(111) 0(0) 219(97) 108(77) 107(74)	**17** El Toro Rd. & Tereticornis Av. 433(158) 19(50) 24(18) 173(12) 191(134) 68(25)	**18** El Toro Rd. & Carmela Ct. 237(10) 360(154) 8(6) 16(1) 0(0) 6(5) 134(15) 0(0) 274(30) 173(14) 109(143) 6(4)	**19** Dexter Av. & Central Av. (SR-74) 387(328) 147(95) 72(70) 194(71) 1428(1157) 126(162) 236(352) 922(1682) 129(168) 103(124) 261(135) 91(175)	**20** Cambern Av. & Central Av. (SR-74) 89(86) 4(3) 131(239) 115(149) 1670(1165) 1(0) 128(262) 1065(1806) 1(1) 3(1) 2(3) 1(1)	**21** Driveway 1 & Nichols Rd. Future Intersection

6.4 INTERSECTION OPERATIONS ANALYSIS

LOS calculations were conducted for the study intersections to evaluate their operations under EA and EAP (2020) traffic conditions with roadway and intersection geometrics consistent with Section 6.1 *Roadway Improvements*. The intersection analysis results are summarized in Table 6-1, which indicates there are no additional intersections anticipated to operate at unacceptable LOS for EA and EAP (2020) traffic conditions than those previously identified under Existing (2018) traffic conditions.

A summary of the peak hour intersection LOS for EA and EAP (2020) traffic conditions are shown on Exhibits 6-3 and 6-4, respectively. The intersection operations analysis worksheets for EA and EAP (2020) traffic conditions are included in Appendices 6.1 and 6.2 of this TIA, respectively.

6.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

No additional study area intersections are anticipated to meet traffic signal warrants for EA and EAP (2020) traffic conditions in addition to those previously warranted under Existing traffic conditions (see Appendices 6.3 and 6.4, respectively).

6.6 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-15 Freeway and Nichols Road interchange to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-15 Freeway mainline. Queuing analysis findings are presented in Table 6-2 for EA and EAP (2020) traffic conditions. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 6-2, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for EA and EAP (2020) traffic conditions. Worksheets for EA and EAP (2020) conditions off-ramp queuing analysis are provided in Appendices 6.5 and 6.6, respectively.

6.7 BASIC FREEWAY SEGMENT ANALYSIS

EA and EAP (2020) mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibits 6-5 and 6-6, respectively. As shown in Table 6-3, the freeway segments analyzed for this study are anticipated to operate at an acceptable LOS during the peak hours under EA and EAP (2020) traffic conditions, with the exception of the following segment:

- I-15 Freeway Southbound, South of Nichols Road (#2) – LOS E PM peak hour only

EA and EAP (2020) basic freeway segment analysis worksheets are provided in Appendices 6.7 and 6.8, respectively.

Table 6-1

Intersection Analysis for EA and EAP (2020) Conditions

#	Intersection	Traffic Control[2]	EA (2020) Delay[1] (secs.) AM	EA (2020) Delay[1] (secs.) PM	EA (2020) LOS[3] AM	EA (2020) LOS[3] PM	EAP (2020) Delay[1] (secs.) AM	EAP (2020) Delay[1] (secs.) PM	EAP (2020) LOS[3] AM	EAP (2020) LOS[3] PM
1	Lake St. & Nichols Rd.	TS	17.3	30.2	B	C	17.4	30.3	B	C
2	Lake St. & Alberhill Ranch Rd.	TS	13.3	7.8	B	A	13.2	7.8	B	A
3	Alberhill Ranch Rd. & Nichols Rd.	AWS	11.8	9.9	B	A	11.8	9.9	B	A
4	Lakeshore Dr. & Riverside Dr. (SR-74)	TS	47.8	45.1	D	D	47.8	45.2	D	D
5	Gunnerson St./Strickland Av. & Riverside Dr. (SR-74)	CSS	**97.8**	**>100.0**	**F**	**F**	**99.9**	**>100.0**	**F**	**F**
	Current Intersection Lanes [4]	*CSS*	***97.8***	***>100.0***	***F***	***F***	***99.9***	***>100.0***	***F***	***F***
6	Collier Av. & Nichols Rd.	CSS	21.6	32.1	C	D	21.9	32.7	C	D
7	Collier Av. & Riverside Dr. (SR-74)	TS	15.2	26.3	B	C	15.4	26.4	B	C
8	Collier Av. & Central Av. (SR-74)	TS	34.5	33.4	C	C	34.5	33.4	C	C
9	I-15 Southbound Ramps & Nichols Rd.	AWS	16.4	14.1	C	B	16.8	14.4	C	B
10	I-15 Northbound Ramps & Nichols Rd.	CSS	**>100.0**	**35.3**	**F**	**E**	**>100.0**	**38.4**	**F**	**E**
	Current Intersection Control [5]	*AWS*	***40.3***	*11.6*	***E***	*B*	***43.6***	*11.8*	***E***	*B*
11	A St. & Nichols Rd.		Future Intersection				Future Intersection			
12	B St. & Nichols Rd.	**CSS**	Future Intersection				14.1	10.9	B	B
13	B St. & F St.		Future Intersection				Future Intersection			
14	B St. & H St.		Future Intersection				Future Intersection			
15	K St. & B St.	**CSS**	Future Intersection				9.2	8.9	A	A
16	El Toro Rd. & B St.	**CSS**	Future Intersection				11.5	9.4	B	A
17	El Toro Rd. & Tereticornis Av.	CSS	**>100.0**	10.3	**F**	B	**>100.0**	10.3	**F**	B
	With Normalized PHF [6,7]	CSS	24.6	--	C	--	24.9	--	C	--
18	El Toro Rd. & Carmela Ct.	CSS	**>100.0**	11.7	**F**	B	**>100.0**	11.7	**F**	B
	With Normalized PHF [6,7]	CSS	**>100.0**	--	**F**	--	**>100.0**	--	**F**	--
19	Dexter Av. & Central Av. (SR-74)	TS	41.4	45.7	D	D	41.5	50.3	D	D
20	Cambern Av. & Central Av. (SR-74)	TS	28.4	28.4	C	C	28.4	28.4	C	C
21	Driveway 1 & Nichols Rd.	**CSS**	Future Intersection				Future Intersection			

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

1 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.

2 CSS = Cross-street Stop; AWS = All-way Stop; TS = Traffic Signal; **CSS** = Improvement

3 LOS = Level of Service

4 At the time field review was conducted, the eastbound and westbound left turn lanes were under construction. However, these lanes have since been completed. This analysis identifies the LOS results with the current left turn lanes in place.

5 Although at the time of the field review and traffic counts this intersection was operating as a cross-street stop controlled intersection, it is our understanding that the I-15 Northbound Ramps currently operates as an all-way stop.

6 The two intersections of Tereticornis Avenue and Carmela Court are in close proximity to the existing Temescal Canyon High School on El Toro Road and have been evaluated with the AM existing peak hour factor from the raw count worksheet and also with a normalized peak hour factor of 0.92. Lower peak hour factors during the AM peak hour (morning drop-off) occur near schools due to the peak 10-15 minute traffic flows during the AM peak hour, which are much

7 PHF = Peak Hour Factor

Table 6-2

Peak Hour Freeway Off-Ramp Queuing Summary for EA and EAP (2020) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	EA (2020)				EAP (2020)			
			95th Percentile Queue (Feet)		Acceptable?[1]		95th Percentile Queue (Feet)		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-15 SB Off-Ramp & Nichols Rd.	SBL/T/R	1,600	90	45	Yes	Yes	93	48	Yes	Yes
I-15 NB Off-Ramp & Nichols Rd.	NBL/T/R	1,530	578	150	Yes	Yes	605	163	Yes	Yes
Current Traffic Control[2]	*NBL/T/R*	*1,530*	*175*	*60*	*Yes*	*Yes*	*178*	*65*	*Yes*	*Yes*

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided.

[2] Although at the time of the field review and traffic counts this intersection was operating as a cross-street stop controlled intersection, it is our understanding that the I-15 Northbound Ramps currently operates as an all-way stop.

Table 6-3

Basic Freeway Segment Analysis for EA and EAP (2020) Conditions

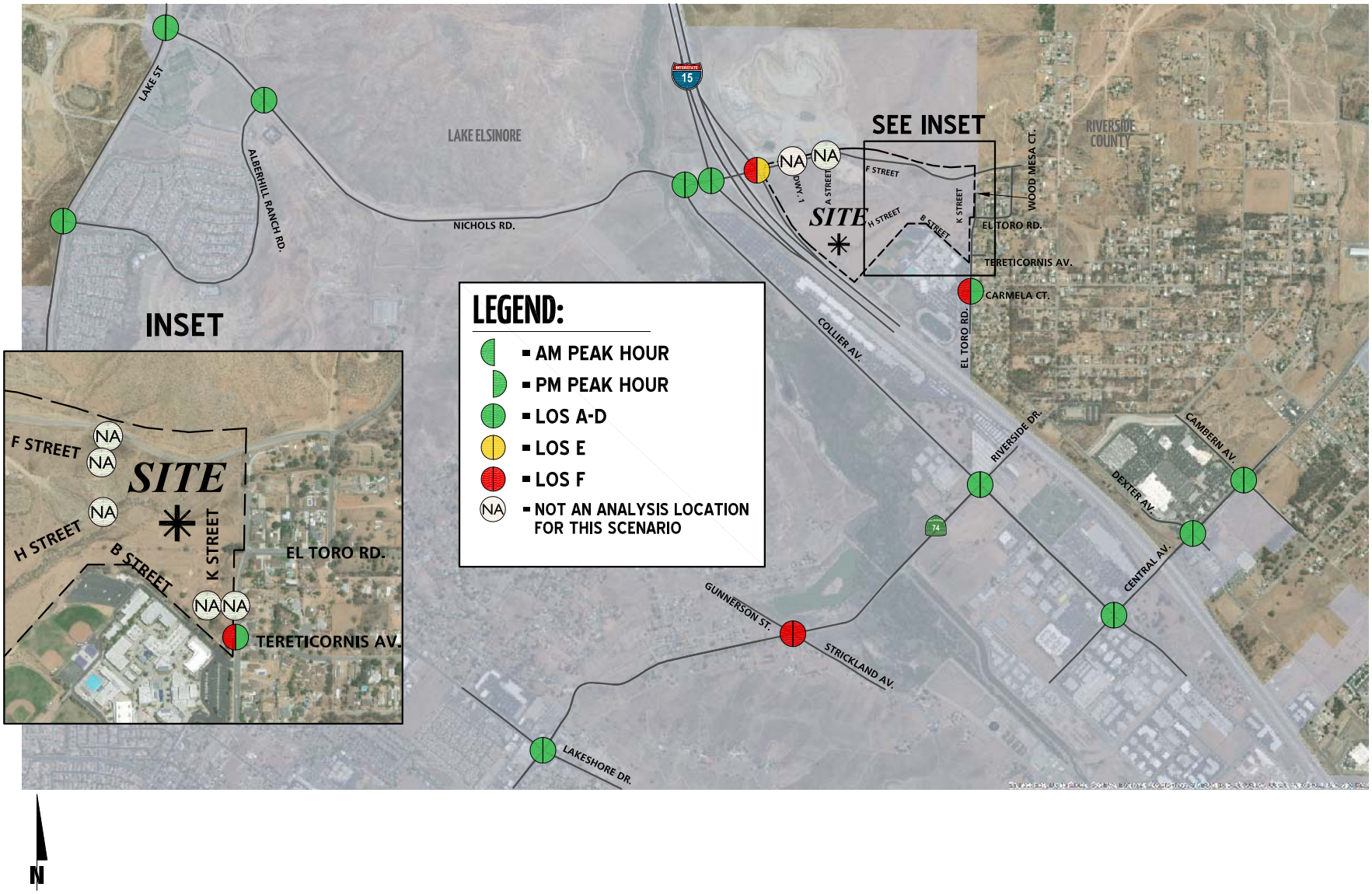
Freeway	Direction	Mainline Segment	Lanes[1]	EA (2020)				EAP (2020)			
				Density[2]		LOS[3]		Density[2]		LOS[3]	
				AM	PM	AM	PM	AM	PM	AM	PM
I-15 Freeway	Southbound	North of Nichols Rd.	3	28.2	34.6	D	D	28.2	34.7	D	D
		South of Nichols Rd.	3	29.0	**35.5**	D	**E**	29.0	**35.6**	D	**E**
	Northbound	North of Nichols Rd.	3	23.0	17.4	C	B	23.0	17.4	C	B
		South of Nichols Rd.	3	23.5	17.8	C	B	23.5	17.8	C	B

[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] LOS = Level of Service

EXHIBIT 6-3: EA (2020) SUMMARY OF LOS



URBAN CROSSROADS

EXHIBIT 6-4: EAP (2020) SUMMARY OF LOS

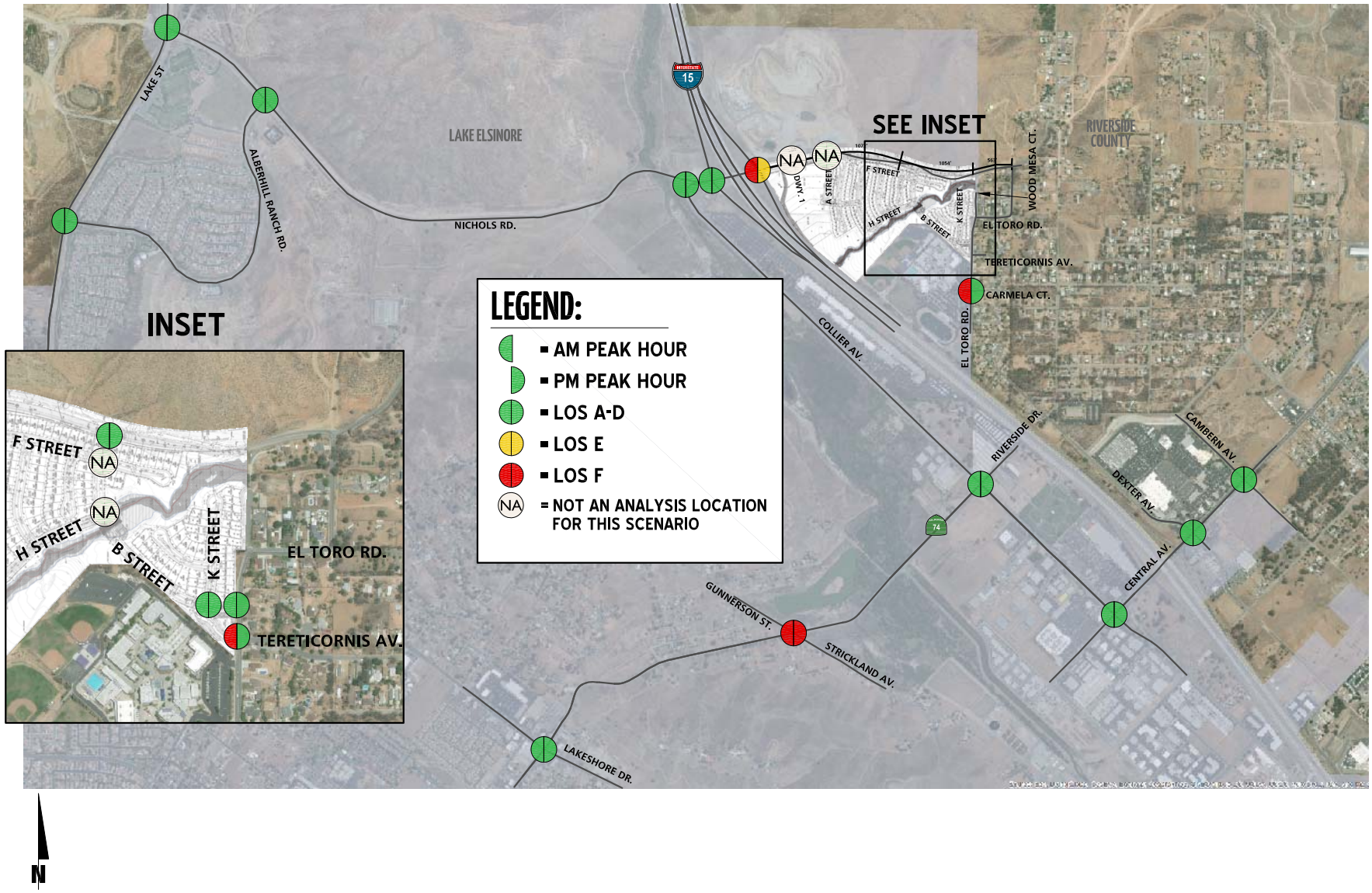
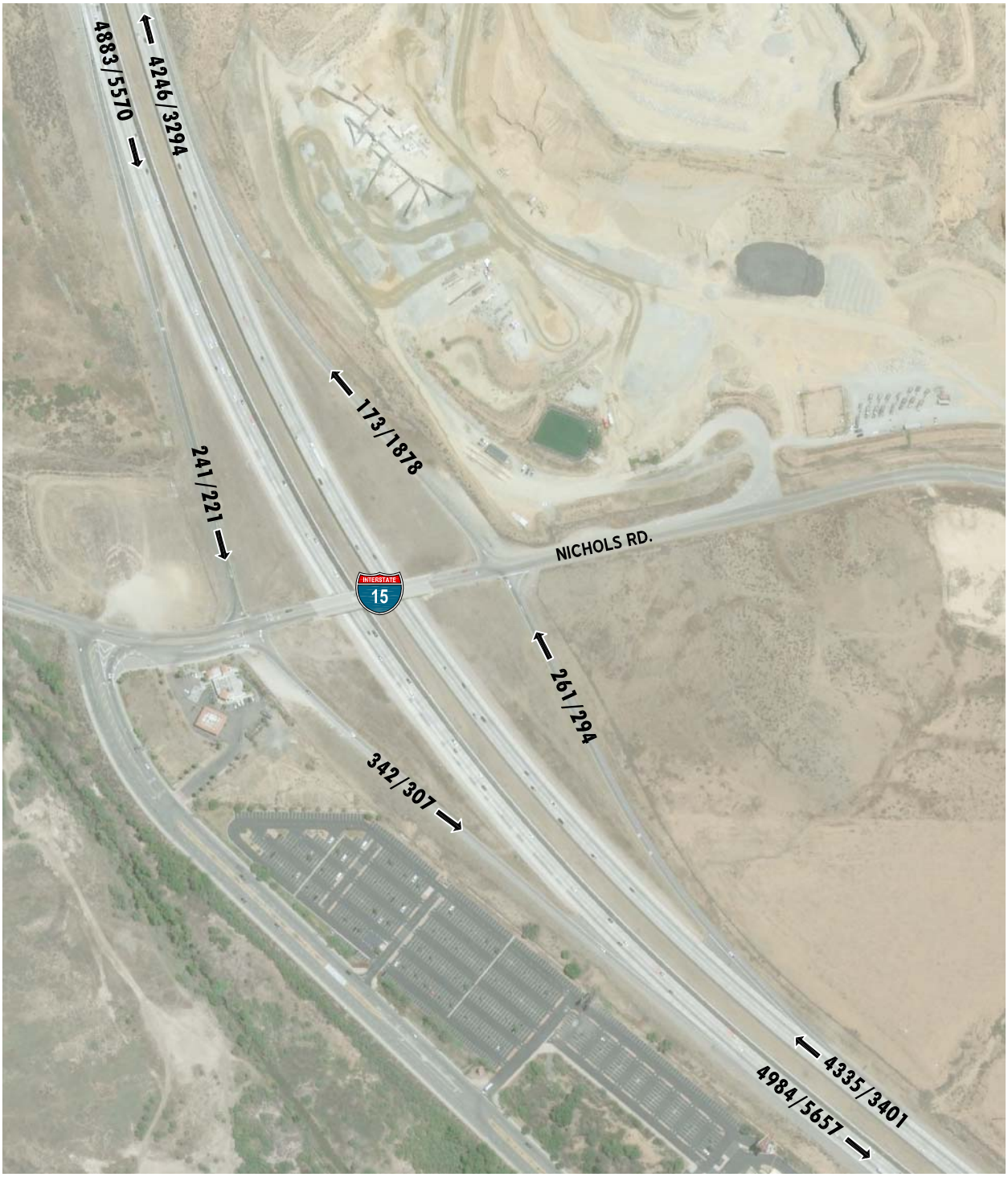


EXHIBIT 6-5: EA (2020) FREEWAY MAINLINE VOLUMES

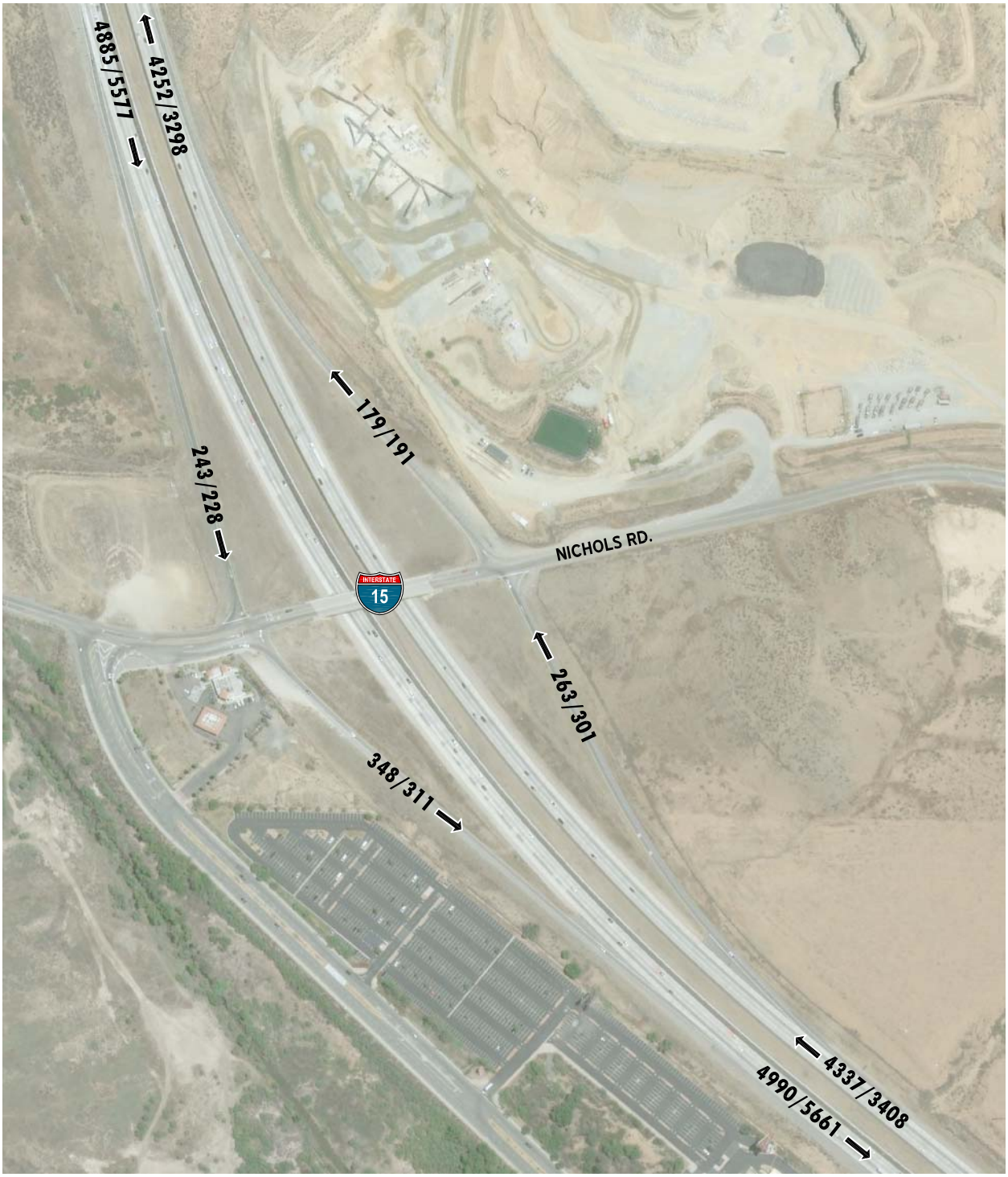


LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

N

EXHIBIT 6-6: EAP (2020) FREEWAY MAINLINE VOLUMES



LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

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6.8 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 ramp merge/diverge segments analyzed for this study are anticipated to operate at an acceptable LOS during the peak hours under EA and EAP (2020) traffic conditions, with the exception of the following ramp junction:

- I-15 Freeway Southbound, Off-Ramp at Nichols Road (#1) – LOS E PM peak hour only

EA and EAP (2020) freeway ramp junction operations analysis worksheets are provided in Appendices 6.9 and 6.10, respectively.

6.9 RECOMMENDED IMPROVEMENTS

6.9.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as deficient to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS C / LOS D or better). The effectiveness of the proposed recommended improvements is presented in Table 6-5 for EA and EAP (2020) traffic conditions.

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal.

Eastbound and westbound left turn lanes are currently under construction and are anticipated to be in place by summer 2018. However, the intersection is anticipated to continue to operate at an unacceptable LOS without the installation of a traffic signal.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal.
- Add a northbound right turn lane.

El Toro Road & Carmela Court (#18)

- Install stop signs along El Toro Road to implement an all-way stop control.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.

6.9.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

At this time, Caltrans has no fee programs or other improvement programs in place to address the deficiencies caused by development projects in the City of Lake Elsinore (or other neighboring jurisdictions) on the SHS roadway segments. As such, no additional improvements have been recommended to address the EA and EAP (2020) deficiencies on the SHS.

Table 6-4

Freeway Ramp Junction Merge/Diverge Analysis for EA and EAP (2020) Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	EA (2020)				EAP (2020)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]
I-15 Freeway	Southbound	Off-Ramp at Nichols Rd.	3	32.1	D	**35.1**	**E**	32.1	D	**35.1**	**E**
		On-Ramp at Nichols Rd.	3	28.6	D	31.9	D	28.6	D	32.0	D
	Northbound	On-Ramp at Nichols Rd.	3	23.4	C	18.6	B	23.4	C	18.6	B
		Off-Ramp at Nichols Rd.	3	28.8	D	23.8	C	28.8	D	23.9	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] LOS = Level of Service

Table 6-5

Intersection Analysis for EA and EAP (2020) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1] Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Delay[2] (secs.) AM	Delay[2] (secs.) PM	Level of Service AM	Level of Service PM
5	Gunnerson St./Strickland Av. & Riverside Dr. (SR-74)																	
	EA (2020)																	
	- Without Improvements	CSS	0	1	1	0	1	1	0	1	0	0	1	0	**97.8**	**>100.0**	**F**	**F**
	- Without Improvements	CSS	0	1	1	0	1	1	**1**	1	0	**1**	1	0	**97.8**	**>100.0**	**F**	**F**
	- With Improvements[4,5]	**TS**	0	1	1	0	1	1	**1**	1	0	**1**	1	0	9.1	9.1	A	A
	EAP (2020)																	
	- Without Improvements	CSS	0	1	1	0	1	1	0	1	0	0	1	0	**99.9**	**>100.0**	**F**	**F**
	- Without Improvements	CSS	0	1	1	0	1	1	**1**	1	0	**1**	1	0	**99.9**	**>100.0**	**F**	**F**
	- With Improvements[4,5]	**TS**	0	1	1	0	1	1	**1**	1	0	**1**	1	0	9.1	9.1	A	A
10	I-15 Northbound Ramps & Nichols Rd.																	
	EA (2020)																	
	- Without Improvements	CSS	0	1	0	0	0	0	1	1	0	0	1	0	**>100.0**	**35.3**	**F**	**E**
	- Without Improvements	AWS	0	1	0	0	0	0	1	1	0	0	1	0	**40.3**	11.6	**E**	B
	- With Improvements	**TS**	0	1	**1**	0	0	0	1	1	0	0	1	0	14.2	18.0	B	B
	EAP (2020)																	
	- Without Improvements	CSS	0	1	0	0	0	0	1	1	0	0	1	0	**>100.0**	**38.4**	**F**	**E**
	- Without Improvements	AWS	0	1	0	0	0	0	1	1	0	0	1	0	**43.6**	11.8	**E**	B
	- With Improvements	**TS**	0	1	**1**	0	0	0	1	1	0	0	1	0	14.4	18.3	B	B
18	El Toro Rd. & Carmela Ct.																	
	EA (2020)																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	11.7	**F**	B
	- With Improvements[7]	**AWS**	0	1	0	0	1	**1**	0	1	0	0	1	0	**71.4**	9.3	**F**	A
	- Without Improvements[6]	CSS	0	1	0	0	1	0	0	1	0	0	1	0	**>100.0**	**--**	**F**	**--**
	- With Improvements[6,7]	**AWS**	0	1	0	0	1	**1**	0	1	0	0	1	0	21.9	--	C	--
	EAP (2020)																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	11.7	**F**	B
	- With Improvements[7]	**AWS**	0	1	0	0	1	**1**	0	0	0	0	1	0	**72.6**	9.4	**F**	A
	- Without Improvements[6]	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	--	**F**	--
	- With Improvements[6,7]	**AWS**	0	1	0	0	1	**1**	0	0	0	0	1	0	22.1	--	C	--

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

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; d = Defacto Right Turn Lane; **1** = Improvement

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

3 CSS = Cross-street Stop; AWS = All-way Stop; TS = Traffic Signal; **CSS** = Improvement

4 Eastbound and westbound left turn lanes are currently under construction and are anticipated to be in place by summer 2018. However, the intersection is anticipated to continue to operate at an unacceptable LOS without the installation of a traffic signal.

5 Although the intersection is not anticipated to warrant a traffic signal under Existing, EA, and EAP conditions, the addition of lane geometric improvements alone is not anticipated to improve the peak hour delays. As such, the intersection should be monitored and a traffic signal should be installed at the City Traffic Engineer's discretion.

6 A normalized AM PHF of 0.92 is used to determine peak hour operations outside of the 10-15 minute drop-off period.

7 Prohibit on-street parking to allow restriping for a 100 foot southbound right turn pocket.

7 EA AND EAP (2021) TRAFFIC CONDITIONS

This section discusses the methods used to develop EA and EAP (2021) 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 EA and EAP (2024) conditions are consistent with those shown on Exhibit 3-1:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EAP conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways). This includes B Street between El Toro Road and Nichols Road as part of Phase 1.
- Subsequent to the traffic counts and field review conducted for this traffic study, improvements were implemented at the intersections of Gunnerson Street/Strickland Avenue at Riverside Drive (SR-74) and at the I-15 Northbound Ramps at Nichols Road. The recent improvements at Gunnerson Street/Strickland Avenue and Riverside Drive (SR-74) include eastbound and westbound left turn lanes. The I-15 Northbound Ramps at Nichols Road has recently been modified to an all-way stop controlled intersections. The operations analysis has been conducted for both Existing lanes and controls and these recently implemented improvements for EA and EAP (2021) traffic conditions.

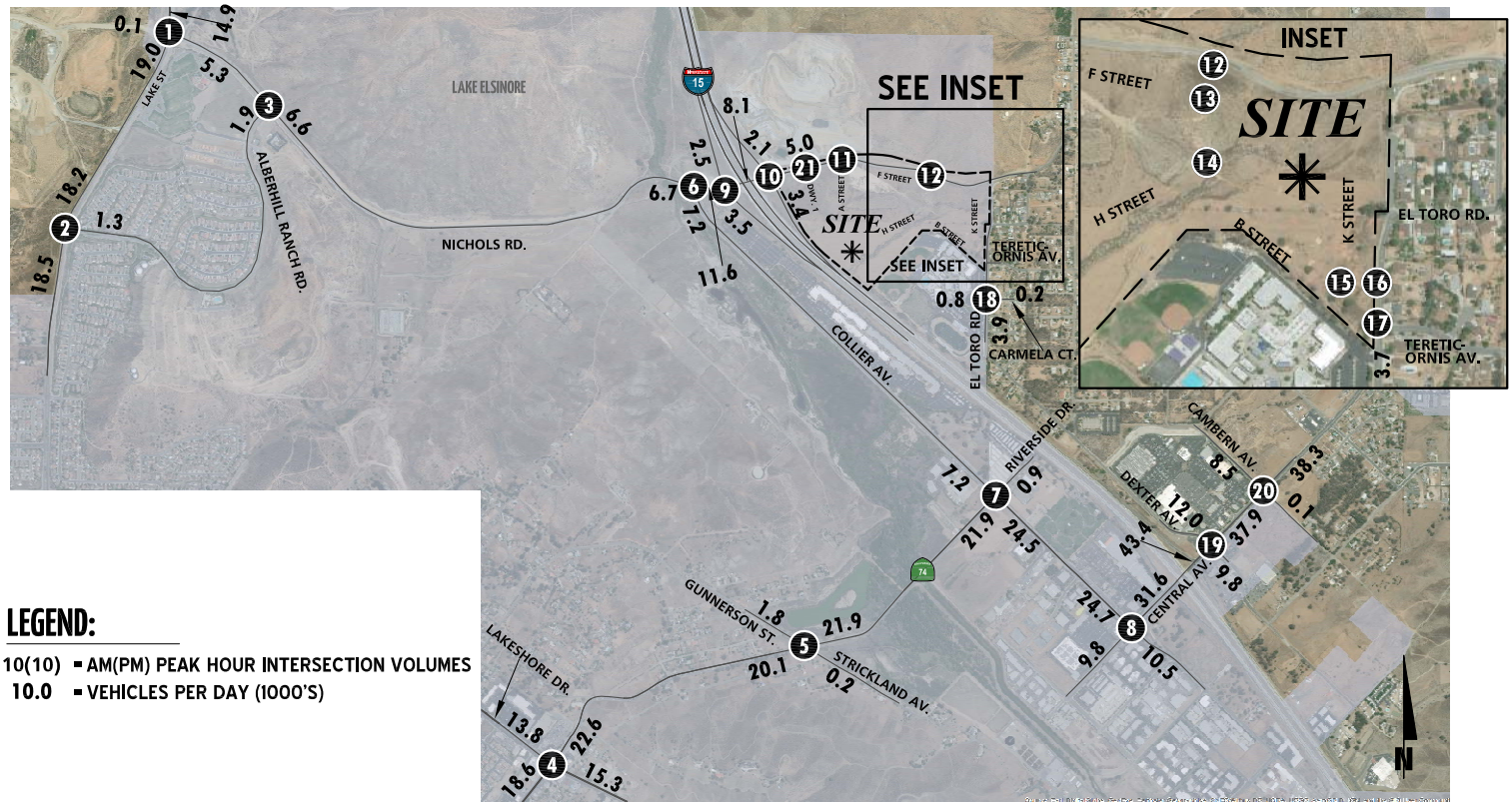
7.2 EA (2021) TRAFFIC VOLUME FORECASTS

To account for background traffic growth, an ambient growth from Existing conditions of 6.12% (2 percent per year compounded over 3 years) is included for EA (2021) traffic conditions. Cumulative development projects are not included as part of the EA analysis. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for EA (2021) traffic conditions are shown on Exhibit 7-1.

7.3 EAP (2021) TRAFFIC VOLUME FORECASTS

To account for background traffic growth, an ambient growth from Existing conditions of 6.12% (2 percent per year compounded over 3 years) is included for EAP (2021) traffic conditions, plus Phase 1 and Phase 2 Project traffic. Cumulative development projects are not included as part of the EAP analysis. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for EAP (2021) traffic conditions are shown on Exhibit 7-2.

EXHIBIT 7-1: EA (2021) TRAFFIC VOLUMES



LEGEND:

10(10) ▪ AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 ▪ VEHICLES PER DAY (1000'S)

1	Lake St. & Nichols Rd.																			
	4(1)	289(897)	18(31)	40(19)	5(0)	188(241)	16(1)	4(6)	0(1)	0(1)	715(384)	368(174)								
2	Lake St. & Alberhill Ranch Rd.																			
	439(1074)	19(24)	50(20)	60(37)	1075(510)	51(32)														
3	Alberhill Ranch Rd. & Nichols Rd.																			
	192(252)	37(79)	381(194)	17(19)	40(10)	73(65)														
4	Lakeshore Dr. & Riverside Dr. (SR-74)																			
	10(16)	181(327)	211(281)	358(316)	561(629)	137(124)	20(31)	470(505)	150(279)	282(206)	311(266)	116(166)								
5	Gunnerson St./ Strickland Av. & Riverside Dr. (SR-74)																			
	5(2)	3(1)	49(30)	37(122)	658(907)	2(6)	0(2)	878(884)	3(4)	0(0)	2(0)	12(6)								
6	Collier Av. & Nichols Rd.																			
	195(264)	99(236)	428(198)	34(57)	39(83)	97(270)														
7	Collier Av. & Riverside Dr. (SR-74)																			
	48(98)	55(189)	1(3)	2(7)	1(18)	5(21)	79(105)	11(12)	849(803)	648(920)	75(236)	11(20)								
8	Collier Av. & Central Av. (SR-74)																			
	12(33)	60(140)	803(957)	627(756)	292(203)	530(215)	35(198)	92(334)	31(53)	31(52)	56(124)	291(357)								
9	I-15 SB Ramps & Nichols Rd.																			
	66(140)	6(2)	174(83)	228(360)	59(27)	242(254)	283(284)													
10	I-15 NB Ramps & Nichols Rd.																			
	94(41)	139(119)	79(149)	337(188)	149(267)	3(1)	115(32)													
11	A Street & Nichols Rd.																			
	Future Intersection																			
12	B Street & Nichols Rd.																			
	233(160)	0(0)	452(220)	0(0)	0(0)	0(0)														
13	B Street & F Street																			
	Future Intersection																			
14	B Street & H Street																			
	Future Intersection																			
15	K Street & B Street																			
	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)														
16	El Toro Rd. & B Street																			
	0(0)	457(210)	0(0)	0(0)	0(0)	219(152)														
17	El Toro Rd. & Tereticornis Av.																			
	438(159)	19(51)	24(18)	176(13)	194(134)	69(25)														
18	El Toro Rd. & Carmela Ct.																			
	242(11)	364(155)	8(6)	16(1)	0(0)	6(5)	137(15)	0(0)	279(31)	176(14)	110(143)	6(4)								
19	Dexter Av. & Central Av. (SR-74)																			
	395(334)	150(97)	72(71)	197(71)	1457(1180)	128(166)	241(359)	940(1716)	132(171)	105(126)	266(138)	92(178)								
20	Cambern Av. & Central Av. (SR-74)																			
	91(88)	4(3)	134(244)	118(152)	1703(1187)	1(0)	131(267)	1086(1842)	1(1)	3(1)	2(3)	1(1)								
21	Driveway 1 & Nichols Rd.																			
	Future Intersection																			

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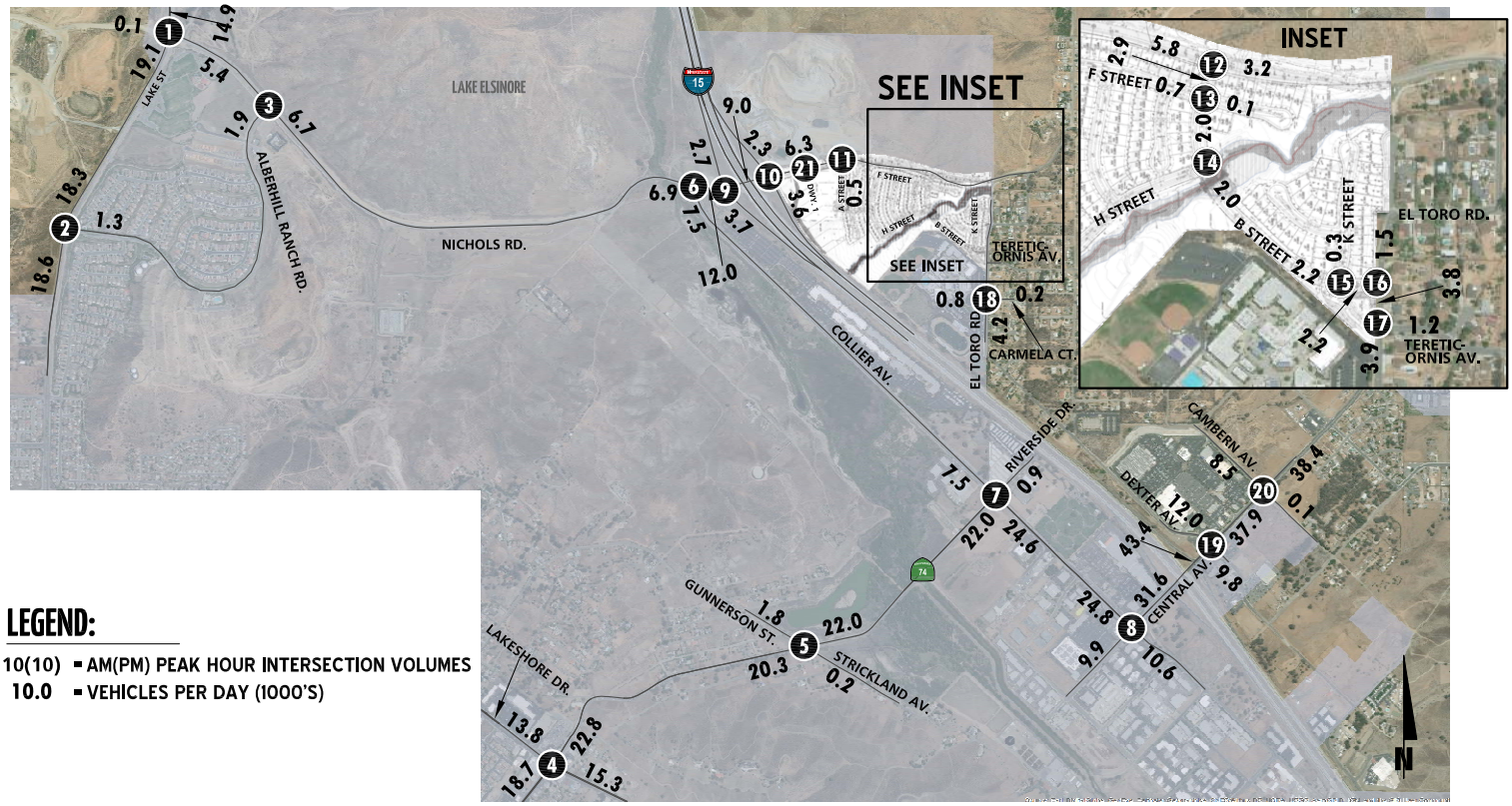
EXHIBIT 7-2: EAP (2021) TRAFFIC VOLUMES



LEGEND:

10(10) ▪ AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 ▪ VEHICLES PER DAY (1000'S)

1 Lake St. & Nichols Rd. 4(1) 289(897) 19(33) 42(20) 5(0) 193(244) 16(1) 4(6) 0(1) 0(1) 715(384) 370(179)	**2 Lake St. & Alberhill Ranch Rd.** 444(1077) 19(24) 50(20) 60(37) 1077(515) 51(32)	**3 Alberhill Ranch Rd. & Nichols Rd.** 199(256) 37(79) 383(201) 17(19) 40(10) 73(65)	**4 Lakeshore Dr. & Riverside Dr. (SR-74)** 10(16) 181(327) 211(281) 358(316) 568(633) 140(126) 20(31) 472(512) 150(279) 282(206) 311(266) 117(169)	**5 Gunnerson St./ Strickland Av. & Riverside Dr. (SR-74)** 5(2) 3(1) 49(30) 37(122) 668(913) 2(6) 0(2) 881(895) 3(4) 0(0) 2(0) 12(6)	**6 Collier Av. & Nichols Rd.** 202(268) 116(247) 430(205) 34(57) 39(83) 103(289)	**7 Collier Av. & Riverside Dr. (SR-74)** 58(104) 63(194) 1(3) 2(7) 1(18) 5(21) 82(116) 11(12) 849(803) 648(920) 78(244) 11(20)
8 Collier Av. & Central Av. (SR-74) 16(36) 64(143) 803(957) 627(756) 292(203) 530(215) 36(202) 92(334) 31(53) 31(52) 57(128) 291(357)	**9 I-15 SB Ramps & Nichols Rd.** 66(140) 6(2) 184(115) 252(376) 88(46) 250(281) 283(284)	**10 I-15 NB Ramps & Nichols Rd.** 123(60) 191(154) 79(149) 355(246) 149(267) 3(1) 125(64)	**11 A Street & Nichols Rd.** 285(195) 0(0) 470(278) 10(32) 29(19) 0(0)	**12 B Street & Nichols Rd.** 124(84) 0(0) 231(123) 239(155) 161(111) 0(0)	**13 B Street & F Street** 13(41) 224(107) 2(6) 6(4) 0(0) 1(1) 37(25) 0(0) 4(3) 1(4) 118(82) 0(1)	**14 B Street & H Street** Future Intersection
15 K Street & B Street 9(6) 10(6) 3(11) 111(81) 3(10) 226(100)	**16 El Toro Rd. & B Street** 0(0) 237(114) 0(0) 235(106) 114(92) 109(76)	**17 El Toro Rd. & Tereticornis Av.** 452(168) 19(51) 24(18) 176(13) 199(150) 69(25)	**18 El Toro Rd. & Carmela Ct.** 242(11) 378(164) 8(6) 16(1) 0(0) 6(5) 137(15) 0(0) 279(31) 176(14) 115(159) 6(4)	**19 Dexter Av. & Central Av. (SR-74)** 395(334) 152(98) 75(73) 198(74) 1457(1180) 128(166) 241(359) 940(1716) 132(171) 105(126) 267(140) 92(178)	**20 Cambern Av. & Central Av. (SR-74)** 91(88) 4(3) 134(244) 118(152) 1704(1190) 1(0) 131(267) 1089(1844) 1(1) 3(1) 2(3) 1(1)	**21 Driveway 1 & Nichols Rd.** Future Intersection

7.4 INTERSECTION OPERATIONS ANALYSIS

LOS calculations were conducted for the study intersections to evaluate their operations under EAP conditions with roadway and intersection geometrics consistent with Section 7.1 *Roadway Improvements*. The intersection analysis results are summarized in Table 7-1, which indicates that the following additional intersection is anticipated to operate at unacceptable LOS for EA (2021) traffic conditions, in addition to those previously identified under EA (2020) traffic conditions:

- El Toro Road & Tereticornis Avenue (#17) – LOS D AM peak hour only (with normalized PHF)

With the addition of Phase 2 Project traffic, the following additional intersection is anticipated to operate at an unacceptable LOS during one or more peak hours under EAP (2021) traffic conditions, in addition to the locations previously identified under EA (2021) traffic conditions:

- Collier Avenue & Nichols Road (#6) – LOS E PM peak hour only

A summary of the peak hour intersection LOS for EA and EAP (2021) traffic conditions are shown on Exhibits 7-3 and 7-4, respectively. The intersection operations analysis worksheets for EA and EAP (2021) traffic conditions are included in Appendices 7.1 and 7.2 of this TIA, respectively.

7.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

No additional study area intersections are anticipated to meet traffic signal warrants for EA and EAP (2021) traffic conditions in addition to those previously warranted under Existing traffic conditions (see Appendices 7.3 and 7.4, respectively).

7.6 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-15 Freeway and Nichols Road interchange to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially “spill back” onto the I-15 Freeway mainline. Queuing analysis findings are presented in Table 7-2 for EA and EAP (2021) traffic conditions. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 7-2, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for EA and EAP (2021) traffic conditions. Worksheets for EA and EAP (2021) conditions off-ramp queuing analysis are provided in Appendices 7.5 and 7.6, respectively.

Table 7-1

Intersection Analysis for EA and EAP (2021) Conditions

#	Intersection	Traffic Control[2]	EA (2021) Delay[1] (secs.) AM	EA (2021) Delay[1] (secs.) PM	EA (2021) Level of Service AM	EA (2021) Level of Service PM	EAP (2021) Delay[1] (secs.) AM	EAP (2021) Delay[1] (secs.) PM	EAP (2021) LOS[3] AM	EAP (2021) LOS[3] PM
1	Lake St. & Nichols Rd.	TS	17.9	33.6	B	C	18.3	34.1	B	C
2	Lake St. & Alberhill Ranch Rd.	TS	13.8	8.0	B	A	13.8	8.0	B	A
3	Alberhill Ranch Rd. & Nichols Rd.	AWS	12.0	10.0	B	A	12.1	10.1	B	B
4	Lakeshore Dr. & Riverside Dr. (SR-74)	TS	49.2	46.5	D	D	49.8	46.8	D	D
5	Gunnerson St./Strickland Av. & Riverside Dr. (SR-74)	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**
	Current Intersection Lanes[4]	*CSS*	***>100.0***	***>100.0***	***F***	***F***	***>100.0***	***>100.0***	***F***	***F***
6	Collier Av. & Nichols Rd.	CSS	22.4	34.0	C	D	24.3	**37.3**	C	**E**
7	Collier Av. & Riverside Dr. (SR-74)	TS	15.5	27.2	B	C	16.0	28.1	B	C
8	Collier Av. & Central Av. (SR-74)	TS	34.7	33.6	C	C	34.7	33.6	C	C
9	I-15 Southbound Ramps & Nichols Rd.	AWS	16.9	14.5	C	B	18.7	16.4	C	C
10	I-15 Northbound Ramps & Nichols Rd.	CSS	**>100.0**	**38.2**	**F**	**E**	**>100.0**	**66.3**	**F**	**F**
	Current Intersection Control[5]	*AWS*	***43.8***	*11.7*	***E***	*B*	***68.6***	*13.3*	***F***	*B*
11	A St. & Nichols Rd.	**CSS**	Future Intersection				16.6	12.4	C	B
12	B St. & Nichols Rd.	**CSS**	Future Intersection				15.4	11.4	C	B
13	B St. & F St.	**CSS**	Future Intersection				11.7	10.3	B	B
14	B St. & H St.	**CSS**	Future Intersection				0.0	0.0	A	A
15	K St. & B St.	**CSS**	Future Intersection				10.0	9.3	B	A
16	El Toro Rd. & B St.	**CSS**	Future Intersection				11.8	9.4	B	A
17	El Toro Rd. & Tereticornis Av.	CSS	**>100.0**	10.4	**F**	B	**>100.0**	10.5	**F**	B
	With Normalized PHF[6,7]	CSS	**25.8**	--	**D**	--	**27.0**	--	**D**	--
18	El Toro Rd. & Carmela Ct.	CSS	**>100.0**	11.7	**F**	B	**>100.0**	12.0	**F**	B
	With Normalized PHF[6,7]	CSS	**>100.0**	--	**F**	--	**>100.0**	--	**F**	--
19	Dexter Av. & Central Av. (SR-74)	TS	42.5	46.9	D	D	42.8	53.4	D	D
20	Cambern Av. & Central Av. (SR-74)	TS	29.8	29.2	C	C	29.9	29.2	C	C
21	Driveway 1 & Nichols Rd.	**CSS**	Future Intersection				Future Intersection			

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

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

2 CSS = Cross-street Stop; AWS = All-way Stop; TS = Traffic Signal; **CSS** = Improvement

3 LOS = Level of Service

4 At the time field review was conducted, the eastbound and westbound left turn lanes were under construction. However, these lanes have since been completed. This analysis identifies the LOS results with the current left turn lanes in place.

5 Although at the time of the field review and traffic counts this intersection was operating as a cross-street stop controlled intersection, it is our understanding that the I-15 Northbound Ramps currently operates as an all-way stop.

6 The two intersections of Tereticornis Avenue and Carmela Court are in close proximity to the existing Temescal Canyon High School on El Toro Road and have been evaluated with the AM existing peak hour factor from the raw count worksheet and also with a normalized peak hour factor of 0.92. Lower peak hour factors during the AM peak hour (morning drop-off) occur near schools due to the peak 10-15 minute traffic flows during the AM peak hour, which are much

7 PHF = Peak Hour Factor

Table 7-2

Peak Hour Freeway Off-Ramp Queuing Summary for EA and EAP (2021) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	EA (2021)				EAP (2021)			
			95th Percentile Queue (Feet)		Acceptable?[1]		95th Percentile Queue (Feet)		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-15 SB Off-Ramp & Nichols Rd.	SBL/T/R	1,600	93	48	Yes	Yes	108	63	Yes	Yes
I-15 NB Off-Ramp & Nichols Rd.	NBL/T/R	1,530	623	163	Yes	Yes	773	250	Yes	Yes
Current Traffic Control[2]	*NBL/T/R*	*1,530*	*183*	*63*	*Yes*	*Yes*	*215*	*83*	*Yes*	*Yes*

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided.

[2] Although at the time of the field review and traffic counts this intersection was operating as a cross-street stop controlled intersection, it is our understanding that the I-15 Northbound Ramps currently operates as an all-way stop.

EXHIBIT 7-3: EA (2021) SUMMARY OF LOS

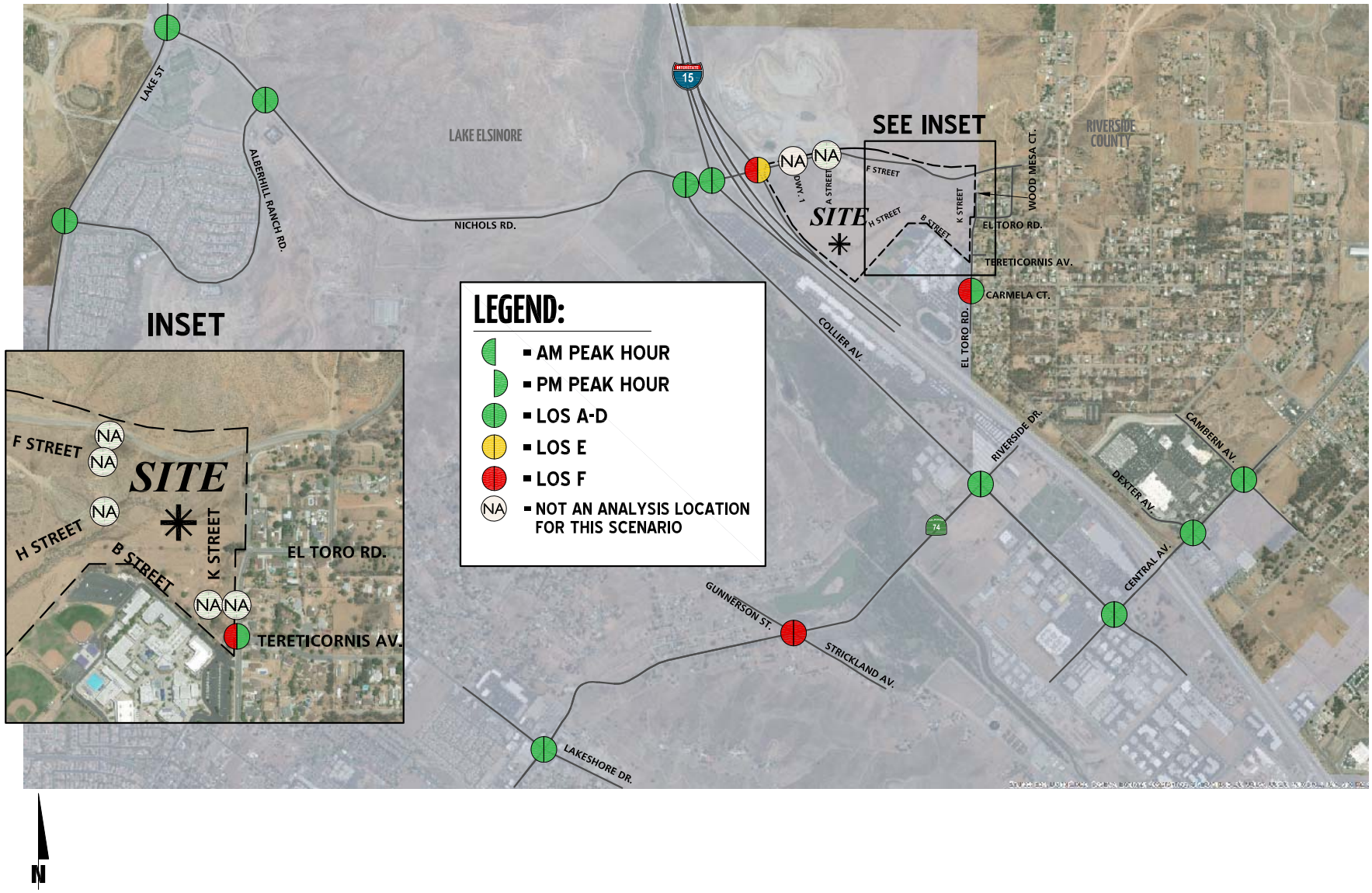


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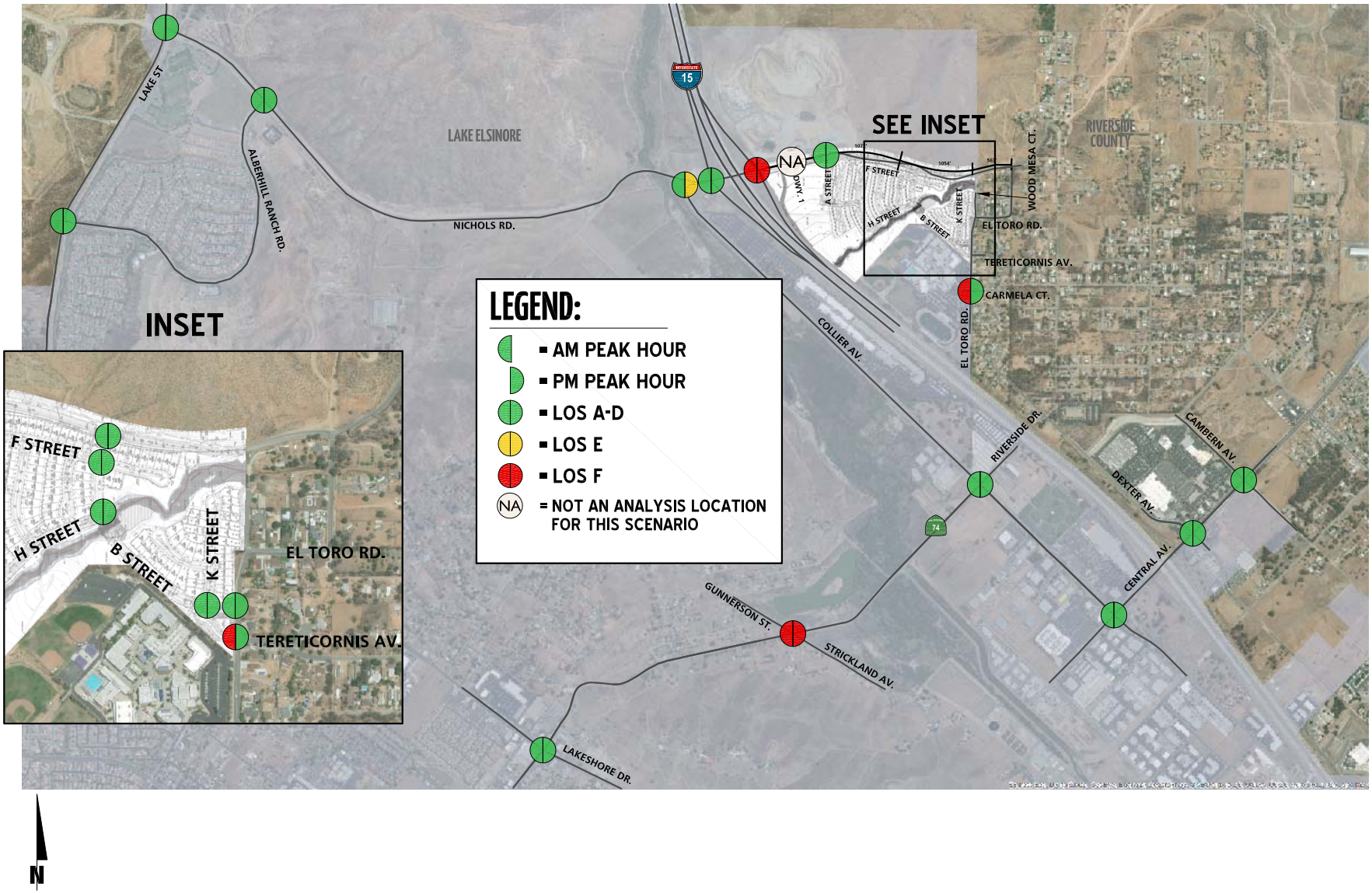
EXHIBIT 7-4: EAP (2021) SUMMARY OF LOS



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7.7 BASIC FREEWAY SEGMENT ANALYSIS

EA and EAP (2021) mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibits 7-5 and 7-6, respectively. As shown in Table 7-3, the freeway segments analyzed for this study are anticipated to operate at an acceptable LOS during the peak hours under EA and EAP (2021) traffic conditions, with the exception of the following segment:

- I-15 Freeway Southbound, North of Nichols Road (#1) – LOS E PM peak hour only

EA and EAP (2021) basic freeway segment analysis worksheets are provided in Appendices 7.7 and 7.8, respectively.

7.8 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for EA and EAP (2021) traffic conditions and the results of this analysis are presented in Table 7-4. As shown in Table 7-4, there are no additional ramp merge/diverge junction areas anticipated to operate at an unacceptable LOS during the peak hours for EA and EAP (2021) traffic conditions, in addition to the location previously identified under EA (2020) traffic conditions. EA and EAP (2021) freeway ramp junction operations analysis worksheets are provided in Appendices 7.9 and 7.10, respectively.

7.9 RECOMMENDED IMPROVEMENTS

7.9.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as deficient to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS C / LOS D or better). The effectiveness of the proposed recommended improvements is presented in Table 7-5 for EA and EAP (2021) traffic conditions.

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal.

Eastbound and westbound left turn lanes are currently under construction and are anticipated to be in place by summer 2018. However, the intersection is anticipated to continue to operate at an unacceptable LOS without the installation of a traffic signal.

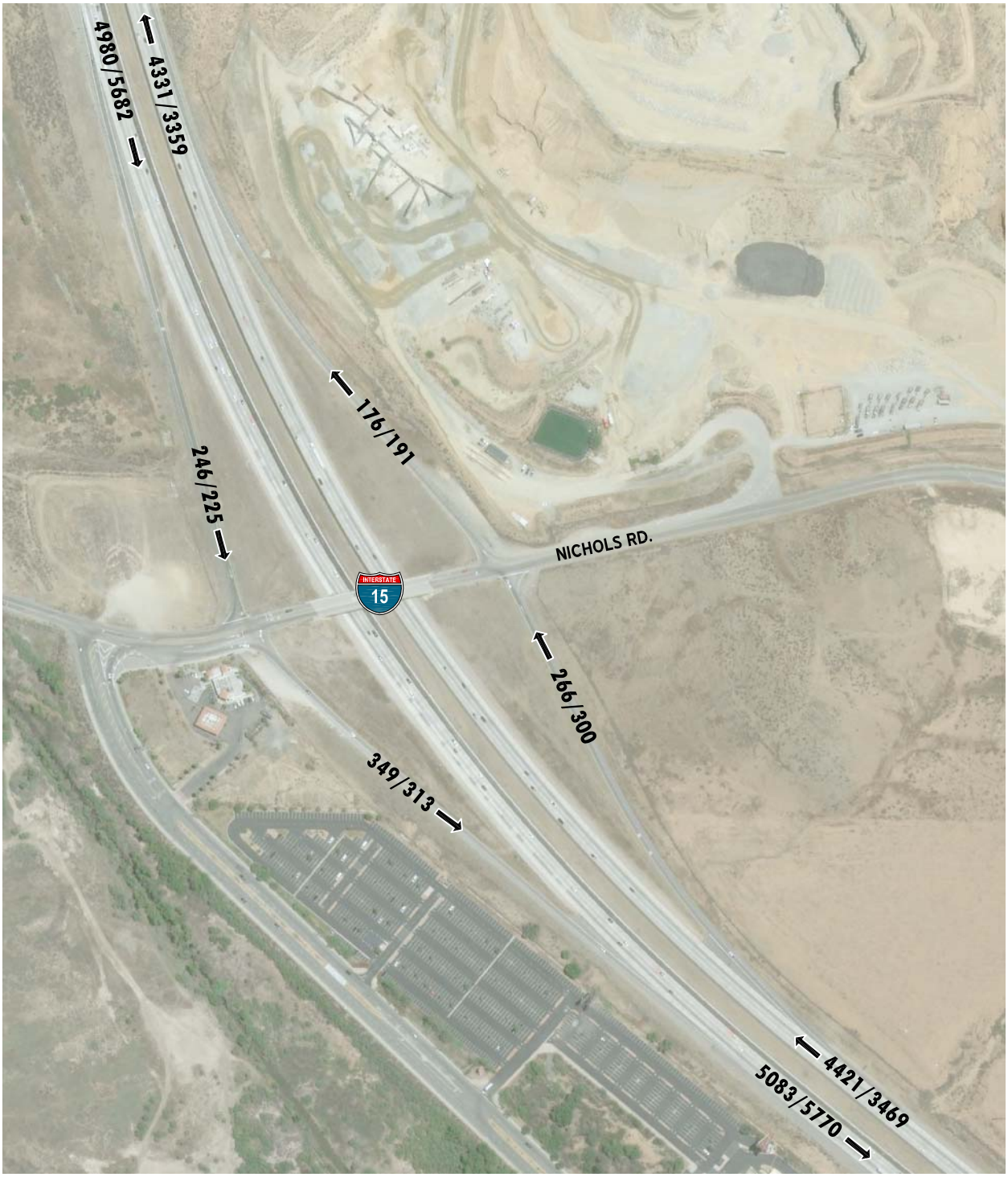
Collier Avenue & Nichols Road (#6)

- Install stop signs along Nichols Road to implement an all-way stop control.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal.
- Add a northbound right turn lane.

EXHIBIT 7-5: EA (2021) FREEWAY MAINLINE VOLUMES

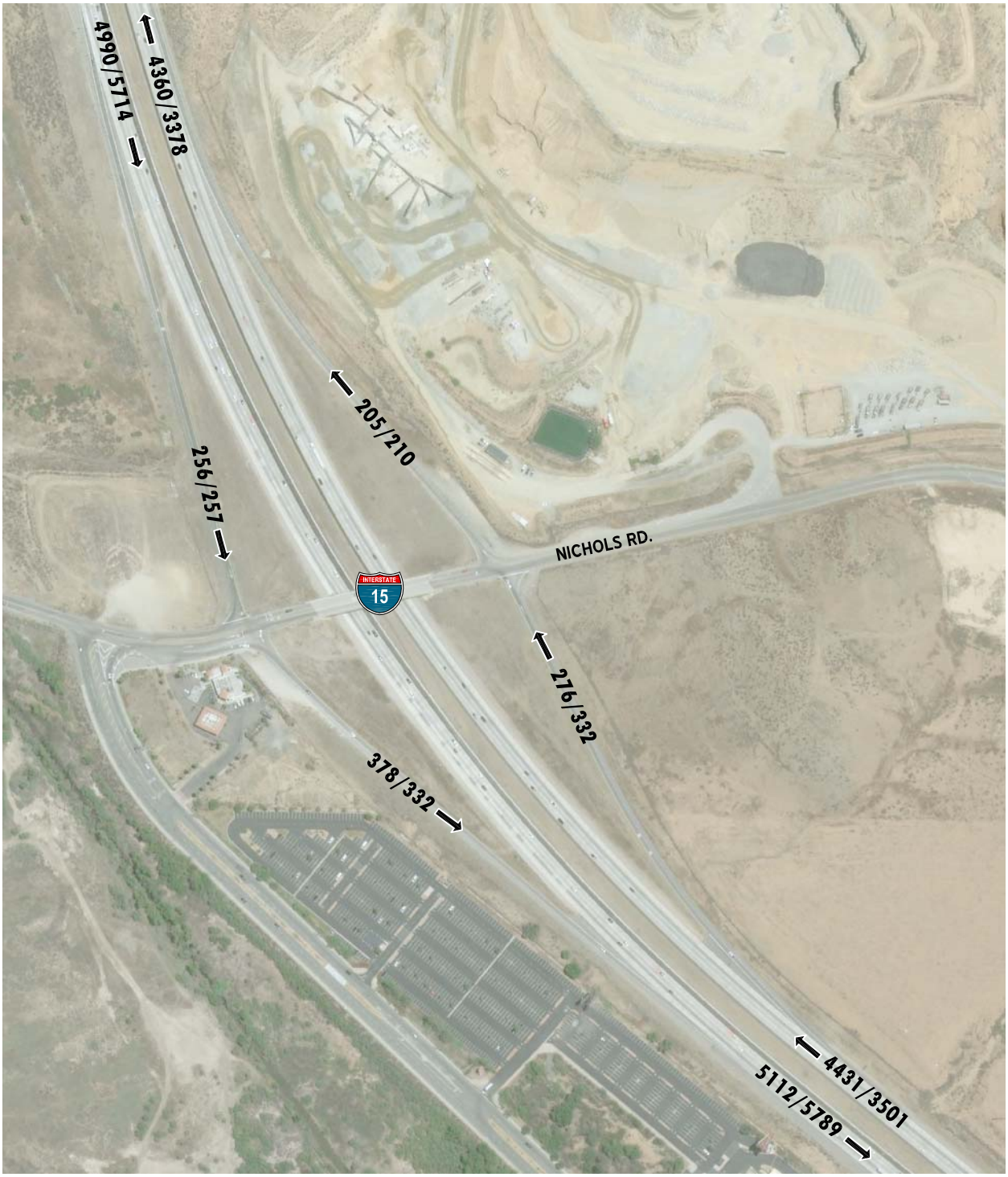


LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

N

EXHIBIT 7-6: EAP (2021) FREEWAY MAINLINE VOLUMES



LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

N

Table 7-3

Basic Freeway Segment Analysis for EA and EAP (2021) Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	EA (2021)				EAP (2021)			
				Density[2]		LOS[3]		Density[2]		LOS[3]	
				AM	PM	AM	PM	AM	PM	AM	PM
I-15 Freeway	Southbound	North of Nichols Rd.	3	29.0	**35.8**	D	**E**	29.0	**36.2**	D	**E**
		South of Nichols Rd.	3	29.9	**36.8**	D	**E**	30.1	**37.0**	D	**E**
	Northbound	North of Nichols Rd.	3	23.5	17.7	C	B	23.7	17.8	C	B
		South of Nichols Rd.	3	24.1	18.2	C	C	24.2	18.3	C	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] LOS = Level of Service

Table 7-4

Freeway Ramp Junction Merge/Diverge Analysis for EA and EAP (2021) Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	EA (2021)				EAP (2021)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]
I-15 Freeway	Southbound	Off-Ramp at Nichols Rd.	3	32.5	D	**35.6**	**E**	32.6	D	**35.7**	**E**
		On-Ramp at Nichols Rd.	3	29.1	D	31.9	D	29.3	D	32.7	D
	Northbound	On-Ramp at Nichols Rd.	3	23.8	C	19.0	B	24.0	C	19.1	B
		Off-Ramp at Nichols Rd.	3	29.2	D	24.2	C	29.3	D	24.4	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] LOS = Level of Service

Table 7-5

Intersection Analysis for EA and EAP (2021) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1] Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Delay[2] (secs.) AM	Delay[2] (secs.) PM	Level of Service AM	Level of Service PM
5	Gunnerson St./Strickland Av. & Riverside Dr. (SR-74)																	
	EA (2021)																	
	- Without Improvements	CSS	0	1	1	0	1	1	0	1	0	0	1	0	**>100.0**	**>100.0**	**F**	**F**
		CSS	0	1	1	0	1	1	**1**	1	0	**1**	1	0	**>100.0**	**>100.0**	**F**	**F**
	- With Improvements[4,5]	**TS**	0	1	1	0	1	1	**1**	1	0	**1**	1	0	9.1	9.1	A	A
	EAP (2021)																	
	- Without Improvements	CSS	0	1	1	0	1	1	0	1	0	0	1	0	**>100.0**	**>100.0**	**F**	**F**
		CSS	0	1	1	0	1	1	**1**	1	0	**1**	1	0	**>100.0**	**>100.0**	**F**	**F**
	- With Improvements[4,5]	**TS**	0	1	1	0	1	1	**1**	1	0	**1**	1	0	9.2	9.1	A	A
6	Collier Av. & Nichols Rd.																	
	EA (2021)																	
	- Without Improvements	CSS	1	0	1	0	0	0	0	1	0	1	1	0	22.4	34.0	C	D
	- With Improvements		Not Applicable															
	EAP (2021)																	
	- Without Improvements	CSS	1	0	1	0	0	0	0	1	0	1	1	0	24.3	**37.3**	C	**E**
	- With Improvements	**AWS**	1	0	1	0	0	0	0	1	0	1	1	0	18.0	16.5	C	C
10	I-15 Northbound Ramps & Nichols Rd.																	
	EA (2021)																	
	- Without Improvements	CSS	0	1	0	0	0	0	1	1	0	0	1	0	**>100.0**	**66.3**	**F**	**F**
	- Without Improvements	AWS	0	1	0	0	0	0	1	1	0	0	1	0	**43.8**	11.7	**E**	B
	- With Improvements	**TS**	0	1	**1**	0	0	0	1	1	0	0	1	0	14.1	18.4	B	B
	EAP (2021)																	
	- Without Improvements	CSS	0	1	0	0	0	0	1	1	0	0	1	0	**>100.0**	**66.3**	**F**	**F**
	- Without Improvements	AWS	0	1	0	0	0	0	1	1	0	0	1	0	**68.6**	13.3	**F**	B
	- With Improvements	**TS**	0	1	**1**	0	0	0	1	1	0	0	1	0	15.6	20.2	B	C
17	El Toro Rd. & Tereticornis Av.																	
	EA (2021)																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	10.4	**F**	B
	- With Improvements	**AWS**	0	1	0	0	1	0	0	0	0	0	1	0	**53.4**	9.5	**F**	A
	- Without Improvements[6]	CSS	0	1	0	0	1	0	0	1	0	0	1	0	**25.8**	--	**D**	--
	- With Improvements[6]	**AWS**	0	1	0	0	1	0	0	0	0	0	1	0	15.4	--	C	--
	EAP (2021)																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	10.5	**F**	B
	- With Improvements	**AWS**	0	1	0	0	1	0	0	0	0	0	1	0	**61.0**	9.7	**F**	A
	- Without Improvements[6]	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**27.0**	--	**D**	--
	- With Improvements[6]	**AWS**	0	1	0	0	1	0	0	0	0	0	1	0	16.0	--	C	--

Table 7-5

Intersection Analysis for EA and EAP (2021) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
18	El Toro Rd. & Carmela Ct.																	
	EA (2021)																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	11.7	**F**	B
	- With Improvements[7]	**AWS**	0	1	0	0	1	**1**	0	1	0	0	1	0	**77.5**	9.4	**F**	A
	- Without Improvements[6]	CSS	0	1	0	0	1	0	0	1	0	0	1	0	**>100.0**	--	**F**	--
	- With Improvements[6,7]	**AWS**	0	1	0	0	1	**1**	0	1	0	0	1	0	23.2	--	C	--
	EAP (2021)																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	12.0	**F**	B
	- With Improvements[7]	**AWS**	0	1	0	0	1	**1**	0	0	0	0	1	0	**83.7**	9.6	**F**	A
	- Without Improvements[6]	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	--	**F**	--
	- With Improvements[6,7]	**AWS**	0	1	0	0	1	**1**	0	0	0	0	1	0	24.4	--	C	--

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

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; d = Defacto Right Turn Lane; **1** = Improvement

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

3 CSS = Cross-street Stop; AWS = All-way Stop; TS = Traffic Signal; **CSS** = Improvement

4 Eastbound and westbound left turn lanes are currently under construction and are anticipated to be in place by summer 2018. However, the intersection is anticipated to continue to operate at an unacceptable LOS without the installation of a traffic signal.

5 Although the intersection is not anticipated to warrant a traffic signal under Existing and EAP conditions, the addition of lane geometric improvements alone is not anticipated to improve the peak hour delays. As such, the intersection should be monitored and a traffic signal should be installed at the City Traffic Engineer's

6 A normalized AM PHF of 0.92 is used to determine peak hour operations outside of the 10-15 minute drop-off period.

7 Prohibit on-street parking to allow restriping for a 100 foot southbound right turn pocket.

El Toro Road & Tereticornis Avenue (#17)

- Install stop signs along El Toro Road to implement an all-way stop control.

El Toro Road & Carmela Court (#18)

- Install stop signs along El Toro Road to implement an all-way stop control.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.

7.9.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

At this time, Caltrans has no fee programs or other improvement programs in place to address the deficiencies caused by development projects in the City of Lake Elsinore (or other neighboring jurisdictions) on the SHS roadway segments. As such, no additional improvements have been recommended to address the EA and EAP (2021) deficiencies on the SHS.

8 EA AND EAP (2024) TRAFFIC CONDITIONS

This section discusses the methods used to develop EA and EAP (2024) 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 EA and EAP (2024) conditions are consistent with those shown on Exhibit 3-1:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EAP conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways). This includes B Street between El Toro Road and Nichols Road as part of Phase 1.
- Subsequent to the traffic counts and field review conducted for this traffic study, improvements were implemented at the intersections of Gunnerson Street/Strickland Avenue at Riverside Drive (SR-74) and at the I-15 Northbound Ramps at Nichols Road. The recent improvements at Gunnerson Street/Strickland Avenue and Riverside Drive (SR-74) include eastbound and westbound left turn lanes. The I-15 Northbound Ramps at Nichols Road has recently been modified to an all-way stop controlled intersections. The operations analysis has been conducted for both Existing lanes and controls and these recently implemented improvements for EA and EAP (2024) traffic conditions.

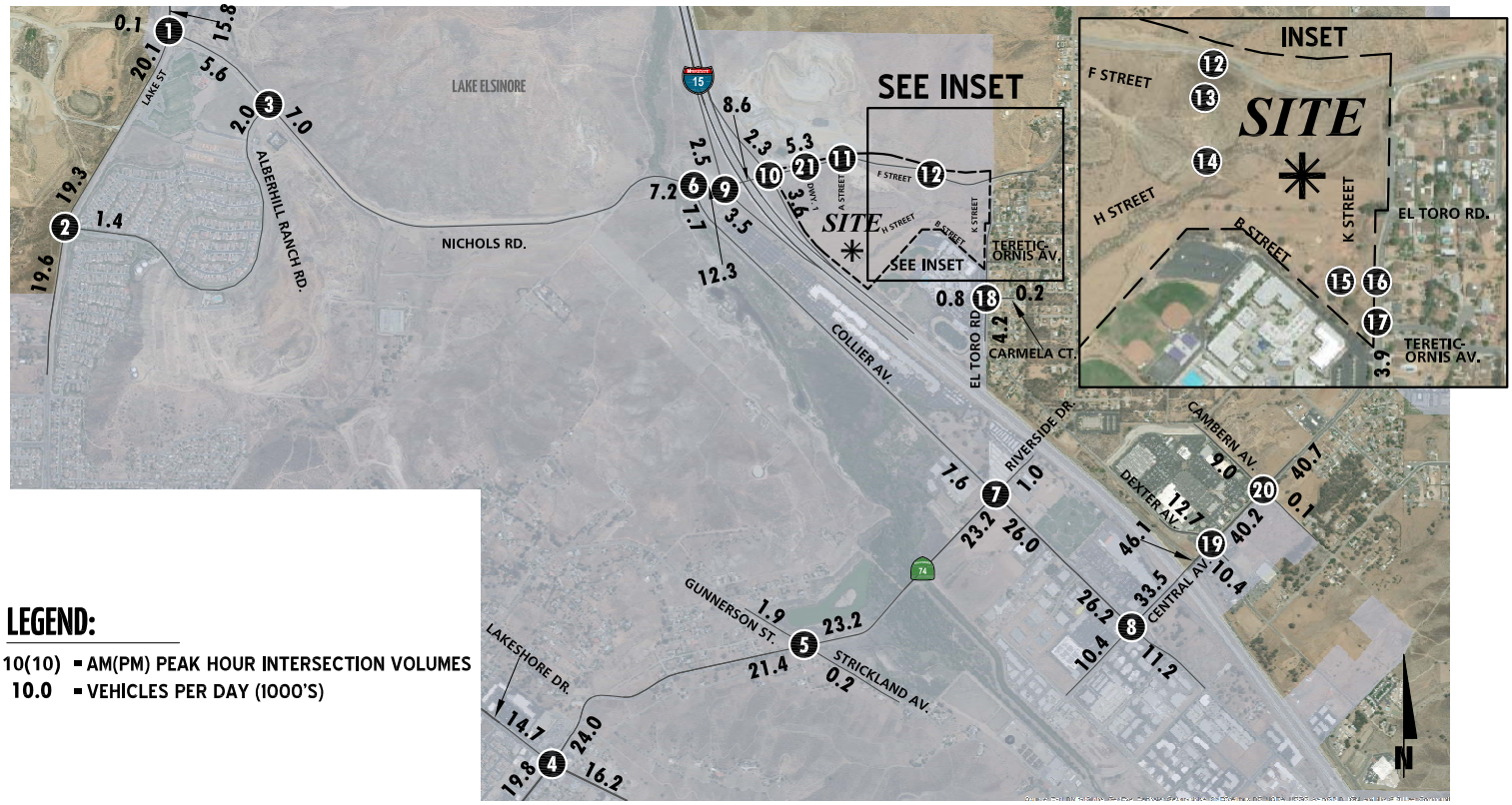
8.2 EA (2024) TRAFFIC VOLUME FORECASTS

To account for background traffic growth, an ambient growth from Existing conditions of 12.62% (2 percent per year compounded over 6 years) is included for EA (2024) traffic conditions. Cumulative development projects are not included as part of the EA analysis. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for EA (2024) traffic conditions are shown on Exhibit 8-1.

8.3 EAP TRAFFIC VOLUME FORECASTS

To account for background traffic growth, an ambient growth from Existing conditions of 12.62% (2 percent per year compounded over 6 years) is included for EAP (2024) traffic conditions, plus Project Buildout traffic. Cumulative development projects are not included as part of the EAP analysis. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for EAP (2024) traffic conditions are shown on Exhibit 8-2.

EXHIBIT 8-1: EA (2024) TRAFFIC VOLUMES



LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)

1 Lake St. & Nichols Rd.

5(1)	306(952)	19(33)
43(20)	6(0)	199(256)
17(1)	5(7)	0(1)
0(1)	759(408)	391(185)

2 Lake St. & Alberhill Ranch Rd.

466(1140)	20(26)
53(21)	64(39)
1141(542)	54(34)

3 Alberhill Ranch Rd. & Nichols Rd.

204(267)	39(83)
404(206)	18(20)
43(10)	78(69)

4 Lakeshore Dr. & Riverside Dr. (SR-74)

10(17)	193(347)	224(298)
380(336)	596(668)	145(132)
21(33)	499(536)	159(296)
300(218)	330(283)	123(176)

5 Gunnerson St./ Strickland Av. & Riverside Dr. (SR-74)

6(2)	3(1)	52(32)
39(130)	698(963)	2(7)
0(2)	931(938)	3(5)
0(0)	2(0)	12(7)

6 Collier Av. & Nichols Rd.

207(280)	105(250)
454(211)	36(61)
42(88)	102(286)

7 Collier Av. & Riverside Dr. (SR-74)

51(104)	59(200)	1(3)
2(8)	1(19)	6(23)
83(111)	11(12)	901(853)
688(976)	80(250)	11(21)

8 Collier Av. & Central Av. (SR-74)

12(35)	64(149)	853(1016)
666(802)	310(215)	562(229)
37(211)	98(355)	33(56)
33(55)	60(132)	309(378)

9 I-15 SB Ramps & Nichols Rd.

70(149)	7(2)	185(88)
242(382)	63(28)
257(269)	301(302)

10 I-15 NB Ramps & Nichols Rd.

100(44)	148(126)
83(158)	358(199)
158(284)	3(1)	122(34)

11 A Street & Nichols Rd.

Future Intersection

12 B Street & Nichols Rd.

248(170)
0(0)
480(233)
0(0)
0(0)
0(0)

13 B Street & F Street

Future Intersection

14 B Street & H Street

Future Intersection

15 K Street & B Street

0(0)	0(0)
0(0)
0(0)
0(0)

16 El Toro Rd. & B Street

0(0)	485(223)
0(0)
0(0)
0(0)	232(161)

17 El Toro Rd. & Tereticornis Av.

465(169)	20(54)
26(19)
187(14)
206(142)	73(27)

18 El Toro Rd. & Carmela Ct.

257(11)	386(164)	9(7)
17(1)
0(0)
7(6)
145(16)
0(0)
296(33)
187(15)	117(152)	7(5)

19 Dexter Av. & Central Av. (SR-74)

419(355)	159(102)	77(75)
209(75)
1546(1252)
136(176)
256(381)
998(1821)
140(181)
111(134)	283(146)	98(189)

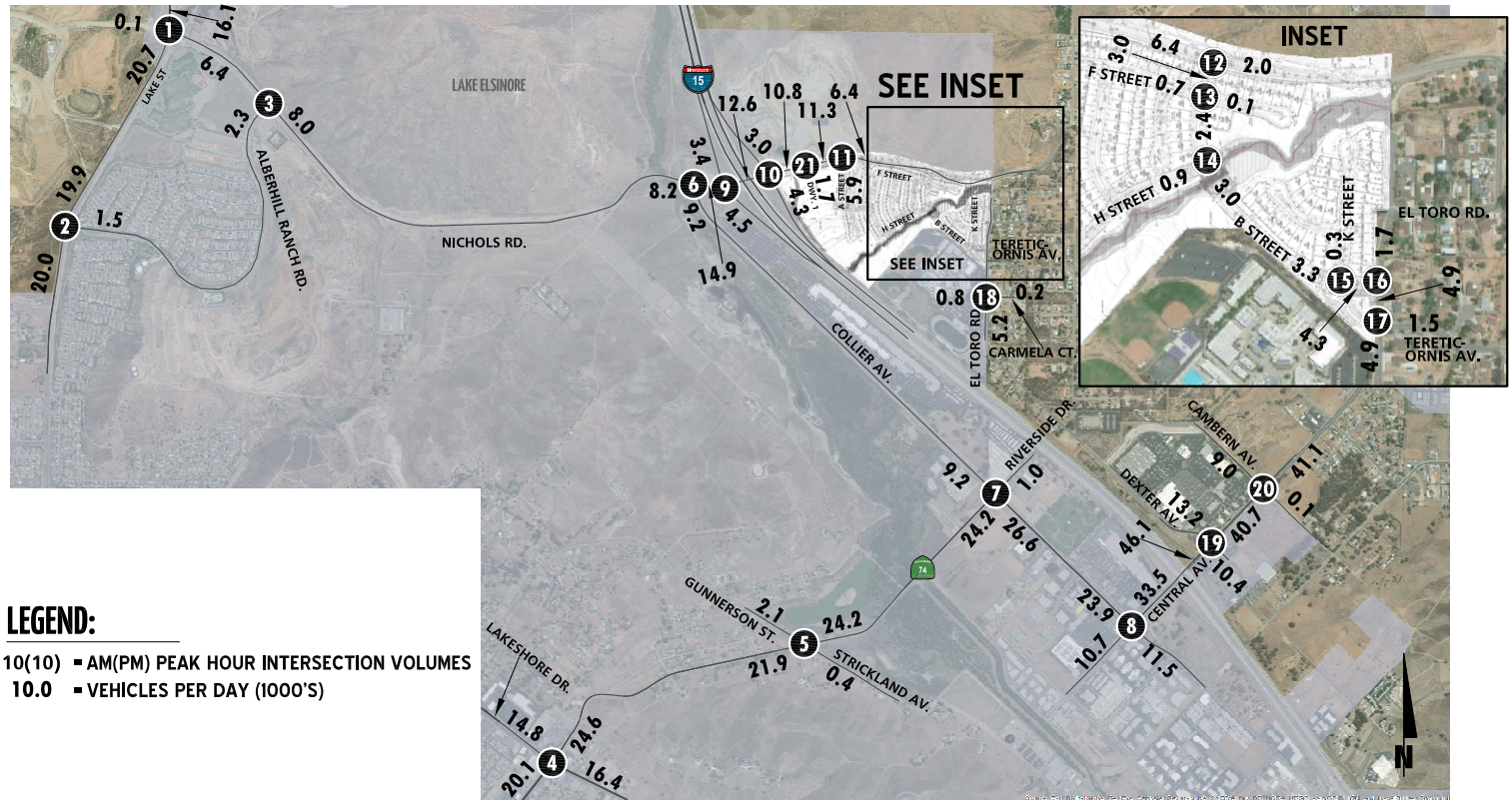
20 Cambern Av. & Central Av. (SR-74)

97(93)	5(3)	142(259)
125(161)
1807(1260)
1(0)
139(284)
1152(1955)
1(1)
3(1)	2(3)	1(1)

21 Driveway 1 & Nichols Rd.

Future Intersection

EXHIBIT 8-2: EAP (2024) TRAFFIC VOLUMES



LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)

Location	Lake St. & Nichols Rd.	Lake St. & Alberhill Ranch Rd.	Alberhill Ranch Rd. & Nichols Rd.	Lakeshore Dr. & Riverside Dr. (SR-74)	Gunnerson St./ Strickland Av. & Riverside Dr. (SR-74)	Collier Av. & Nichols Rd.	Collier Av. & Riverside Dr. (SR-74)
1	5(1) 306(952) 37(46)	486(1158) 27(33)		10(17) 193(347) 234(305)	6(2) 3(1) 66(41)		97(145) 89(226) 1(3)
	56(32) 6(0) 226(280)	63(28) 64(39)	245(303) 51(94)	387(343) 609(679) 152(138)	49(139) 725(987) 12(16)	260(327) 180(317)	2(8) 1(19) 6(23)
	17(1) 5(7) 0(1)	1166(562) 54(34)	457(246) 18(20)	21(33) 513(550) 159(296)	0(2) 963(966) 3(5)	524(262) 36(61)	142(157) 11(12) 901(853)
	0(1) 759(408) 426(212)		43(10) 95(80)	300(218) 330(283) 131(183)	0(0) 2(0) 26(16)	42(88) 198(361)	688(976) 116(279) 11(21)

Location	Collier Av. & Central Av. (SR-74)	I-15 SB Ramps & Nichols Rd.	I-15 NB Ramps & Nichols Rd.	A Street & Nichols Rd.	B Street & Nichols Rd.	B Street & F Street	B Street & H Street
8	27(48) 79(162) 853(1016)	70(149) 7(2) 257(155)				12(32) 237(110) 2(5)	0(0) 241(112)
	666(802) 310(215) 562(229)	370(496) 130(87)	164(99) 343(299)	288(194) 17(11)	149(101) 0(0)	4(3) 0(0) 1(0)	
	55(226) 98(355) 33(56)	422(395) 301(302)	83(158) 596(392)	441(222) 126(122)	258(142) 251(147)	29(17) 0(0) 3(2)	0(0) 48(44)
	33(55) 78(147) 309(378)		158(284) 3(1) 200(104)	399(385) 5(4)	156(105) 0(0)	1(3) 123(85) 0(1)	68(46) 125(89)

Location	K Street & B Street	El Toro Rd. & B Street	El Toro Rd. & Tereticornis Av.	El Toro Rd. & Carmela Ct.	Dexter Av. & Central Av. (SR-74)	Cambern Av. & Central Av. (SR-74)	Driveway 1 & Nichols Rd.
15	7(4) 7(4)	0(0) 251(120)	514(211) 30(63)	257(11) 435(206) 9(7)	419(355) 160(103) 101(96)	100(95) 5(3) 142(259)	
	3(8) 185(131)		40(28) 187(14)	17(1) 0(0) 7(6)	240(98) 1546(1252) 136(176)	125(161) 1835(1281) 1(0)	327(219)
	3(8) 285(148)	0(0) 293(153)	265(191) 73(27)	145(16) 0(0) 296(33)	256(381) 998(1821) 140(181)	141(286) 1173(1974) 1(1)	443(220) 354(276)
		278(176) 26(44)		187(15) 176(201) 7(5)	111(134) 284(148) 98(189)	3(1) 2(3) 1(1)	7(7)

8.4 INTERSECTION OPERATIONS ANALYSIS

LOS calculations were conducted for the study intersections to evaluate their operations under EAP conditions with roadway and intersection geometrics consistent with Section 8.1 *Roadway Improvements*. The intersection analysis results are summarized in Table 6-1, which indicates that the following additional intersection is anticipated to operate at unacceptable LOS for EA (2024) traffic conditions, in addition to those previously identified under EA (2021) traffic conditions:

- Lakeshore Drive & Riverside Drive (SR-74) (#4) – LOS E AM peak hour only

With the addition of Project Buildout traffic, the following additional intersection is anticipated to operate at an unacceptable LOS during one or more peak hours under EAP (2024) traffic conditions, in addition to the locations previously identified under EA (2024) traffic conditions:

- I-15 Northbound Ramps & Nichols Road (#9) – LOS F AM peak hour, LOS E PM peak hour

A summary of the peak hour intersection LOS for EA and EAP (2024) traffic conditions are shown on Exhibits 8-3 and 8-4, respectively. The intersection operations analysis worksheets for EA and EAP (2024) traffic conditions are included in Appendices 8.1 and 8.2 of this TIA, respectively.

8.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

No additional study area intersections are anticipated to meet traffic signal warrants for EA EAP (2024) traffic conditions in addition to those previously warranted under Existing traffic conditions (see Appendix 8.3).

The intersection of Alberhill Ranch Road & Nichols Road is anticipated to meet the traffic signal warrant under EAP (2024) traffic conditions (see Appendix 8.4). However, this intersection operates at an acceptable LOS for EAP traffic conditions. As such, the intersection should be monitored, and a traffic signal should be installed at the discretion of the City of Lake Elsinore Traffic Engineer.

8.6 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-15 Freeway and Nichols Road interchange to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially “spill back” onto the I-15 Freeway mainline. Queuing analysis findings are presented in Table 8-2 for EA and EAP (2024) traffic conditions. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 8-2, the I-15 Northbound off-ramp at Nichols Road is anticipated to experience queuing issues under EAP (2024) traffic conditions only for the northbound shared left-through-right turn lane during the AM peak hour only. Worksheets for EA and EAP (2024) conditions off-ramp queuing analysis are provided in Appendices 8.5 and 8.6, respectively.

Table 8-1

Intersection Analysis for EA and EAP (2024) Conditions

#	Intersection	Traffic Control[2]	EA (2024) Delay[1] (secs.) AM	EA (2024) Delay[1] (secs.) PM	EA (2024) Level of Service AM	EA (2024) Level of Service PM	EAP (2024) Delay[1] (secs.) AM	EAP (2024) Delay[1] (secs.) PM	EAP (2024) LOS[3] AM	EAP (2024) LOS[3] PM
1	Lake St. & Nichols Rd.	TS	20.2	46.9	C	D	24.7	54.5	C	D
2	Lake St. & Alberhill Ranch Rd.	TS	15.9	8.8	B	A	17.7	9.7	B	A
3	Alberhill Ranch Rd. & Nichols Rd.	AWS	12.8	10.4	B	B	15.7	11.4	C	B
4	Lakeshore Dr. & Riverside Dr. (SR-74)	TS	**55.2**	51.6	**E**	D	**56.4**	53.3	**E**	D
5	Gunnerson St./Strickland Av. & Riverside Dr. (SR-74)	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**
	Current Intersection Lanes[4]	*CSS*	***>100.0***	***>100.0***	***F***	***F***	***>100.0***	***>100.0***	***F***	***F***
6	Collier Av. & Nichols Rd.	CSS	24.8	**41.4**	C	**E**	**47.2**	**94.2**	**E**	**F**
7	Collier Av. & Riverside Dr. (SR-74)	TS	16.3	31.2	B	C	19.3	37.1	B	D
8	Collier Av. & Central Av. (SR-74)	TS	35.3	34.3	D	C	35.3	34.6	D	D
9	I-15 Southbound Ramps & Nichols Rd.	AWS	19.1	16.0	C	C	**68.4**	**37.2**	**F**	**E**
10	I-15 Northbound Ramps & Nichols Rd.	CSS	**>100.0**	**52.6**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**
	Current Intersection Control[5]	*AWS*	***56.3***	*12.4*	***F***	*B*	***>100.0***	*25.7*	***F***	*D*
11	A St. & Nichols Rd.	**CSS/TS[6]**	Future Intersection				16.6	13.1	B	B
12	B St. & Nichols Rd.	**CSS**	Future Intersection				16.7	11.7	C	B
13	B St. & F St.	**CSS**	Future Intersection				11.8	10.2	B	B
14	B St. & H St.	**CSS**	Future Intersection				10.0	9.1	B	A
15	K St. & B St.	**CSS**	Future Intersection				10.8	9.8	B	A
16	El Toro Rd. & B St.	**CSS**	Future Intersection				13.0	9.8	B	A
17	El Toro Rd. & Tereticornis Av.	CSS	**>100.0**	10.6	**F**	B	**>100.0**	11.1	**F**	B
	With Normalized PHF[7,8]	CSS	**29.5**	--	**D**	--	**51.2**	--	**F**	--
18	El Toro Rd. & Carmela Ct.	CSS	**>100.0**	12.1	**F**	B	**>100.0**	13.4	**F**	B
	With Normalized PHF[7,8]	CSS	**>100.0**	--	**F**	--	**>100.0**	--	**F**	--
19	Dexter Av. & Central Av. (SR-74)	TS	48.0	52.8	D	D	50.7	54.8	D	D
20	Cambern Av. & Central Av. (SR-74)	TS	36.9	31.8	D	C	39.2	32.3	D	C
21	Driveway 1 & Nichols Rd.	**CSS**	Future Intersection				13.1	10.5	B	B

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

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

2 CSS = Cross-street Stop; AWS = All-way Stop; TS = Traffic Signal; **CSS** = Improvement

3 LOS = Level of Service

4 At the time field review was conducted, the eastbound and westbound left turn lanes were under construction. However, these lanes have since been completed. This analysis identifies the LOS results with the current left turn lanes in place.

5 Although at the time of the field review and traffic counts this intersection was operating as a cross-street stop controlled intersection, it is our understanding that the I-15 Northbound Ramps currently operates as an all-way stop.

6 For buildout conditions, the intersection is evaluated with a traffic signal, an eastbound right-turn pocket and striping the northbound approach to a left turn and right turn lane.

7 The two intersections of Tereticornis Avenue and Carmela Court are in close proximity to the existing Temescal Canyon High School on El Toro Road and have been evaluated with the AM existing peak hour factor from the raw count worksheet and also with a normalized peak hour factor of 0.92. Lower peak hour factors during the AM peak hour (morning drop-off) occur near schools due to the peak 10-15 minute traffic flows during the AM peak hour, which are much

8 PHF = Peak Hour Factor

Table 8-2

Peak Hour Freeway Off-Ramp Queuing Summary for EA and EAP (2024) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	EA (2024)				EAP (2024)			
			95th Percentile Queue (Feet)		Acceptable?[1]		95th Percentile Queue (Feet)		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-15 SB Off-Ramp & Nichols Rd.	SBL/T/R	1,600	110	55	Yes	Yes	235	105	Yes	Yes
I-15 NB Off-Ramp & Nichols Rd.	NBL/T/R	1,530	758	213	Yes	Yes	**1,563**	653	**No**	Yes
Current Traffic Control[2]	*NBL/T/R*	*1,530*	*213*	*73*	*Yes*	*Yes*	*410*	*160*	*Yes*	*Yes*

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided.

[2] Although at the time of the field review and traffic counts this intersection was operating as a cross-street stop controlled intersection, it is our understanding that the I-15 Northbound Ramps currently operates as an all-way stop.

EXHIBIT 8-3: EA (2024) SUMMARY OF LOS

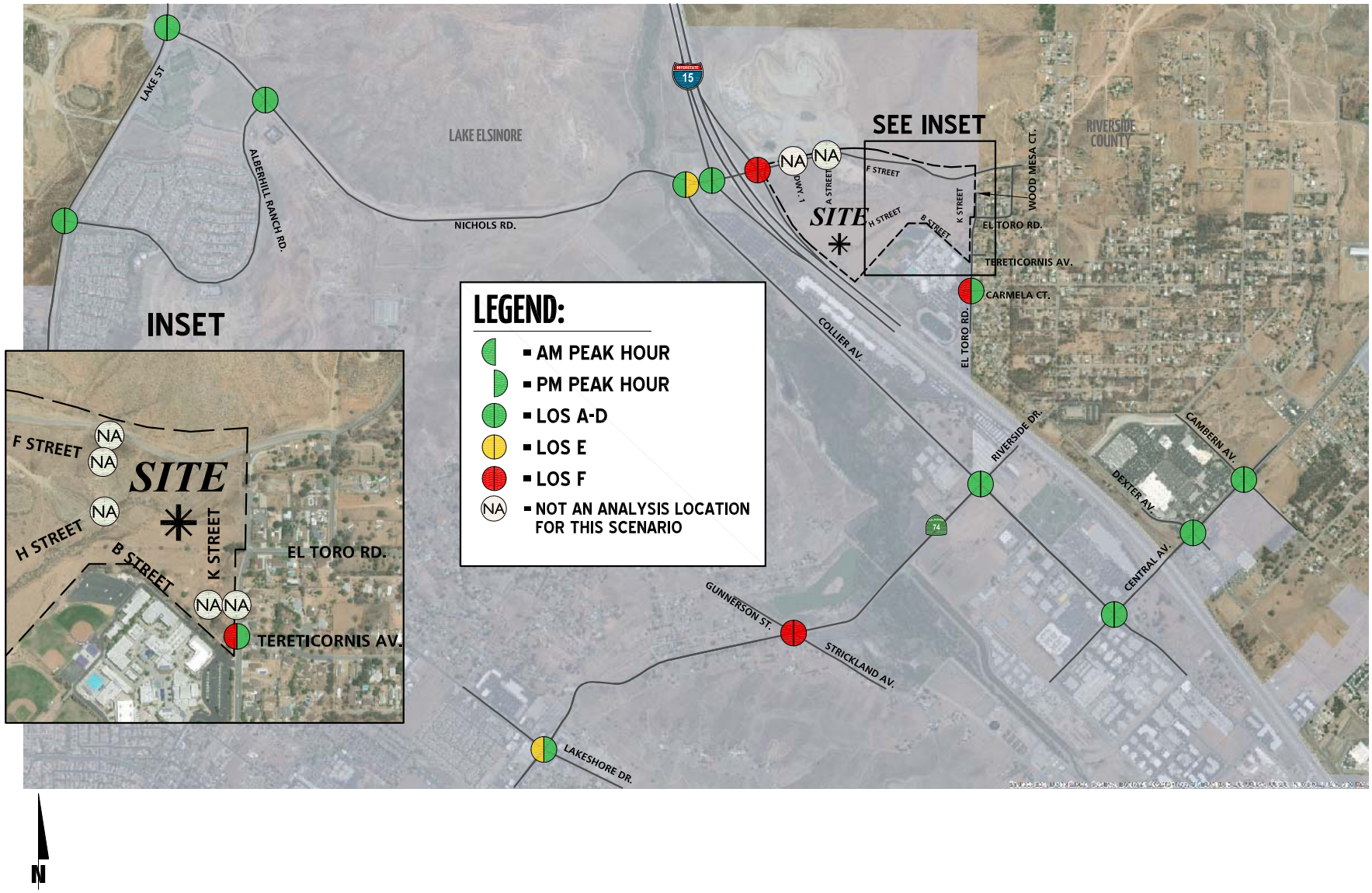
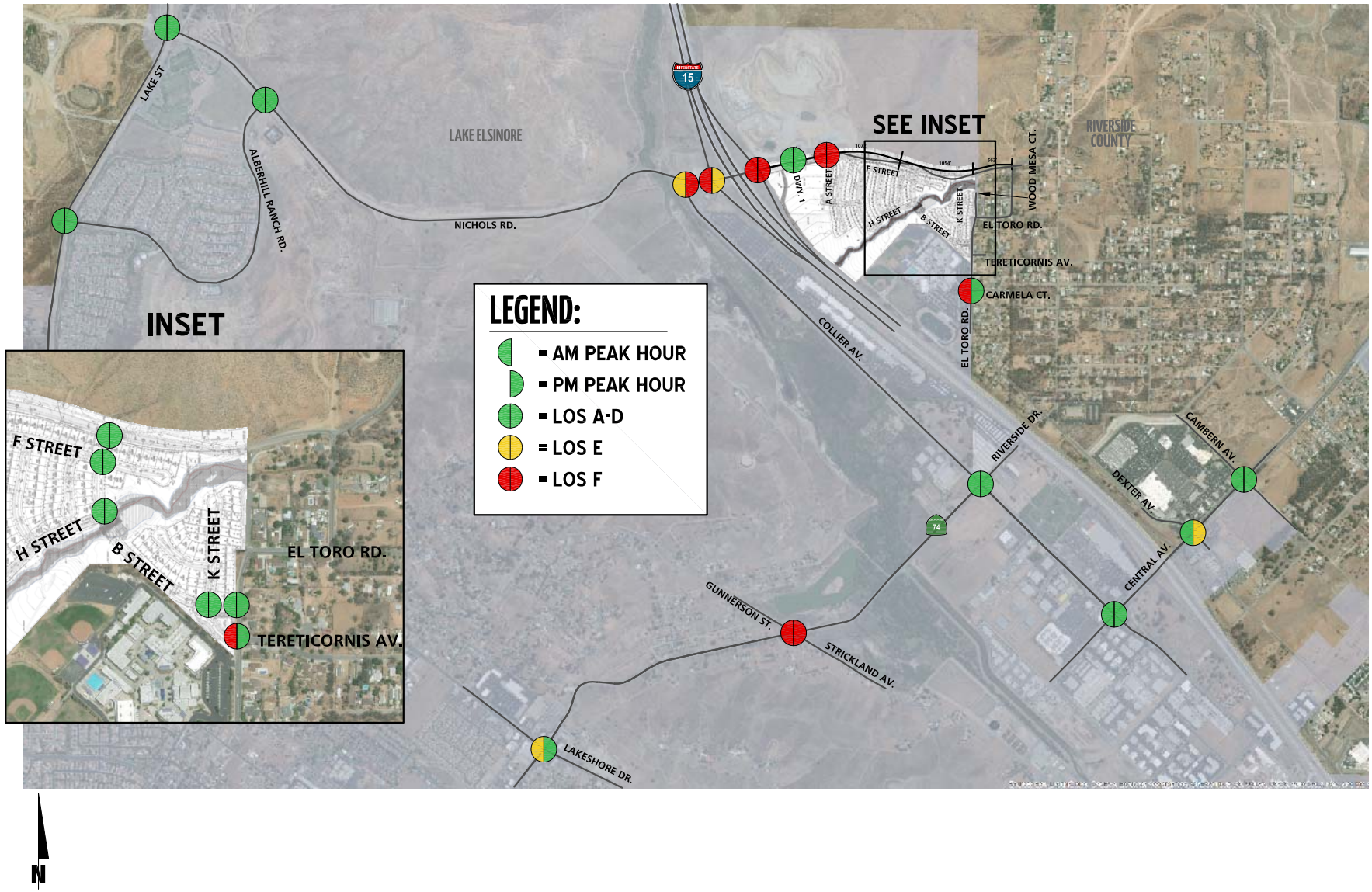


EXHIBIT 8-4: EAP (2024) SUMMARY OF LOS



8.7 BASIC FREEWAY SEGMENT ANALYSIS

EA and EAP (2024) mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibits 8-5 and 8-6, respectively. As shown in Table 8-3, there are no additional freeway segments anticipated to operate at an unacceptable LOS under EA and EAP (2024) traffic conditions, in addition to those previously identified under EA (2021) traffic conditions. EA and EAP (2024) basic freeway segment analysis worksheets are provided in Appendices 8.7 and 8.8, respectively.

8.8 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for EA and EAP (2024) conditions and the results of this analysis are presented in Table 8-4. As shown in Table 8-4, there are no additional ramp merge/diverge segments anticipated to operate at an unacceptable LOS under EA and EAP (2024) traffic conditions, in addition to those previously identified under EA (2021) traffic conditions. EA and EAP (2024) freeway ramp junction operations analysis worksheets are provided in Appendices 8.9 and 8.10, respectively.

8.9 RECOMMENDED IMPROVEMENTS

8.9.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as deficient to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS C / LOS D or better). The effectiveness of the proposed recommended improvements is presented in Table 8-5 for EA and EAP (2024) traffic conditions.

Lakeshore Drive & Riverside Drive (SR-74) (#4)

- Restripe the westbound right turn lane to a shared through-right lane.

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal.

Eastbound and westbound left turn lanes are currently under construction and are anticipated to be in place by summer 2018. However, the intersection is anticipated to continue to operate at an unacceptable LOS without the installation of a traffic signal.

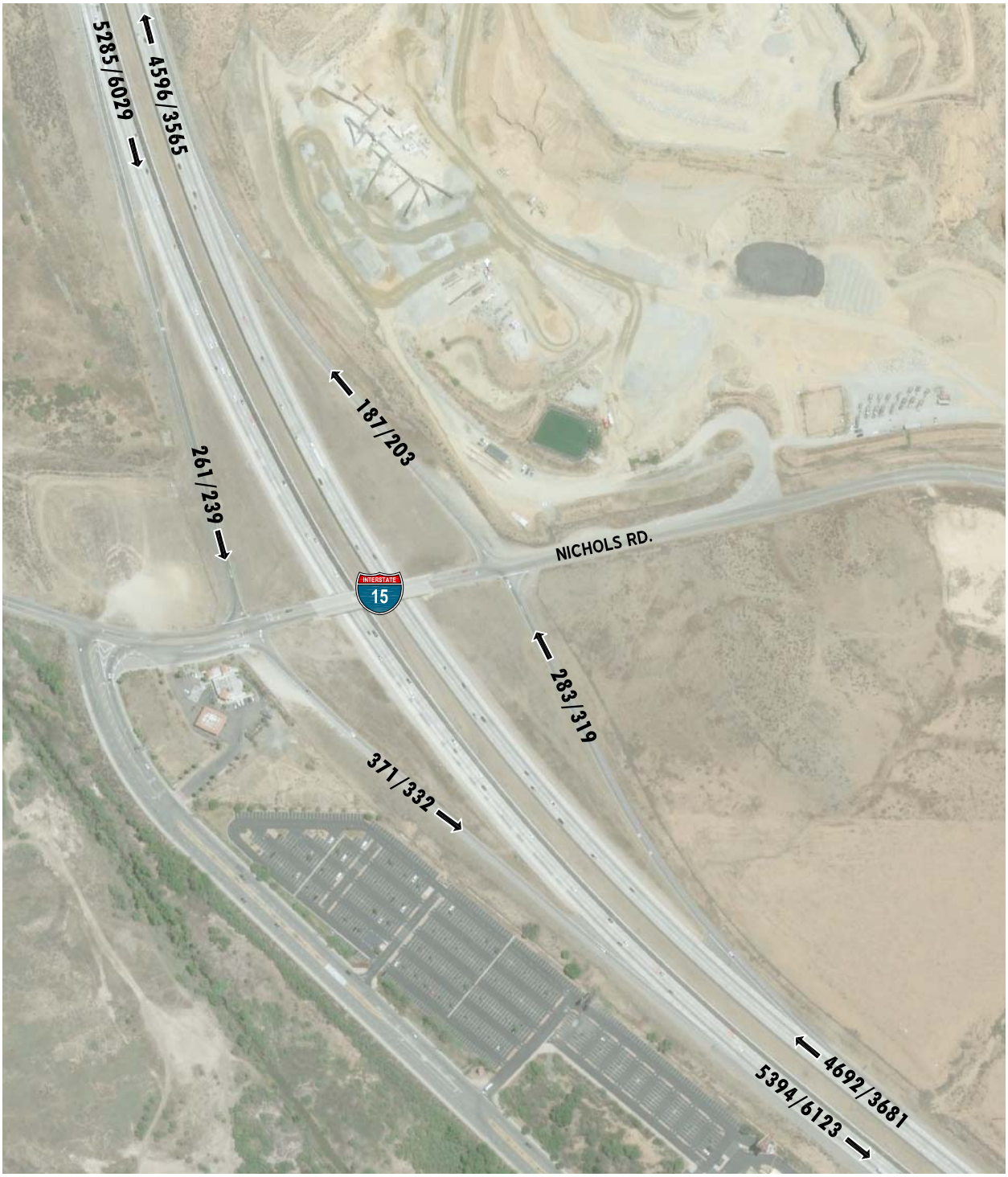
Collier Avenue & Nichols Road (#6)

- Install a traffic signal.

I-15 Southbound Ramps & Nichols Road (#9)

- Install a traffic signal.
- Add a southbound left turn lane.

EXHIBIT 8-5: EA (2024) FREEWAY MAINLINE VOLUMES



LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

N

10878 - freeway.dwg

URBAN CROSSROADS

EXHIBIT 8-6: EAP (2024) FREEWAY MAINLINE VOLUMES

LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

N

Table 8-3

Basic Freeway Segment Analysis for EA and EAP (2024) Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	EA (2024)				EAP (2024)			
				Density[2]		LOS[3]		Density[2]		LOS[3]	
				AM	PM	AM	PM	AM	PM	AM	PM
I-15 Freeway	Southbound	North of Nichols Rd.	3	29.0	**40.1**	D	**E**	29.6	**40.9**	D	**E**
		South of Nichols Rd.	3	32.8	**41.3**	D	**E**	30.5	**42.1**	D	**E**
	Northbound	North of Nichols Rd.	3	25.3	18.9	C	C	23.9	19.2	C	C
		South of Nichols Rd.	3	26.0	19.3	C	C	24.6	19.7	C	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] LOS = Level of Service

Table 8-4

Freeway Ramp Junction Merge/Diverge Analysis for EA and EAP (2024) Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	EA (2024)				EAP (2024)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]
I-15 Freeway	Southbound	Off-Ramp at Nichols Rd.	3	33.9	D	**37.5**	**E**	34.3	D	**38.2**	**E**
		On-Ramp at Nichols Rd.	3	30.8	D	34.4	D	31.4	D	34.9	D
	Northbound	On-Ramp at Nichols Rd.	3	25.2	C	20.1	C	25.7	C	20.3	C
		Off-Ramp at Nichols Rd.	3	30.5	D	25.3	C	31.0	D	25.8	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] LOS = Level of Service

Table 8-5

Intersection Analysis for EA and EAP (2024) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1] Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Delay[2] (secs.) AM	Delay[2] (secs.) PM	Level of Service AM	Level of Service PM
4	Lakeshore Dr. & Riverside Dr. (SR-74)																	
	EA (2024)																	
	- Without Improvements	TS	1	2	0	1	2	1	1	2	1	1	1	1	**55.2**	51.6	**E**	D
	- With Improvements	TS	1	2	0	1	2	1	1	2	1	1	**2**	**0**	44.7	41.8	D	D
	EAP (2024)																	
	- Without Improvements	TS	1	2	0	1	2	1	1	2	1	1	1	1	**56.4**	53.3	**E**	D
	- With Improvements[4]	TS	1	2	0	1	2	1	1	2	1	1	**2**	**0**	46.0	43.4	D	D
5	Gunnerson St./Strickland Av. & Riverside Dr. (SR-74)																	
	EA (2024)																	
	- Without Improvements	CSS	0	1	1	0	1	1	0	1	0	0	1	0	**>100.0**	**>100.0**	**F**	**F**
		CSS	0	1	1	0	1	1	**1**	1	0	**1**	1	0	**>100.0**	**>100.0**	**F**	**F**
	- With Improvements[5,6]	**TS**	0	1	1	0	1	1	**1**	1	0	**1**	1	0	9.1	9.1	A	A
	EAP (2024)																	
	- Without Improvements	CSS	0	1	1	0	1	1	0	1	0	0	1	0	**>100.0**	**>100.0**	**F**	**F**
		CSS	0	1	1	0	1	1	**1**	1	0	**1**	1	0	**>100.0**	**>100.0**	**F**	**F**
	- With Improvements[5,6]	**TS**	0	1	1	0	1	1	**1**	1	0	**1**	1	0	9.3	9.5	A	A
6	Collier Av. & Nichols Rd.																	
	EA (2024)																	
	- Without Improvements	CSS	1	0	1	0	0	0	0	1	0	1	1	0	24.8	**41.4**	C	**E**
	- With Improvements	**TS**	1	0	1	0	0	0	0	1	0	1	1	0	9.9	12.1	A	B
	EAP (2024)																	
	- Without Improvements	CSS	1	0	1	0	0	0	0	1	0	1	1	0	**47.2**	**94.2**	**E**	**F**
	- With Improvements	**TS**	1	0	1	0	0	0	0	1	0	1	1	0	11.3	19.4	B	B
9	I-15 Southbound Ramps & Nichols Rd.																	
	EA (2024)																	
	- Without Improvements	AWS	0	0	0	0	1	0	0	1	1	1	1	0	19.1	16.0	C	C
	- With Improvements								Not Applicable									
	EAP (2024)																	
	- Without Improvements	AWS	0	0	0	0	1	0	0	1	1	1	1	0	**68.4**	**37.2**	**F**	**E**
	- With Improvements	**TS**	0	0	0	**1**	1	0	0	1	1	1	1	0	20.5	20.2	C	C
10	I-15 Northbound Ramps & Nichols Rd.																	
	EA (2024)																	
	- Without Improvements	CSS	0	1	0	0	0	0	1	1	0	0	1	0	**>100.0**	**52.6**	**F**	**F**
	- Without Improvements	AWS	0	1	0	0	0	0	1	1	0	0	1	0	**56.3**	12.4	**F**	B
	- With Improvements	**TS**	0	1	**1**	0	0	0	1	1	0	0	1	0	14.6	20.6	B	C
	EAP (2024)																	
	- Without Improvements	CSS	0	1	0	0	0	0	1	1	0	0	1	0	**>100.0**	**>100.0**	**F**	**F**
	- Without Improvements	AWS	0	1	0	0	0	0	1	1	0	0	1	0	**>100.0**	25.7	**F**	D
	- With Improvements	**TS**	0	1	**1**	0	0	0	1	1	0	0	1	0	36.5	42.7	D	D
17	El Toro Rd. & Tereticornis Av.																	
	EA (2024)																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	10.6	**F**	B
	- With Improvements	**AWS**	0	1	0	0	1	0	0	0	0	0	1	0	**73.7**	9.8	**F**	A
	- Without Improvements[7]	CSS	0	1	0	0	1	0	0	1	0	0	1	0	29.5	--	D	--
	- With Improvements[7]								Not Applicable									
	EAP (2024)																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	11.1	**F**	B
	- With Improvements	**AWS**	0	1	0	0	1	0	0	0	0	0	1	0	**121.3**	11.3	**F**	B
	- Without Improvements[7]	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**51.2**	--	**F**	--
	- With Improvements[7]	**AWS**	0	1	0	0	1	0	0	0	0	0	1	0	24.5	--	C	--

Table 8-5

Intersection Analysis for EA and EAP (2024) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
18	El Toro Rd. & Carmela Ct.																	
	EA (2024)																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	12.1	**F**	B
	- With Improvements[8,9,10]	**TS**	0	1	0	0	1	**1**	0	1	0	0	1	0	49.7	5.4	D	A
	- Without Improvements[7]	CSS	0	1	0	0	1	0	0	1	0	0	1	0	**>100.0**	**--**	**F**	**--**
	- With Improvements[7,8,9,10]	**TS**	0	1	0	0	1	**1**	0	1	0	0	1	0	15.1	--	B	--
	EAP (2024)																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	13.4	**F**	B
	- With Improvements[8,9,10]	**TS**	**1**	1	0	0	1	**1**	0	0	0	0	1	0	**57.9**	5.6	**E**	A
	- Without Improvements[7]	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	--	**F**	--
	- With Improvements[7,8,9,10]	**TS**	**1**	1	0	0	1	**1**	0	0	0	0	1	0	16.7	5.6	B	A

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

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; d = Defacto Right Turn Lane; **1** = Improvement

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

3 CSS = Cross-street Stop; AWS = All-way Stop; TS = Traffic Signal; **CSS** = Improvement

4 Improvement consists of restriping the existing westbound right turn lane to a shared through-right lane.

5 Eastbound and westbound left turn lanes are currently under construction and are anticipated to be in place by summer 2018. However, the intersection is anticipated to continue to operate at an unacceptable LOS without the installation of a traffic signal.

6 Although the intersection is not anticipated to warrant a traffic signal under Existing and EAP conditions, the addition of lane geometric improvements alone is not anticipated to improve the peak hour delays. As such, the intersection should be monitored and a traffic signal should be installed at the City Traffic Engineer's discretion.

7 A normalized AM PHF of 0.92 is used to determine peak hour operations outside of the 10-15 minute drop-off period.

8 Prohibit on-street parking to allow restriping for a 100 foot southbound right turn pocket.

9 Prohibit on-street parking to allow restriping for a 100 foot northbound left turn pocket.

10 The installation of a traffic signal may not be appropriate for the character of the surrounding residential neighborhood. As such, it is recommended that a traffic guard be utilized during the AM peak hour only to direct traffic similar to the way a signalized intersection would operate.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal.
- Add a northbound right turn lane.

El Toro Road & Tereticornis Avenue (#17)

- Install stop signs along El Toro Road to implement an all-way stop control.

El Toro Road & Carmela Court (#18)

- Implementation of a traffic guard during the AM peak hour only.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.
- Remove a portion of on-street parking on the northbound approach to allow restriping for a dedicated 100-foot left turn pocket.

Although the intersection of El Toro Road and Carmela Court operates at an unacceptable LOS and meets the traffic signal warrant under EAP (2024) traffic conditions, the installation of a traffic signal may not be appropriate for the character of the surrounding residential neighborhood. As such, to mitigate the impacts, it is recommended that a traffic guard be utilized during the AM peak hour only to direct traffic similar to the way a signalized intersection would operate.

The EA and EAP (2024) intersection operations analysis worksheets, with improvements, are included in Appendices 8.11 and 8.12 of this TIA, respectively.

Table 8-6 shows the effectiveness of the improvements strategies at intersections that experience off-ramp queuing issues during EAP (2024). With the recommended intersection improvements at the study area freeway ramp-to-arterial intersections (see Table 8-5), the analysis indicates there are no queuing issues anticipated that may potentially "spill back" onto the SR-60 Freeway mainline during the peak hours for EAP (2024) traffic conditions (see Table 8-6). Off-ramp queuing analysis worksheets with improvements are provided in Appendix 8.13 of this TIA.

8.9.2 Recommended Improvements to Address Deficiencies on Freeway Facilities

At this time, Caltrans has no fee programs or other improvement programs in place to address the deficiencies caused by development projects in the City of Lake Elsinore (or other neighboring jurisdictions) on the SHS roadway segments. As such, no additional improvements have been recommended to address the EA and EAP (2024) deficiencies on the SHS.

Table 8-6

Peak Hour Freeway Off-Ramp Queuing Summary for EAP Conditions With Improvements

Intersection	Movement	Available Stacking Distance (Feet)	EAP (2024)			
			95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM
I-15 NB Off-Ramp & Nichols Rd.	NBL/T	1,530	181	340	Yes	Yes
	NBR	200	87	32	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance providec

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9 EAPC TRAFFIC CONDITIONS

This section discusses the methods used to develop EAPC (2020), EAPC (2021) and EAPC (2024) traffic forecasts, and the resulting intersection operations, traffic signal warrant, and freeway mainline operations analyses.

9.1 ROADWAY IMPROVEMENTS

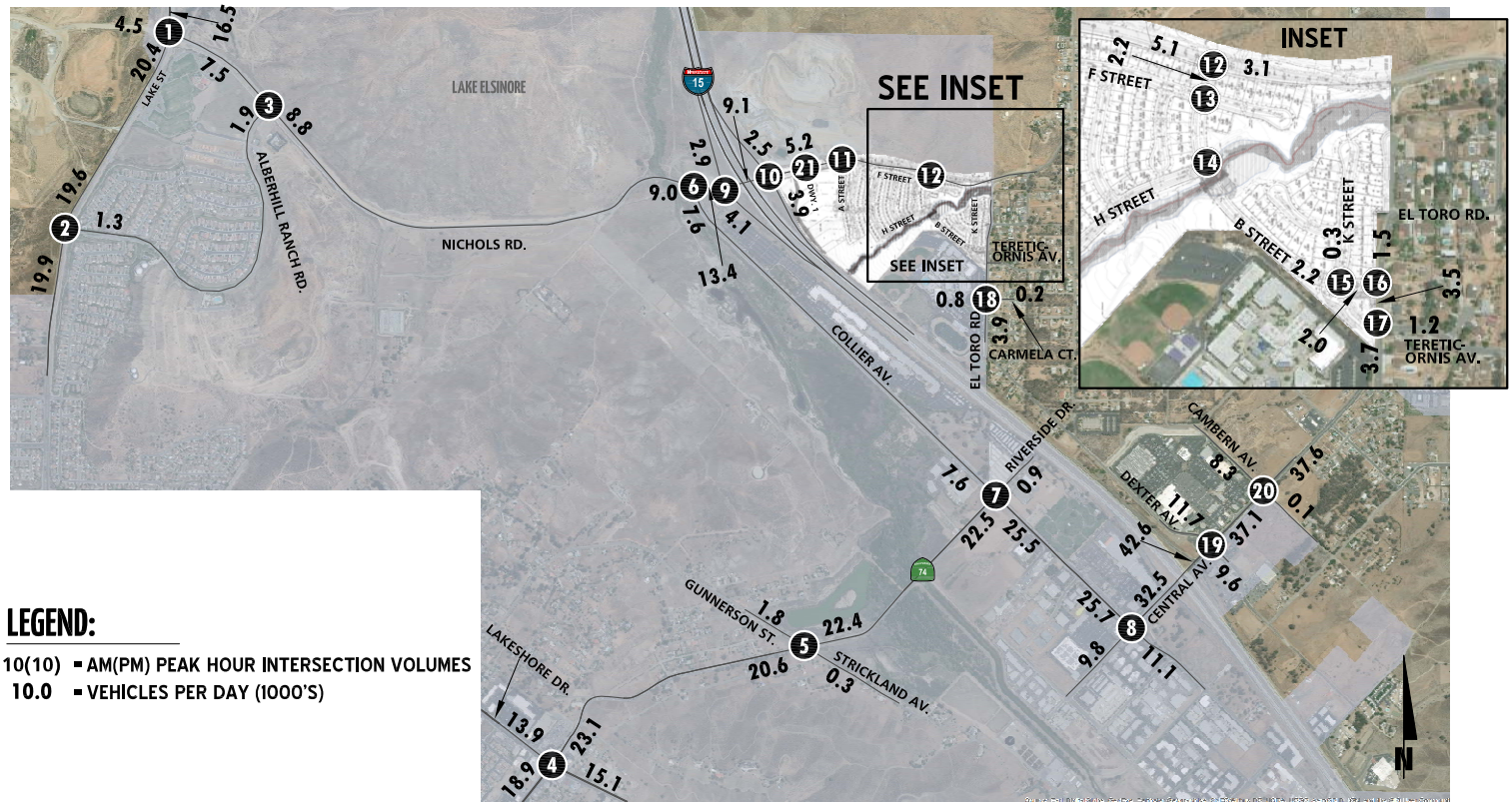
The lane configurations and traffic controls assumed to be in place for EAPC conditions are consistent with the following improvements discussed below. The improvements listed below have been confirmed with City of Lake Elsinore staff, or the Project Applicant.

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for EAPC conditions only (e.g., intersection and roadway improvements at the Project's frontage and driveways). This includes B Street between El Toro Road and Nichols Road as part of Phase 1.
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for EAPC conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways).
- Subsequent to the traffic counts and field review conducted for this traffic study, improvements were implemented at the intersections of Gunnerson Street/Strickland Avenue at Riverside Drive (SR-74) and at the I-15 Northbound Ramps at Nichols Road. The recent improvements at Gunnerson Street/Strickland Avenue and Riverside Drive (SR-74) include eastbound and westbound left turn lanes. The I-15 Northbound Ramps at Nichols Road has recently been modified to an all-way stop controlled intersections. The operations analysis has been conducted for both Existing lanes and controls and these recently implemented improvements for EAPC traffic conditions.

9.2 EAPC TRAFFIC VOLUME FORECASTS

To account for background traffic growth, an ambient growth from Existing conditions of 4.04% (2 percent per year compounded over 2 years) is included for EAPC (2020) traffic conditions, an ambient growth from Existing conditions of 6.12% (2 percent per year compounded over 3 years) is included for EAPC (2021) traffic conditions, and an ambient growth from Existing conditions of 12.62% (2 percent per year compounded over 6 years) is included for EAPC (2024) traffic conditions. Cumulative development projects are also included as part of the EAPC analysis. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for EAPC (2020), EAPC (2021), and EAPC (2024) traffic conditions are shown on Exhibits 9-1, 9-2, and 9-3, respectively. Starting with Phase 1 (2020), the Project will provide a connection between Nichols Road and El Toro Road via B Street. As such, it is unlikely that existing through traffic would continue to utilize El Toro Road to Wood Mesa Court to access Nichols Road once B Street provides access to Nichols Road. As such, the existing volumes at El Toro Road at Nichols Road and El Toro Road/Wood Mesa Court at El Toro Road will be reallocated to reflect the use of B Street starting in Phase 1 (2020). It is anticipated that 50% of the existing traffic will be reallocated to utilize B Street.

EXHIBIT 9-1: EAPC (2020) TRAFFIC VOLUMES

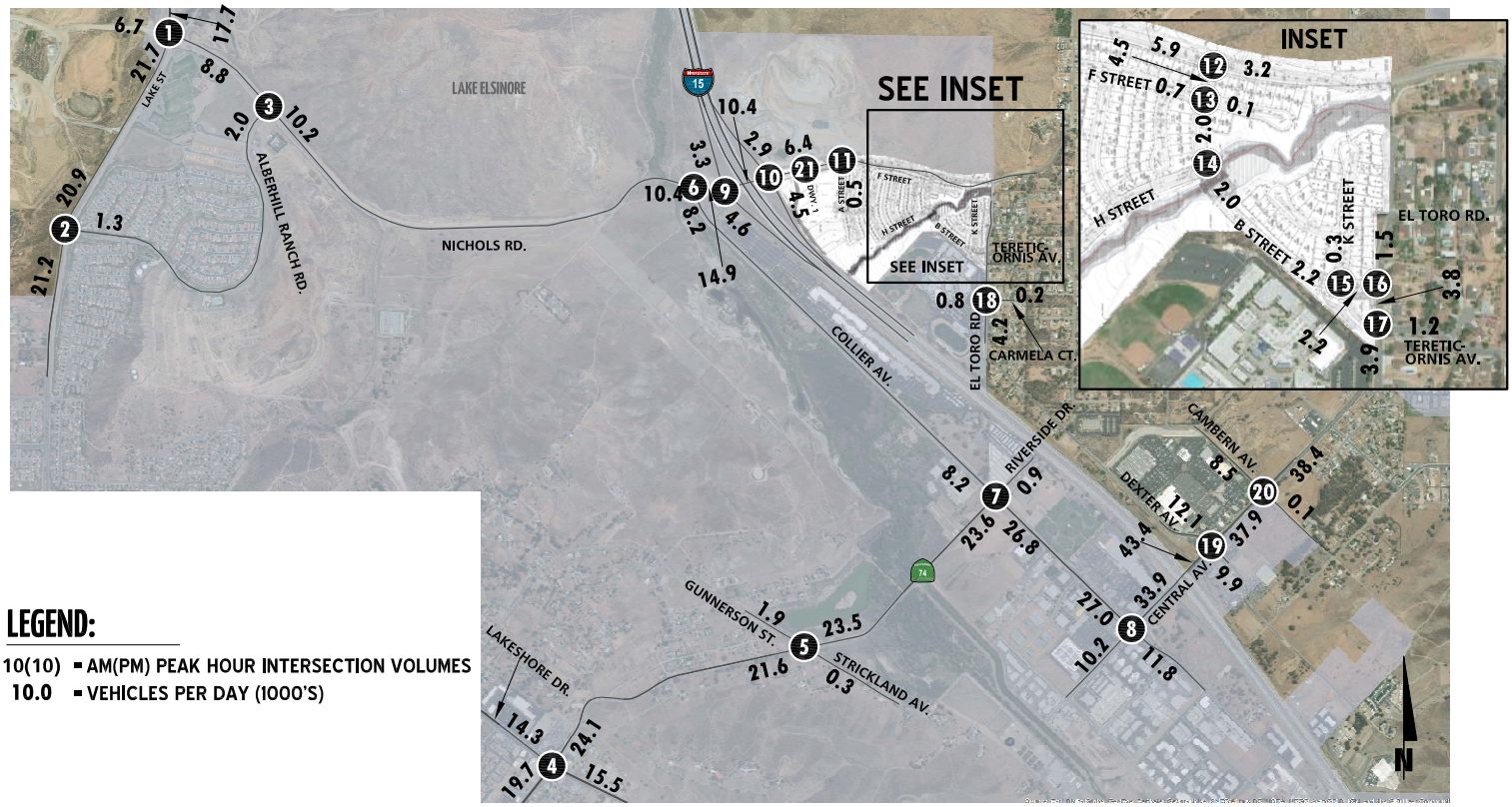


LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)

1 Lake St. & Nichols Rd.	**2** Lake St. & Alberhill Ranch Rd.	**3** Alberhill Ranch Rd. & Nichols Rd.	**4** Lakeshore Dr. & Riverside Dr. (SR-74)	**5** Gunnerson St./ Strickland Av. & Riverside Dr. (SR-74)	**6** Collier Av. & Nichols Rd.	**7** Collier Av. & Riverside Dr. (SR-74)
40(92) 289(899) 19(32)	482(1154) 19(24)		11(17) 179(321) 216(283)	6(3) 3(1) 50(31)		49(98) 74(205) 1(3)
40(20) 48(109) 193(263)	49(20) 60(37)	240(384) 37(80)	358(322) 571(647) 136(124)	38(122) 673(932) 3(9)	237(376) 101(235)	2(7) 1(18) 5(21)
86(70) 89(89) 36(55)	1132(581) 51(32)	481(292) 17(19)	21(32) 482(525) 147(274)	1(3) 892(905) 4(5)	511(281) 51(75)	78(106) 10(11) 867(831)
38(53) 719(388) 383(188)		40(9) 73(66)	277(203) 306(262) 115(165)	1(1) 2(0) 13(8)	48(105) 97(269)	665(951) 84(257) 10(20)
8 Collier Av. & Central Av. (SR-74)	**9** I-15 SB Ramps & Nichols Rd.	**10** I-15 NB Ramps & Nichols Rd.	**11** A Street & Nichols Rd.	**12** B Street & Nichols Rd.	**13** B Street & F Street	**14** B Street & H Street
13(34) 75(155) 823(983)	82(182) 6(2) 173(88)		Future Intersection		Future Intersection	Future Intersection
645(790) 292(204) 534(228)	257(428) 65(30)	99(45) 147(125)		122(83) 0(0)		
35(197) 93(335) 31(53)	275(288) 335(332)	112(178) 335(197)		227(121) 222(114)		
31(52) 63(143) 293(371)		173(334) 3(1) 115(39)		123(85) 0(0)		
15 K Street & B Street	**16** El Toro Rd. & B Street	**17** El Toro Rd. & Tereticornis Av.	**18** El Toro Rd. & Carmela Ct.	**19** Dexter Av. & Central Av. (SR-74)	**20** Cambern Av. & Central Av. (SR-74)	**21** Driveway 1 & Nichols Rd.
16(11) 3(2)	0(0) 232(112)	433(159) 19(50)	237(10) 361(155) 8(6)	390(333) 149(97) 75(81)	90(87) 5(6) 131(239)	Future Intersection
1(3) 107(74)		24(18) 173(13)	16(1) 0(0) 6(5)	202(78) 1516(1248) 126(163)	115(149) 1751(1243) 8(12)	
6(19) 216(95)	0(0) 219(97)		134(15) 0(0) 274(30)	239(356) 974(1800) 139(179)	128(263) 1107(1917) 7(11)	
	108(77) 107(75)	192(135) 68(26)	173(14) 110(145) 6(4)	112(138) 263(138) 91(175)	15(18) 4(5) 14(14)	

EXHIBIT 9-2: EAPC (2021) TRAFFIC VOLUMES

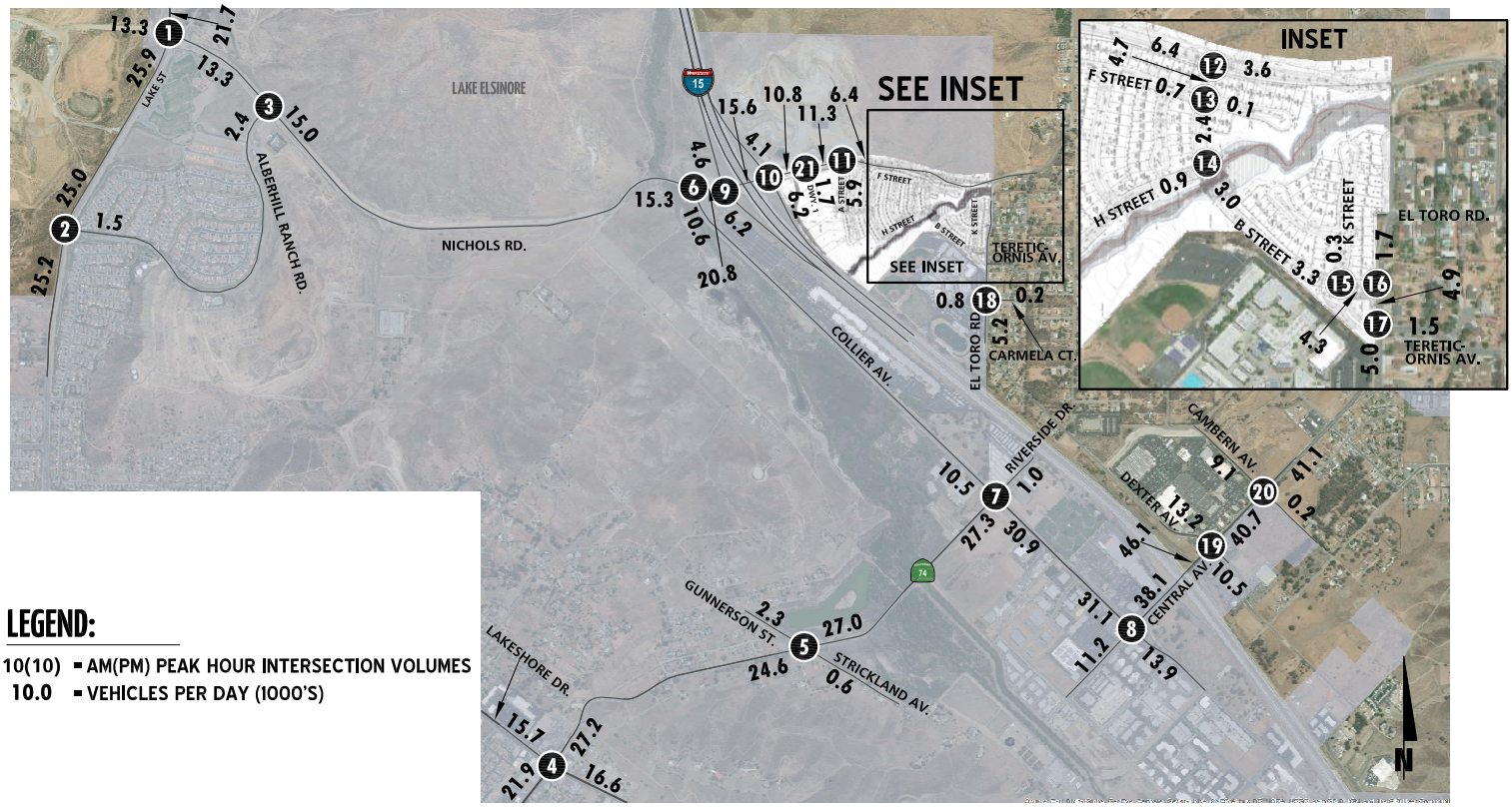


LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)

1 Lake St. & Nichols Rd.	**2** Lake St. & Alberhill Ranch Rd.	**3** Alberhill Ranch Rd. & Nichols Rd.	**4** Lakeshore Dr. & Riverside Dr. (SR-74)	**5** Gunnerson St./ Strickland Av. & Riverside Dr. (SR-74)	**6** Collier Av. & Nichols Rd.	**7** Collier Av. & Riverside Dr. (SR-74)
57(138) 298(926) 20(35)	520(1226) 19(24)		12(18) 183(328) 225(293)	7(3) 3(1) 51(33)		59(106) 91(222) 1(3)
43(23) 69(164) 205(283)	50(20) 62(38)	276(461) 38(82)	369(333) 597(677) 141(129)	39(126) 708(975) 4(10)	269(442) 117(249)	2(7) 1(18) 5(21)
122(104) 131(130) 54(82)		545(351) 17(19)	22(33) 504(554) 151(280)	1(3) 927(949) 4(5)	568(333) 61(86)	82(118) 11(12) 901(869)
57(79) 742(402) 404(203)	1194(635) 52(33)	40(10) 75(68)	283(207) 312(268) 119(171)	1(1) 2(0) 14(10)	53(119) 104(290)	693(993) 92(280) 11(20)
8 Collier Av. & Central Av. (SR-74)	**9** I-15 SB Ramps & Nichols Rd.	**10** I-15 NB Ramps & Nichols Rd.	**11** A Street & Nichols Rd.	**12** B Street & Nichols Rd.	**13** B Street & F Street	**14** B Street & H Street
17(37) 86(168) 857(1024)	92(207) 6(2) 184(115)				13(41) 224(107) 2(6)	
673(829) 300(210) 552(241)	295(485) 89(46)	123(60) 192(155)	286(196) 0(0)	125(85) 0(0)	6(4) 0(0) 1(1)	Future Intersection
37(204) 96(345) 32(55)	304(330) 369(364)	131(198) 356(246)	471(278) 10(32)	232(124) 239(155)	37(25) 0(0) 4(3)	
31(54) 68(159) 302(389)		190(376) 3(1) 125(64)	29(19) 0(0)	161(111) 0(0)	1(4) 118(82) 0(1)	
15 K Street & B Street	**16** El Toro Rd. & B Street	**17** El Toro Rd. & Tereticornis Av.	**18** El Toro Rd. & Carmela Ct.	**19** Dexter Av. & Central Av. (SR-74)	**20** Cambern Av. & Central Av. (SR-74)	**21** Driveway 1 & Nichols Rd.
9(6) 10(6)	0(0) 237(114)	453(169) 19(51)	242(11) 379(166) 8(6)	399(342) 154(101) 80(90)	92(89) 6(7) 134(244)	
3(11) 111(81)		24(18) 177(14)	16(1) 0(0) 6(5)	212(85) 1588(1317) 129(166)	118(152) 1827(1307) 11(18)	Future Intersection
3(10) 226(100)	0(0) 235(106)		137(15) 0(0) 279(31)	246(365) 1018(1892) 147(189)	131(268) 1151(2010) 11(15)	
	114(92) 110(77)	200(151) 69(27)	176(14) 116(161) 6(4)	118(148) 270(144) 92(179)	22(27) 5(6) 21(20)	

EXHIBIT 9-3: EAPC (2024) TRAFFIC VOLUMES



LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)

Intersection	Lake St. & Nichols Rd.	Lake St. & Alberhill Ranch Rd.	Alberhill Ranch Rd. & Nichols Rd.	Lakeshore Dr. & Riverside Dr. (SR-74)	Gunnerson St./ Strickland Av. & Riverside Dr. (SR-74)	Collier Av. & Nichols Rd.	Collier Av. & Riverside Dr. (SR-74)
1	111(275) 325(1011) 40(50)	57(37) 133(328) 250(357)	637(1457) 27(33)	15(21) 195(349) 262(329)	8(5) 3(1) 71(47)	394(675) 183(322)	98(149) 143(283) 1(3)
2	228(207) 258(254) 108(164)	114(158) 812(442) 492(259)	63(28) 67(42)	409(377) 667(766) 155(144)	53(146) 804(1110) 16(23)	800(516) 89(119)	2(8) 1(19) 6(23)
3			398(714) 54(102)	26(38) 577(633) 161(299)	2(5) 1056(1075) 6(7)	69(161) 201(365)	144(162) 11(12) 1004(984)
4			780(545) 18(20)	302(221) 333(286) 135(188)	2(3) 2(0) 31(22)		777(1122) 144(352) 11(21)
5			43(10) 99(87)				
6							
7							
8	30(51) 123(212) 960(1149)	757(949) 326(229) 608(280)	121(282) 7(2) 257(155)	290(196) 17(11)	151(102) 0(0)	12(32) 237(110) 2(5)	0(0) 241(112)
9	57(229) 105(375) 35(60)	34(59) 100(208) 331(443)	455(714) 131(88)	442(223) 126(122)	259(143) 251(147)	4(3) 0(0) 1(0)	0(0) 48(44)
10			529(494) 472(461)	399(385) 5(4)	156(105) 0(0)	29(17) 0(0) 3(2)	68(46) 125(89)
11			164(99) 345(302)			1(3) 123(85) 0(1)	
12			189(256) 597(394)				
13			241(500) 3(1) 201(105)				
14							
15	7(4) 7(4)	3(8) 185(131)	0(0) 252(122)	257(11) 438(210) 9(7)	427(370) 165(111) 111(130)	101(97) 8(11) 142(259)	444(221) 354(276)
16	3(8) 285(148)		0(0) 293(153)	17(1) 0(0) 7(6)	267(121) 1809(1526) 137(176)	125(161) 2080(1515) 22(35)	329(221)
17			278(176) 27(46)	145(16) 0(0) 296(33)	265(394) 1154(2173) 170(217)	40(52) 8(8) 40(40)	7(7)
18			515(213) 30(63)	187(15) 177(205) 7(5)	138(177) 289(156) 98(190)		
19			40(28) 188(15)				
20			266(193) 74(29)				
21							

9.3 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 9.1 *Roadway Improvements*. The intersection analysis results are summarized in Table 9-1, which indicates that the following intersections are anticipated to operate at an unacceptable LOS for EAPC (2020) traffic conditions:

- Lake Street & Nichols Road (#1) – LOS F PM peak hour only
- Gunnerson Street/Strickland Avenue (#5) – LOS F AM and PM peak hours
- Collier Avenue & Nichols Road (#6) – LOS F PM peak hour only
- I-15 Northbound Ramps & Nichols Road (#10) – LOS F AM and PM peak hours
- El Toro Road & Tereticornis Avenue (#17) – LOS D AM peak hour only (with normalized PHF)
- El Toro Road & Carmela Court (#18) – LOS E PM peak hour only (with normalized PHF)
- Dexter Avenue & Central Avenue (SR-74) (#19) – LOS E PM peak hour only

As shown in Table 9-1, there are no additional intersections are anticipated to operate at unacceptable LOS for EAPC (2021) traffic conditions, in addition to those previously identified under EAPC (2020) traffic conditions.

As shown in Table 9-1, the following additional intersections are anticipated to operate at unacceptable LOS for EAPC (2024) traffic conditions, in addition to those previously identified under EAPC (2020) traffic conditions:

- Alberhill Ranch Road & Nichols Road (#3) – LOS F AM and PM peak hours
- Lakeshore Drive & Riverside Drive (SR-74) (#4) – LOS E AM and PM peak hours
- Collier Avenue & Riverside Drive (SR-74) (#7) – LOS E PM peak hour only
- I-15 Southbound Ramps & Nichols Road (#9) – LOS F AM and PM peak hours
- Cambern Avenue & Central Avenue (SR-74) (#20) – LOS E AM and PM peak hours

A summary of the peak hour intersection LOS for EAPC (2020), EAPC (2021), and EAPC (2024) traffic conditions are shown on Exhibits 9-4, 9-5, and 9-6, respectively. The intersection operations analysis worksheets for EAPC (2020), EAPC (2021), and EAPC (2024) traffic conditions are included in Appendices 9.1, 9.2, and 9.3 of this TIA, respectively.

9.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

The intersection of Alberhill Ranch Road and Nichols Road is anticipated to meet the traffic signal warrant under EAPC (2021) traffic conditions, in addition to those intersections previously warranted under Existing (2018), E+P, and EAP traffic conditions (see Appendices 9.4, 9.5, and 9.6, respectively). No additional warrants have been met under EAPC (2020) or EAPC (2024).

Table 9-1

Intersection Analysis for EAPC Conditions

#	Intersection	Traffic Control[2]	EAPC (2020) Delay[1] (secs.) AM	EAPC (2020) Delay[1] (secs.) PM	EAPC (2020) LOS[3] AM	EAPC (2020) LOS[3] PM	EAPC (2021) Delay[1] (secs.) AM	EAPC (2021) Delay[1] (secs.) PM	EAPC (2021) LOS[3] AM	EAPC (2021) LOS[3] PM	EAPC (2024) Delay[1] (secs.) AM	EAPC (2024) Delay[1] (secs.) PM	EAPC (2024) LOS[3] AM	EAPC (2024) LOS[3] PM
1	Lake St. & Nichols Rd.	TS	24.2	**126.0**	C	**F**	31.7	**180.5**	C	**F**	**81.6**	**>200.0**	**F**	**F**
2	Lake St. & Alberhill Ranch Rd.	TS	15.1	8.7	B	A	17.6	9.7	B	A	41.7	18.9	D	B
3	Alberhill Ranch Rd. & Nichols Rd.	AWS	16.0	13.0	C	B	21.2	16.7	C	C	**>100.0**	**83.0**	**F**	**F**
4	Lakeshore Dr. & Riverside Dr. (SR-74)	TS	49.7	47.9	D	D	53.1	51.8	D	D	**67.0**	**66.9**	**E**	**E**
5	Gunnerson St./Strickland Av. & Riverside Dr. (SR-74)	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**
	Current Intersection Lanes[4]	*CSS*	***>100.0***	***>100.0***	***F***	***F***	***>100.0***	***>100.0***	***F***	***F***	***>100.0***	***>100.0***	***F***	***F***
6	Collier Av. & Nichols Rd.	CSS	29.7	**74.7**	D	**F**	**41.1**	**>100.0**	**E**	**F**	**>100.0**	**>100.0**	**F**	**F**
7	Collier Av. & Riverside Dr. (SR-74)	TS	16.2	29.6	B	C	17.4	34.1	B	C	23.4	**59.9**	C	**E**
8	Collier Av. & Central Av. (SR-74)	TS	34.6	33.5	C	C	34.7	33.9	C	C	35.7	37.6	D	D
9	I-15 Southbound Ramps & Nichols Rd.	AWS	21.4	20.4	C	C	30.6	34.7	D	D	**>100.0**	**>100.0**	**F**	**F**
10	I-15 Northbound Ramps & Nichols Rd.	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**
	Current Intersection Control[5]	*AWS*	***51.1***	*13.9*	***F***	*B*	***85.4***	*18.3*	***F***	*C*	***>100.0***	***72.3***	***F***	***F***
11	A St. & Nichols Rd.	**CSS/TS[6]**	Future Intersection				16.7	12.4	C	B	16.6	13.1	B	B
12	B St. & Nichols Rd.	**CSS**	14.1	10.9	B	B	15.5	11.4	C	B	16.7	11.7	C	B
13	B St. & F St.	**CSS**	Future Intersection				11.7	10.3	B	B	11.8	10.2	B	B
14	B St. & H St.	**CSS**	Future Intersection				0.0	0.0	A	A	10.0	9.1	B	A
15	K St. & B St.	**CSS**	9.2	8.9	A	A	10.0	9.3	B	A	10.8	9.8	B	A
16	El Toro Rd. & B St.	**CSS**	11.5	9.4	B	A	11.8	9.4	B	A	13.0	9.8	B	A
17	El Toro Rd. & Tereticornis Av.	CSS	**>100.0**	10.4	**F**	B	**>100.0**	10.6	**F**	B	**>100.0**	11.2	**F**	B
	With Normalized PHF[7,8]	CSS	**25.0**	--	**D**	--	**27.3**	--	**D**	--	**52.5**	--	**F**	--
18	El Toro Rd. & Carmela Ct.	CSS	**>100.0**	11.7	**F**	B	**>100.0**	12.1	**F**	B	**>100.0**	13.5	**F**	B
	With Normalized PHF[7,8]	CSS	**>100.0**	--	**F**	--	**>100.0**	--	**F**	--	**>100.0**	--	**F**	--
19	Dexter Av. & Central Av. (SR-74)	TS	44.5	**59.8**	D	**E**	49.8	**70.1**	D	**E**	**76.7**	**118.7**	**E**	**F**
20	Cambern Av. & Central Av. (SR-74)	TS	32.8	37.2	C	D	38.8	44.5	D	D	**68.1**	**77.4**	**E**	**E**
21	Driveway 1 & Nichols Rd.	**CSS**	Future Intersection				Future Intersection				13.1	10.5	B	B

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

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

2 CSS = Cross-street Stop; AWS = All-way Stop; TS = Traffic Signal; **CSS** = Improvement

3 LOS = Level of Service

4 At the time field review was conducted, the eastbound and westbound left turn lanes were under construction. However, these lanes have since been completed. This analysis identifies the LOS results with the current left turn lanes in place.

5 Although at the time of the field review and traffic counts this intersection was operating as a cross-street stop controlled intersection, it is our understanding that the I-15 Northbound Ramps currently operates as an all-way stop.

6 For buildout conditions, the intersection is evaluated with a traffic signal, an eastbound right-turn pocket and striping the northbound approach to a left turn and right turn lane.

7 The two intersections of Tereticornis Avenue and Carmela Court are in close proximity to the existing Temescal Canyon High School on El Toro Road and have been evaluated with the AM existing peak hour factor from the raw count worksheet and also with a normalized peak hour factor of 0.92. Lower peak hour factors during the AM peak hour (morning drop-off) occur near schools due to the peak 10-15 minute traffic flows during the AM peak hour, which are much higher in comparison to the other 15-minute periods within the hour.

8 PHF = Peak Hour Factor

EXHIBIT 9-4: EAPC (2020) SUMMARY OF LOS

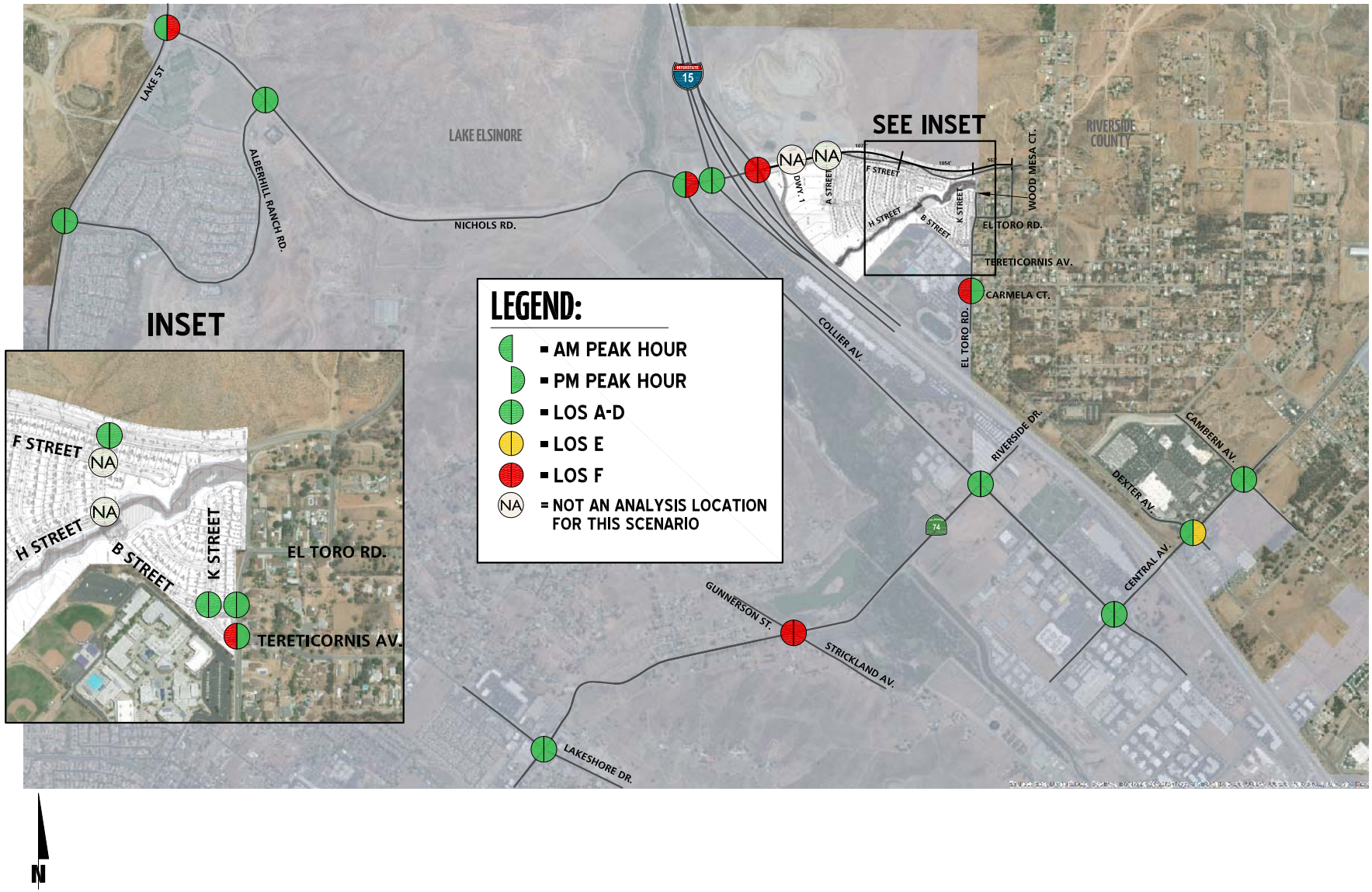


EXHIBIT 9-5: EAPC (2021) SUMMARY OF LOS

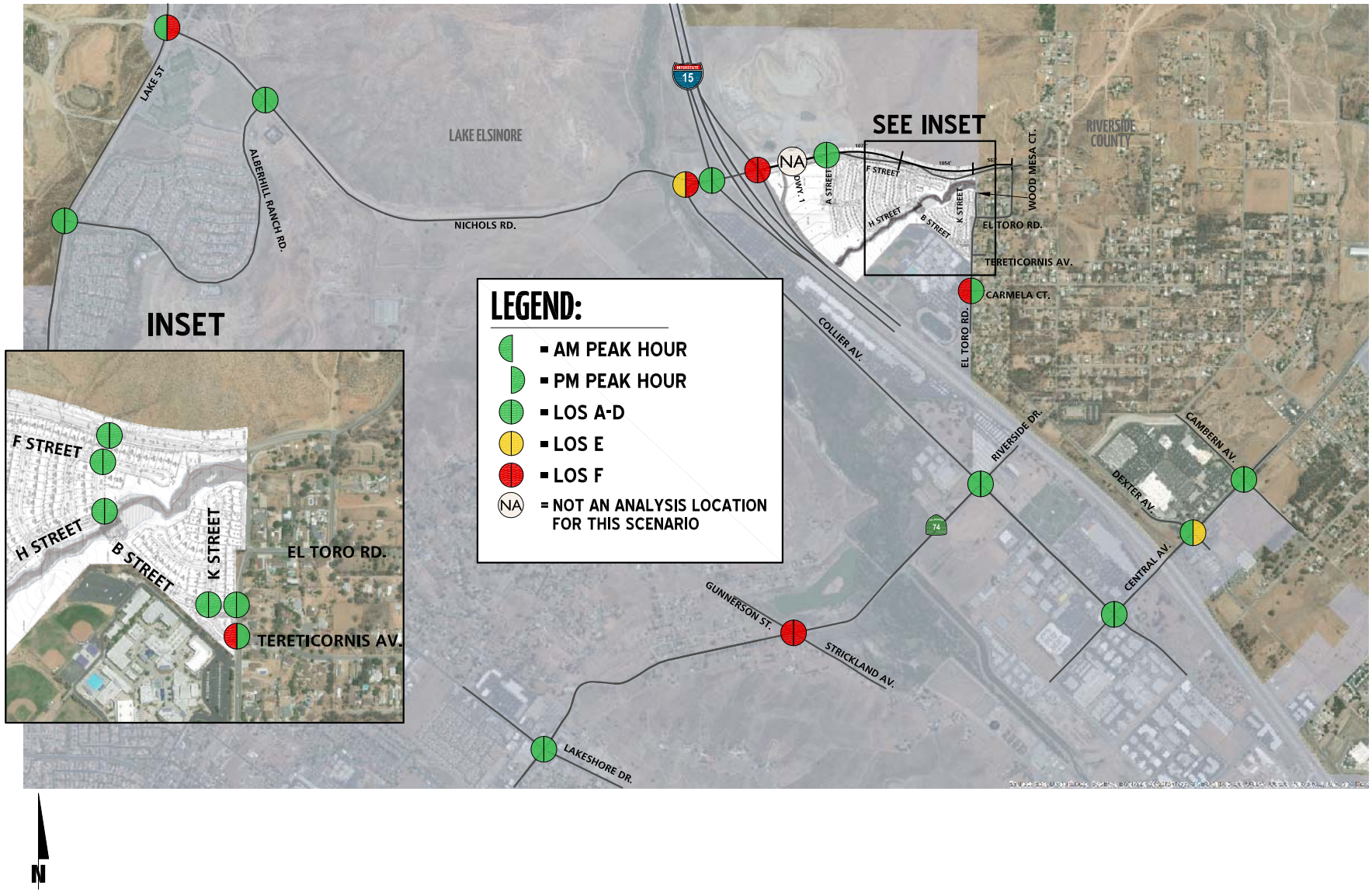
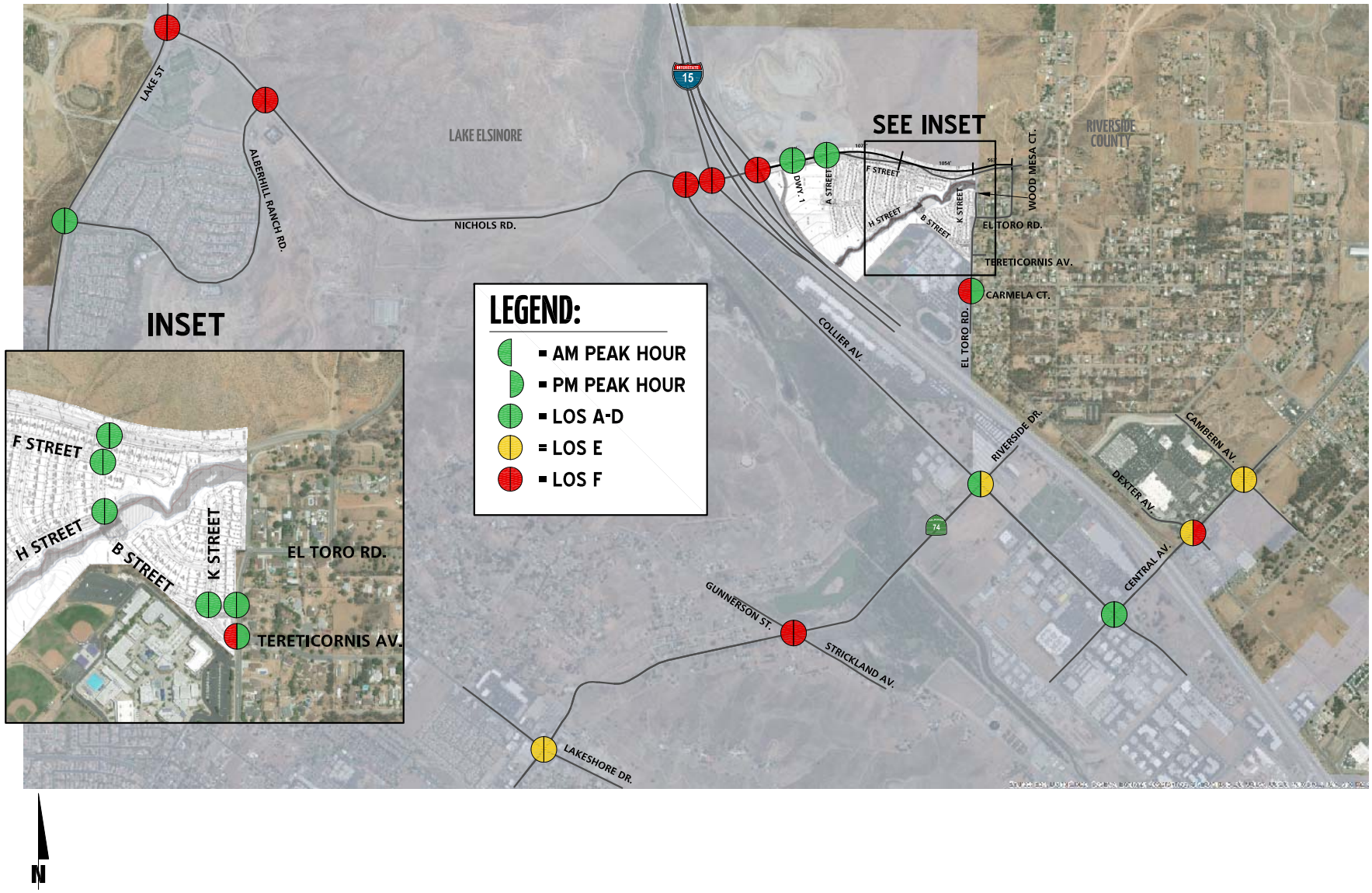


EXHIBIT 9-6: EAPC (2024) SUMMARY OF LOS



9.5 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-15 Freeway and Nichols Road interchange to assess vehicle queues for the off ramps that may potentially result in deficient peak hour operations at the ramp-to-arterial intersections and may potentially "spill back" onto the I-15 Freeway mainline. Queuing analysis findings are presented in Table 9-2 for EAPC traffic conditions. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown in Table 9-2, there are no movements anticipated to experience queuing issues for EAPC (2020) and EAPC (2021) traffic conditions. The following movements are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for EAPC (2024) traffic conditions:

- I-15 Freeway Southbound Off-ramp at Nichols Road (#1): Shared southbound left-through-right turn lane during the AM peak hour only
- I-15 Freeway Northbound Off-ramp at Nichols Road (#2): Shared northbound left-through-right turn lane during the AM peak hour only

Worksheets for EAPC (2020), EAPC (2021), and EAPC (2024) conditions off-ramp queuing analysis are provided in Appendices 9.7, 9.8, and 9.9, respectively.

9.6 BASIC FREEWAY SEGMENT ANALYSIS

EAPC (2020), EAPC (2021), and EAPC (2024) mainline directional volumes for the weekday AM and PM peak hours are provided on Exhibits 9-5 and 9-6, respectively. As shown in Table 9-3, the following basic freeway segments are anticipated to operate at an unacceptable LOS for EAPC (2020) traffic conditions:

- I-15 Freeway Southbound, North of Nichols Road (#1) – LOS E PM peak hour only
- I-15 Freeway Southbound, South of Nichols Road (#2) – LOS E PM peak hour only

There are no additional basic freeway segments anticipated to operate at an unacceptable LOS for EAPC (2021) and EAPC (2024), in addition to those previously identified for EAPC (2020) traffic conditions. EAPC (2020), EAPC (2021), and EAPC (2024) basic freeway segment analysis worksheets are provided in Appendices 9.10, 9.11, and 9.12, respectively.

Table 9-2

Peak Hour Freeway Off-Ramp Queuing Summary for EAPC Conditions

Intersection	Movement	Available Stacking Distance (Feet)	EAPC (2020)				EAPC (2021)				EAPC (2024)			
			95th Percentile Queue (Feet)		Acceptable?[1]		95th Percentile Queue (Feet)		Acceptable?[1]		95th Percentile Queue (Feet)		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
I-15 SB Off-Ramp & Nichols Rd.	SBL/T/R	1,600	523	73	Yes	Yes	643	538	Yes	Yes	**1,743**	235	**No**	Yes
I-15 NB Off-Ramp & Nichols Rd.	NBL/T/R	1,530	878	358	Yes	Yes	1,163	658	Yes	Yes	**2,178**	**1,588**	**No**	**No**
Current Traffic Control[2]	*NBL/T/R*	*1,530*	*240*	*103*	*Yes*	*Yes*	*325*	*168*	*Yes*	*Yes*	*720*	*598*	*Yes*	*Yes*

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided.

[2] Although at the time of the field review and traffic counts this intersection was operating as a cross-street stop controlled intersection, it is our understanding that the I-15 Northbound Ramps currently operates as an all-way stop.

Table 9-3

Basic Freeway Segment Analysis for EAPC Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	EAPC (2020)				EAPC (2021)				EAPC (2024)			
				Density[2]		LOS[3]		Density[2]		LOS[3]		Density[2]		LOS[3]	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
I-15 Freeway	Southbound	North of Nichols Rd.	3	28.3	**35.1**	D	**E**	29.3	**36.9**	D	**E**	32.9	**42.8**	D	**E**
		South of Nichols Rd.	3	29.6	**36.2**	D	**E**	30.9	**38.0**	D	**E**	**35.2**	**44.6**	**E**	**E**
	Northbound	North of Nichols Rd.	3	23.2	17.6	C	B	24.1	18.1	C	C	26.6	19.8	D	C
		South of Nichols Rd.	3	23.7	18.2	C	C	24.5	18.9	C	C	27.2	21.0	D	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] LOS = Level of Service

Table 9-4

Freeway Ramp Junction Merge/Diverge Analysis for EAPC Conditions

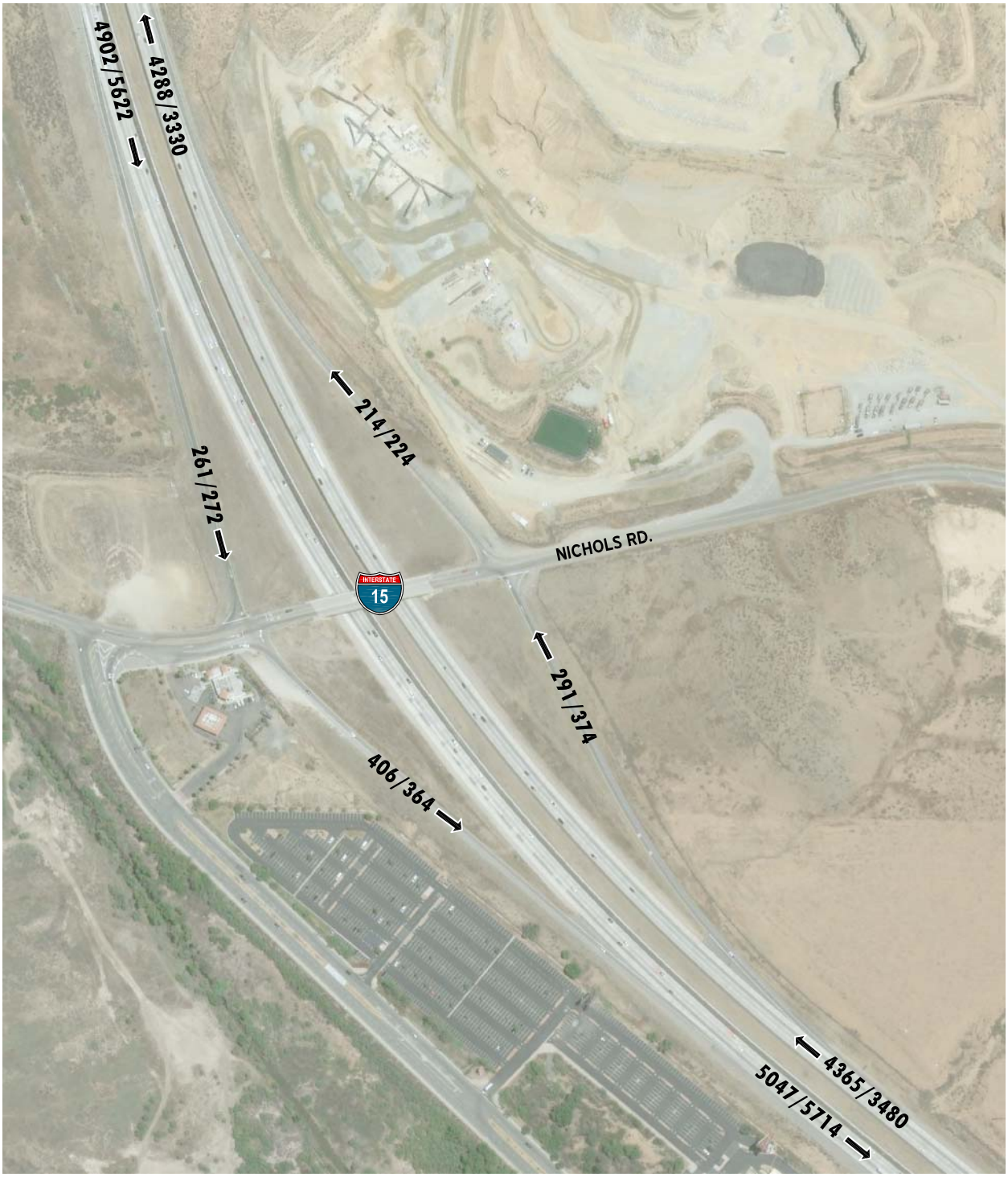
Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	EAPC (2020)				EAPC (2021)				EAPC (2024)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]
I-15 Freeway	Southbound	Off-Ramp at Nichols Rd.	3	32.2	D	**35.3**	**E**	32.7	D	**36.1**	**E**	34.6	D	**39.5**	**E**
		On-Ramp at Nichols Rd.	3	29.1	D	32.4	D	30.1	D	33.4	D	32.8	D	**36.2**	**E**
	Northbound	On-Ramp at Nichols Rd.	3	23.7	C	18.9	B	24.5	C	19.5	B	26.6	C	21.1	C
		Off-Ramp at Nichols Rd.	3	29.0	D	24.4	C	29.5	D	25.2	C	31.5	D	27.5	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] LOS = Level of Service

EXHIBIT 9-7: EAPC (2020) FREEWAY MAINLINE VOLUMES

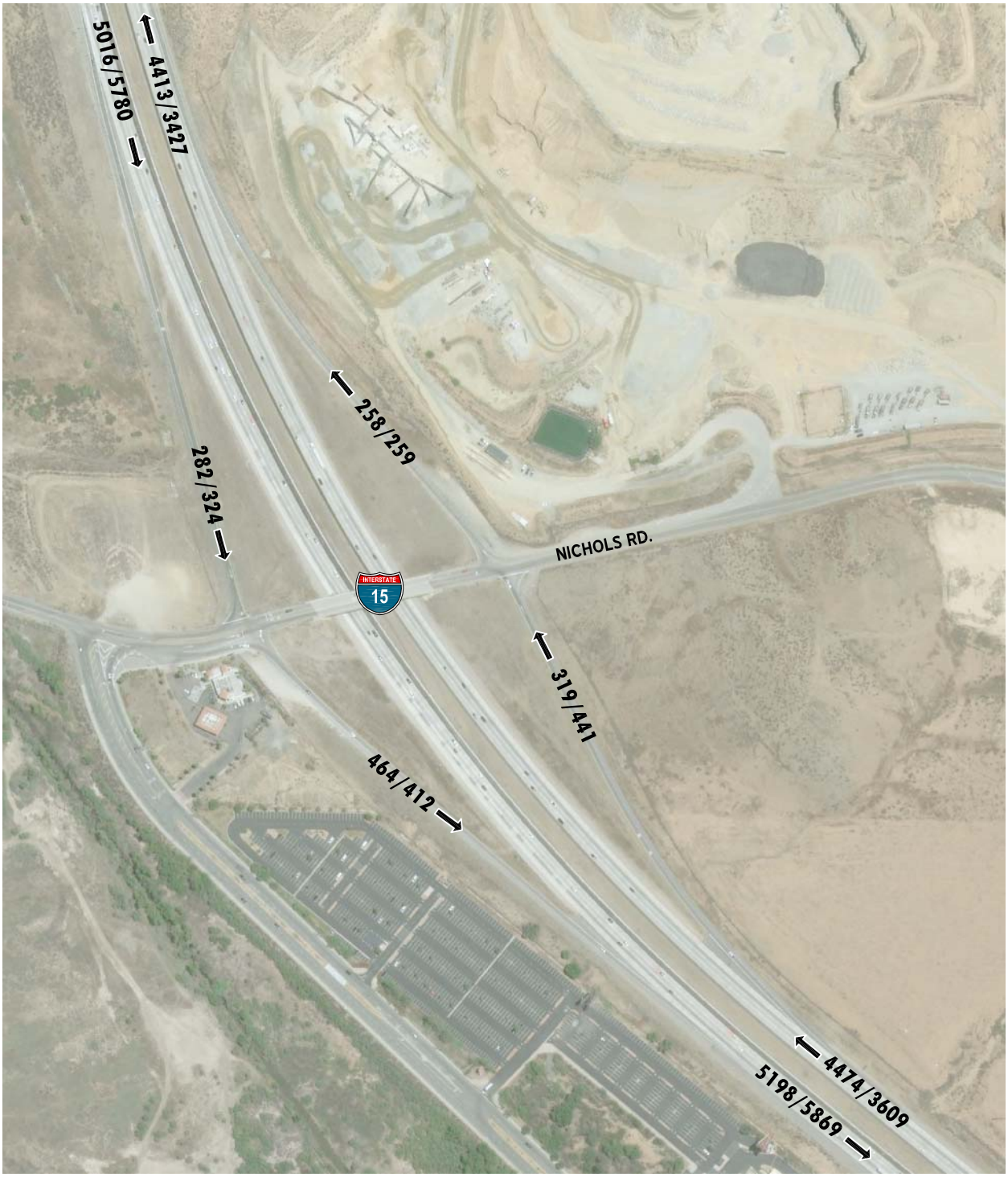


LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

N

EXHIBIT 9-8: EAPC (2021) FREEWAY MAINLINE VOLUMES

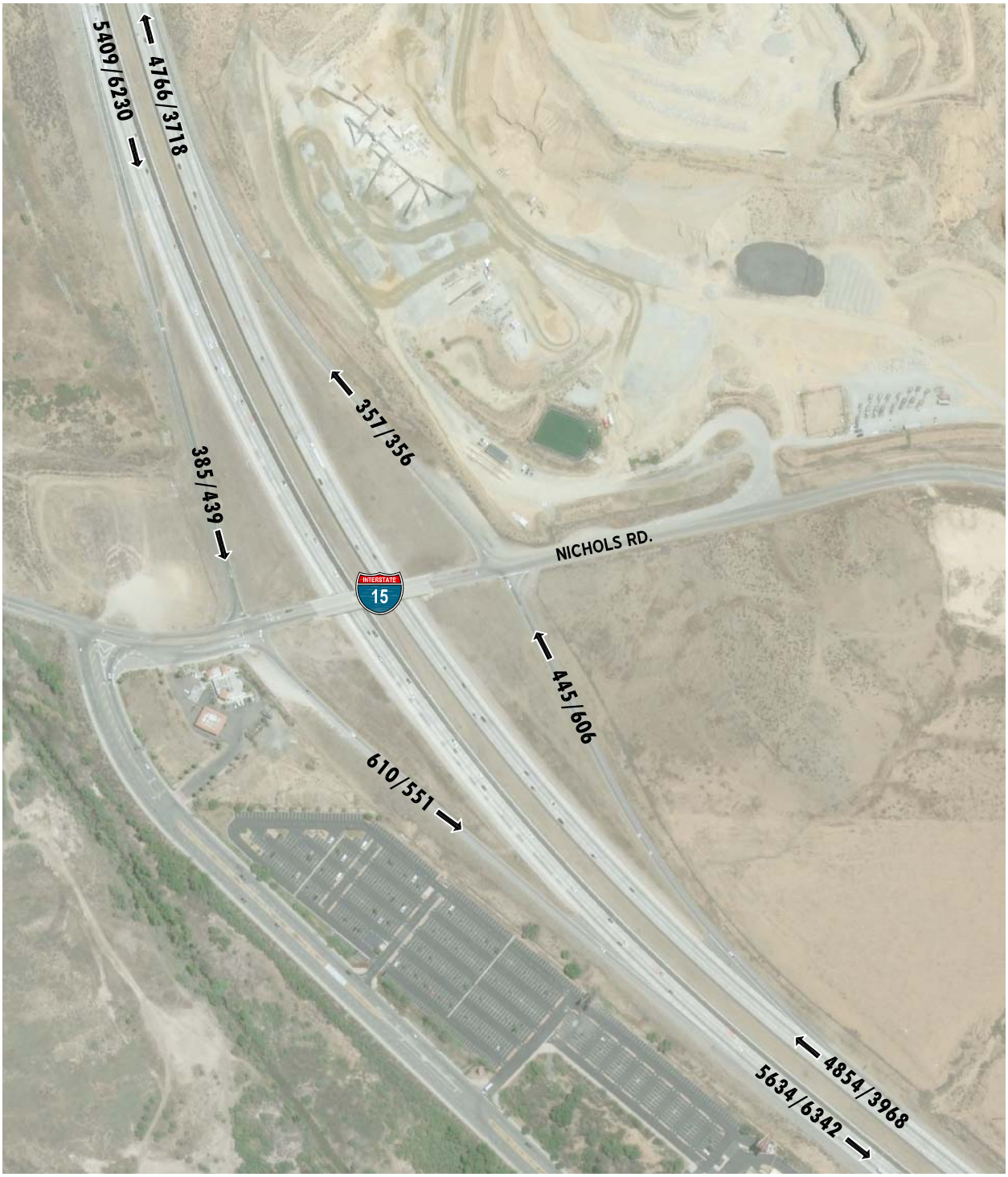


LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

N

EXHIBIT 9-9: EAPC (2024) FREEWAY MAINLINE VOLUMES



LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

N

9.7 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 9-4. As shown in Table 9-4, the following ramp merge/diverge segment is anticipated to operate at an unacceptable LOS during one or more peak hours under EAPC (2020) traffic conditions:

- I-15 Freeway Southbound, Off-Ramp at Nichols Road (#1) – LOS E PM peak hour only

There are no additional ramp merge/diverge segments anticipated to operate at an unacceptable LOS during one or more peak hours under EAPC (2021) traffic conditions, in addition to those previously identified under EAPC (2020) traffic conditions.

As shown in Table 9-4, the following ramp merge/diverge segment is anticipated to operate at an unacceptable LOS during one or more peak hours under EAPC (2024) traffic conditions, in addition to those previously identified under EAPC (2020) traffic conditions:

- I-15 Freeway Southbound, On-Ramp at Nichols Road (#2) – LOS E PM peak hour only

EAPC (2020), EAPC (2021), and EAPC (2024) freeway ramp junction operations analysis worksheets are provided in Appendices 9.13, 9.14, and 9.15, respectively.

9.8 EAPC DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

9.8.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as deficient to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS C / LOS D or better). The effectiveness of the proposed recommended improvements is presented in Table 9-5 for EAPC (2020), EAPC (2021), and EAPC (2024) traffic conditions.

Recommended improvements to address deficiencies for EAPC (2020) traffic conditions are described below:

Lake Street & Nichols Street (#1)

- Add a 2nd northbound through lane.
- Add a 2nd southbound through lane.
- Add an eastbound left turn lane.
- Add a westbound left lane.

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal.

Eastbound and westbound left turn lanes are currently under construction and are anticipated to be in place by summer 2018. However, the intersection is anticipated to continue to operate at an unacceptable LOS without the installation of a traffic signal.

Table 9-5

Intersection Analysis for EAPC Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1] Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Delay[2] (secs.) AM	Delay[2] (secs.) PM	Level of Service AM	Level of Service PM
1	Lake St. & Nichols Rd.																	
	EAPC (2020)																	
	- Without Improvements	TS	1	1	1	1	1	0	0	1	0	0	1	0	24.2	**126.0**	C	**F**
	- With Improvements	TS	1	**2**	1	1	**2**	0	**1**	1	0	**1**	1	0	25.6	30.0	C	C
	EAPC (2021)																	
	- Without Improvements	TS	1	1	1	1	1	0	0	1	0	0	1	0	31.7	**180.5**	C	**F**
	- With Improvements	TS	1	**2**	1	1	**2**	0	**1**	1	0	**1**	1	0	30.4	43.0	C	D
	EAPC (2024)																	
	- Without Improvements	TS	1	1	1	1	1	0	0	1	0	0	1	0	**81.6**	**>200.0**	**F**	**F**
	- With Improvements	TS	1	**2**	1	1	**2**	**1**	**1**	1	**1**	**1**	1	0	39.0	54.2	D	D
3	Alberhill Ranch Rd. & Nichols Rd.																	
	EAPC (2020)																	
	- Without Improvements	AWS	1	0	1	0	0	0	0	1	0	0	1	0	16.0	13.0	C	B
	- With Improvements							Not Applicable										
	EAPC (2021)																	
	- Without Improvements	AWS	1	0	1	0	0	0	0	1	0	0	1	0	21.2	16.7	C	C
	- With Improvements							Not Applicable										
	EAPC (2024)																	
	- Without Improvements	AWS	1	0	1	0	0	0	0	1	0	0	1	0	**>100.0**	**83.0**	**F**	**F**
	- With Improvements[4]	**TS**	1	0	1	0	0	0	0	1	0	0	1	0	46.0	43.4	D	D
4	Lakeshore Dr. & Riverside Dr. (SR-74)																	
	EAPC (2020)																	
	- Without Improvements	TS	1	2	0	1	2	1	1	2	1	1	1	1	49.7	47.9	D	D
	- With Improvements							Not Applicable										
	EAPC (2021)																	
	- Without Improvements	TS	1	2	0	1	2	1	1	2	1	1	1	1	53.1	51.8	D	D
	- With Improvements							Not Applicable										
	EAPC (2024)																	
	- Without Improvements	TS	1	2	0	1	2	1	1	2	1	1	1	1	**67.0**	**66.9**	**E**	**E**
	- With Improvements[4]	TS	1	2	0	1	2	1	1	2	1	1	**2**	**0**	49.6	49.1	D	D
5	Gunnerson St./Strickland Av. & Riverside Dr. (SR-74)																	
	EAPC (2020)																	
	- Without Improvements	CSS	0	1	1	0	1	1	0	1	0	0	1	0	**>100.0**	**>100.0**	**F**	**F**
	- Without Improvements	CSS	0	1	1	0	1	1	**1**	1	0	**1**	1	0	**>100.0**	**>100.0**	**F**	**F**
	- With Improvements[5,6]	**TS**	0	1	1	0	1	1	**1**	1	0	**1**	1	0	9.1	9.1	A	A
	EAPC (2021)																	
	- Without Improvements	CSS	0	1	1	0	1	1	0	1	0	0	1	0	**>100.0**	**>100.0**	**F**	**F**
	- Without Improvements	CSS	0	1	1	0	1	1	**1**	1	0	**1**	1	0	**>100.0**	**>100.0**	**F**	**F**
	- With Improvements[5,6]	**TS**	0	1	1	0	1	1	**1**	1	0	**1**	1	0	9.2	9.1	A	A
	EAPC (2024)																	
	- Without Improvements	CSS	0	1	1	0	1	1	0	1	0	0	1	0	**>100.0**	**>100.0**	**F**	**F**
	- Without Improvements	CSS	0	1	1	0	1	1	**1**	1	0	**1**	1	0	**>100.0**	**>100.0**	**F**	**F**
	- With Improvements[5,6]	**TS**	0	1	1	0	1	1	**1**	1	0	**1**	1	0	9.4	12.3	A	B
6	Collier Av. & Nichols Rd.																	
	EAPC (2020)																	
	- Without Improvements	CSS	1	0	1	0	0	0	0	1	0	1	1	0	29.7	**74.7**	D	**F**
	- With Improvements	**AWS**	1	0	1	0	0	0	0	1	0	1	1	0	31.7	23.4	D	C
	EAPC (2021)																	
	- Without Improvements	CSS	1	0	1	0	0	0	0	1	0	1	1	0	41.1	**>100.0**	E	**F**
	- With Improvements	**TS**	1	0	1	0	0	0	0	1	0	1	1	0	10.2	15.0	B	B
	EAPC (2024)																	
	- Without Improvements	CSS	1	0	1	0	0	0	0	1	0	1	1	0	**>100.0**	**>100.0**	**F**	**F**
	- With Improvements	**TS**	1	0	1	0	0	0	0	1	0	1	1	0	20.7	44.8	C	D

Table 9-5

Intersection Analysis for EAPC Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1] Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Delay[2] (secs.) AM	Delay[2] (secs.) PM	Level of Service AM	Level of Service PM
7	Collier Av. & Riverside Dr. (SR-74)																	
	EAPC (2020)																	
	- Without Improvements	TS	1	1	0	1	1	1	0	1	1>	0	1	0	16.2	29.6	B	C
	- With Improvements		Not Applicable															
	EAPC (2021)																	
	- Without Improvements	TS	1	1	0	1	1	1	0	1	1>	0	1	0	17.4	34.1	B	C
	- With Improvements		Not Applicable															
	EAPC (2024)																	
	- Without Improvements	TS	1	1	0	1	1	1	0	1	1>	0	1	0	23.4	**59.9**	C	**E**
	- With Improvements	TS	**2**	1	0	1	1	1	0	1	1>	0	1	0	20.8	32.2	C	C
9	I-15 Southbound Ramps & Nichols Rd.																	
	EAPC (2020)																	
	- Without Improvements	AWS	0	0	0	0	1	0	0	1	1	1	1	0	21.4	20.4	C	C
	- With Improvements		Not Applicable															
	EAPC (2021)																	
	- Without Improvements	AWS	0	0	0	0	1	0	0	1	1	1	1	0	30.6	34.7	D	D
	- With Improvements		Not Applicable															
	EAPC (2024)																	
	- Without Improvements	AWS	0	0	0	0	1	0	0	1	1	1	1	0	**>100.0**	**>100.0**	**F**	**F**
	- With Improvements	**TS**	0	0	0	**1**	1	**1**	0	1	1	1	1	0	25.4	15.3	C	B
10	I-15 Northbound Ramps & Nichols Rd.																	
	EAPC (2020)																	
	- Without Improvements	CSS	0	1	0	0	0	0	1	1	0	0	1	0	**>100.0**	**>100.0**	**F**	**F**
	- Without Improvements	AWS	0	1	0	0	0	0	1	1	0	0	1	0	**51.1**	13.9	**F**	B
	- With Improvements	**TS**	0	1	**1**	0	0	0	1	1	0	0	1	0	15.9	24.3	B	C
	EAPC (2021)																	
	- Without Improvements	CSS	0	1	0	0	0	0	1	1	0	0	1	0	**>100.0**	**>100.0**	**F**	**F**
	- Without Improvements	AWS	0	1	0	0	0	0	1	1	0	0	1	0	**85.4**	18.3	**F**	C
	- With Improvements	**TS**	0	1	**1**	0	0	0	1	1	0	0	1	0	19.7	36.8	B	D
	EAPC (2024)																	
	- Without Improvements	CSS	0	1	0	0	0	0	1	1	0	0	1	0	**>100.0**	**>100.0**	**F**	**F**
	- Without Improvements	AWS	0	1	0	0	0	0	1	1	0	0	1	0	**>100.0**	**72.3**	**F**	**F**
	- With Improvements	**TS**	0	1	**1**	0	0	0	**2**	**2**	0	0	**2**	0	19.4	42.0	B	D
17	El Toro Rd. & Tereticornis Av.																	
	EAPC (2020)																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	10.4	**F**	B
	- With Improvements	**AWS**	0	1	0	0	1	0	0	0	0	0	1	0	**50.1**	9.5	**F**	A
	- Without Improvements[7]	CSS	0	1	0	0	1	0	0	0	0	0	1	0	22.4	--	C	--
	- With Improvements[7]	**AWS**	0	1	0	0	1	0	0	0	0	0	1	0	15.0	--	B	--
	EAPC (2021)																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	10.6	**F**	B
	- With Improvements	**AWS**	0	1	0	0	1	0	0	0	0	0	1	0	**61.8**	9.8	**F**	A
	- Without Improvements[7]	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**27.3**	--	**D**	--
	- With Improvements[7]	**AWS**	0	1	0	0	1	0	0	0	0	0	1	0	16.1	--	C	--
	EAPC (2024)																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	11.2	**F**	B
	- With Improvements	**AWS**	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	11.4	**F**	B
	- Without Improvements[7]	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**52.5**	--	**F**	--
	- With Improvements[7]	**AWS**	0	1	0	0	1	0	0	0	0	0	1	0	24.8	--	C	--

Table 9-5

Intersection Analysis for EAPC Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1] Northbound L	Northbound T	Northbound R	Southbound L	Southbound T	Southbound R	Eastbound L	Eastbound T	Eastbound R	Westbound L	Westbound T	Westbound R	Delay[2] (secs.) AM	Delay[2] (secs.) PM	Level of Service AM	Level of Service PM
18	El Toro Rd. & Carmela Ct.																	
	EAPC (2020)																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	11.7	**F**	B
	- With Improvements[8]	**AWS**	0	1	0	0	1	**1**	0	0	0	0	1	0	**73.2**	9.4	**F**	A
	- Without Improvements[7]	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	--	**F**	--
	- With Improvements[7,8]	**AWS**	0	1	0	0	1	**1**	0	0	0	0	1	0	22.2	--	C	--
	EAPC (2021)																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	12.1	**F**	B
	- With Improvements[8]	**AWS**	0	1	0	0	1	**1**	0	0	0	0	1	0	**84.4**	9.7	**F**	A
	- Without Improvements[7]	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	--	**F**	--
	- With Improvements[7,8]	**AWS**	0	1	0	0	1	**1**	0	0	0	0	1	0	24.5	--	C	--
	EAPC (2024)																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	13.5	**F**	B
	- With Improvements[8,9,11]	**TS**	**1**	1	0	0	1	**1**	0	0	0	0	1	0	**58.7**	5.6	**E**	A
	- Without Improvements[7]	CSS	0	1	0	0	1	0	0	0	0	0	1	0	**>100.0**	--	**F**	--
	- With Improvements[7,8,9,11]	**TS**	**1**	1	0	0	1	**1**	0	0	0	0	1	0	16.8	--	B	--
19	Dexter Av. & Central Av. (SR-74)																	
	EAPC (2020)																	
	- Without Improvements	TS	1	1	0	1	1	1>	1	3	1	1	4	1	44.5	**59.8**	D	**E**
	- With Improvements[10]	TS	**0**	**0**	**1**	**0**	**0**	**1**	**0**	3	1	**0**	4	1	21.4	9.0	C	A
	- With Alternative Improvements[10]	TS	1	1	0	1	1	1>	**2**	3	1	1	4	1	40.1	36.3	D	D
	EAPC (2021)																	
	- Without Improvements	TS	1	1	0	1	1	1>	1	3	1	1	4	1	49.8	**70.1**	D	**E**
	- With Improvements[10]	TS	**0**	**0**	**1**	**0**	**0**	**1**	**0**	3	1	**0**	4	1	21.8	23.0	C	C
	- With Alternative Improvements[10]	TS	1	1	0	1	1	1>	**2**	3	1	**2**	4	1	39.5	51.7	D	D
	EAPC (2024)																	
	- Without Improvements	TS	1	1	0	1	1	1>	1	3	1	1	4	1	**76.7**	**118.7**	**E**	**F**
	- With Improvements[10]	TS	**0**	**0**	**1**	**0**	**0**	**1**	**0**	3	1	**0**	4	1	22.3	26.4	C	C
	- With Alternative Improvements[10]	TS	1	1	0	1	1	1>	**2**	**4**	1	**2**	4	1	36.3	54.8	D	D
20	Cambern Av. & Central Av. (SR-74)																	
	EAPC (2020)																	
	- Without Improvements	TS	1	1	0	0	1	1	2	2	0	1	2	1	32.8	37.2	C	D
	- With Improvements							Not Applicable										
	EAPC (2021)																	
	- Without Improvements	TS	1	1	0	0	1	1	2	2	0	1	2	1	38.8	44.5	D	D
	- With Improvements							Not Applicable										
	EAPC (2024)																	
	- Without Improvements	TS	1	1	0	0	1	1	2	2	0	1	2	1	**68.1**	**77.4**	**E**	**E**
	- With Improvements	TS	1	1	0	**2**	1	1	2	**3**	0	1	**3**	1	40.6	49.1	D	D

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

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; d = Defacto Right Turn Lane; **1** = Improvement

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

3 CSS = Cross-street Stop; AWS = All-way Stop; TS = Traffic Signal; **CSS** = Improvement

4 Improvement consists of restriping the existing westbound right turn lane to a shared through-right lane.

5 Eastbound and westbound left turn lanes are currently under construction and are anticipated to be in place by summer 2018. However, the intersection is anticipated to continue to operate at an unacceptable LOS without the installation of a traffic signal.

6 Although the intersection is not anticipated to warrant a traffic signal under Existing and EAP conditions, the addition of lane geometric improvements alone is not anticipated to improve the peak hour delays. As such, the intersection should be monitored and a traffic signal should be installed at the City Traffic Engineer's discretion.

7 A normalized AM PHF of 0.92 is used to determine peak hour operations outside of the 10-15 minute drop-off period.

8 Prohibit on-street parking to allow restriping for a 100 foot southbound right turn pocket.

9 Prohibit on-street parking to allow restriping for a 100 foot northbound left turn pocket.

10 Improvements are consistent with the ultimate buildout design of the I-15/SR-74 interchange and will be completed with the construction of the new I-15/SR-74 interchange. The project is still in the PAED phase and plans to close off Dexter Avenue are not confirmed at this time. As such, alternative improvements have also been provided for this intersection.

Table 9-5

Page 4 of 4

Intersection Analysis for EAPC Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM

[11] The installation of a traffic signal may not be appropriate for the character of the surrounding residential neighborhood. As such, it is recommended that a traffic guard be utilized during the AM peak hour only to direct traffic similar to the way a signalized intersection would operate.

Collier Avenue & Nichols Road (#6)

- Install stop signs along Nichols Road to implement an all-way stop control.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal.
- Add a northbound right turn lane.

El Toro Road & Tereticornis Avenue (#17)

- Install stop signs along El Toro Road to implement an all-way stop control.

El Toro Road & Carmela Court (#18)

- Install stop signs along El Toro Road to implement an all-way stop control.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.

Dexter Avenue & Central Avenue (SR-74) (#19)

- Modify the intersection to its ultimate design by restricting the northbound and southbound approaches to right turn only, and removing the left turns on the eastbound and westbound approaches. The future I-15 Freeway and Central Avenue (SR-74) interchange project is currently in the PAED phase and a preferred alternative has not been selected. As such, the intersection was also evaluated assuming full access. The full access intersection would need a 2nd eastbound left turn lane for EAPC (2020) traffic conditions for acceptable peak hour operations.

Recommended improvements to address deficiencies for EAPC (2021) traffic conditions are described below:

Lake Street & Nichols Street (#1)

- Add a 2nd northbound through lane.
- Add a 2nd southbound through lane.
- Add an eastbound left turn lane.
- Add a westbound left lane.

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

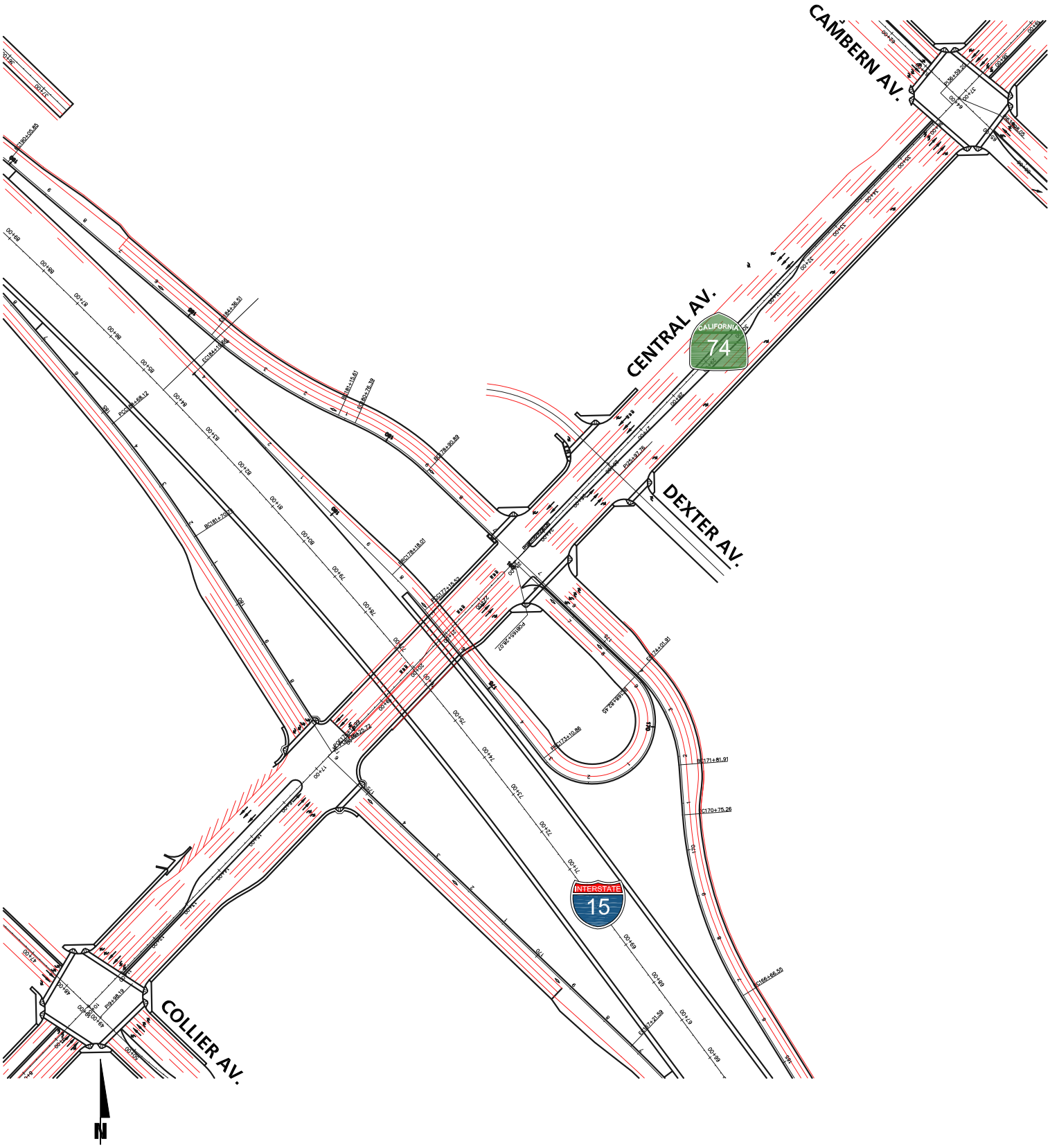
- Install a traffic signal.

Eastbound and westbound left turn lanes are currently under construction and are anticipated to be in place by summer 2018. However, the intersection is anticipated to continue to operate at an unacceptable LOS without the installation of a traffic signal.

Collier Avenue & Nichols Road (#6)

- Install a traffic signal.

EXHIBIT 9-10: I-15/SR-74 INTERCHANGE PROPOSED CONCEPTUAL DESIGN



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I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal.
- Add a northbound right turn lane.

El Toro Road & Tereticornis Avenue (#17)

- Install stop signs along El Toro Road to implement an all-way stop control.

El Toro Road & Carmela Court (#18)

- Install stop signs along El Toro Road to implement an all-way stop control.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.

Dexter Avenue & Central Avenue (SR-74) (#19)

- Modify the intersection to its ultimate design by restricting the northbound and southbound approaches to right turn only, and removing the left turns on the eastbound and westbound approaches. The future I-15 Freeway and Central Avenue (SR-74) interchange project is currently in the PAED phase and a preferred alternative has not been selected. As such, the intersection was also evaluated assuming full access. The full access intersection would need a 2nd eastbound left turn lane and 2nd westbound left turn lane for EAPC (2021) traffic conditions for acceptable peak hour operations.

Recommended improvements to address deficiencies for EAPC (2024) traffic conditions are described below:

Lake Street & Nichols Street (#1)

- Add a 2nd northbound through lane.
- Add a 2nd southbound through lane.
- Add an eastbound left turn lane.
- Add a westbound left lane.
- Add a southbound left lane.
- Add an eastbound right turn lane.

Alberhill Ranch Road & Nichols Road (#3)

- Install a traffic signal.

Lakeshore Drive & Riverside Drive (SR-74) (#4)

- Restripe the westbound right turn lane to a shared through-right lane.

Gunnerson Street/Strickland Avenue & Riverside Drive (SR-74) (#5)

- Install a traffic signal.

Eastbound and westbound left turn lanes are currently under construction and are anticipated to be in place by summer 2018. However, the intersection is anticipated to continue to operate at an unacceptable LOS without the installation of a traffic signal.

Collier Avenue & Nichols Road (#6)

- Install a traffic signal.

Collier Avenue & Riverside Drive (SR-74) (#7)

- Add a 2nd northbound left turn lane.

I-15 Southbound Ramps & Nichols Road (#9)

- Install a traffic signal.
- Add a southbound left turn lane.
- Add a southbound right turn lane.

I-15 Northbound Ramps & Nichols Road (#10)

- Install a traffic signal
- Add a northbound right turn lane.
- Add a 2nd eastbound left turn lane
- Add a 2nd eastbound through lane
- Add a 2nd westbound through lane

El Toro Road & Tereticornis Avenue (#17)

- Install stop signs along El Toro Road to implement an all-way stop control.

El Toro Road & Carmela Court (#18)

- Implementation of a traffic guard during the AM peak hour only.
- Remove a portion of on-street parking on the southbound approach to allow restriping for a dedicated 100-foot right turn pocket.
- Remove a portion of on-street parking on the northbound approach to allow restriping for a dedicated 100-foot left turn pocket.

Dexter Avenue & Central Avenue (SR-74) (#19)

- Modify the intersection to its ultimate design by restricting the northbound and southbound approaches to right turn only, and removing the left turns on the eastbound and westbound approaches. The future I-15 Freeway and Central Avenue (SR-74) interchange project is currently in the PAED phase and a preferred alternative has not been selected. As such, the intersection was also evaluated assuming full access. The full access intersection would need a 2nd eastbound left turn lane, 4th eastbound through lane, and 2nd westbound left turn lane for EAPC (2024) traffic conditions for acceptable peak hour operations.

Cambern Avenue & Central Avenue (SR-74) (#20)

- Add dual southbound left turn lanes.
- Add a 3rd eastbound through lane.
- Add a 3rd westbound through lane.

Although the intersection of El Toro Road and Carmela Court operates at an unacceptable LOS and meets the traffic signal warrant under EAPC (2024) traffic conditions, the installation of a traffic signal may not be appropriate for the character of the surrounding residential neighborhood. As such, to mitigate the impacts, it is recommended that a traffic guard be utilized during the AM peak hour only to direct traffic similar to the way a signalized intersection would operate. The EAPC (2020), EAPC (2021), and EAPC (2024) intersection operations analysis worksheets, with improvements, are included in Appendices 9.16, 9.17, and 9.18 of this TIA, respectively.

Table 9-6 shows the effectiveness of the improvements strategies at intersections that experience off-ramp queuing issues during EAPC (2024). With the proposed intersection improvements at the study area freeway ramp-to-arterial intersections (see Table 9-5), the analysis indicates there are no queuing issues anticipated that may potentially "spill back" onto the SR-60 Freeway mainline during the peak hours for EAPC (2024) traffic conditions (see Table 9-6). Off-ramp queuing analysis worksheets with improvements are provided in Appendix 9.19 of this TIA.

9.8.2 Recommended Improvements to Address Deficiencies on Freeway Facilities

At this time, Caltrans has no fee programs or other improvement programs in place to address the deficiencies caused by development projects in the City of Lake Elsinore (or other neighboring jurisdictions) on the SHS roadway segments. As such, no additional improvements have been recommended to address the EAPC (2020), EAPC (2021), and EAPC (2022) deficiencies on the SHS.

Table 9-6

Peak Hour Freeway Off-Ramp Queuing Summary for EAPC Conditions With Improvements

Intersection	Movement	Available Stacking Distance (Feet)	EAPC (2024)			
			95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM
I-15 SB Off-Ramp & Nichols Rd.	SBL	1,600	259	141	Yes	Yes
	SBT/R	200	29	46	Yes	Yes
	SBR	200	23	45	Yes	Yes
I-15 NB Off-Ramp & Nichols Rd.	NBL/T	1,530	169	383	Yes	Yes
	NBR	200	110	33	Yes	Yes

[1] Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance providec

10 REFERENCES

1. **Riverside County Transportation Department.** *Traffic Impact Analysis Preparation Guide.* County of Riverside : s.n., April 2008.
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4. **Riverside County Transportation Commission.** *2011 Riverside County Congestion Management Program.* County of Riverside : RCTC, December 14, 2011.
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7. —. *Freeway Performance Measurement (PeMS).* [Online] [Cited: January 7, 2014.] http://pems.dot.ca.gov/.
8. **Institute of Transportation Engineers.** *Trip Generation Handbook.* August 2014.
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