



The Merge

TRAFFIC IMPACT ANALYSIS

CITY OF EASTVALE

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TABLE OF CONTENTS

TABLE OF CONTENTS	I
APPENDICES	III
LIST OF EXHIBITS	V
LIST OF TABLES	VII
LIST OF ABBREVIATED TERMS	IX
1 INTRODUCTION	1
1.1 Project Overview.....	1
1.2 Analysis Scenarios	3
1.3 Study Area.....	4
1.4 Analysis Findings	8
1.5 Local and Regional Funding Mechanisms	17
1.6 Cumulative Impacts	34
1.7 On-Site Roadway and Site Access Improvements	34
1.8 Pedestrian and Bicycle Accommodations.....	38
1.9 Truck Access and Circulation.....	38
2 METHODOLOGIES	41
2.1 Level of Service	41
2.2 Intersection Capacity Analysis	41
2.3 Roadway Segment Capacity Analysis.....	44
2.4 Traffic Signal Warrant Analysis Methodology.....	45
2.5 Freeway Off-Ramp Queuing Analysis.....	46
2.6 Freeway Mainline Segment Analysis Methodology.....	46
2.7 Freeway Merge/Diverge Ramp Junction Analysis.....	47
2.8 Minimum Acceptable Levels of Service (LOS) and Intersection Deficiency Criteria	48
2.9 Thresholds of Significance.....	49
2.10 Project Fair Share Calculation Methodology	51
3 AREA CONDITIONS	53
3.1 Existing Circulation Network.....	53
3.2 City of Eastvale General Plan Circulation Element.....	53
3.3 City of Ontario and City of Chino General Plan Circulation Element	58
3.4 Truck Routes	58
3.5 Bicycle, Equestrian, & Pedestrian Facilities	58
3.6 Transit Service.....	70
3.7 Existing (2018) Traffic Counts	70
3.8 Intersection Operations Analysis	72
3.9 Existing Conditions Roadway Segment Capacity Analysis	72
3.10 Traffic Signal Warrants Analysis.....	78
3.11 Off-Ramp Queuing Analysis	78
3.12 Basic Freeway Segment Analysis	78
3.13 Freeway Merge/Diverge Analysis	78
4 PROJECTED FUTURE TRAFFIC	83
4.1 Project Trip Generation.....	83
4.2 Project Trip Distribution.....	87
4.3 Modal Split	88
4.4 Project Trip Assignment.....	88

4.5 Background Traffic 88

4.6 Cumulative Development Traffic 99

4.7 Horizon Year (2040) Volume Development 107

5 E+P TRAFFIC CONDITIONS..... 109

5.1 Roadway Improvements 109

5.2 Existing plus Project Traffic Volume Forecasts 109

5.3 Intersection Operations Analysis 109

5.4 Roadway Segment Capacity Analysis..... 109

5.5 Traffic Signal Warrants Analysis 115

5.6 Off-Ramp Queuing Analysis 115

5.7 Basic Freeway Segment Analysis 115

5.8 Freeway Merge/Diverge Analysis 115

5.9 Project Impacts and Recommended Improvements 120

6 OPENING YEAR CUMULATIVE (2021) TRAFFIC CONDITIONS 125

6.1 Roadway Improvements 125

6.2 Opening Year Cumulative (2021) Without Project Traffic Volume Forecasts 125

6.3 Opening Year Cumulative (2021) With Project Traffic Volume Forecasts 125

6.4 Intersection Operations Analysis 131

6.5 Roadway Segment Capacity Analysis..... 135

6.6 Traffic Signal Warrants Analysis..... 137

6.7 Off-Ramp Queuing Analysis 137

6.8 Basic Freeway Segment Analysis 137

6.9 Freeway Merge/Diverge Analysis 142

6.10 Recommended Improvements 142

7 HORIZON YEAR (2040) TRAFFIC CONDITIONS 151

7.1 Roadway Improvements 151

7.2 Horizon Year (2040) Without Project Traffic Volume Forecasts..... 151

7.3 Horizon Year (2040) With Project Traffic Volume Forecasts 156

7.4 Intersection Operations Analysis 156

7.5 Roadway Segment Capacity Analysis..... 169

7.6 Traffic Signal Warrants Analysis..... 171

7.7 Off-Ramp Queuing Analysis 171

7.8 Basic Freeway Segment Analysis 171

7.9 Freeway Merge/Diverge Analysis 176

7.10 Horizon Year (2040) Deficiencies and Recommended Improvements 176

8 REFERENCES..... 187

APPENDICES

- APPENDIX 1.1: APPROVED TRAFFIC STUDY SCOPING AGREEMENT
- APPENDIX 1.2: SITE ADJACENT QUEUES
- APPENDIX 3.1: EXISTING TRAFFIC COUNTS – APRIL 2018
- 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 QUEUING ANALYSIS WORKSHEETS
- APPENDIX 3.5: EXISTING (2018) CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS
- APPENDIX 3.6: EXISTING (2018) CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS
- APPENDIX 4.1: POST PROCESSING WORKSHEETS
- APPENDIX 4.2: CUMULATIVE DEVELOPMENT RESEARCH
- APPENDIX 5.1: E+P CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
- APPENDIX 5.2: E+P CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS
- APPENDIX 5.3: E+P CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS
- APPENDIX 5.4: E+P CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS
- APPENDIX 5.5: E+P CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS
- APPENDIX 5.6: E+P CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS
- APPENDIX 6.1: OPENING YEAR CUMULATIVE (2021) WITHOUT PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
- APPENDIX 6.2: OPENING YEAR CUMULATIVE (2021) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
- APPENDIX 6.3: OPENING YEAR CUMULATIVE (2021) WITHOUT PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS
- APPENDIX 6.4: OPENING YEAR CUMULATIVE (2021) WITH PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS
- APPENDIX 6.5: OPENING YEAR CUMULATIVE (2021) WITHOUT PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS
- APPENDIX 6.6: OPENING YEAR CUMULATIVE (2021) WITH PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS
- APPENDIX 6.7: OPENING YEAR CUMULATIVE (2021) WITHOUT PROJECT CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS
- APPENDIX 6.8: OPENING YEAR CUMULATIVE (2021) WITH PROJECT CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS
- APPENDIX 6.9: OPENING YEAR CUMULATIVE (2021) WITHOUT PROJECT CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS
- APPENDIX 6.10: OPENING YEAR CUMULATIVE (2021) WITH PROJECT CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS
- APPENDIX 6.11: OPENING YEAR CUMULATIVE (2021) WITH PROJECT CONDITIONS INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS
- APPENDIX 6.12: OPENING YEAR CUMULATIVE (2021) WITH PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS WITH IMPROVEMENTS
- APPENDIX 6.13: OPENING YEAR CUMULATIVE (2021) WITHOUT PROJECT CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS WITH IMPROVEMENTS
- APPENDIX 6.14: OPENING YEAR CUMULATIVE (2021) WITH PROJECT CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS WITH IMPROVEMENTS
- APPENDIX 6.15: OPENING YEAR CUMULATIVE (2021) WITHOUT PROJECT CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS WITH IMPROVEMENTS

APPENDIX 6.16: OPENING YEAR CUMULATIVE (2021) WITH PROJECT CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 7.1: HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS, WITHOUT LIMONITE AVENUE EXTENSION INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
APPENDIX 7.2: HORIZON YEAR (2040) WITH PROJECT CONDITIONS, WITHOUT LIMONITE AVENUE EXTENSION INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
APPENDIX 7.3: HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS, WITH LIMONITE AVENUE EXTENSION INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
APPENDIX 7.4: HORIZON YEAR (2040) WITH PROJECT CONDITIONS, WITH LIMONITE AVENUE EXTENSION INTERSECTION OPERATIONS ANALYSIS WORKSHEETS
APPENDIX 7.5: HORIZON YEAR (2040) WITH PROJECT CONDITIONS TRAFFIC SIGNAL WARRANT ANALYSIS WORKSHEETS
APPENDIX 7.6: HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS
APPENDIX 7.7: HORIZON YEAR (2040) WITH PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS
APPENDIX 7.8: HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS
APPENDIX 7.9: HORIZON YEAR (2040) WITH PROJECT CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS
APPENDIX 7.10: HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS
APPENDIX 7.11: HORIZON YEAR (2040) WITH PROJECT CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS
APPENDIX 7.12: HORIZON YEAR (2040) WITH PROJECT CONDITIONS, WITHOUT LIMONITE AVENUE EXTENSION INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 7.13: HORIZON YEAR (2040) WITH PROJECT CONDITIONS, WITH LIMONITE AVENUE EXTENSION INTERSECTION OPERATIONS ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 7.14: HORIZON YEAR (2040) WITH PROJECT CONDITIONS OFF-RAMP QUEUING ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 7.15: HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 7.16: HORIZON YEAR (2040) WITH PROJECT CONDITIONS BASIC FREEWAY SEGMENT ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 7.17: HORIZON YEAR (2040) WITHOUT PROJECT CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS WITH IMPROVEMENTS
APPENDIX 7.18: HORIZON YEAR (2040) WITH PROJECT CONDITIONS RAMP JUNCTION ANALYSIS WORKSHEETS WITH IMPROVEMENTS

LIST OF EXHIBITS

EXHIBIT 1-1: PRELIMINARY SITE PLAN.....2

EXHIBIT 1-2: LOCATION MAP5

EXHIBIT 1-3: SUMMARY OF DEFICIENT INTERSECTIONS BY ANALYSIS SCENARIO9

EXHIBIT 1-4: SITE ADJACENT ROADWAY AND SITE ACCESS RECOMMENDATIONS.....36

EXHIBIT 1-5: TRUCK ACCESS.....39

EXHIBIT 3-1: EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS54

EXHIBIT 3-2: CITY OF EASTVALE GENERAL PLAN CIRCULATION ELEMENT.....56

EXHIBIT 3-3: CITY OF EASTVALE GENERAL PLAN ROADWAY CROSS-SECTIONS57

EXHIBIT 3-4: CITY OF ONTARIO GENERAL PLAN CIRCULATION ELEMENT59

EXHIBIT 3-5: CITY OF ONTARIO GENERAL PLAN ROADWAY CROSS-SECTIONS60

EXHIBIT 3-6: CITY OF CHINO GENERAL PLAN CIRCULATION ELEMENT.....61

EXHIBIT 3-7: CITY OF CHINO GENERAL PLAN ROADWAY CROSS-SECTIONS62

EXHIBIT 3-8: CITY OF ONTARIO TRUCK ROUTES64

EXHIBIT 3-9: CITY OF CHINO TRUCK ROUTES65

EXHIBIT 3-10: EASTVALE AREA TRAILS AND BIKEWAYS66

EXHIBIT 3-11: CITY OF ONTARIO GENERAL PLAN TRAILS AND BIKEWAY SYSTEMS.....67

EXHIBIT 3-12: CITY OF CHINO FUTURE BICYCLE FACILITIES68

EXHIBIT 3-13: EXISTING PEDESTRIAN FACILITIES.....69

EXHIBIT 3-14: EXISTING TRANSIT ROUTES71

EXHIBIT 3-15: EXISTING (2018) AVERAGE DAILY TRAFFIC (ADT).....73

EXHIBIT 3-16: EXISTING (2018) TRAFFIC VOLUMES (IN PCE)74

EXHIBIT 3-17: EXISTING (2018) SUMMARY OF LOS75

EXHIBIT 3-18: EXISTING (2018) FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)82

EXHIBIT 4-1: PROJECT (E+P AND OPENING YEAR CUMULATIVE PASSENGER CAR) TRIP DISTRIBUTION.89

EXHIBIT 4-2: PROJECT (HORIZON YEAR WITHOUT LIMONITE AVENUE EXTENSION PASSENGER CAR) TRIP DISTRIBUTION.....90

EXHIBIT 4-3: PROJECT (HORIZON YEAR WITH LIMONITE AVENUE EXTENSION PASSENGER CAR) TRIP DISTRIBUTION.....91

EXHIBIT 4-4: PROJECT (E+P, OPENING YEAR CUMULATIVE, AND HORIZON YEAR TRUCK) TRIP DISTRIBUTION.....92

EXHIBIT 4-5: PROJECT ONLY (E+P AND OPENING YEAR CUMULATIVE) AVERAGE DAILY TRAFFIC (ADT) 93

EXHIBIT 4-6: PROJECT ONLY (E+P AND OPENING YEAR CUMULATIVE) TRAFFIC VOLUMES (IN PCE)94

EXHIBIT 4-7: PROJECT ONLY (HORIZON YEAR WITHOUT LIMONITE AVENUE EXTENSION) AVERAGE DAILY TRAFFIC (ADT).....95

EXHIBIT 4-8: PROJECT ONLY (HORIZON YEAR WITHOUT LIMONITE AVENUE EXTENSION) TRAFFIC VOLUMES (IN PCE)96

EXHIBIT 4-9: PROJECT ONLY (HORIZON YEAR WITH LIMONITE AVENUE EXTENSION) AVERAGE DAILY TRAFFIC (ADT).....97

EXHIBIT 4-10: PROJECT ONLY (HORIZON YEAR WITH LIMONITE AVENUE EXTENSION) TRAFFIC VOLUMES (IN PCE)98

EXHIBIT 4-11: CUMULATIVE DEVELOPMENT LOCATION MAP..... 100

EXHIBIT 4-12: CUMULATIVE DEVELOPMENT ONLY AVERAGE DAILY TRAFFIC (ADT)..... 101

EXHIBIT 4-13: CUMULATIVE DEVELOPMENT ONLY TRAFFIC VOLUMES (IN PCE) 102

EXHIBIT 5-1: E+P AVERAGE DAILY TRAFFIC (ADT)..... 110

EXHIBIT 5-2: E+P TRAFFIC VOLUMES (IN PCE) 111

EXHIBIT 5-3: E+P SUMMARY OF LOS 112

EXHIBIT 5-4: E+P FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES) 119

EXHIBIT 6-1: I-15/LIMONITE AVENUE INTERCHANGE PROJECT 126

EXHIBIT 6-2: OPENING YEAR CUMULATIVE (2021) WITHOUT PROJECT AVERAGE DAILY TRAFFIC (ADT) 127

EXHIBIT 6-3: OPENING YEAR CUMULATIVE (2021) WITHOUT PROJECT TRAFFIC VOLUMES (IN PCE)... 128

EXHIBIT 6-4: OPENING YEAR CUMULATIVE (2021) WITH PROJECT AVERAGE DAILY TRAFFIC (ADT).... 129

EXHIBIT 6-5: OPENING YEAR CUMULATIVE (2021) WITH PROJECT TRAFFIC VOLUMES (IN PCE) 130

EXHIBIT 6-6: OPENING YEAR CUMULATIVE (2021) WITHOUT PROJECT SUMMARY OF LOS..... 133

EXHIBIT 6-7: OPENING YEAR CUMULATIVE (2021) WITH PROJECT SUMMARY OF LOS..... 134

EXHIBIT 6-8: OPENING YEAR CUMULATIVE (2021) WITHOUT PROJECT FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES) 140

EXHIBIT 6-9: OPENING YEAR CUMULATIVE (2021) WITH PROJECT FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES) 141

EXHIBIT 7-1: HORIZON YEAR (2040) WITHOUT PROJECT (WITHOUT LIMONITE AVENUE EXTENSION) AVERAGE DAILY TRAFFIC (ADT) 152

EXHIBIT 7-2: HORIZON YEAR (2040) WITHOUT PROJECT (WITHOUT LIMONITE AVENUE EXTENSION) TRAFFIC VOLUMES (IN PCE) 153

EXHIBIT 7-3: HORIZON YEAR (2040) WITH PROJECT (WITHOUT LIMONITE AVENUE EXTENSION) AVERAGE DAILY TRAFFIC (ADT) 154

EXHIBIT 7-4: HORIZON YEAR (2040) WITH PROJECT (WITHOUT LIMONITE AVENUE EXTENSION) TRAFFIC VOLUMES (IN PCE) 155

EXHIBIT 7-5: HORIZON YEAR (2040) WITHOUT PROJECT (WITH LIMONITE AVENUE EXTENSION) AVERAGE DAILY TRAFFIC (ADT) 157

EXHIBIT 7-6: HORIZON YEAR (2040) WITHOUT PROJECT (WITH LIMONITE AVENUE EXTENSION) TRAFFIC VOLUMES (IN PCE) 158

EXHIBIT 7-7: HORIZON YEAR (2040) WITH PROJECT (WITH LIMONITE AVENUE EXTENSION) AVERAGE DAILY TRAFFIC (ADT) 159

EXHIBIT 7-8: HORIZON YEAR (2040) WITH PROJECT (WITH LIMONITE AVENUE EXTENSION) TRAFFIC VOLUMES (IN PCE) 160

EXHIBIT 7-9: HORIZON YEAR (2040) WITHOUT PROJECT (WITHOUT LIMONITE AVENUE EXTENSION) SUMMARY OF LOS 163

EXHIBIT 7-10: HORIZON YEAR (2040) WITH PROJECT (WITHOUT LIMONITE AVENUE EXTENSION) SUMMARY OF LOS 164

EXHIBIT 7-11: HORIZON YEAR (2040) WITHOUT PROJECT (WITHOUT LIMONITE AVENUE EXTENSION) SUMMARY OF LOS 165

EXHIBIT 7-12: HORIZON YEAR (2040) WITH PROJECT (WITHOUT LIMONITE AVENUE EXTENSION) SUMMARY OF LOS 166

EXHIBIT 7-13: HORIZON YEAR (2040) WITHOUT PROJECT FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES) 174

EXHIBIT 7-14: HORIZON YEAR (2040) WITH PROJECT FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES) 175

LIST OF TABLES

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS	6
TABLE 1-2: ROADWAY SEGMENT ANALYSIS LOCATIONS	7
TABLE 1-3: FREEWAY MAINLINE SEGMENT ANALYSIS LOCATIONS	7
TABLE 1-4: FREEWAY MERGE/DIVERGE RAMP JUNCTION ANALYSIS LOCATIONS	8
TABLE 1-5: SUMMARY OF IMPROVEMENTS AND ROUGH ORDER OF MAGNITUDE COSTS – WITHOUT LIMONITE AVENUE EXTENSION	19
TABLE 1-6: SUMMARY OF IMPROVEMENTS AND ROUGH ORDER OF MAGNITUDE COSTS WITH LIMONITE AVENUE EXTENSION	23
TABLE 1-7: PROJECT FAIR SHARE CALCULATIONS FOR WITHOUT LIMONITE AVENUE EXTENSION.....	29
TABLE 1-8: PROJECT FAIR SHARE CALCULATIONS FOR WITH LIMONITE AVENUE EXTENSION	31
TABLE 2-1: SIGNALIZED INTERSECTION LOS THRESHOLDS	42
TABLE 2-2: UNSIGNALIZED INTERSECTION LOS THRESHOLDS	44
TABLE 2-3: ROADWAY SEGMENT CAPACITIES.....	44
TABLE 2-4: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS	45
TABLE 2-5: DESCRIPTION OF FREEWAY MAINLINE LOS.....	47
TABLE 2-6: DESCRIPTION OF FREEWAY MERGE AND DIVERGE LOS.....	48
TABLE 3-1: INTERSECTION ANALYSIS FOR EXISTING (2018) CONDITIONS.....	76
TABLE 3-2: ROADWAY SEGMENT CAPACITY ANALYSIS FOR EXISTING (2018) CONDITIONS.....	77
TABLE 3-3: PEAK HOUR FREEWAY OFF-RAMP QUEUING SUMMARY FOR EXISTING (2018) CONDITIONS	79
TABLE 3-4: BASIC FREEWAY SEGMENT ANALYSIS FOR EXISTING (2018) CONDITIONS.....	80
TABLE 3-5: FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS FOR EXISTING (2018) CONDITIONS	81
TABLE 4-1: PROJECT TRIP GENERATION RATES	84
TABLE 4-2: PROJECT TRIP GENERATION SUMMARY (PCE)	85
TABLE 4-3: PROJECT TRIP GENERATION SUMMARY (ACTUAL VEHICLES).....	86
TABLE 4-4: CUMULATIVE DEVELOPMENT LAND USE SUMMARY	103
TABLE 5-1: INTERSECTION ANALYSIS FOR E+P CONDITIONS.....	113
TABLE 5-2: ROADWAY SEGMENT CAPACITY ANALYSIS FOR E+P CONDITIONS.....	114
TABLE 5-3: PEAK HOUR FREEWAY OFF-RAMP QUEUING SUMMARY FOR E+P CONDITIONS.....	116
TABLE 5-4: BASIC FREEWAY SEGMENT ANALYSIS FOR E+P CONDITIONS.....	117
TABLE 5-5: FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS FOR E+P CONDITIONS.....	118
TABLE 5-6: INTERSECTION ANALYSIS FOR E+P CONDITIONS WITH IMPROVEMENTS	121
TABLE 5-7: ROADWAY SEGMENT CAPACITY ANALYSIS FOR E+P CONDITIONS WITH IMPROVEMENTS.....	122
TABLE 6-1: INTERSECTION ANALYSIS FOR OPENING YEAR CUMULATIVE (2021) CONDITIONS	132
TABLE 6-2: ROADWAY SEGMENT CAPACITY ANALYSIS FOR OPENING YEAR CUMULATIVE (2021) CONDITIONS	136
TABLE 6-3: PEAK HOUR FREEWAY OFF-RAMP QUEUING SUMMARY FOR OPENING YEAR CUMULATIVE (2021) CONDITIONS	138
TABLE 6-4: BASIC FREEWAY SEGMENT ANALYSIS FOR OPENING YEAR CUMULATIVE (2021) CONDITIONS	139
TABLE 6-5: FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS FOR OPENING YEAR CUMULATIVE (2021) CONDITIONS	143
TABLE 6-6: INTERSECTION ANALYSIS FOR OPENING YEAR CUMULATIVE (2021) CONDITIONS WITH IMPROVEMENTS.....	144
TABLE 6-7: ROADWAY SEGMENT CAPACITY ANALYSIS FOR OPENING YEAR CUMULATIVE (2021) CONDITIONS WITH IMPROVEMENTS	146

TABLE 6-8: PEAK HOUR FREEWAY OFF-RAMP QUEUING SUMMARY FOR OPENING YEAR CUMULATIVE (2021) CONDITIONS WITH IMPROVEMENTS..... 147

TABLE 6-9: BASIC FREEWAY SEGMENT ANALYSIS FOR OPENING YEAR CUMULATIVE (2021) CONDITIONS WITH IMPROVEMENTS 149

TABLE 6-10: FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS FOR OPENING YEAR CUMULATIVE (2021) CONDITIONS WITH IMPROVEMENTS..... 150

TABLE 7-1: INTERSECTION ANALYSIS FOR HORIZON YEAR (2040) WITHOUT LIMONITE AVENUE EXTENSION CONDITIONS..... 161

TABLE 7-2: INTERSECTION ANALYSIS FOR HORIZON YEAR (2040) WITHOUT LIMONITE AVENUE EXTENSION CONDITIONS..... 167

TABLE 7-3: ROADWAY SEGMENT CAPACITY ANALYSIS FOR HORIZON YEAR (2040) CONDITIONS..... 170

TABLE 7-4: PEAK HOUR FREEWAY OFF-RAMP QUEUING SUMMARY FOR HORIZON YEAR (2040) CONDITIONS 172

TABLE 7-5: BASIC FREEWAY SEGMENT ANALYSIS FOR HORIZON YEAR (2040) CONDITIONS 173

TABLE 7-6: FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS FOR HORIZON YEAR (2040) CONDITIONS 177

TABLE 7-7: INTERSECTION ANALYSIS FOR HORIZON YEAR (2040) CONDITIONS WITH IMPROVEMENTS 178

TABLE 7-8: ROADWAY SEGMENT CAPACITY ANALYSIS FOR HORIZON YEAR (2040) CONDITIONS WITH IMPROVEMENTS 182

TABLE 7-9: PEAK HOUR FREEWAY OFF-RAMP QUEUING SUMMARY FOR HORIZON YEAR (2040) CONDITIONS WITH IMPROVEMENTS 183

TABLE 7-10: BASIC FREEWAY SEGMENT ANALYSIS FOR HORIZON YEAR (2040) CONDITIONS WITH IMPROVEMENTS..... 185

TABLE 7-11: FREEWAY RAMP JUNCTION MERGE/DIVERGE ANALYSIS FOR HORIZON YEAR (2040) 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
CCI	Construction Cost Index
CEQA	California Environmental Quality Act
CMP	Congestion Management Program
DIF	Development Impact Fee
E+P	Existing Plus Project
HCM	Highway Capacity Manual
ICU	Intersection Capacity Utilization
ITE	Institute of Transportation Engineers
JCSD	Jurupa Community Services District
LOS	Level of Service
NCHRP	National Cooperative Highway Research Program
PeMS	Performance Measurement System
NP	No Project (or Without Project)
PCE	Passenger Car Equivalents
PHF	Peak Hour Factor
Project	The Merge
RBBD	Road and Bridge Benefit District
RivTAM	Riverside Transportation Analysis Model
RTA	Riverside Transport Authority
RTP	Regional Transportation Plan
SBCTA	San Bernardino County Transportation Authority
SBTAM	San Bernardino Transportation Analysis Model
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCS	Sustainable Communities Strategy
sf	Square Feet
SHS	State Highway System
SR	State Route
TIA	Traffic Impact Analysis
TUMF	Transportation Uniform Mitigation Fee
v/c	Volume to Capacity
vphgpl	Vehicles per Hour Green per Lane
WP	With Project

WRCOG

Western Riverside Council of Governments

1 INTRODUCTION

This report presents the results of the traffic impact analysis (TIA) for the proposed The Merge (“Project”), which is located on the northeast corner of Archibald Avenue and Limonite Avenue in the City of Eastvale, as shown on Exhibit 1-1.

The purpose of this TIA is to evaluate the potential circulation system deficiencies that may result from the development of the proposed Project, and to recommend improvements to achieve acceptable circulation system operational conditions. As directed by City of Eastvale staff, this traffic study has been prepared in accordance with the County of Riverside Traffic Impact Analysis Preparation Guidelines, the California Department of Transportation (Caltrans) Guide for the Preparation of Traffic Impact Studies, and consultation with City staff during the scoping process. (1) (2) Where applicable, the San Bernardino County Transportation Authority (SBCTA) Congestion Management Program (CMP) Guidelines for CMP Traffic Impact Analysis Reports (Appendix B, 2016 Update) has also been followed for the study area intersections located in the City of Ontario or City of Chino. (3) The approved Project Traffic Study Scoping agreement is provided in Appendix 1.1 of this TIA.

1.1 PROJECT OVERVIEW

Exhibit 1-1 illustrates the preliminary Project site plan. As indicated on Exhibit 1-1, the Project is proposed to consist of the following uses:

- 336,501 square feet of warehousing use
- 4,750 square feet of shopping center use
- 30,000 square foot supermarket (grocery store)
- 14,600 square foot pharmacy/drug store use with drive-through window
- 16 vehicle fueling position gas station with convenience market
- 4,000 square foot automated car wash
- 7,750 square feet of fast-food restaurant without drive-through window use
- 6,000 square feet of fast-food restaurant with drive-through window use
- 2,500 square foot coffee/donut shop with drive-through window use

Regional access to the Project site is provided via the SR-60 Freeway at Archibald Avenue and the I-15 Freeway at Limonite Avenue interchange.

EXHIBIT 1-1: PRELIMINARY SITE PLAN



LEGEND:

- RIRO** = RIGHT-IN/RIGHT-OUT ONLY ACCESS
- FULL** = FULL ACCESS
- LI** = LEFT IN



The Project is located on the northeast corner of Archibald Avenue and Limonite Avenue in the City of Eastvale. Vehicular and truck traffic access will be provided via the following driveways:

- Archibald Avenue & Driveway 1 – Right-in/right-out/left-in driveway providing access to both passenger cars and trucks
- Archibald Avenue & Driveway 2 – Right-in/right-out driveway providing access to passenger cars only
- Driveway 3 & Limonite Avenue – Right-in/right-out driveway providing access to passenger cars only
- Driveway 4 & Limonite Avenue – Signalized full access driveway providing access to both passenger cars and trucks. This driveway is proposed to align with a future driveway to the south.

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. (4) The proposed Project is anticipated to generate a net total of 6,917 passenger car equivalent (PCE) trip-ends per day, 558 PCE AM peak hour trips and 617 PCE PM peak hour trips. In comparison, the proposed Project is anticipated to generate a net total of 6,737 actual vehicle trip-ends per day with 541 AM peak hour trips and 599 PM peak hour trips. The assumptions and methods used to estimate the Project’s trip generation characteristics are discussed in greater detail in Section 4.1 *Project Trip Generation* of this report.

1.2 ANALYSIS SCENARIOS

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

- Existing (2018) Conditions
- Existing plus Project (E+P) Conditions
- Opening Year Cumulative (2021) Without Project Conditions
- Opening Year Cumulative (2021) With Project Conditions
- Horizon Year (2040) Without Project, Without Limonite Avenue Extension Conditions
- Horizon Year (2040) With Project, Without Limonite Avenue Extension Conditions
- Horizon Year (2040) Without Project, With Limonite Avenue Extension Conditions
- Horizon Year (2040) With Project, With Limonite Avenue Extension Conditions

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. The E+P analysis is intended to identify the project-specific traffic impacts associated

solely with the development of the proposed Project based on a comparison of the E+P traffic conditions to Existing (2018) conditions.

1.2.3 OPENING YEAR CUMULATIVE CONDITIONS

The Opening Year Cumulative traffic conditions analyses determine the potential near-term cumulative circulation system deficiencies. To account for background traffic growth, traffic associated with other known cumulative development projects in conjunction with an ambient growth factor from Existing conditions of 4.88% (for 2021 conditions – 1.6 percent per year compounded over 3 years) are included for Opening Year Cumulative traffic conditions. This comprehensive list was compiled from information provided by the City of Eastvale and other near-by agencies (see Appendix 4.2).

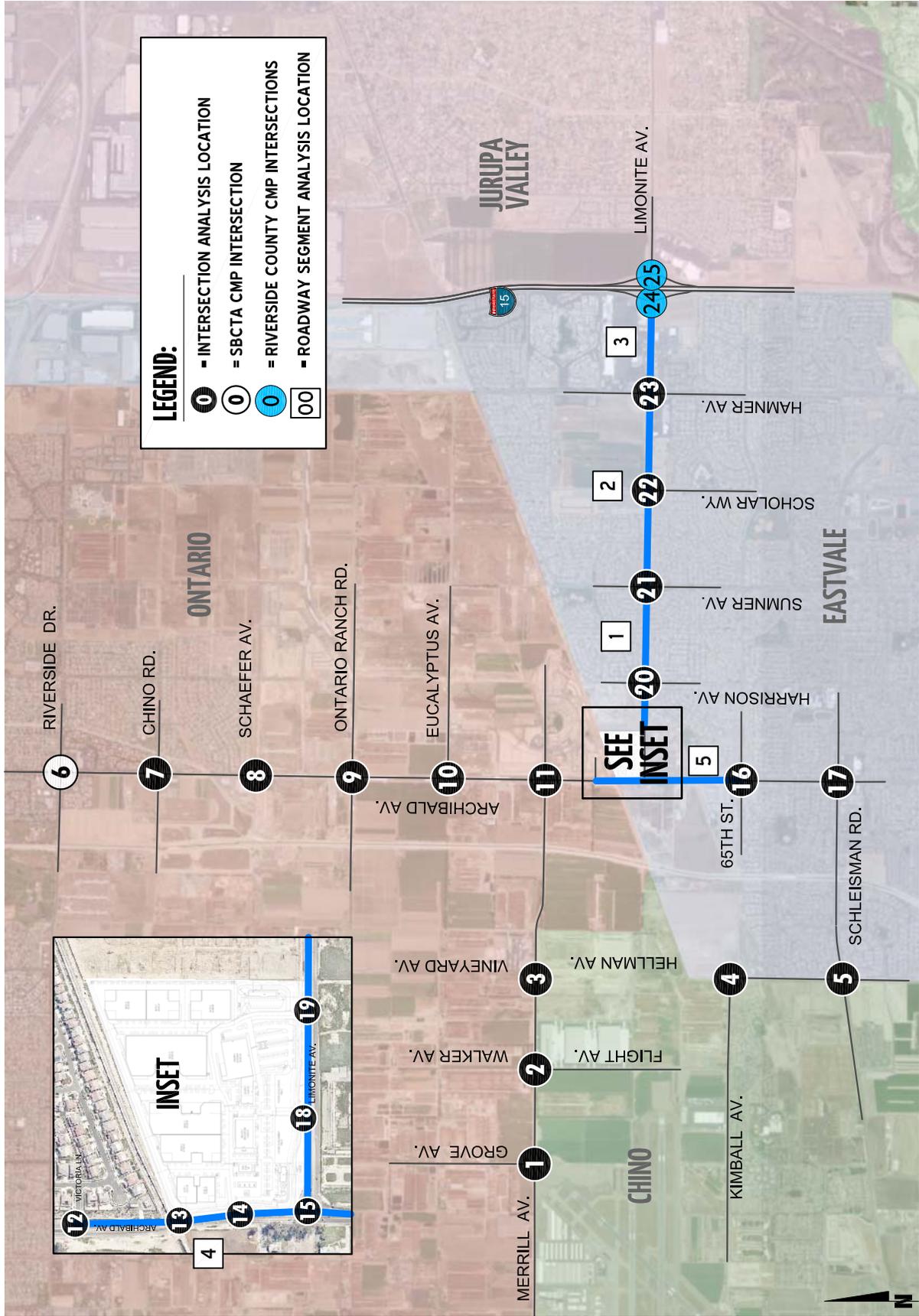
1.2.4 HORIZON YEAR (2040) CONDITIONS

Traffic projections for Horizon Year (2040) with Project conditions were derived from the Riverside Transportation Analysis Model (RivTAM) for study area intersections located in Riverside County and the San Bernardino Transportation Analysis Model (SBTAM) for study area intersections located in San Bernardino County. The Horizon Year conditions analysis will be utilized to determine if improvements funded through regional transportation mitigation fee programs, such as the Western Riverside Council of Governments Transportation Uniform Mitigation Fee (TUMF), City of Eastvale Development Impact Fee (DIF) programs, or other approved funding mechanism (e.g., Mira Loma Road and Bridge Benefit District (RBBD), etc.) can accommodate the long-range cumulative traffic at the target Level of Service (LOS) identified in the City of Eastvale (lead agency) General Plan. (5) Other improvements needed beyond the “funded” improvements (such as localized improvements to non-TUMF, non-DIF, or non-RBBD facilities) are identified as such. Each of these regional transportation fee programs are discussed in more detail in Section 1.5 *Local and Regional Funding Mechanisms*.

1.3 STUDY AREA

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

EXHIBIT 1-2: LOCATION MAP



1.3.1 INTERSECTIONS

The following 25 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 Eastvale staff. The “50 peak hour trip” criterion utilized by the City of Eastvale is consistent with the methodology employed by the County of Riverside, and generally represents a minimum number of trips at which a typical intersection would have the potential to be substantively impacted by a given development proposal. Although each intersection may have unique operating characteristics, this traffic engineering rule of thumb is a widely utilized tool for estimating a potential area of impact (i.e., study area). The “50 peak hour trip” criterion is also utilized by the County of San Bernardino, including the City of Ontario and City of Chino. Other analysis intersections, within the adjacent cities were not selected for evaluation as the Project is anticipated to contribute less than 50 peak hour trips.

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction	CMP?
1	Grove Av. & Merrill Av.	Chino/Ontario	No
2	Flight Av. & Merrill Av.	Chino/Ontario	No
3	Hellman Av. & Merrill Av.	Chino/Ontario	No
4	Hellman Av. & Kimball Av.	Chino/Eastvale	No
5	Hellman Av. & Pine Av.	Chino/Eastvale	No
6	Archibald Av. & Riverside Dr.	Ontario	Yes
7	Archibald Av. & Chino Av.	Ontario	No
8	Archibald Av. & Schaefer Av.	Ontario	No
9	Archibald Av. & Ontario Ranch Rd.	Ontario	No
10	Archibald Av. & Eucalyptus Av.	Ontario	No
11	Archibald Av. & Merrill Av.	Ontario	No
12	Archibald Av. & Victoria Ln.	Ontario	No
13	Archibald Av. & Driveway 1 – Future Intersection	Eastvale	No
14	Archibald Av. & Driveway 2 – Future Intersection	Eastvale	No
15	Archibald Av. & Limonite Av.	Eastvale	No
16	Archibald Av. & 65 th St.	Eastvale	No
17	Archibald Av. & Schleisman Rd.	Eastvale	No
18	Driveway 3 & Limonite Av. – Future Intersection	Eastvale	No
19	Driveway 4 & Limonite Av. – Future Intersection	Eastvale	No
20	Harrison Av. & Limonite Av.	Eastvale	No
21	Sumner Av. & Limonite Av.	Eastvale	No
22	Scholar Wy. & Limonite Av.	Eastvale	No
23	Hamner Av. & Limonite Av.	Eastvale	No
24	I-15 SB Ramps & Limonite Av.	Caltrans/Eastvale	Yes
25	I-15 NB Ramps & Limonite Av.	Caltrans/Jurupa Valley	Yes

1.3.2 ROADWAY SEGMENTS

Pursuant to the direction of City staff, daily volume-to-capacity (v/c) roadway analyses have been evaluated for the following roadway segments as shown in Table 1-2:

TABLE 1-2: ROADWAY SEGMENT ANALYSIS LOCATIONS

ID	Roadway Segments
1	Limonite Av., Archibald Av. to Sumner Av.
2	Limonite Av., Sumner Av. to Hamner Av.
3	Limonite Av., Hamner Av. to I-15 Freeway
4	Archibald Av., Victoria Ln. to Limonite Av.
5	Archibald Av., Limonite Av. to 65 th St.

1.3.3 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) Consistent with recent Caltrans guidance, and because impacts to freeway segments tend to 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 typically is not required. As such, this study evaluates the following freeway segments adjacent to the point of entry to the SHS, where the Project is anticipated to contribute 25 or more one-way peak hour trips (see Table 1-3):

TABLE 1-3: FREEWAY MAINLINE SEGMENT ANALYSIS LOCATIONS

ID	Freeway Mainline Segments
1	I-15 Freeway – Southbound, North of Limonite Av.
2	I-15 Freeway – Southbound, South of Limonite Av.
3	I-15 Freeway – Northbound, North of Limonite Av.
4	I-15 Freeway – Northbound, South of Limonite Av.

1.3.4 FREEWAY MERGE/DIVERGE RAMP JUNCTIONS

The study area freeway merge/diverge ramp junction analysis locations include the following freeway ramp junctions for each direction of flow as shown in Table 1-4, where the Project is anticipated to contribute 25 or more one-way peak hour trips:

TABLE 1-4: FREEWAY MERGE/DIVERGE RAMP JUNCTION ANALYSIS LOCATIONS

ID	Freeway Merge/Diverge Ramp Junctions
1	I-15 Freeway – Southbound, Off-Ramp at Limonite Av. (Diverge)
2	I-15 Freeway – Southbound, Loop On-Ramp at Limonite Av. (Merge) – Future Ramp
3	I-15 Freeway – Southbound, On-Ramp at Limonite Av. (Merge)
4	I-15 Freeway – Northbound, On-Ramp at Limonite Av. (Merge)
5	i-15 Freeway – Northbound, Loop On-Ramp at Limonite Av. (Merge)
6	I-15 Freeway – Northbound, Off-Ramp at Limonite Av. (Diverge)

1.4 ANALYSIS FINDINGS

This section provides a summary of the analysis results for Existing (2018), E+P (Project Buildout), Opening Year Cumulative (2021) Without and With Project, and Horizon Year (2040) Without and With Project conditions for both Without and With the Limonite Avenue Extension.

1.4.1 EXISTING (2018) CONDITIONS

Intersection Operations Analysis

The summary of LOS results for Existing (2018) traffic conditions are presented on Exhibit 1-3. As shown, there are two study area intersections that are currently operating at an unacceptable LOS:

- Flight Av. & Merrill Av. (#2) – LOS F AM peak hour only
- Hellman Av. & Kimball Av. (#4) – LOS F AM peak hour; LOS E PM peak hour

Roadway Segment Capacity Analysis

For Existing (2018) traffic conditions, the following study area roadway segments currently operate at an unacceptable LOS based on the City’s planning level daily roadway capacity thresholds:

- Limonite Av., Sumner Av. to Hamner Av. (#2) – LOS E
- Archibald Av., Victoria Ln. to Limonite Av. (#4) – LOS F

Off-Ramp Queuing Analysis

A queuing analysis was performed for the northbound and southbound off-ramps at the I-15 Freeway at the Limonite Avenue interchange for Existing (2018) traffic conditions. The analysis indicates there are currently no queues that may potentially “spill back” onto the I-15 Freeway mainline during the peak hours.

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

#	Intersection	Existing (2018)	E+P	Opening Year (2021) Without Project	Opening Year (2021) With Project	Horizon Year (2040) Without Project	Horizon Year (2040) With Project	Horizon Year (2040) Without Project	Horizon Year (2040) With Project
1	Grove Av. / Merrill Av.	●	●	●	●	●	●	●	●
2	Walker Av. / Flight Av. / Merrill Av.	●	●	●	●	●	●	●	●
3	Vineyard Av. / Hellman Av. / Merrill Av.	NA	NA	●	●	●	●	●	●
4	Hellman Av. / Kimball Av.	●	●	●	●	●	●	●	●
5	Hellman Av. / Pine Av.	●	●	●	●	●	●	●	●
6	Archibald Av. / Riverside Dr.	●	●	●	●	●	●	●	●
7	Archibald Av. / Chino Av.	●	●	●	●	●	●	●	●
8	Archibald Av. / Schaefer Av.	NA	NA	●	●	●	●	●	●
9	Archibald Av. / Ontario Ranch Rd.	●	●	●	●	●	●	●	●
10	Archibald Av. / Eucalyptus Av.	●	●	●	●	●	●	●	●
11	Archibald Av. / Merrill Av.	●	●	●	●	●	●	●	●
12	Archibald Av. / Victoria Ln.	●	●	●	●	●	●	●	●
13	Archibald Av. / Dwy. 1	NA	●	●	●	●	●	●	●
14	Archibald Av. / Dwy. 2	NA	●	●	●	●	●	●	●
15	Archibald Av. / Limonite Av.	●	●	●	●	●	●	●	●
16	Archibald Av. / 65th St.	●	●	●	●	●	●	●	●
17	Archibald Av. / Schleisman Rd.	●	●	●	●	●	●	●	●
18	Dwy. 3 / Limonite Av.	NA	●	●	●	●	●	●	●
19	Dwy. 4 / Limonite Av.	NA	●	●	●	●	●	●	●
20	Harrison Av. / Limonite Av.	●	●	●	●	●	●	●	●
21	Sumner Av. / Limonite Av.	●	●	●	●	●	●	●	●
22	Scholar Wy. / Limonite Av.	●	●	●	●	●	●	●	●
23	Hamner Av. / Limonite Av.	●	●	●	●	●	●	●	●
24	I-15 SB Ramps / Limonite Av.	●	●	●	●	●	●	●	●
25	I-15 NB Ramps / Limonite Av.	●	●	●	●	●	●	●	●

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



Freeway Operations Analyses

For Existing (2018) traffic conditions, the study area freeway mainline segments and ramp merge/diverge junctions are currently operating at an acceptable LOS (i.e., LOS D or better) during one or both peak hours, with the exception of the following freeway mainline segment and merge ramp junction:

- Segment: I-15 Freeway Southbound, South of Limonite Av. (#2) – LOS E AM and PM peak hours
- Ramp: I-15 Freeway, Southbound On-Ramp at Limonite Av. (#3) – LOS E AM peak hour only

There are planned improvements for the I-15 Freeway at Limonite Avenue Interchange, which would consist of a new 8-lane overcrossing along Limonite Avenue (3 through lanes in each direction plus 2 right turn lanes at each ramp), widening of the off-ramps from 2 to 4 lanes, the addition of 2 new loop on-ramps, and additional widening of Limonite Avenue to 4 lanes in each direction between Hamner Avenue and Wineville Avenue. The construction is anticipated to begin mid to late 2018 with completion of construction to occur in 2019. However, this planned improvement does not widen the existing freeway mainline segments. There is a separate I-15 Freeway project that includes the construction of 2 tolled Express Lanes between the SR-60 Freeway and Cajalco Road. The Express Lanes are not anticipated to be completed until Year 2020.

1.4.2 E+P CONDITIONS

Intersection Operations Analysis

As shown on Exhibit 1-3, there is one additional study area intersection that is anticipated to operate at an unacceptable LOS for E+P traffic conditions, in addition to the locations previously identified for Existing (2018) traffic conditions:

- Archibald Av. & Limonite Av. (#15) – LOS E AM peak hour; LOS F PM peak hour

Mitigation Measures

Based on the applicable jurisdiction's significance criteria, the following study area intersections were found to be significantly impacted by the Project for E+P traffic conditions:

- Flight Av. & Merrill Av. (#2)
- Hellman Av. & Kimball Av. (#4)
- Archibald Av. & Limonite Av. (#15)

Improvements listed in Tables 1-5 and 1-6 would resolve identified intersection deficiencies projected to occur under E+P traffic conditions. Tables 1-5 and 1-6 also identify fee programs providing for funding of the required improvements. Pursuant to ordinance requirements, the Applicant would pay all requisite TUMF (if any), DIF (if any), and RBBB monies (if any) that would be assigned to financing of the required improvements. For the improvements that are not included in a pre-existing fee program, it was determined that the improvement recommendations are within the General Plan classifications for each roadway type. The following mitigation measure is incorporated.

Mitigation Measure 1.1 – Prior to the issuance of building permits, the Project Applicant shall pay that building’s fair share fee amounts toward the construction of City of Eastvale improvements required under the E+P analysis scenario listed in Table 1-5 or 1-6. Where intersection improvements require additional through lanes, fees shall also be applied to construction of required through lane/roadway segment improvements. The greatest fair share fee shall be paid at each potentially affected facility.

Roadway Segment Capacity Analysis

Consistent with Existing traffic conditions, there are no additional study area roadway segments that are anticipated to operate at an unacceptable LOS based on the City’s planning level daily roadway capacity thresholds with the addition of Project traffic. No additional roadway improvements have been recommended beyond the site adjacent roadway widening that would be constructed by the Project for the following reasons:

- The segment of Limonite Avenue between Sumner Avenue and Hamner Avenue is anticipated to be widened to its ultimate 6-lane facility as sites adjacent to Limonite Avenue develop, such as along the Leal Specific Plan boundary.

Off-Ramp Queuing Analysis

A queuing analysis was performed for the northbound and southbound off-ramps at the I-15 Freeway at the Limonite Avenue interchange for E+P traffic conditions. Consistent with Existing conditions, the analysis indicates there are no queuing issues anticipated during the peak hours.

Freeway Operations Analyses

For E+P traffic conditions, there are no additional study area freeway mainline segments and ramp merge/diverge junctions that are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours in addition to those previously identified for Existing traffic conditions. The Project is anticipated to contribute less than 25 one-way peak hour trips to the deficient freeway mainline segments and ramp junctions for E+P traffic conditions. As such, the impacts are less than significant.

There are planned improvements for the I-15 Freeway at Limonite Avenue Interchange, which would consist of a new 8-lane overcrossing along Limonite Avenue (3 through lanes in each direction plus 2 right turn lanes at each ramp), widening of the off-ramps from 2 to 4 lanes, the addition of 2 new loop on-ramps, and additional widening of Limonite Avenue to 4 lanes in each direction between Hamner Avenue and Wineville Avenue. The construction is anticipated to begin mid to late 2018 with completion of construction to occur in 2019. However, this planned improvement does not widen the existing freeway mainline segments. There is a separate I-15 Freeway project that includes the construction of 2 tolled Express Lanes between the SR-60 Freeway and Cajalco Road. The Express Lanes are not anticipated to be completed until Year 2020. As such, no improvements have been assumed for E+P traffic conditions.

1.4.3 OPENING YEAR CUMULATIVE (2021) CONDITIONS

Intersection Operations Analysis

As shown on Exhibit 1-3, there are 14 study area intersections that are anticipated to operate at an unacceptable LOS for Opening Year Cumulative (2021) Without Project traffic conditions. The addition of Project traffic will result in two additional deficiencies.

Mitigation Measures

Based on the applicable jurisdiction's significance criteria, the following study area intersections were found to be cumulatively impacted by the Project for Opening Year Cumulative (2021) With Project traffic conditions:

- Grove Av. & Merrill Av. (#1)
- Flight Av. & Merrill Av. (#2)
- Hellman Av. & Merrill Av. (#3)
- Archibald Av. & Riverside Dr. (#6)
- Archibald Av. & Schaefer Av. (#8)
- Archibald Av. & Ontario Ranch Rd. (#9)
- Archibald Av. & Merrill Av. (#11)
- Archibald Av. & Victoria Av. (#12)
- Archibald Av. & Limonite Av. (#15)
- Archibald Av. & 65th St. (#16)
- Archibald Av. & Schleisman Rd. (#17)
- Harrison Av. & Limonite Av. (#20)
- I-15 Southbound Ramps & Limonite Av. (#24)
- I-15 Northbound Ramps & Limonite Av. (#25)

Improvements listed in Tables 1-5 and 1-6 would resolve identified intersection deficiencies projected to occur under Opening Year Cumulative (2021) With Project traffic conditions. Tables 1-5 and 1-6 also identify fee programs providing for funding of the required improvements. Pursuant to ordinance requirements, the Applicant would pay all requisite TUMF (if any), DIF (if any), and RBBD monies (if any) that would be assigned to financing of the required improvements. For the improvements that are not included in a pre-existing fee program, it was determined that the improvement recommendations are within the General Plan classifications for each roadway type. The following mitigation measure is incorporated. The following mitigation measure is incorporated.

Mitigation Measure 2.1 – Prior to the issuance of building permits, the Project Applicant shall pay that building's fair share fee amounts toward the construction of City of Eastvale improvements required under the Opening Year with Project scenarios listed in Tables 1-5 or 1-6. Where intersection improvements require additional through lanes, fees shall also be applied

to construction of required continuing lane/roadway segment improvements. The greatest fair share fee shall be paid at each potentially affected facility. Duplicate fees for improvements previously funded under Mitigation Measure 1.1 shall not be required.

Roadway Segment Capacity Analysis

All study area roadway segments are anticipated to operate at an unacceptable LOS based on the City's planning level daily roadway capacity thresholds for Opening Year Cumulative (2021) Without Project traffic conditions. The addition of Project traffic is anticipated to increase the v/c, however, some segments adjacent to the site are anticipated to improve with the construction of the site adjacent improvements. The buildout of Limonite Avenue and Archibald Avenue at its ultimate 6-lane cross-section is anticipated to improve the segment LOS below pre-project traffic conditions, although many segments are anticipated to continue to operate at a deficient LOS. No additional roadway improvements have been recommended for the following segment:

- The segment of Limonite Avenue between Hamner Avenue and the I-15 Freeway will be widened to its ultimate as part of the I-15 Freeway/Limonite Avenue interchange project. Additional lanes beyond those planned by the interchange project are not feasible as there is currently development on either side of Limonite Avenue in this area. Peak hour intersection operations analysis on either side of this segment suggests the intersections would adequately process peak hour traffic with the proposed intersection improvements. As such, additional widening along this segment is not recommended.

Off-Ramp Queuing Analysis

A queuing analysis was performed for the northbound and southbound off-ramps at the I-15 Freeway at the Limonite Avenue interchange for Opening Year Cumulative (2021) Without and With Project traffic conditions. Consistent with Existing conditions, the analysis indicates there are no queuing issues anticipated during the peak hours for both Opening Year Cumulative (2021) Without and With Project traffic conditions. The peak hour off-ramp queues are anticipated to improve with the completion of the I-15/Limonite Avenue interchange project.

Freeway Operations Analyses

For Opening Year Cumulative (2021) Without Project traffic conditions, the following study area freeway mainline segments and ramp merge/diverge junctions are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours:

- Segment: I-15 Freeway Southbound, North of Limonite Av. (#1) – LOS E AM and PM peak hours
- Segment: I-15 Freeway Southbound, South of Limonite Av. (#2) – LOS F AM and PM peak hours
- Segment: I-15 Freeway Northbound, North of Limonite Av. (#3) – LOS E AM peak hour only
- Ramp: I-15 Freeway, Southbound Off-Ramp at Limonite Av. (#1) – LOS E AM and PM peak hours
- Ramp: I-15 Freeway, Southbound On-Ramp at Limonite Av. (#3) – LOS F AM and PM peak hours
- Ramp: I-15 Freeway, Northbound On-Ramp at Limonite Av. (#4) – LOS E AM peak hour only
- Ramp: I-15 Freeway, Northbound Off-Ramp at Limonite Av. (#6) – LOS E AM and PM peak hours

The Project is anticipated to contribute 25 or more one-way peak hour trips to the segments and ramp junctions north of Limonite Avenue on the I-15 Freeway. As such, only these segments and ramp junctions would be cumulatively impacted. The planned improvements for both the I-15/Limonite Avenue interchange project and the I-15 Express Lane project have been assumed for Opening Year Cumulative (2021) traffic conditions as they are anticipated to be completed by Year 2019 and Year 2020. With the implementation of these improvements, all of the study area freeway segments and ramp junctions are anticipated to operate at an acceptable LOS during the peak hours for Opening Year Cumulative (2021) traffic conditions, with the exception of the following:

- Segment: I-15 Freeway Southbound, South of Limonite Av. (#2) – LOS E AM and PM peak hours

1.4.4 HORIZON YEAR (2040) CONDITIONS

Intersection Operations Analysis: Without Limonite Avenue Extension

As shown on Exhibit 1-3, there are 20 study area intersections that are anticipated to operate at an unacceptable LOS for Horizon Year (2040) Without Project traffic conditions. The addition of Project traffic will result in one additional deficiency.

Intersection Operations Analysis: With Limonite Avenue Extension

The Limonite Avenue Extension includes the extension of Limonite Avenue between Archibald Avenue to Hellman Avenue where it will join with the existing terminus of Kimball Avenue in the City of Chino. As shown on Exhibit 1-3, there are 10 study area intersections that are anticipated to operate at an unacceptable LOS for Horizon Year (2040) Without Project traffic conditions. The addition of Project traffic will result in one additional deficiency.

Mitigation Measures: Without Limonite Avenue Extension

Based on the applicable jurisdiction's significance criteria, the following study area intersections were found to be cumulatively impacted by the Project for Horizon Year (2040) With Project traffic conditions:

- Grove Av. & Merrill Av. (#1)
- Flight Av. & Merrill Av. (#2)
- Hellman Av. & Merrill Av. (#3)
- Hellman Av. & Kimball Av. (#4)
- Archibald Av. & Riverside Dr. (#6)
- Archibald Av. & Chino Av. (#7)
- Archibald Av. & Schaefer Av. (#8)
- Archibald Av. & Ontario Ranch Rd. (#9)
- Archibald Av. & Eucalyptus Av. (#10)
- Archibald Av. & Merrill Av. (#11)
- Archibald Av. & Victoria Av. (#12)

- Archibald Av. & Limonite Av. (#15)
- Archibald Av. & 65th St. (#16)
- Archibald Av. & Schleisman Rd. (#17)
- Harrison Av. & Limonite Av. (#20)
- Sumner Av. & Limonite Av. (#21)
- Scholar Wy. & Limonite Av. (#22)
- I-15 Southbound Ramps & Limonite Av. (#24)
- I-15 Northbound Ramps & Limonite Av. (#25)

It is recommended that the Project contribute its fair share towards the long-term improvements needed to improve each impacted intersection's LOS back to acceptable LOS, thus reducing the Project's impact to less than significant levels. Mitigation measures for each applicable agency are identified in the subsequent section.

Mitigation Measures: With Limonite Avenue Extension

Based on the applicable jurisdiction's significance criteria, the following study area intersections were found to be cumulatively impacted by the Project for Horizon Year (2040) With Project traffic conditions:

- Grove Av. & Merrill Av. (#1)
- Flight Av. & Merrill Av. (#2)
- Hellman Av. & Merrill Av. (#3)
- Hellman Av. & Kimball Av. (#4)
- Hellman Av. & Pine Av./Schleisman Rd. (#5)
- Archibald Av. & Riverside Dr. (#6)
- Archibald Av. & Chino Av. (#7)
- Archibald Av. & Schaefer Av. (#8)
- Archibald Av. & Ontario Ranch Rd. (#9)
- Archibald Av. & Eucalyptus Av. (#10)
- Archibald Av. & Merrill Av. (#11)
- Archibald Av. & Victoria Ln. (#12)
- Archibald Av. & Limonite Av. (#15)
- Archibald Av. & 65th St. (#16)
- Archibald Av. & Schleisman Rd. (#17)
- Harrison Av. & Limonite Av. (#20)
- Sumner Av. & Limonite Av. (#21)
- Scholar Way & Limonite Av. (#22)

- I-15 Southbound Ramps & Limonite Av. (#24)
- I-15 Northbound Ramps & Limonite Av. (#25)

Improvements listed in Tables 1-5 and 1-6 would resolve identified intersection deficiencies projected to occur under Horizon Year (2040) With Project traffic conditions. Tables 1-5 and 1-6 also identify fee programs providing for funding of the required improvements. Pursuant to ordinance requirements, the Applicant would pay all requisite TUMF (if any), DIF (if any), and RBBD monies (if any) that would be assigned to financing of the required improvements. For the improvements that are not included in a pre-existing fee program, it was determined that the improvement recommendations are within the General Plan classifications for each roadway type. The following mitigation measure is incorporated. The following mitigation measure is incorporated.

Mitigation Measure 3.1 – Prior to the issuance of building permits, the Project Applicant shall pay that building’s fair share fee amounts toward the construction of City of Eastvale improvements required under each Horizon Year with Project analysis scenarios listed in Tables 1-5 or 1-6. Where intersection improvements require additional through lanes, fees shall also be applied to construction of required continuing lane/roadway segment improvements. The greatest fair share fee shall be paid at each potentially affected facility. Duplicate fees for improvements previously funded under Mitigation Measure 1.1 or Mitigation Measure 2.1 shall not be required.

Roadway Segment Capacity Analysis

All study area roadway segments are anticipated to operate at an unacceptable LOS based on the City’s planning level daily roadway capacity thresholds for Horizon Year (2040) Without Project (both Without and With Limonite Avenue Extension) traffic conditions. The addition of Project traffic is anticipated to increase the v/c, however, some segments adjacent to the site are anticipated to improve with the construction of the site adjacent improvements. The buildout of Limonite Avenue and Archibald Avenue at its ultimate 6-lane cross-section is anticipated to improve the segment LOS below pre-project traffic conditions, although many segments are anticipated to continue to operate at a deficient LOS. No additional roadway improvements have been recommended for the following segment:

- The segment of Limonite Avenue between Hamner Avenue and the I-15 Freeway will be widened to its ultimate as part of the I-15 Freeway/Limonite Avenue interchange project. Additional lanes beyond those planned by the interchange project are not feasible as there is currently development on either side of Limonite Avenue in this area. Peak hour intersection operations analysis on either side of this segment suggests the intersections would adequately process peak hour traffic with the proposed intersection improvements. As such, additional widening along this segment is not recommended.

Off-Ramp Queuing Analysis

A queuing analysis was performed for the northbound and southbound off-ramps at the I-15 Freeway at the Limonite Avenue interchange for Horizon Year (2040) Without and With Project traffic conditions. Consistent with Existing conditions, the analysis indicates there are no queuing

issues anticipated during the peak hours for both Horizon Year (2040) Without and With Project traffic conditions. The peak hour off-ramp queues are anticipated to improve with the completion of the I-15/Limonite Avenue interchange project.

Freeway Operations Analyses

For Horizon Year (2040) Without Project traffic conditions, the following study area freeway mainline segments and ramp merge/diverge junctions are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours:

- Segment: I-15 Freeway Southbound, North of Limonite Av. (#1) – LOS E AM peak hour only
- Segment: I-15 Freeway Southbound, South of Limonite Av. (#2) – LOS F AM peak hour only
- Ramp: I-15 Freeway, Southbound Off-Ramp at Limonite Av. (#1) – LOS E AM peak hour only
- Ramp: I-15 Freeway, Southbound On-Ramp at Limonite Av. (#3) – LOS F AM peak hour only

The Project is anticipated to contribute 25 or more one-way peak hour trips to the segments and ramp junctions north of Limonite Avenue on the I-15 Freeway. As such, only these segments and ramp junctions would be cumulatively impacted. The planned improvements for both the I-15/Limonite Avenue interchange project and the I-15 Express Lane project have been assumed for Horizon Year (2040) traffic conditions as they are anticipated to be completed by Year 2019 and Year 2020. With the implementation of these improvements, all of the study area freeway segments and ramp junctions are anticipated to operate at an acceptable LOS during the peak hours for Horizon Year (2040) traffic conditions, with the exception of the following:

- Ramp: I-15 Freeway, Southbound On-Ramp at Limonite Av. (#3) – LOS E AM peak hour only
- Ramp: I-15 Freeway, Northbound Off-Ramp at Limonite Av. (#6) – LOS E AM peak hour only

1.5 LOCAL AND REGIONAL FUNDING MECHANISMS

Transportation improvements within the City of Eastvale are funded through a combination of direct project mitigation, development impact fee programs or fair share contributions, such as the City of Eastvale Development Impact Fee (DIF) program, Western Riverside Council of Governments (WRCOG) Transportation Uniform Mitigation Fee (TUMF) program, and Mira Loma Road and Bridge Benefit District (RBBD) fee program. Identification and timing of needed improvements is generally determined through local jurisdictions based upon a variety of factors.

Table 1-5 lists the incremental intersection improvements that are required for each analysis scenario from E+P and Horizon Year (2040) (Without Limonite Avenue Extension) traffic conditions to alleviate circulation system deficiencies. Similarly, Table 1-6 lists the improvements that are required for each analysis scenario from E+P to Horizon Year (2040) (With Limonite Avenue Extension) traffic conditions. The regional and local transportation impact fee programs have each been reviewed and compared to the recommended improvements for each impacted facility. Recommended improvements already identified and included in the City of Eastvale DIF, TUMF, and RBBD are clearly denoted. If an impacted facility was found to require improvements beyond those already identified within the fee program, the Project would be required to contribute the associated intersection or roadway fair-share percentage toward the costs of the

recommended improvements. The fair-share calculations, presented in Table 1-7, indicate that the Project contributes 2.2% to 11.5% of new vehicle trips to these intersections for Horizon Year (2040) traffic conditions Without Limonite Avenue Extension in comparison to 1.8% to 10.7% of new vehicles trips for Horizon Year (2040) traffic conditions With Limonite Avenue Extension (see Table 1-8). At the City’s discretion, the construction of facilities by the Project Applicant may be eligible for DIF credit and reimbursement if the construction exceeds the Project’s fair share, as identified in Table 1-5 or Table 1-6.

The improvements listed in Table 1-5 and Table 1-6 comprise lane additions/modifications, installation of signals and signal modifications. As noted, the identified improvements are covered either by the City of Eastvale DIF Program, TUMF, RBBB, or as a fair-share contribution, if not covered by a pre-existing fee program. 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 subsequently.

1.5.1 CITY OF EASTVALE DEVELOPMENT IMPACT FEE PROGRAM

The City of Eastvale has created its own local DIF 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’s DIF includes regional improvements to comply with Measure “I.” The fee schedule was last updated in April 6, 2015 and is reviewed/adjusted annually based upon changes in the construction cost index (CCI). Under the City’s DIF program, the City may grant to developers a credit against specific components of fees when those developers construct certain facilities and landscaped medians identified in the list of improvements funded by the DIF program.

Table 1-5
Page 1 of 4

Summary of Improvements and Rough Order of Magnitude Costs - Without Limonite Avenue Extension

#	Intersection Location	Jurisdiction	E+P	2021 With Project	2040 With Project	Improvements in City DIF, County TUMF, RBBB? ¹	Project Responsibility ¹³	Total Cost ^{2,3,4}	Opening Year Cumulative (2021)		Horizon Year (2040)			
									Fair Share % ⁴	Fair Share Cost ⁵	Fair Share % ⁴	Fair Share Cost ⁵		
1	Grove Av. & Merrill Av.	Chino, Ontario	None	Install a traffic signal	Same	No	Fair Share	\$250,000	5.924%	\$14,809	5.373%	--		
				SB left turn lane	Same	No	Fair Share	\$74,200					\$4,395	--
				EB left turn lane	Same	No	Fair Share	\$74,200					\$4,395	--
				2nd EB through lane	Same	No	Fair Share	\$267,120					\$15,823	--
				2nd WB through lane	Same	No	Fair Share	\$267,120					\$15,823	--
				WB right turn lane	Same	No	Fair Share	\$74,200					\$4,395	--
								\$1,006,840					\$59,642	\$0
2	Flight Av. & Merrill Av.	Chino, Ontario	Install a traffic signal	Same	Same	No	Fair Share	\$250,000	5.153%	\$12,882	3.643%	--		
				Restripe to provide a NB left turn lane within the painted median	Same	No	Fair Share	\$74,200					\$3,823	--
				SB left turn lane	Same	No	Fair Share	\$74,200					\$3,823	--
				SB shared through-right turn lane	Same	No	Fair Share	\$267,120					\$13,764	--
				EB left turn lane	Same	No	Fair Share	\$74,200					\$3,823	--
				2nd EB through lane	Same	No	Fair Share	\$267,120					\$13,764	--
				2nd WB through lane	Same	No	Fair Share	\$267,120					\$13,764	--
					NB right turn lane	No	Fair Share	\$74,200					--	\$2,703
	Modify traffic signal to implement overlap phasing on the NB and EB right turn lanes	No	Fair Share	\$111,300	--	\$4,054								
				\$1,459,460	\$65,645	\$6,757								
3	Hellman Av. & Merrill Av.	Chino, Ontario	None	Install a traffic signal	Same	No	Fair Share	\$250,000	5.398%	\$13,495	4.160%	--		
				NB left turn lane	Same	No	Fair Share	\$74,200					\$4,005	--
				NB shared through-right turn lane	Same	No	Fair Share	\$267,120					\$14,419	--
				SB left turn lane	Same	No	Fair Share	\$74,200					\$4,005	--
				SB shared through-right turn lane	Same	No	Fair Share	\$267,120					\$14,419	--
				EB left turn lane	Same	No	Fair Share	\$74,200					\$4,005	--
				2nd EB through lane	Same	No	Fair Share	\$267,120					\$14,419	--
				EB right turn lane	Same	No	Fair Share	\$74,200					\$4,005	--
				WB left turn lane	Same	No	Fair Share	\$74,200					\$4,005	--
				2nd WB through lane	Same	No	Fair Share	\$267,120					\$14,419	--
					2nd NB left turn lane	No	Fair Share	\$74,200					--	\$3,087
					NB right turn lane	No	Fair Share	\$267,120					--	\$11,111
					WB right turn lane	No	Fair Share	\$74,200					--	\$3,087
					Modify traffic signal to implement overlap phasing on the NB right turn lane	No	Fair Share	\$111,300					--	\$4,630
			Total	\$2,216,300	\$91,198	\$21,914								

Table 1-5
Page 2 of 4

Summary of Improvements and Rough Order of Magnitude Costs - Without Limonite Avenue Extension

#	Intersection Location	Jurisdiction	E+P	2021 With Project	2040 With Project	Improvements in City DIF, County TUMF, RBBB? ¹	Project Responsibility ¹³	Total Cost ^{2,3,4}	Opening Year Cumulative (2021)		Horizon Year (2040)																																																								
									Fair Share % ⁴	Fair Share Cost ⁵	Fair Share % ⁴	Fair Share Cost ⁵																																																							
4	Hellman Av. & Kimball Av.	Chino, Eastvale	Install a traffic signal	- No significant impact	Same	No	Under Construction	\$250,000	5.776%	--	3.280%	--																																																							
													2nd NB left turn lane	No	Fair Share	\$74,200	--	--	\$2,434																																																
																				2 NB through lanes	No	Fair Share	\$534,240	--	\$17,524																																										
																										SB left turn lane	No	Fair Share	\$74,200	--	\$2,434																																				
																																2 SB through lanes	No	Fair Share	\$534,240	--	\$17,524																														
																																						SB right turn lane	No	Fair Share	\$74,200	--	\$2,434																								
																																												EB left turn lane	No	Fair Share	\$74,200	--	\$2,434																		
																																																		EB through lane	No	Fair Share	\$267,120	--	\$8,762												
																																																								WB left turn lane	No	Fair Share	\$148,400	--	\$4,868						
																																																														WB through lane	No	Fair Share	\$267,120	--	\$8,762
Total	\$2,409,220	\$0	\$70,825																																																																
				Total	\$2,409,220	\$0	\$70,825																																																												
								2nd NB left turn lane	No	Fair Share	\$74,200	3.851%	\$2,857	5.045%	--																																																				
																2nd SB left turn lane	No	Fair Share	\$74,200	\$2,857	--																																														
																						EB right turn lane	No	Fair Share	\$74,200	\$2,857	--																																								
																												Modify traffic signal to implement overlap phasing on the WB right turn lane	No	Fair Share	\$111,300	\$4,286	--																																		
																																		Total	\$333,900	\$12,858	\$0																														
																																						Total	\$333,900	\$12,858	\$0																										
																																										Archibald Av. & Chino Av.	Ontario	None	None	3rd SB through lane	No	Fair Share	\$267,120	5.939%	--	5.641%	\$15,067														
																																																						Total	\$267,120	\$0	\$15,067										
																																																										Total	\$267,120	\$0	\$15,067						
Archibald Av. & Schaefer Av.	Ontario	None	Install a traffic signal																																																											Same	No	Fair Share	\$250,000	5.712%	\$14,280
				NB left turn lane	No	Fair Share	\$74,200																																																												
								EB left turn lane	No	Fair Share	\$74,200	\$4,238	--																																																						
														EB shared through-right turn lane	No	Fair Share	\$267,120	\$15,258	--																																																
																				WB left turn lane	No	Fair Share	\$74,200	\$4,238	--																																										
																										WB shared through-right turn lane	No	Fair Share	\$267,120	\$15,258	--																																				
																																3rd NB through lane	No	Fair Share	\$267,120	--	\$9,974																														
																																						3rd SB through lane	No	Fair Share	\$267,120																										
																																										SB right turn lane	No	Fair Share	\$74,200	--	\$2,771																				
																																																2nd EB through lane	No	Fair Share	\$267,120	--	\$9,974														
																																																						2nd WB through lane	No	Fair Share	\$267,120	--	\$9,974								
Modify traffic signal to implement overlap phasing on the SB right turn lane	No	Fair Share	\$111,300																																																									--	\$4,156						
				Total	\$2,260,820	\$57,512	\$46,823																																																												
								Total	\$2,260,820	\$57,512	\$46,823																																																								

Table 1-5
Page 3 of 4

Summary of Improvements and Rough Order of Magnitude Costs - Without Limonite Avenue Extension

#	Intersection Location	Jurisdiction	E+P	2021 With Project	2040 With Project	Improvements in City DIF, County TUMF, RBBB? ¹	Project Responsibility ¹³	Total Cost ^{2,3,4}	Opening Year Cumulative (2021)		Horizon Year (2040)	
									Fair Share % ⁴	Fair Share Cost ⁵	Fair Share % ⁴	Fair Share Cost ⁵
9	Archibald Av. & Ontario Ranch Rd.	Ontario	None	2nd NB left turn lane	Same	No	Fair Share	\$74,200	6.025%	\$4,470	4.893%	--
				3rd NB through lane	Same	No	Fair Share	\$267,120				
				3rd SB through lane	Same	No	Fair Share	\$267,120				
				2nd WB through lane	Same	No	Fair Share	\$267,120				
				Modify traffic signal to implement	Same	No	Fair Share	\$111,300				
				3rd EB through lane	Same	No	Fair Share	\$267,120				
				3rd WB through lane	Same	No	Fair Share	\$267,120				
				Modify traffic signal to implement overlap phasing on the SB right turn lane	Same	No	Fair Share	\$111,300				
				Total				\$1,632,400				
10	Archibald Av. & Eucalyptus Av.	Ontario	None	None	3rd NB through lane	No	Fair Share	\$267,120	6.562%	--	7.440%	\$13,071
				3rd SB through lane	No	Fair Share	\$267,120					
				EB left turn lane	No	Fair Share	\$74,200					
				EB shared through-right turn lane	No	Fair Share	\$267,120					
				WB left turn lane	No	Fair Share	\$74,200					
				Total			\$949,760	\$0				
11	Archibald Av. & Merrill Av.	Ontario	None	2nd NB left turn lane	Same	No	Fair Share	\$74,200	7.070%	\$5,246	8.129%	--
				3rd NB through lane	Same	No	Fair Share	\$267,120				
				3rd SB through lane	Same	No	Fair Share	\$267,120				
				SB right turn lane	Same	No	Fair Share	\$74,200				
				2nd EB left turn lane	Same	No	Fair Share	\$74,200				
				EB free-right turn lane	Same	No	Fair Share	\$111,300				
				Modify traffic signal to implement overlap phasing on the SB right turn lane	Same	No	Fair Share	\$111,300				
				2nd EB through lane	Same	No	Fair Share	\$267,120				
				2nd WB through lane	Same	No	Fair Share	\$267,120				
				2nd WB left turn lane	Same	No	Fair Share	\$74,200				
				Modify traffic signal to implement overlap phasing on the NB right turn lane	Same	No	Fair Share	\$111,300				
				Total			\$1,699,180	\$69,249				
12	Archibald Av. & Victoria Ln.	Ontario	None	Install a traffic signal	Same	No	Fair Share	\$250,000	9.009%	\$22,524	8.741%	--
				NB left turn lane	Same	No	Fair Share	\$74,200				
				3rd NB through lane	Same	No	Fair Share	\$267,120				
				SB left turn lane	Same	No	Fair Share	\$74,200				
				3rd SB through lane	Same	No	Fair Share	\$267,120				
				SB right turn lane	Same	No	Fair Share	\$74,200				
				EB shared left-through-right turn	Same	No	Fair Share	-- ⁶				
				Total			\$1,006,840	\$90,711				

Table 1-5
Page 4 of 4

Summary of Improvements and Rough Order of Magnitude Costs - Without Limonite Avenue Extension

#	Intersection Location	Jurisdiction	E+P	2021 With Project	2040 With Project	Improvements in City DIF, County TUMF, RBBB? ¹	Project Responsibility ¹³	Total Cost ^{2,3,4}	Opening Year Cumulative (2021)		Horizon Year (2040)	
									Fair Share % ⁴	Fair Share Cost ⁵	Fair Share % ⁴	Fair Share Cost ⁵
15	Archibald Av. & Limonite Av.	Eastvale	2nd SB left turn lane 2nd WB right turn lane	Same Same 2nd NB through lane 2nd SB through lane 2nd WB left turn lane	Same Same Same Same Same	No No Yes (TUMF/RBBB) Yes (TUMF/RBBB) No	Construct Construct Fees Fees Fair Share	\$74,200 \$74,200 -- -- \$74,200	12.036%	-- -- -- -- \$8,931	9.001%	-- -- -- -- \$0
16	Archibald Av. & 65th St.	Eastvale	None	3rd NB through lane	Same	Yes (TUMF/RBBB)	Fees	--	14.713%	--	7.500%	--
17	Archibald Av. & Schleisman Rd.	Eastvale	None	Modify traffic signal to implement overlap phasing on all approaches	Same	No	Fair Share	\$111,300	10.408%	\$11,585	5.887%	--
20	Harrison Av. & Limonite Av.	Eastvale	None	3rd WB through lane	Same	Yes (TUMF/RBBB)	Fees	--	10.870%	--	10.951%	--
21	Sumner Av. & Limonite Av.	Eastvale	None	None	2nd NB left turn lane EB right turn lane Modify traffic signal to implement overlap phasing on the EB right turn lane	No No No	Fair Share Fair Share Fair Share	\$74,200 \$74,200 \$111,300	9.949%	-- -- --	5.801%	\$4,304 \$4,304 \$6,457
22	Scholar Way & Limonite Av.	Eastvale	None	None	3rd EB through lane 3rd WB through lane	Yes (TUMF/RBBB) Yes (TUMF/RBBB)	Fees Fees	-- --	9.903%	-- --	7.895%	-- --
24	I-15 SB Ramps & Limonite Av.	Caltrans, Eastvale	None	Interchange Redesign ⁷	Interchange Redesign ⁷	Yes (TUMF/RBBB)	Fees	--		--		--
25	I-15 NB Ramps & Limonite Av.	Caltrans, Jurupa Valley	None	Interchange Redesign ⁷	Interchange Redesign ⁷	Yes (TUMF/RBBB)	Fees	--		--		--
Total Costs for Horizon Year (2040) Improvements								\$16,102,560			\$526,786	\$313,026
Total Project Fair Share Contribution to the City of Eastvale (non-DIF/other)⁸											\$20,515	\$48,653
Total Project Fair Share Contribution to the City of Chino⁹											\$103,077	\$62,823
Total Project Fair Share Contribution to the City of Ontario¹⁰											\$403,194	\$201,550
Total Project Fair Share Contribution to the City of Jurupa Valley¹¹											\$0	\$0
Total Project Fair Share Contribution to Caltrans¹²											\$0	\$0

¹ Improvements included in City of Eastvale DIF, WRCOG TUMF, or Mira Loma RBBB fee programs for local, regional and specific plan components.
² Costs have been estimated using the data provided in Appendix "G" of the CMP (2003 Update) for preliminary construction costs.
³ Appendix "G" costs escalated by a factor of 1.484 except Traffic Signals to reflect current costs.
⁴ Program improvements constructed by project may be eligible for fee credit, at discretion of City. See Table 1-7 for Fair Share Calculations.
⁵ Rough order of magnitude cost estimate.
⁶ Improvements are to be constructed by other projects since these improvements are needed for site access.
⁷ Interchange redesign includes widening the bridge over the I-15 Freeway to three lanes in each direction with loop on-ramps, eliminating the left turns onto the on-ramps. Interchange construction is anticipated to be completed in Year 2019.
⁸ Total project fair share contribution consists of the improvements which are not already included in the City-wide DIF for those intersections wholly or partially within the City of Eastvale.
⁹ Total project fair share contribution consists of the improvements which are not already included in a fee program for those intersections wholly or partially within the City of Chino.
¹⁰ Total project fair share contribution consists of the improvements which are not already included in a fee program for those intersections wholly or partially within the City of Ontario.
¹¹ Total project fair share contribution consists of the improvements which are not already included in a fee program for those intersections wholly or partially within the City of Jurupa Valley.
¹² Total project fair share contribution consists of the improvements which are not already included in a fee program for those intersections wholly or partially within Caltrans' jurisdiction.
¹³ Identifies the Project's responsibility to construct an improvement or contribute fair share towards the implementation of the improvements shown.

Table 1-6
Page 1 of 5

Summary of Improvements and Rough Order of Magnitude Costs - With Limonite Avenue Extension

#	Intersection Location	Jurisdiction	E+P	2021 With Project	2040 With Project	Improvements in City DIF, County TUMF, RBB?¹	Project Responsibility¹²	Total Cost²,³,⁴	Opening Year Cumulative (2021)		Horizon Year (2040)			
									Fair Share %⁴	Fair Share Cost⁵	Fair Share %⁴	Fair Share Cost⁵		
1	Grove Av. & Merrill Av.	Chino, Ontario	None	Install a traffic signal	Same	No	Fair Share	\$250,000	5.924%	\$14,809	6.211%	--		
				SB left turn lane	Same	No	Fair Share	\$74,200					\$4,395	--
				EB left turn lane	Same	No	Fair Share	\$74,200					\$4,395	--
				2nd EB through lane	Same	No	Fair Share	\$267,120					\$15,823	--
				2nd WB through lane	Same	No	Fair Share	\$267,120					\$15,823	--
				WB right turn lane	Same	No	Fair Share	\$74,200					\$4,395	--
				\$1,006,840	\$59,642	\$0								
2	Flight Av. & Merrill Av.	Chino, Ontario	Install a traffic signal	Same	Same	No	Fair Share	\$250,000	5.153%	\$12,882	5.580%	--		
				Restripe to provide a NB left turn lane within the painted median	Same	No	Fair Share	\$74,200					\$3,823	--
				SB left turn lane	Same	No	Fair Share	\$74,200					\$3,823	--
				SB shared through-right turn lane	Same	No	Fair Share	\$267,120					\$13,764	--
				EB left turn lane	Same	No	Fair Share	\$74,200					\$3,823	--
				2nd EB through lane	Same	No	Fair Share	\$267,120					\$13,764	--
				2nd WB through lane	Same	No	Fair Share	\$267,120					\$13,764	--
				Modify traffic signal to implement overlap phasing on the EB right turn lane		No	Fair Share	\$111,300					--	\$6,210
\$1,385,260	\$65,645	\$6,210												
3	Hellman Av. & Merrill Av.	Chino, Ontario	None	Install a traffic signal	Same	No	Fair Share	\$250,000	5.398%	\$13,495	5.720%	--		
				NB left turn lane	Same	No	Fair Share	\$74,200					\$4,005	--
				NB shared through-right turn lane	Same	No	Fair Share	\$267,120					\$14,419	--
				SB left turn lane	Same	No	Fair Share	\$74,200					\$4,005	--
				SB shared through-right turn lane	Same	No	Fair Share	\$267,120					\$14,419	--
				EB left turn lane	Same	No	Fair Share	\$74,200					\$4,005	--
				2nd EB through lane	Same	No	Fair Share	\$267,120					\$14,419	--
				EB right turn lane	Same	No	Fair Share	\$74,200					\$4,005	--
				WB left turn lane	Same	No	Fair Share	\$74,200					\$4,005	--
				2nd WB through lane	Same	No	Fair Share	\$267,120					\$14,419	--
				2nd NB left turn lane		No	Fair Share	\$74,200					--	\$4,244
				NB right turn lane		No	Fair Share	\$267,120					--	\$15,278
				WB right turn lane		No	Fair Share	\$74,200					--	\$4,244
				Modify traffic signal to implement overlap phasing on the NB right turn lane		No	Fair Share	\$111,300					--	\$6,366
Total	\$2,216,300	\$91,198	\$30,132											

Table 1-6
Page 2 of 5

Summary of Improvements and Rough Order of Magnitude Costs - With Limonite Avenue Extension

#	Intersection Location	Jurisdiction	E+P	2021 With Project	2040 With Project	Improvements in City DIF, County TUMF, RBBB?¹	Project Responsibility¹²	Total Cost²,³,⁴	Opening Year Cumulative (2021)		Horizon Year (2040)			
									Fair Share %⁴	Fair Share Cost⁵	Fair Share %⁴	Fair Share Cost⁵		
4	Hellman Av. & Kimball Av.	Chino, Eastvale	Install a traffic signal	- No significant impact	Same	No	Under Construction	\$250,000	5.776%	\$14,439	2.743%	--		
							Fair Share	\$74,200					--	\$2,035
							Fair Share	\$534,240					--	\$14,656
							Fair Share	\$74,200					--	\$2,035
							Fair Share	\$74,200					--	\$2,035
							Fair Share	\$534,240					--	\$14,656
							Fair Share	\$74,200					--	\$2,035
							Fair Share	\$74,200					--	\$2,035
							Fair Share	\$534,240					--	\$14,656
							Fair Share	\$148,400					--	\$4,071
							Fair Share	\$534,240					--	\$14,656
							Fair Share	\$111,300					--	\$3,053
							Total	\$3,017,660					\$14,439	\$75,924
							5	Hellman Av. & Pine Av.					Chino, Eastvale	None
Total	\$111,300	\$0	\$5,691											
6	Archibald Av. & Riverside Dr.	Ontario	None	2nd NB left turn lane	Same	No	Fair Share	\$74,200	3.851%	\$2,857	5.045%	--		
							Fair Share	\$74,200					--	--
							Fair Share	\$74,200					--	--
							Fair Share	\$111,300					\$4,286	--
							Total	\$333,900					\$12,858	\$0
7	Archibald Av. & Chino Av.	Ontario	None	None	3rd SB through lane	No	Fair Share	\$267,120	5.939%	--	5.641%	\$15,067		
							Total	\$267,120					\$0	\$15,067
8	Archibald Av. & Schaefer Av.	Ontario	None	Install a traffic signal	Same	No	Fair Share	\$250,000	5.712%	\$14,280	3.734%	--		
							Fair Share	\$74,200					\$4,238	--
							Fair Share	\$74,200					\$4,238	--
							Fair Share	\$267,120					\$15,258	--
							Fair Share	\$74,200					\$4,238	--
							Fair Share	\$267,120					\$15,258	--
							Fair Share	\$267,120					--	\$9,974
							Fair Share	\$267,120					--	\$9,974
							Fair Share	\$74,200					--	\$2,771
							Fair Share	\$267,120					--	\$9,974
							Fair Share	\$267,120					--	\$9,974
							Fair Share	\$111,300					--	\$4,156
							Total	\$2,260,820					\$57,512	\$46,823

Table 1-6
Page 3 of 5

Summary of Improvements and Rough Order of Magnitude Costs - With Limonite Avenue Extension

#	Intersection Location	Jurisdiction	E+P	2021 With Project	2040 With Project	Improvements in City DIF, County TUMF, RBBB?¹	Project Responsibility¹²	Total Cost²,³,⁴	Opening Year Cumulative (2021)		Horizon Year (2040)						
									Fair Share %⁴	Fair Share Cost⁵	Fair Share %⁴	Fair Share Cost⁵					
9	Archibald Av. & Ontario Ranch Rd.	Ontario	None	2nd NB left turn lane	Same	No	Fair Share	\$74,200	6.025%	\$4,470	4.893%	--					
				3rd NB through lane	Same	No	Fair Share	\$267,120		\$16,093		--					
				3rd SB through lane	Same	No	Fair Share	\$267,120		\$16,093		--					
				2nd WB through lane	Same	No	Fair Share	\$267,120		\$16,093		--					
				Modify traffic signal to implement	Same	No	Fair Share	\$111,300		\$6,706		--					
				3rd EB through lane	Same	No	Fair Share	\$267,120		--		\$13,071					
				3rd WB through lane	Same	No	Fair Share	\$267,120		--		\$13,071					
				Modify traffic signal to implement overlap phasing on the SB right turn lane	Same	No	Fair Share	\$111,300		--		\$5,446					
				Total									\$1,632,400		\$59,456		\$31,589
10	Archibald Av. & Eucalyptus Av.	Ontario	None	None	3rd NB through lane	No	Fair Share	\$267,120	6.562%	--	7.440%	\$13,071					
				3rd SB through lane	Same	No	Fair Share	\$267,120		--		\$13,071					
				EB left turn lane	Same	No	Fair Share	\$74,200		--		\$3,631					
				EB shared through-right turn lane	Same	No	Fair Share	\$267,120		--		\$13,071					
				WB left turn lane	Same	No	Fair Share	\$74,200		--		\$3,631					
				Total									\$949,760		\$0		\$46,476
11	Archibald Av. & Merrill Av.	Ontario	None	2nd NB left turn lane	Same	No	Fair Share	\$74,200	7.070%	\$5,246	9.597%	--					
				3rd NB through lane	Same	No	Fair Share	\$267,120		\$18,886		--					
				3rd SB through lane	Same	No	Fair Share	\$267,120		\$18,886		--					
				SB right turn lane	Same	No	Fair Share	\$74,200		\$5,246		--					
				2nd EB left turn lane	Same	No	Fair Share	\$74,200		\$5,246		--					
				EB free-right turn lane	Same	No	Fair Share	\$111,300		\$7,869		--					
				Modify traffic signal to implement overlap phasing on the SB right turn lane	Same	No	Fair Share	\$111,300		\$7,869		--					
				2nd EB through lane	Same	No	Fair Share	\$267,120		--		\$25,635					
				2nd WB through lane	Same	No	Fair Share	\$267,120		--		\$25,635					
				2nd WB left turn lane	Same	No	Fair Share	\$74,200		--		\$7,121					
				Modify traffic signal to implement overlap phasing on the NB right turn lane	Same	No	Fair Share	\$111,300		--		\$10,681					
				Total									\$1,699,180		\$69,249		\$69,072
				12	Archibald Av. & Victoria Ln.	Ontario	None	Install a traffic signal		Same		No	Fair Share	\$250,000	9.009%	\$22,524	10.676%
NB left turn lane	Same	No	Fair Share					\$74,200	\$6,685	--							
3rd NB through lane	Same	No	Fair Share					\$267,120	\$24,066	--							
SB left turn lane	Same	No	Fair Share					\$74,200	\$6,685	--							
3rd SB through lane	Same	No	Fair Share					\$267,120	\$24,066	--							
SB right turn lane	Same	No	Fair Share					\$74,200	\$6,685	--							
EB shared left-through-right turn lane	Same	No	Fair Share					-- ⁶	--	--							
Total											\$1,006,840		\$90,711			\$0	

Table 1-6
Page 4 of 5

Summary of Improvements and Rough Order of Magnitude Costs - With Limonite Avenue Extension

#	Intersection Location	Jurisdiction	E+P	2021 With Project	2040 With Project	Improvements in City DIF, County TUMF, RBBB? ¹	Project Responsibility ¹²	Total Cost ^{2,3,4}	Opening Year Cumulative (2021)		Horizon Year (2040)	
									Fair Share % ⁴	Fair Share Cost ⁵	Fair Share % ⁴	Fair Share Cost ⁵
15	Archibald Av. & Limonite Av.	Eastvale	2nd SB left turn lane 2nd WB right turn lane	Same	Same	No	Construct	\$74,200	12.036%	--	7.383%	--
				Same	Same	No	Construct	\$74,200				
				2nd NB through lane	Same	Yes (TUMF/RBBB)	Fees	--				
				2nd SB through lane	Same	Yes (TUMF/RBBB)	Fees	--				
				2nd WB left turn lane	Same	No	Fair Share	\$74,200				
						No	Fair Share	\$74,200				
						Yes (TUMF/RBBB)	Fees	--				
						Yes (TUMF/RBBB)	Fees	--				
						No	Fair Share	\$74,200				
						No	Fair Share	\$148,400				
						Yes (TUMF/RBBB)	Fees	--				
						Yes (TUMF/RBBB)	Fees	--				
							Total	\$519,400				
16	Archibald Av. & 65th St.	Eastvale	None	3rd NB through lane	Same	Yes (TUMF/RBBB)	Fees	--	14.713%	--	5.313%	--
							Total	\$0		\$0		\$0
17	Archibald Av. & Schleisman Rd.	Eastvale	None	Modify traffic signal to implement overlap phasing on all approaches	Same	No	Fair Share	\$111,300	10.408%	\$11,585	2.082%	--
							Total	\$111,300		\$11,585		\$0
20	Harrison Av. & Limonite Av.	Eastvale	None	3rd WB through lane	Same	Yes (TUMF)	Fees	--	10.870%	--	10.951%	--
							Total	\$0		\$0		\$0
21	Sumner Av. & Limonite Av.	Eastvale	None	None	2nd NB left turn lane	No	Fair Share	\$74,200	9.949%	--	5.801%	\$4,304
					EB right turn lane	No	Fair Share	\$74,200				\$4,304
					Modify traffic signal to implement overlap phasing on the EB right turn lane	No	Fair Share	\$111,300				\$6,457
							Total	\$259,700		\$0		\$15,066
22	Scholar Way & Limonite Av.	Eastvale	None	None	3rd EB through lane	Yes (TUMF/RBBB)	Fees	--	9.903%	--	7.895%	--
					3rd WB through lane	Yes (TUMF/RBBB)	Fees	--				
							Total	\$0		\$0		\$0
24	I-15 SB Ramps & Limonite Av.	Caltrans, Eastvale	None	Interchange Redesign ⁷	Interchange Redesign ⁷	Yes (TUMF/RBBB)	Fees	--	6.679%	--	3.879%	--
							Total	\$0		\$0		\$0

Table 1-6
Page 5 of 5

Summary of Improvements and Rough Order of Magnitude Costs - With Limonite Avenue Extension

#	Intersection Location	Jurisdiction	E+P	2021 With Project	2040 With Project	Improvements in City DIF, County TUMF, RBBB? ¹	Project Responsibility ¹²	Total Cost ^{2,3,4}	Opening Year Cumulative (2021)		Horizon Year (2040)	
									Fair Share % ⁴	Fair Share Cost ⁵	Fair Share % ⁴	Fair Share Cost ⁵
25	I-15 NB Ramps & Limonite Av.	Caltrans, Jurupa Valley	None	Interchange Redesign ⁷	Interchange Redesign ⁷	Yes (TUMF/RBBB)	Fees Total	-- \$0	6.002%	-- \$0	2.338%	-- \$0
Total Costs for Horizon Year (2040) Improvements								\$16,777,780		\$541,225		\$363,965
Total Project Fair Share Contribution to the City of Eastvale (non-DIF/other)⁷										See Table 1-5		\$74,433
Total Project Fair Share Contribution to the City of Chino⁸											\$76,261	
Total Project Fair Share Contribution to the City of Ontario⁹											\$213,271	
Total Project Fair Share Contribution to the City of Jurupa Valley¹⁰											\$0	
Total Project Fair Share Contribution to Caltrans¹¹											\$0	

¹ Improvements included in City of Eastvale DIF program for local, regional and specific plan components.
² Costs have been estimated using the data provided in Appendix "G" of the CMP (2003 Update) for preliminary construction costs.
³ Appendix "G" costs escalated by a factor of 1.484 except Traffic Signals to reflect current costs.
⁴ Program improvements constructed by project may be eligible for fee credit, at discretion of City. See Table 1-8 for Fair Share Calculations.
⁵ Rough order of magnitude cost estimate.
⁶ Improvements are to be constructed by other projects since these improvements are needed for site access.
⁷ Total project fair share contribution consists of the improvements which are not already included in the City-wide DIF for those intersections wholly or partially within the City of Eastvale.
⁸ Total project fair share contribution consists of the improvements which are not already included in a fee program for those intersections wholly or partially within the City of Chino.
⁹ Total project fair share contribution consists of the improvements which are not already included in a fee program for those intersections wholly or partially within the City of Ontario.
¹⁰ Total project fair share contribution consists of the improvements which are not already included in a fee program for those intersections wholly or partially within the City of Jurupa Valley.
¹¹ Total project fair share contribution consists of the improvements which are not already included in a fee program for those intersections wholly or partially within Caltrans' jurisdiction.
¹² Identifies the Project's responsibility to construct an improvement or contribute fair share towards the implementation of the improvements shown.



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Table 1-7
Page 1 of 2

Project Fair Share Calculations for Without Limonite Avenue Extension

#	Intersection	Existing	Opening Year Cumulative (2021)			Horizon Year (2040)			Project % of New Traffic	
			Project (2021)	2021 With Project Volume	Net New Traffic	Project % of New Traffic	Project (2040)	2040 With Project Volume		Net New Traffic
1	Grove Av. & Merrill Av. AM: PM:	1,080 1,138	59 65	2,076 2,349	996 1,211	5.924% 5.367%	54 59	2,186 2,236	1,106 1,098	4.882% 5.373%
2	Flight Av. & Merrill Av. AM: PM:	1,131 1,132	59 65	2,276 2,547	1,145 1,415	5.153% 4.594%	64 71	2,888 3,102	1,757 1,970	3.643% 3.604%
3	Hellman Av. & Merrill Av. AM: PM:	871 951	59 65	1,964 2,305	1,093 1,354	5.398% 4.801%	91 100	3,147 3,355	2,276 2,404	3.998% 4.160%
4	Hellman Av. & Kimball Av. AM: PM:	1,087 1,106	32 35	1,642 1,712	555 606	5.766% 5.776%	37 41	2,215 2,574	1,128 1,468	3.280% 2.793%
5	Hellman Av. & Pine Av. AM: PM:	3,207 3,094	69 76	4,080 4,104	873 1,010	7.904% 7.525%	69 76	3,805 4,745	598 1,651	11.538% 4.603%
6	Archibald Av. & Riverside Dr. AM: PM:	3,494 4,003	62 73	5,104 6,084	1,610 2,081	3.851% 3.508%	52 61	4,629 5,212	1,135 1,209	4.581% 5.045%
7	Archibald Av. & Chino Av. AM: PM:	1,999 2,016	74 83	3,245 3,553	1,246 1,537	5.939% 5.400%	59 65	3,045 4,287	1,046 2,271	5.641% 2.862%
8	Archibald Av. & Schaefer Av. AM: PM:	1,593 1,833	75 83	2,906 3,461	1,313 1,628	5.712% 5.098%	64 71	3,307 4,729	1,714 2,896	3.734% 2.452%
9	Archibald Av. & Ontario Ranch Rd. AM: PM:	2,956 3,194	117 130	4,898 5,736	1,942 2,542	6.025% 5.114%	101 112	5,020 6,866	2,064 3,672	4.893% 3.050%
10	Archibald Av. & Eucalyptus Av. AM: PM:	2,186 2,259	117 130	3,969 4,482	1,783 2,223	6.562% 5.848%	106 118	4,016 3,845	1,830 1,586	5.792% 7.440%

Table 1-7
Page 2 of 2

Project Fair Share Calculations for Without Limonite Avenue Extension

#	Intersection	Existing	Opening Year Cumulative (2021)			Horizon Year (2040)			Project % of New Traffic	
			Project (2021)	2021 With Project Volume	Net New Traffic	Project % of New Traffic	Project (2040)	2040 With Project Volume		Net New Traffic
11	Archibald Av. & Merrill Av. AM: PM:	2,806 2,883	181 201	5,366 6,034	2,560 3,151	7.070% 6.379%	219 241	5,500 6,871	2,694 3,988	8.129% 6.043%
12	Archibald Av. & Victoria Ln. AM: PM:	2,185 2,374	181 201	4,194 4,732	2,009 2,358	9.009% 8.524%	218 242	4,679 5,805	2,494 3,431	8.741% 7.053%
15	Archibald Av. & Limonite Av. AM: PM:	2,652 2,967	315 327	5,028 5,853	2,376 2,886	13.258% 11.331%	316 324	5,738 7,113	3,086 4,146	10.240% 7.815%
16	Archibald Av. & 65th St. AM: PM:	2,298 2,512	192 210	3,603 4,188	1,305 1,676	14.713% 12.530%	165 180	4,784 4,912	2,486 2,400	6.637% 7.500%
17	Archibald Av. & Schleisman Rd. AM: PM:	4,201 4,183	158 176	5,719 6,077	1,518 1,894	10.408% 9.293%	143 158	6,630 7,007	2,429 2,824	5.887% 5.595%
20	Harrison Av. & Limonite Av. AM: PM:	2,119 2,020	185 206	3,821 4,066	1,702 2,046	10.870% 10.068%	175 194	3,717 4,724	1,598 2,704	10.951% 7.175%
21	Sumner Av. & Limonite Av. AM: PM:	2,090 2,708	175 194	3,849 4,912	1,759 2,204	9.949% 8.802%	164 183	4,917 6,009	2,827 3,301	5.801% 5.544%
22	Scholar Way & Limonite Av. AM: PM:	2,279 2,420	164 183	3,935 4,448	1,656 2,028	9.903% 9.024%	153 171	4,217 4,962	1,938 2,542	7.895% 6.727%
24	I-15 SB Ramps & Limonite Av. AM: PM:	3,267 3,532	106 119	4,854 5,428	1,587 1,896	6.679% 6.276%	106 119	6,075 6,600	2,808 3,068	3.775% 3.879%
25	I-15 NB Ramps & Limonite Av. AM: PM:	3,057 3,576	66 74	4,164 4,809	1,107 1,233	5.962% 6.002%	66 74	6,061 6,741	3,004 3,165	2.197% 2.338%

BOLD = Denotes highest fair share percentage.



Table 1-8

Project Fair Share Calculations for With Limonite Avenue Extension

#	Intersection	Existing	Opening Year Cumulative (2021)			Horizon Year (2040)				
			Project (2021)	2021 With Project Volume	Net New Traffic	Project % of New Traffic	Project (2040)	2040 With Project Volume	Net New Traffic	Project % of New Traffic
1	Grove Av. & Merrill Av. AM: PM:	1,080 1,138	59 65	2,076 2,349	996 1,211	5.924% 5.367%	54 59	2,017 2,088	937 950	5.763% 6.211%
2	Flight Av. & Merrill Av. AM: PM:	1,131 1,132	59 65	2,276 2,547	1,145 1,415	5.153% 4.594%	64 71	2,278 2,460	1,147 1,328	5.580% 5.346%
3	Hellman Av. & Merrill Av. AM: PM:	871 951	59 65	1,964 2,305	1,093 1,354	5.398% 4.801%	91 100	2,462 3,327	1,591 2,376	5.720% 4.209%
4	Hellman Av. & Kimball Av. AM: PM:	1,087 1,106	32 35	1,642 1,712	555 606	5.766% 5.776%	64 70	3,420 4,259	2,333 3,153	2.743% 2.220%
5	Hellman Av. & Pine Av. AM: PM:	3,207 3,094	69 76	4,080 4,104	873 1,010	7.904% 7.525%	27 29	3,735 4,665	528 1,571	5.114% 1.846%
11	Archibald Av. & Merrill Av. AM: PM:	2,806 2,883	181 201	5,366 6,034	2,560 3,151	7.070% 6.379%	219 241	5,088 6,075	2,282 3,192	9.597% 7.550%
12	Archibald Av. & Victoria Ln. AM: PM:	2,185 2,374	181 201	4,194 4,732	2,009 2,358	9.009% 8.524%	218 242	4,227 4,985	2,042 2,611	10.676% 9.268%
15	Archibald Av. & Limonite Av. AM: PM:	2,652 2,967	315 327	5,028 5,853	2,376 2,886	13.258% 11.331%	316 325	6,405 7,498	3,753 4,531	8.420% 7.173%
16	Archibald Av. & 65th St. AM: PM:	2,298 2,512	192 210	3,603 4,188	1,305 1,676	14.713% 12.530%	96 105	4,105 4,537	1,807 2,025	5.313% 5.185%
17	Archibald Av. & Schleisman Rd. AM: PM:	4,201 4,183	158 176	5,719 6,077	1,518 1,894	10.408% 9.293%	74 82	7,755 8,753	3,554 4,570	2.082% 1.794%

BOLD = Denotes highest fair share percentage.



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

The Project Applicant will be subject to the City's DIF fee program, and will pay the requisite City DIF fees at the rates then in effect pursuant to the City's ordinance. The Project Applicant's payment of the requisite DIF at the rates then in effect, pursuant to the City DIF Program, would satisfy the Project's proportional mitigation requirements at potentially affected DIF-funded facilities.

1.5.2 TRANSPORTATION UNIFORM MITIGATION FEE (TUMF) PROGRAM

The TUMF program is administered by WRCOG based upon a regional Nexus Study completed in 2016 to address major changes in right of way acquisition and improvement cost factors. TUMF identifies a network of backbone and local roadways that are needed to accommodate growth through 2035. This regional program was put into place to ensure that development pays its fair share and that funding is in place for construction of facilities needed to maintain the requisite level of service and critical to mobility in the region.

TUMF fees are imposed on new residential, industrial, and commercial development through application of the TUMF fee ordinance and fees are collected at the building or occupancy permit stage. An annual inflation adjustment is considered each year in January. In this way, TUMF fees are adjusted upwards on a regular basis to ensure that the development impact fees collected keep pace with construction and labor costs, etc.

The Project Applicant will be subject to the TUMF fee program and will pay the requisite TUMF fees at the rates then in effect pursuant to the TUMF Ordinance. WRCOG has a successful track record funding and overseeing the construction of improvements funded through the TUMF program. In total, the TUMF program is anticipated to generate nearly \$5 billion in transportation projects for Western Riverside County.

1.5.3 MIRA LOMA ROAD AND BRIDGE BENEFIT DISTRICT (RBBB) PROGRAM

Similar to other regions within Riverside County, the City of Eastvale is anticipated to experience substantial growth. Extensive improvements are necessitated by new development within the region. In particular, Riverside County recognized the impact of this growth on the vicinity of the study area when it formed the Mira Loma RBBB. The proposed Project lies within Zone D of the Mira Loma RBBB. Zone D is generally bounded by the San Bernardino County line to the north and west, Hamner Avenue to the east, and the City of Corona to the south. As discussed above, the facilities improvements that will be ultimately constructed as a result of the collection of these fees and assessments are significant. The fee for industrial and commercial use is currently \$9,117 per gross acre within Zone D. They include:

Mira Loma Road and Bridge Benefits District (Zone D):

- Limonite Avenue and I-15 Freeway interchange improvements
- Archibald Avenue widening from River Road to San Bernardino/Riverside County Line, including the landscaped median
- Limonite Avenue widening from Hamner Avenue to Archibald Avenue, including the landscaped median
- Schleisman Road from Hamner Avenue to San Bernardino/Riverside County Line, including the landscaped median
- Hamner Avenue landscaped median from Bellegrave Avenue to the Santa Ana River

1.5.4 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. Improvements constructed by development may be eligible for a fee credit or reimbursement through the program where appropriate (to be determined at the City's discretion).

When off-site improvements are identified with a minor share of responsibility assigned to proposed development, the approving jurisdiction may elect to collect a fair share contribution or require the development to construct improvements. Detailed fair share calculations, for each peak hour, have been provided in Table 1-7 for the deficient intersections shown previously in Table 1-5 and in Table 1-8 for the deficient intersections shown previously in Table 1-6.

A rough order of magnitude cost has been prepared to determine the appropriate contribution value based upon the project's fair share of traffic as part of the project approval process. Table 1-5 and Table 1-6 also summarize the applicable cost associated with each of the recommended improvements based on the preliminary construction cost estimates found in Appendix G of the San Bernardino County CMP in conjunction with a cost escalation factor of 1.484 to reflect current (2018) costs. The total cost of needed study area intersection improvements is \$16,102,560 for Without Limonite Avenue Extension conditions and \$11,074,080 for With Limonite Avenue Extension. Based on the Project fair share percentages shown in Table 1-7 and Table 1-8, the Project's fair share cost is estimated as follows:

- Opening Year Cumulative (2021): \$526,787
- Horizon Year (2040) Without Limonite Avenue Extension: \$313,026
- Horizon Year (2040) With Limonite Avenue Extension: \$208,944

These estimates are a rough order of magnitude only as they are intended only for discussion purposes and do not imply any legal responsibility or formula for contributions or mitigation.

1.6 CUMULATIVE IMPACTS

Cumulative impacts are deficiencies that would not be directly caused by the Project. The Project would, however, contribute traffic to these deficient facilities along with other cumulative development projects, resulting in a cumulatively considerable impact. The following mitigation measures are based on the improvements needed under Opening Year Cumulative (2021) and Horizon Year (2040) traffic conditions.

1.6.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

A summary of off-site improvements needed to address cumulative traffic impacts for both Opening Year Cumulative (2021) and Horizon Year (2040) traffic conditions was included previously in Table 1-4.

1.6.2 CUMULATIVE MITIGATION MEASURES

Opening Year Cumulative (2021) Conditions

Mitigation Measure 4.1 – Prior to the issuance of building permits, the Project Applicant shall participate in the City’s DIF, TUMF, and RBBD fee programs by paying the requisite fees at the time of building permit; and in addition, shall pay the Project’s fair share amount of \$20,515 for the improvements identified in Table 1-5 that are consistent with the improvements shown in Table 6-6, or as agreed to by the City and Project Applicant.

Horizon Year (2040) Conditions

Mitigation Measure 5.1 – Prior to the issuance of the final Certificate of Occupancy for each building, the Project Applicant shall pay that building’s fair share fee amounts toward the construction of City of Eastvale improvements required under each analysis scenario listed in Table 1-5 or Table 1-6.

1.7 ON-SITE ROADWAY AND SITE ACCESS IMPROVEMENTS

This section summarizes Project site access and on-site circulation recommendations. The Project is proposed to have access on Archibald Avenue and Limonite Avenue via the following driveways:

- Archibald Avenue & Driveway 1 – Right-in/right-out/left-in driveway providing access to both passenger cars and trucks
- Archibald Avenue & Driveway 2 – Right-in/right-out driveway providing access to passenger cars only
- Driveway 3 & Limonite Avenue – Right-in/right-out driveway providing access to passenger cars only
- Driveway 4 & Limonite Avenue – Signalized full access driveway providing access to both passenger cars and trucks. This driveway is proposed to align with a future driveway to the south.

Regional access to the Project site is provided via the SR-60 Freeway at Archibald Avenue and the I-15 Freeway at Limonite Avenue 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 are required to be in place prior to occupancy.

1.7.1 SITE ADJACENT ROADWAY AND SITE ACCESS IMPROVEMENTS

Exhibit 1-4 illustrates the on-site and site adjacent recommended roadway lane improvements. 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. Ultimate improvements along Archibald Avenue and Limonite Avenue are consistent with the City of Eastvale General Plan.

Based on a review of the Project's internal circulation, there are 2 locations where sidewalks are proposed to provide internal pedestrian connections between the proposed warehouse uses and the commercial retail uses.

Archibald Avenue – Archibald Avenue is a north-south oriented roadway located along the western boundary of the Project. Construct Archibald Avenue from the northern Project boundary to Limonite Avenue at its ultimate half-section width as a 6-lane Urban Arterial Highway (ultimate 152-foot right-of-way) in compliance with the circulation recommendations found in the City of Eastvale's General Plan.

The TIA shows that the intersection of Archibald Avenue and Driveway 1 satisfies the City's LOS criteria for acceptable peak hour operations as an unsignalized, right-in/right-out/left-in driveway. In addition, the intersection is not anticipated to meet the peak hour volume or planning level traffic signal warrants based on the future traffic volume forecasts developed for this TIA. However, at some point in the future, additional intersection traffic control at this intersection may be warranted based on conditions at the time.

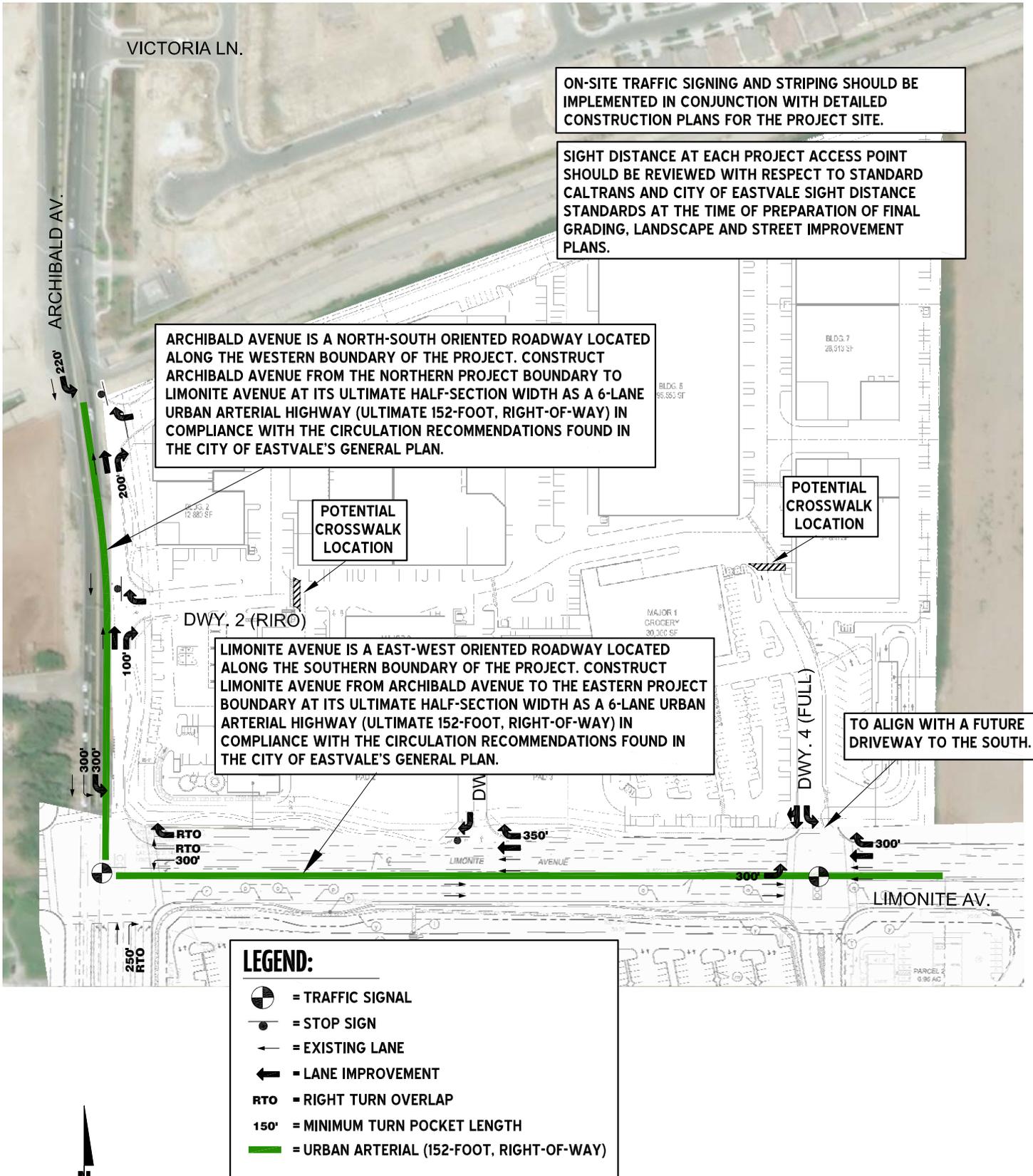
Limonite Avenue – Limonite Avenue is an east-west oriented roadway located along the southern boundary of the Project. Construct Limonite Avenue from Archibald Avenue to the eastern Project boundary at its ultimate half-section width as a 6-lane Urban Arterial Highway (ultimate 152-foot right-of-way) in compliance with the circulation recommendations found in the City of Eastvale's General Plan.

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 Eastvale General Plan Circulation Element.

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 Eastvale sight distance standards at the time of preparation of final grading, landscape and street improvement plans.

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



1.7.2 QUEUING ANALYSIS AT THE PROJECT DRIVEWAYS

A queuing analysis was conducted along the site adjacent roadways of Archibald Avenue and Limonite Avenue for Horizon Year (2040) traffic conditions to determine the turn pocket lengths necessary to accommodate near term 95th percentile queues. The analysis was conducted for both the weekday AM and weekday PM peak hours.

The traffic modeling and signal timing optimization software package Synchro (Version 10) has been utilized to assess queues at the Project access points. Synchro is a macroscopic traffic software program that is based on the signalized and unsignalized intersection capacity analyses 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 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). However, the average queue is the average of all the two-minute maximum queues observed by SimTraffic. The maximum back of queue observed for every two-minute period is recorded by SimTraffic.

SimTraffic has been utilized to assess peak hour queuing at the site access driveways for Horizon Year (2040) With Project traffic conditions. The random simulations generated by SimTraffic have been utilized to determine the 95th percentile queue lengths observed for each turn lane. A SimTraffic simulation has been recorded five (5) times, during the weekday AM and weekday PM peak hours, and has been seeded for 60-minute periods with 60-minute recording intervals.

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 utilized for purposes of determining the necessary turn pocket storage lengths, the 50th percentile queues are also reported. 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 storage length recommendations for the turning movements at the Project were shown previously on Exhibit 1-4. The Horizon Year (2040) queuing results are provided in Appendix 1.2 of this report.

The queuing analysis results also demonstrate the following:

- The proposed spacing between the future signalized intersection at Archibald Avenue at Victoria Lane and the proposed intersection of Archibald Avenue at Driveway 1 is anticipated to be sufficient to accommodate the 95th percentile queues within the through lanes between these intersections.

- The queuing analysis (in conjunction with the peak hour intersection operations analysis) also indicates that right-in/right-out access at Driveway 3 on Limonite Avenue is feasible and is in line with other right-in/right-out driveways throughout the City.

1.8 PEDESTRIAN AND BICYCLE ACCOMMODATIONS

1.8.1 PEDESTRIAN ACCOMMODATIONS

The Project will construct its ultimate half-section of Archibald Avenue and Limonite Avenue including curb and gutter and sidewalk improvements.

1.8.2 BICYCLE ACCOMMODATIONS

Bicycle and multi-use trails in the Project area are reflected in the Jurupa Community Services District (JCSD) Parks and Recreation Master Plan (JCSD Master Plan), and City of Eastvale Bicycle Master Plan. The JCSD indicates planned Class II bike lanes along Archibald Avenue and Limonite Avenue adjacent to the Project site. (Note: The City of Eastvale Bicycle Master Plan (February 2016) recommends provision of a Class IV protected bike lane along Limonite Avenue adjacent to the Project site.) The JCSD Master Plan also indicates a planned off-street Class I Multi-Use Trail along the Project northerly boundary adjacent to the existing San Bernardino County Flood Control District flood control channel.

1.8.3 TRANSIT ACCOMMODATIONS

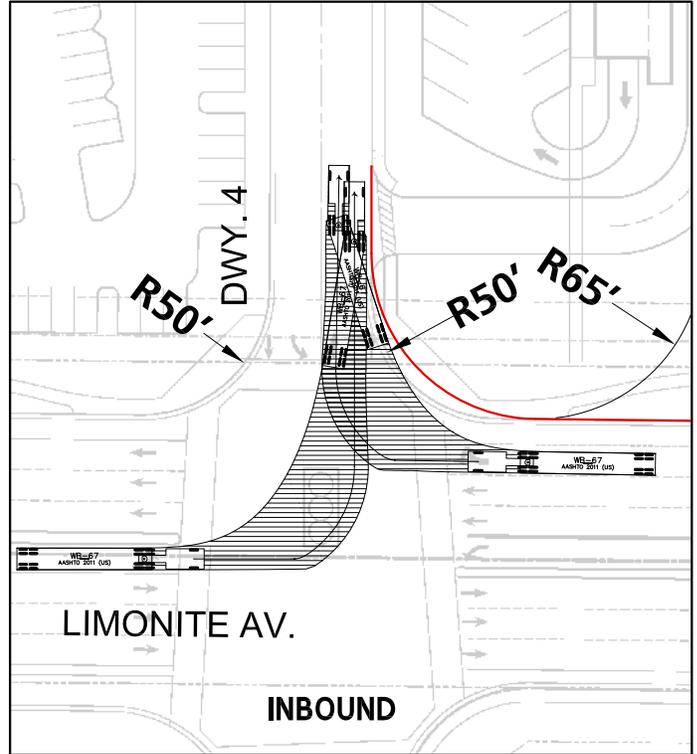
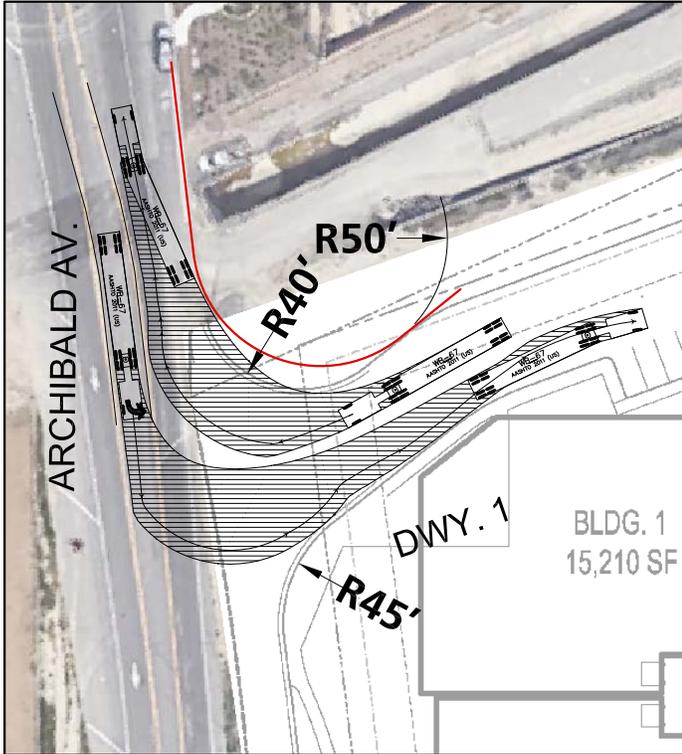
There is a future bus stop location on the south side of Limonite Avenue along the Project's frontage. Providing crosswalks at both the intersections of Archibald Avenue at Limonite Avenue and Driveway 4 at Limonite Avenue will accommodate pedestrian/bicycle access to the future bus stop.

1.9 TRUCK ACCESS AND CIRCULATION

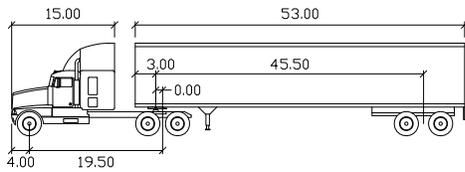
Due to the typical wide turning radius of large trucks, a truck turning template has been overlaid on the site plan at each applicable Project driveway and site adjacent intersection anticipated to be utilized by heavy trucks in order to determine appropriate curb radii and to verify that trucks will have sufficient space to execute turning maneuvers (see Exhibit 1-5). As shown, the Project driveways and site adjacent intersections are anticipated to accommodate the wide turning radius of the heavy trucks at Driveways 1 and 4. As shown on Exhibit 1-4, Driveway 1 on Archibald Avenue should be modified to provide a 50-foot radius on the northeast curb and Driveway 4 on Limonite Avenue should be modified to provide a 65-foot radius on the northeast curb in order to accommodate the ingress and egress of heavy trucks. A WB-67 truck (53-foot trailer) has been utilized for the purposes of this analysis.

The internal on-site circulation of trucks within the drive-aisles and access to and from the docks/bays will be addressed at a later time.

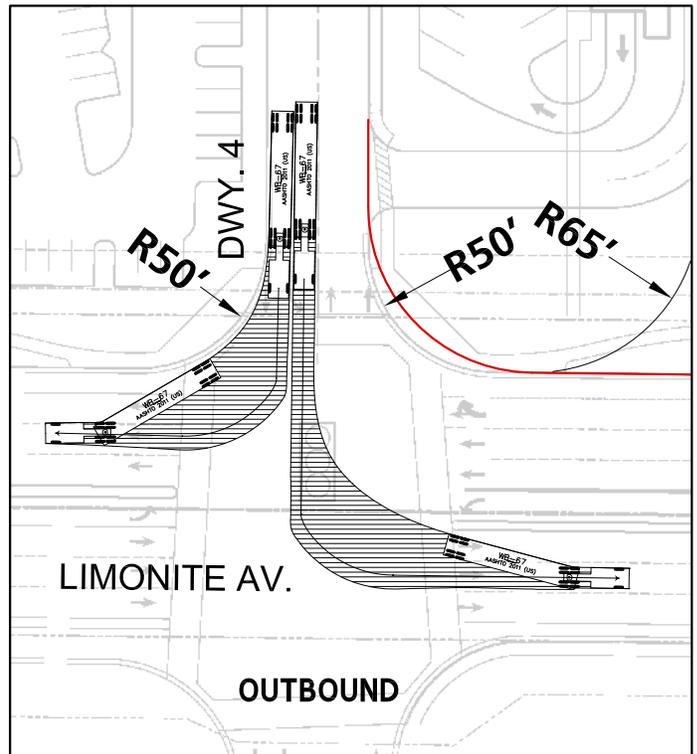
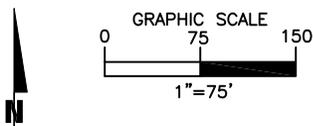
EXHIBIT 1-5: TRUCK ACCESS



LEGEND:



WB-67	feet		
Tractor Width	: 8.00	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 28.4
Tractor Track	: 8.00	Articulating Angle	: 75.0
Trailer Track	: 8.50		



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2 METHODOLOGIES

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

2.1 LEVEL OF SERVICE

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

2.2 INTERSECTION CAPACITY ANALYSIS

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

2.2.1 SIGNALIZED INTERSECTIONS

City of Eastvale, City of Chino, City of Ontario, City of Jurupa Valley

The City of Eastvale, City of Chino, City of Ontario, and City of Jurupa Valley require signalized intersection operations analysis based on the methodology described in the HCM. (6) 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.

At the City's request, HCM 2010 has been utilized to evaluate the study area intersections, with the exception of the following which have utilized the HCM (6th Edition) methodology as they are either CMP locations or Caltrans facilities:

- Archibald Avenue & Riverside Drive (#6)
- I-15 Southbound Ramps & Limonite Avenue (#24)
- I-15 Northbound Ramps & Limonite Avenue (#25)

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 2010

A saturation flow rate of 1900 has been utilized for all study area intersections located within the County of Riverside. Consistent with Appendix B of the San Bernardino County CMP, the following saturation flow rates, in vehicles per hour green per lane (vphgpl), will be utilized in the traffic analysis for signalized intersections in the County of San Bernardino:

Existing and Opening Year Cumulative Traffic Conditions:

- Exclusive through: 1800 vphgpl
- Exclusive left: 1700 vphgpl
- Exclusive right: 1800 vphgpl
- Exclusive dual left: 1600 vphgpl
- Exclusive triple left: 1500 vphgpl

Horizon Year (2040) Traffic Conditions:

- Exclusive through: 1900 vphgpl
- Exclusive left: 1800 vphgpl
- Exclusive dual left: 1700 vphgpl
- Exclusive right: 1900 vphgpl
- Exclusive dual right: 1800 vphgpl
- Exclusive triple left: 1600 vphgpl or less

The traffic modeling and signal timing optimization software package Synchro (Version 10) has been utilized to analyze signalized intersections within the City of Eastvale, City of Chino, City of Ontario, and City of Jurupa Valley. 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.

The peak hour traffic volumes have been adjusted using a peak hour factor (PHF) to reflect peak 15-minute volumes. Common practice for LOS analysis is to use a peak 15-minute rate of flow. However, flow rates are typically expressed in vehicles per hour. The PHF is the relationship between the peak 15-minute flow rate and the full hourly volume (e.g. $PHF = [Hourly Volume] / [4 \times Peak\ 15\text{-minute\ Flow\ Rate}]$). The use of a 15-minute PHF produces a more detailed analysis as compared to analyzing vehicles per hour. Existing PHFs have been used for all 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. (6)

The City of Eastvale has also requested that Intersection Capacity Utilization (ICU) volume to capacity (v/c) results also be reported for the signalized study area intersections. As such, ICU results have been provided for informational purposes in each appendix with an accompanying table summarizing the results. ICU results have been provided for all signalized intersections with the exception of the following locations, where only HCM analysis results have been reported: Archibald Avenue at Riverside Drive, I-15 Southbound Ramps at Limonite Avenue, and I-15 Northbound Ramps at Limonite Avenue.

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 Limonite Avenue). (2) Signal timing for the freeway arterial-to-ramp intersections have been obtained from Caltrans District 8 and were utilized for the purposes of this analysis. HCM (6th Edition) methodology has been utilized for the evaluation of all Caltrans facilities (i.e., intersections, freeway segments, and ramp junctions).

2.2.2 UNSIGNALIZED INTERSECTIONS

The City of Eastvale, City of Chino, City of Ontario, and City of Jurupa Valley require the operations of unsignalized intersections be evaluated using the methodology described in the HCM. (6) The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-2).

TABLE 2-2: UNSIGNALIZED INTERSECTION LOS THRESHOLDS

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

Source: HCM 2010

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

If applicable, the unsignalized intersections have been evaluated in Synchro taking into consideration the presence of upstream and downstream signalized intersections. These upstream and downstream signalized intersections would likely create gaps in through traffic along the major roadway at the unsignalized intersections.

2.3 ROADWAY SEGMENT CAPACITY ANALYSIS

Roadway segment operations have been evaluated using the daily roadway segment capacities for each type of roadway as summarized in Table 2-3.

TABLE 2-3: ROADWAY SEGMENT CAPACITIES

Roadway Lanes	City of Eastvale ¹
2-Lane	17,950
4-Lane	35,900
6-Lane	53,900

¹ Based on LOS E maximum two-way traffic volume (ADT) thresholds from the City of Eastvale General Plan (Table C-1) for an Urban Arterial.

These roadway capacities are “rule of thumb” estimates for planning purposes and are affected by such factors as intersections (spacing, configuration and control features), degree of access control, roadway grades, design geometrics (horizontal and vertical alignment standards), sight distance, vehicle mix (truck and bus traffic) and pedestrian bicycle traffic. As such, where the average daily volume (ADT) based roadway segment analysis indicates a deficiency (unacceptable LOS), a review of the more detailed peak hour intersection analysis and progression analysis are undertaken. The more detailed peak hour intersection analysis explicitly accounts for factors that affect roadway capacity. Therefore, for the purposes of this analysis, roadway segment widening is typically only recommended if the peak hour intersection analysis indicates the need for additional through lanes.

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) for all study area intersections. (7)

The signal warrant criteria for Existing conditions are based upon several factors, including volume of vehicular and pedestrian traffic, frequency of accidents, and location of school areas. The Caltrans CA MUTCD indicates that the installation of a traffic signal should be considered if one or more of the signal warrants are met. (7) Specifically, this TIA utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis for existing study area intersections for all analysis scenarios. 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.

Future unsignalized intersections, that currently do not exist, have been assessed regarding the potential need for new traffic signals based on future average daily traffic (ADT) volumes, using the Caltrans planning level ADT-based signal warrant analysis worksheets. As shown in Table 2-4, 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 2-4: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction
1	Grove Av. & Merrill Av.	Ontario/Chino
2	Flight Av. & Merrill Av.	Ontario/Chino
3	Hellman Av. & Merrill Av.	Ontario/Chino
4	Hellman Av. & Kimball Av.	Chino/Eastvale
8	Archibald Av. & Schaefer Av.	Ontario
12	Archibald Av. & Victoria Ln.	Ontario
13	Archibald Av. & Driveway 1 – Future Intersection	Eastvale
19	Driveway 4 & Limonite Av. – Future Intersection	Eastvale

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 *Opening Year Cumulative (2021) Traffic Analysis*, and Section 7 *Horizon Year (2040) Traffic Analysis* of this report. It is important to note that a signal warrant defines the minimum condition under which the installation of a traffic signal might be warranted. Meeting this threshold condition does not require that a traffic control signal be installed at a particular location, but rather, that other traffic factors and

conditions be evaluated in order to determine whether the signal is truly justified. It should also be noted that signal warrants do not necessarily correlate with LOS. An intersection may satisfy a signal warrant condition and operate at or above acceptable LOS or operate below acceptable LOS and not meet a signal warrant.

2.5 FREEWAY OFF-RAMP QUEUING ANALYSIS

The study area for this TIA includes the freeway-to-arterial interchange of the I-15 Freeway at Limonite Avenue off-ramps. Consistent with Caltrans requirements, the 95th percentile queuing of vehicles has been assessed at the off-ramps to determine potential queuing impacts at the freeway ramp intersections on Limonite Avenue. 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 impacts/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. 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.

2.6 FREEWAY MAINLINE SEGMENT ANALYSIS METHODOLOGY

Consistent with recent Caltrans guidance and because impacts to freeway segments dissipate with distance from the point of 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 25 or more one-way peak hour trips. Because impacts to freeway segments dissipate with distance from the point of SHS entry, quantitative evaluation of freeway segments with less than 25 peak hour trips is not necessary.

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 (6th Edition) and performed using HCS7 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 2-5 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 of 2018. These existing

freeway geometrics have been utilized for Existing, E+P, Opening Year Cumulative (2021) Without and With Project, and Horizon Year (2040) Without and With Project conditions.

The I-15 Freeway mainline volume data were obtained from the Caltrans Performance Measurement System (PeMS) website for the segment of the I-15 Freeway north of Limonite Avenue. The data was obtained from April 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. As such, actual vehicles (as opposed to passenger-car-equivalent volumes) have been utilized for the purposes of the basic freeway segment analysis. (8)

TABLE 2-5: 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: HCM7

2.7 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 (6th Edition) 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 2-6 presents the merge/diverge area level of service descriptions for each density range utilized for this analysis.

TABLE 2-6: 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: HCM7

Similar to the basic freeway segment analysis, the I-15 Freeway mainline volume data was obtained from the Caltrans PeMS website for the segments of the I-15 Freeway north of Limonite Avenue. 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 April 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 volumes) have been utilized for the purposes of the freeway ramp junction (merge/diverge) analysis.

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

Minimum Acceptable Levels of Service (LOS) and associated definitions of intersection deficiencies has been obtained from each of the applicable surrounding jurisdictions.

2.8.1 CITY OF EASTVALE

The City of Eastvale General Plan Policy C-10 sets a standard of LOS C with LOS D as acceptable in commercial and employment areas and at intersections of any combination of major highways, urban arterials, secondary highways, or freeway ramps. Based on this criterion, where feasible, LOS D is the minimum acceptable LOS at each of the study intersections within the City of Eastvale.

LOS D has been utilized as the minimum LOS for all roadway segments.

2.8.2 CITY OF CHINO

The City of Chino utilizes a minimum acceptable LOS of LOS D.

2.8.3 CITY OF ONTARIO

According to the City of Ontario General Plan, LOS E is the minimum acceptable condition that should be maintained during the peak commute hours. Therefore, any intersection or roadway segment operating at LOS F is considered deficient. LOS will also be reported by movement for the City of Eastvale's review.

2.8.4 CITY OF JURUPA VALLEY

The City of Jurupa Valley utilizes a minimum acceptable LOS of LOS D.

2.8.5 CMP

The CMP definition of deficiency is based on maintaining a level of service standard of LOS E or better, except where an existing LOS F condition is identified in the CMP document. However, in an effort to overstate as opposed to understate potential impacts, LOS D has been utilized for the CMP intersections for the purposes of this analysis.

2.8.6 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. In excess of the City of Eastvale LOS threshold of LOS E and consistent with the City of Chino stated LOS threshold of LOS D, LOS D will be used as the target LOS for freeway ramps, freeway segments, and freeway merge/diverge ramp junctions.

2.9 THRESHOLDS OF SIGNIFICANCE

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

2.9.1 INTERSECTIONS

For the study area intersections that lie within the City of Eastvale, Project related significant impacts will be identified by comparing the "Without Project" condition to the "With Project" condition based on the following criteria:

- If the LOS deteriorates from acceptable LOS (LOS D or better) to unacceptable LOS (LOS E or F); or
- If the intersection is already operating at an unacceptable LOS (LOS E or F) in "Without Project" conditions and the addition of Project traffic increases the delay by more than 5.0 seconds.

To determine whether the addition of project traffic (as defined through the comparison of Existing traffic conditions to E+P traffic conditions) at a study intersection that lies outside of the City of Eastvale would result in a direct project-specific traffic impact, the following will be utilized:

- When the pre-Project condition is at or better than LOS D (or LOS E for CMP intersections and intersections located in the City of Ontario) (i.e., acceptable LOS), and project-generated traffic, as measured by 50 or more peak hour trips, causes deterioration below LOS D/LOS E (i.e., unacceptable LOS), a deficiency is deemed to occur.

However, when the pre-Project condition is already below LOS D/LOS E (i.e., unacceptable LOS), the Project will be responsible for mitigating its impact to a level of service equal to or better than it was without the Project for intersections that receive 50 or more peak hour project-related trips. This is a standard protocol in many urban jurisdictions because to require a Project to mitigate to LOS D/LOS E or better would in effect force the Project to mitigate beyond its Project impacts, which is prohibited under California law. Thus, for intersections currently operating at unacceptable LOS during either the AM and/or PM peak hour under Existing traffic conditions, improvements have been identified to mitigate the impacts of the Project to an intersection LOS that is equal to or better than pre-Project conditions.

Cumulative traffic impacts are created as a result of a combination of the proposed Project together with other future developments contributing to the overall traffic impacts requiring additional improvements to maintain acceptable level of service operations with or without the Project. A Project's contribution to a significant cumulative impact can be reduced to less than significant if the Project is required to implement or fund its fair share of improvements designed to alleviate its cumulatively considerable contribution to the impact. Cumulatively considerable is defined as the addition of 50 or more peak hour trips.

In the event that an intersection is operating at or is forecast to operate at a deficient LOS, the CMP guidelines have defined a series of steps to be completed to determine the Project's contribution to the deficiency of intersections, which has been applied to both CMP and non-CMP study area intersections. The steps are as follows:

- Determine the mitigation measures necessary to achieve an acceptable service level,
- Calculate the Project's share in the future traffic volume projections for the peak hours,
- Estimate the cost to implement recommended mitigation measures, and
- Calculate the Project's fair-share contribution to mitigate the Project's traffic impacts

2.9.2 ROADWAY SEGMENTS

Project related significant impacts will be identified by comparing the “Without Project” condition to the “With Project” condition based on the following criteria:

- If the LOS deteriorates from acceptable LOS (LOS D or better) to unacceptable LOS (LOS E or F); or
- If the roadway segment is already operating at an unacceptable LOS (LOS E or F) in “Without Project” conditions and the addition of Project traffic increases the volume-to-capacity ratio by 0.01 or greater.

However, when the pre-Project condition is already below LOS D (i.e., unacceptable LOS), the Project will be responsible for mitigating its impact to a level of service equal to or better than it was without the Project for roadway segments that receive 50 or more peak hour project-related trips. This is a standard protocol in many urban jurisdictions because to require a Project to mitigate to LOS D or better would in effect force the Project to mitigate beyond its Project impacts, which is prohibited under California law.

Cumulative traffic impacts are created as a result of a combination of the proposed Project together with other future developments contributing to the overall traffic impacts requiring additional improvements to maintain acceptable level of service operations with or without the Project. A Project’s contribution to a significant cumulative impact can be reduced to less than significant if the Project is required to implement or fund its fair share of improvements designed to alleviate its cumulatively considerable contribution to the impact. Cumulatively considerable impacts are defined as the addition of 50 or more peak hour trips.

2.9.3 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 25 or more one-way peak hour trips. A segment that is operating at or near capacity is deemed to be deficient.

2.10 PROJECT FAIR SHARE CALCULATION METHODOLOGY

In cases where this TIA identifies that the Project would contribute additional traffic volumes to cumulative traffic deficiencies, Project fair share costs of improvements necessary to address deficiencies have been identified. The Project’s fair share cost of improvements is determined based on the following equation, which is the ratio of Project traffic to new traffic, and new traffic is total future (Horizon Year) traffic less existing baseline traffic:

$$\text{Project Fair Share \%} = \text{Project Traffic} / (\text{2040 With Project Total Traffic} - \text{Existing Traffic})$$

The Project fair share contribution calculations are presented in Section 1.5 *Local and Regional Funding Mechanisms* of this TIA. These cost estimates have been utilized in conjunction with the Project fair share percentages to determine the Project's fair share cost of the recommended cumulative improvements (see Table 1-7 and Table 1-8). These estimates are a rough order of magnitude only as they are intended only for discussion purposes and do not imply any legal responsibility or formula for contributions or mitigation.

3 AREA CONDITIONS

This section provides a summary of the existing circulation network, the City of Eastvale General Plan Circulation Network, and a review of existing peak hour intersection operations, roadway segment capacity, freeway mainline operations, and traffic signal warrant analyses.

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the agreement with City of Eastvale staff (Appendix 1.1), the study area includes a total of 25 existing and future intersections as shown previously on Exhibit 1-2. Exhibit 3-1 illustrates the study area intersections located near the proposed Project and identifies the number of through traffic lanes for existing roadways and intersection traffic controls.

3.2 CITY OF EASTVALE GENERAL PLAN CIRCULATION ELEMENT

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

The study area roadways that are classified as 6-lane Urban Arterials are identified as having three lanes of travel in each direction. The following study area roadways within the City of Eastvale are classified as 6-lane Urban Arterials:

- Limonite Avenue
- Schleisman Road
- Archibald Street
- Hamner Avenue

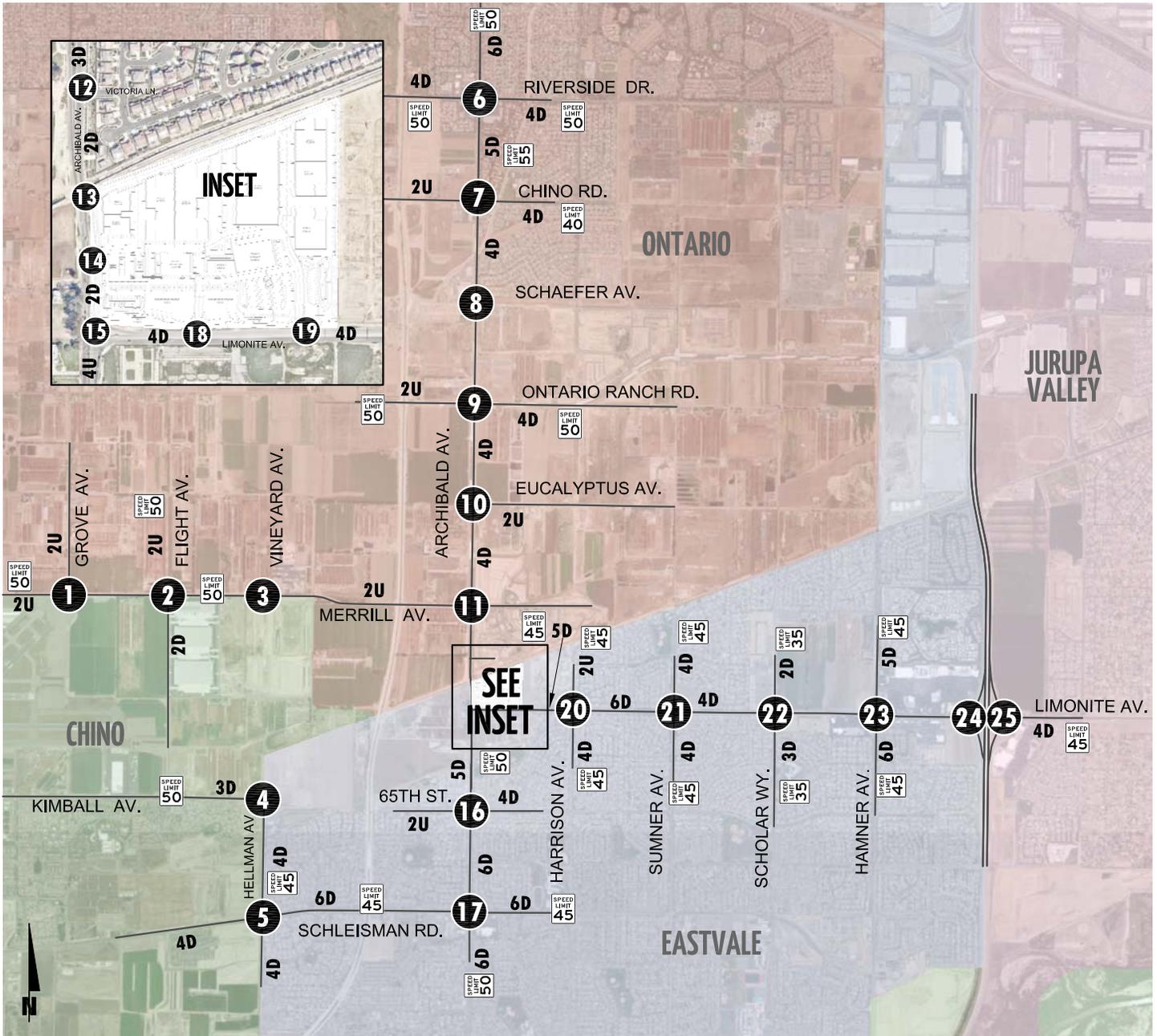
The study area roadway that is classified as a 2-lane Major Collector is identified as having one lane of travel in each direction. The following study area roadway within the City of Eastvale is classified as a 2-lane Major Collector:

- Sumner Avenue

The study area roadways that are classified as 2-lane Secondary Collectors are identified as having one lane of travel in each direction. The following study area roadways within the City of Eastvale are classified as Secondary Collectors:

- 65th Street
- Harrison Avenue
- Scholar Way

EXHIBIT 3-1 (1OF2): EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS



LEGEND:

- 4** = NUMBER OF LANES
- D** = DIVIDED
- U** = UNDIVIDED
-  = SPEED LIMIT (MPH)

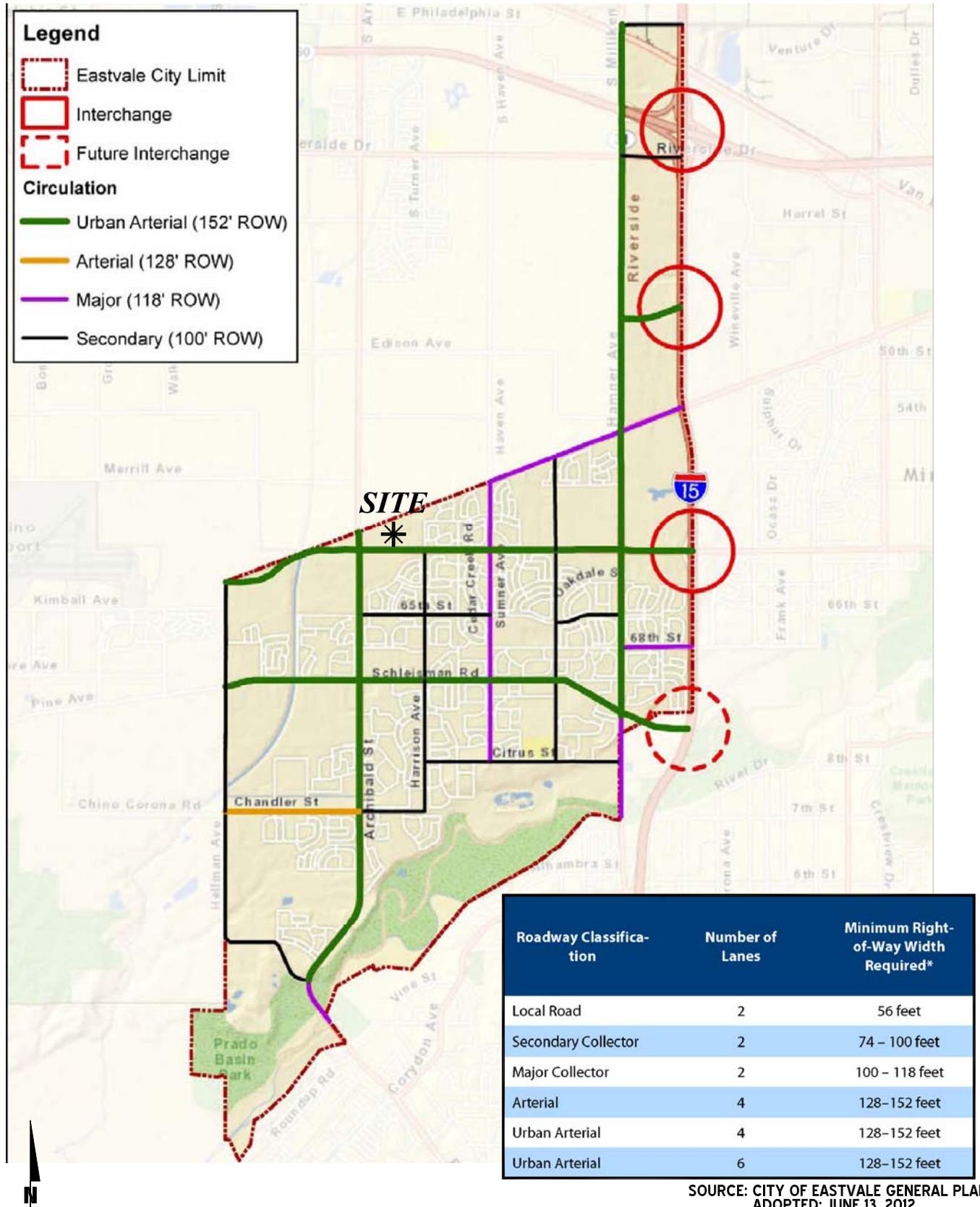
EXHIBIT 3-1 (2OF2): EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS

<p>1 Grove Av. & Merrill Av.</p>	<p>2 Flight Av. & Merrill Av.</p>	<p>3 Hellman Av. & Merrill Av.</p> <p>Future Intersection</p>	<p>4 Hellman Av. & Kimball Av.</p>	<p>5 Hellman Av. & Pine Av.</p>	<p>6 Archibald Av. & Riverside Dr.</p>
<p>7 Archibald Av. & Chlno Av.</p>	<p>8 Archibald Av. & Schaefer Av.</p> <p>Future Intersection</p>	<p>9 Archibald Av. & Ontario Ranch Rd.</p>	<p>10 Archibald Av. & Eucalyptus Av.</p>	<p>11 Archibald Av. & Merrill Av.</p>	<p>12 Archibald Av. & Victoria Ln.</p>
<p>13 Archibald Av. & Dwy. 1</p> <p>Future Intersection</p>	<p>14 Archibald Av. & Dwy. 2</p> <p>Future Intersection</p>	<p>15 Archibald Av. & Limonite Av.</p>	<p>16 Archibald Av. & 65th St.</p>	<p>17 Archibald Av. & Schleisman Rd.</p>	<p>18 Dwy. 3 & Limonite Av.</p> <p>Future Intersection</p>
<p>19 Dwy. 4 & Limonite Av.</p> <p>Future Intersection</p>	<p>20 Harrison Av. & Limonite Av.</p>	<p>21 Sumner Av. & Limonite Av.</p>	<p>22 Scholar Wy. & Limonite Av.</p>	<p>23 Hamner Av. & Limonite Av.</p>	<p>24 I-15 SB Ramps & Limonite Av.</p>
<p>25 I-15 NB Ramps & Limonite Av.</p>					

LEGEND:

- = TRAFFIC SIGNAL
- = ALL WAY STOP
- = STOP SIGN
- = CHANNELIZED YIELD
- = FREE RIGHT TURN
- RTO** = RIGHT TURN OVERLAP
- DEF** = DEFACTO RIGHT TURN

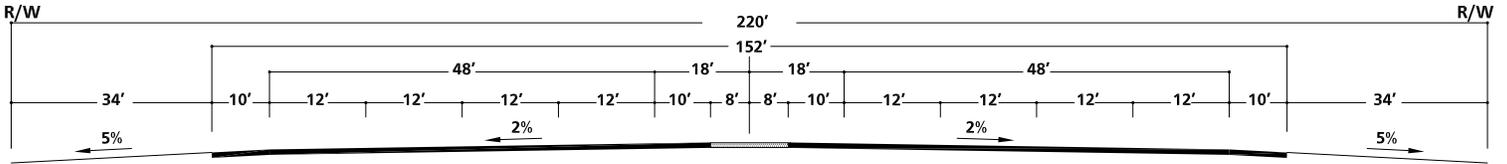
EXHIBIT 3-2: CITY OF EASTVALE GENERAL PLAN CIRCULATION ELEMENT



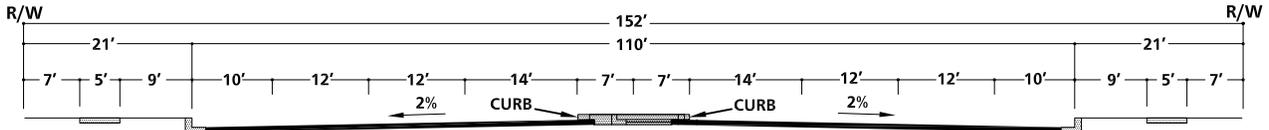
SOURCE: CITY OF EASTVALE GENERAL PLAN ADOPTED: JUNE 13, 2012



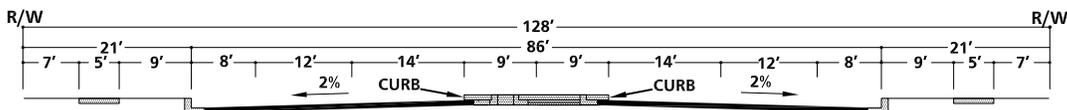
EXHIBIT 3-3: CITY OF EASTVALE GENERAL PLAN ROADWAY CROSS-SECTIONS



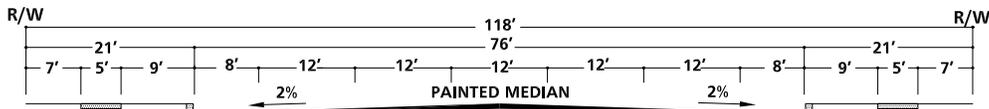
EXPRESSWAY - 8 LANES



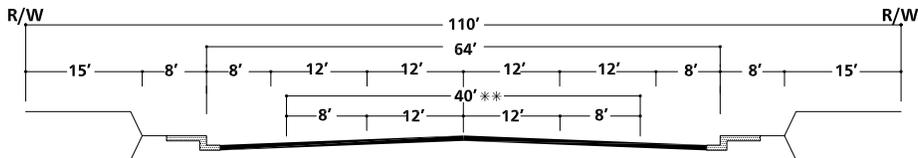
**CURBED MEDIAN
URBAN ARTERIAL HIGHWAY ***



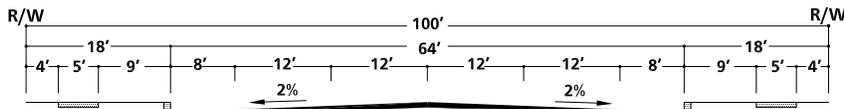
**CURBED MEDIAN
ARTERIAL HIGHWAY ***



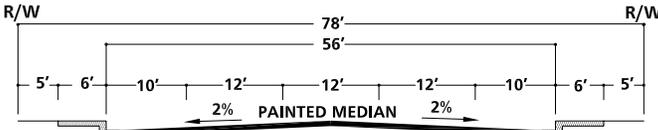
**PAINTED MEDIAN
MAJOR HIGHWAY - 4 LANES**



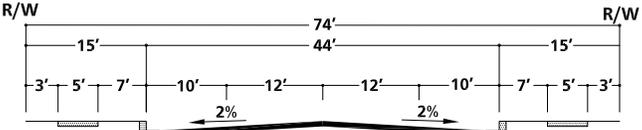
**MOUNTAIN ARTERIAL - 2 TO 4 LANES
** 2 LANE SECTION**



SECONDARY HIGHWAY



**PAINTED MEDIAN
INDUSTRIAL COLLECTOR**



COLLECTOR

* 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.



3.3 CITY OF ONTARIO AND CITY OF CHINO GENERAL PLAN CIRCULATION ELEMENT

Exhibits 3-4 and 3-5 show the City of Ontario’s General Plan Circulation Element and roadway cross-sections, respectively. Exhibits 3-6 and 3-7 show the City of Chino’s General Plan Circulation Element and roadway cross-sections, respectively.

3.4 TRUCK ROUTES

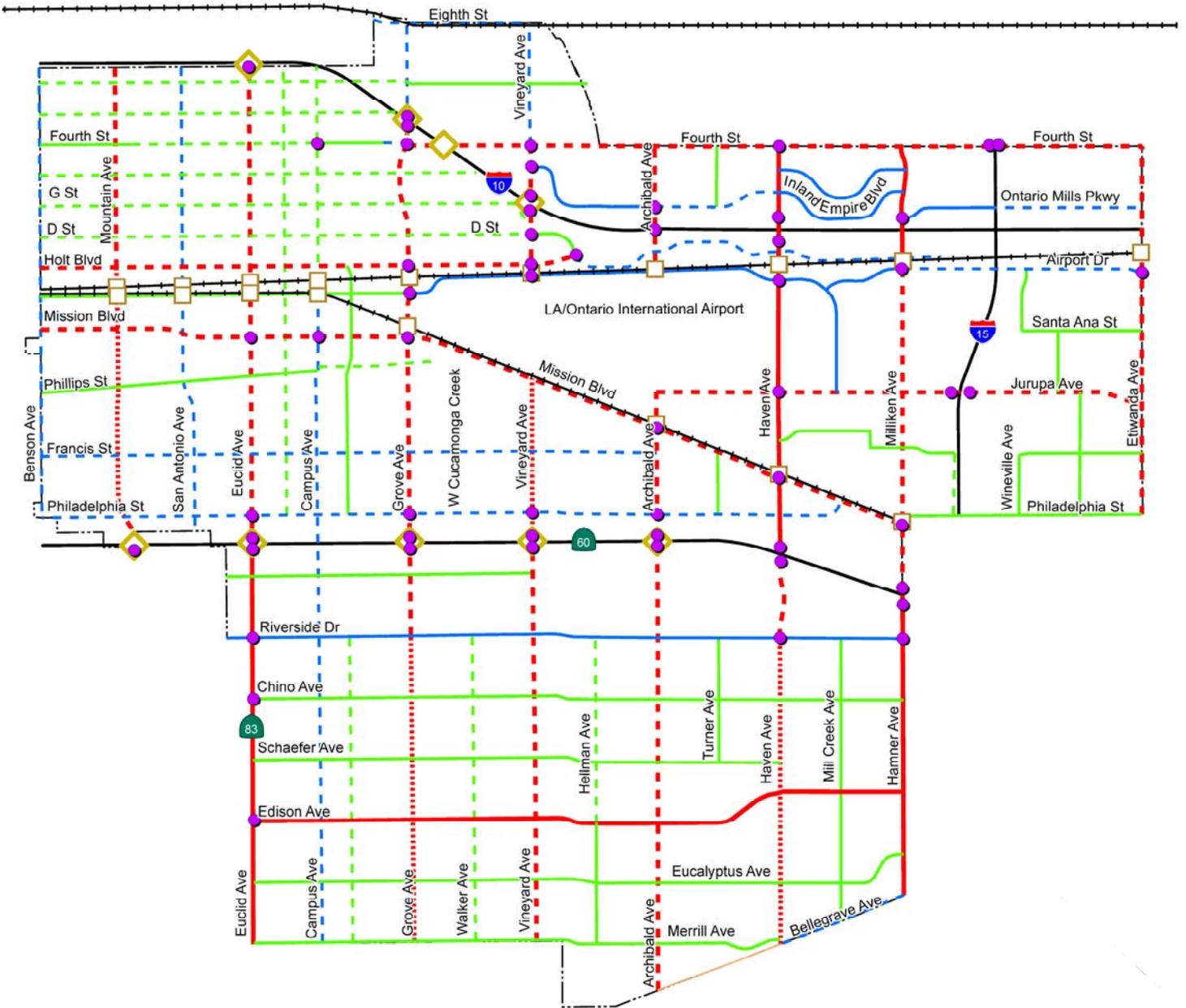
The City of Eastvale’s General Plan does not provide designated truck routes. The City of Ontario designated truck route map is shown on Exhibit 3-8. Edison Avenue/Ontario Ranch Road, Merrill Avenue, Archibald Avenue, and Hamner Avenue/Milliken Avenue are designated as Truck Routes in the City of Ontario. The designated truck route map has been utilized to route truck traffic from both the proposed Project and future cumulative development projects throughout the study area.

The City of Chino designated truck route map is shown on Exhibit 3-9. Merrill Avenue, Kimball Avenue, Pine Avenue, Flight Avenue, and Hellman Avenue are some of the designated City of Chino truck routes near the Project while Euclid Avenue (SR-83) is designated as a State Truck Route. Other truck routes in the study area include, Riverside Drive and Edison Avenue. The designated truck route map has been utilized to route truck traffic from both the proposed Project and future cumulative development projects throughout the study area.

3.5 BICYCLE, EQUESTRIAN, & PEDESTRIAN FACILITIES

Field observations conducted in April 2018 indicate nominal pedestrian and bicycle activity within the study area. Exhibit 3-10 illustrates the City of Eastvale current and future trails and bikeway systems which proposes off-street Class I multi-use trails along Cucamonga Creek Trail and the Southern California Edison easement to Remington Avenue/Bellegrave Avenue. On-street Class II bike lanes are also proposed along Limonite Avenue and Archibald Avenue near the vicinity of the site. Exhibit 3-11 illustrates the City of Ontario future planned bicycle facilities and Exhibit 3-12 illustrates City of Chino future bicycle facilities. Existing pedestrian facilities within the study area are shown on Exhibit 3-13.

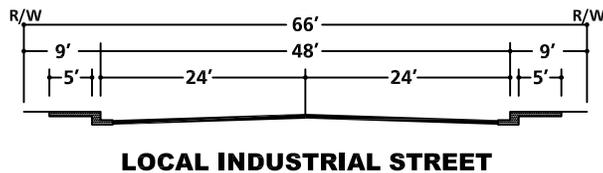
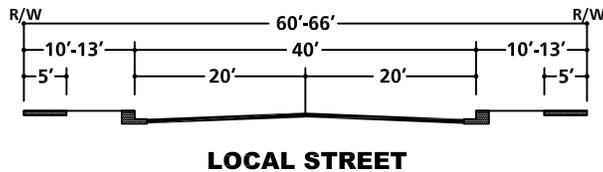
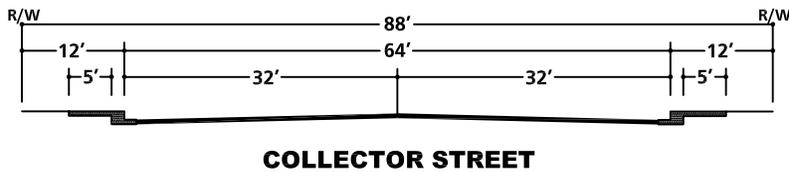
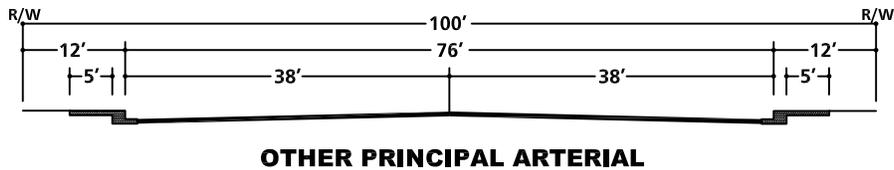
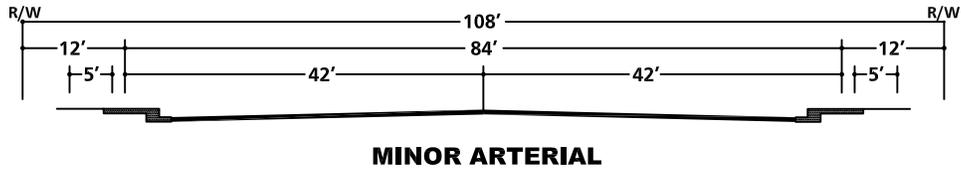
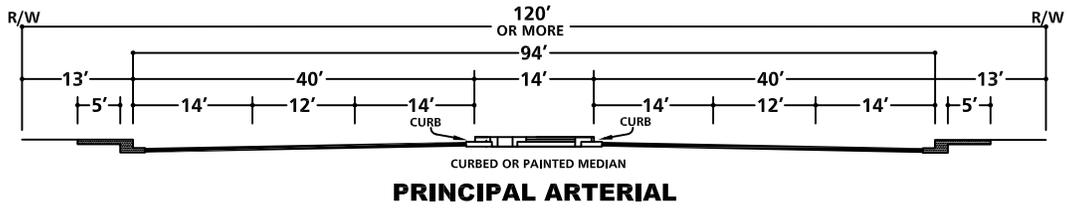
EXHIBIT 3-4: CITY OF ONTARIO GENERAL PLAN CIRCULATION ELEMENT



- | | |
|--------------------------|----------------------------------|
| Other Principal Arterial | — Freeways |
| — 8 Lanes | — Railroads |
| - - - 6 Lanes | ◆ Freeway Interchange |
| ⋯ 4 Lanes | □ Grade-Separated Rail Crossings |
| Minor Arterial | ● Enhanced Intersections |
| — 6 Lanes | |
| - - - 4 Lanes | |
| Collector Street | |
| — 4 Lanes | |
| - - - 2 Lanes | |



EXHIBIT 3-5: CITY OF ONTARIO GENERAL PLAN ROADWAY CROSS-SECTIONS



SOURCE: CITY OF ONTARIO

EXHIBIT 3-6: CITY OF CHINO GENERAL PLAN CIRCULATION ELEMENT

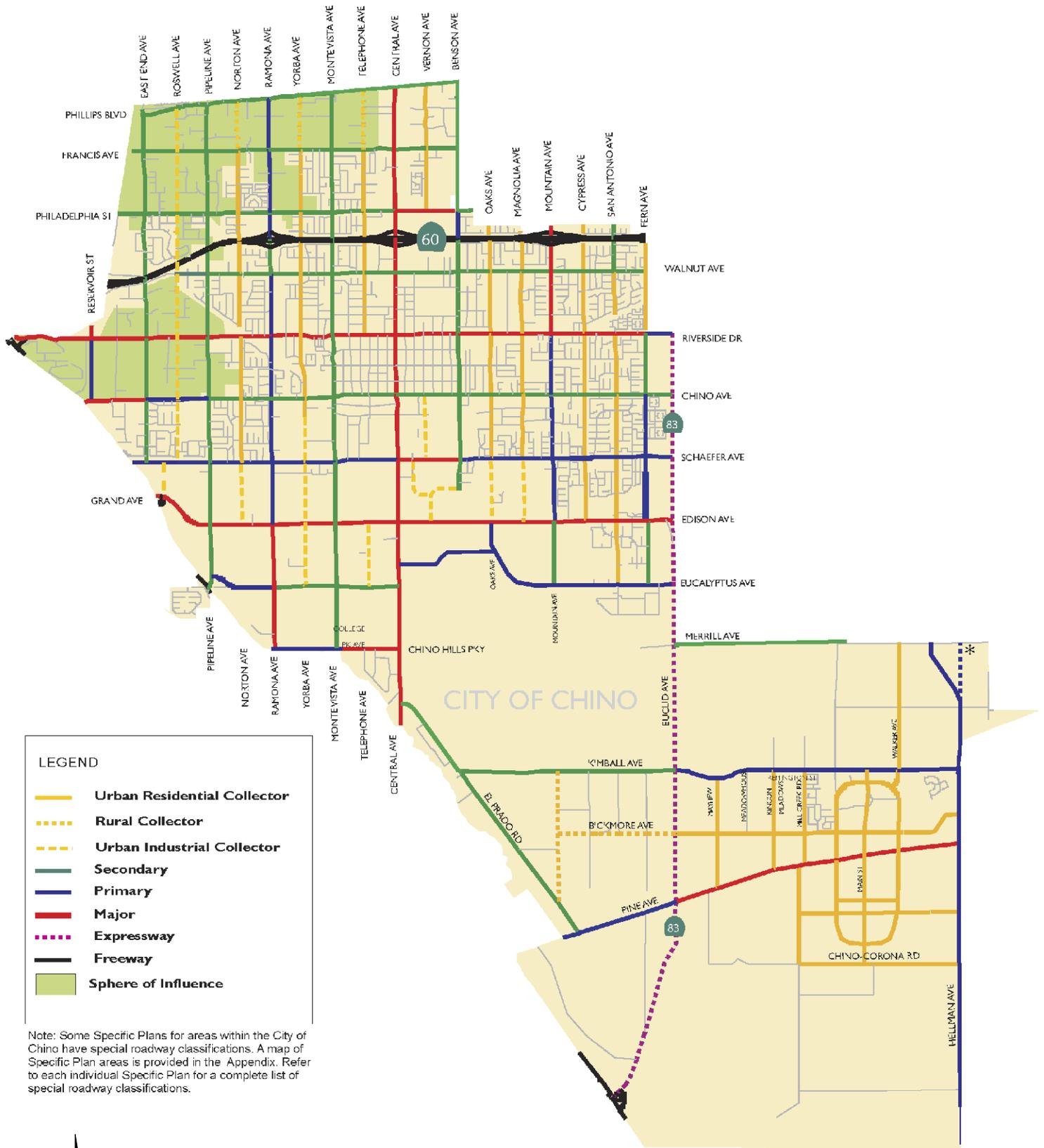
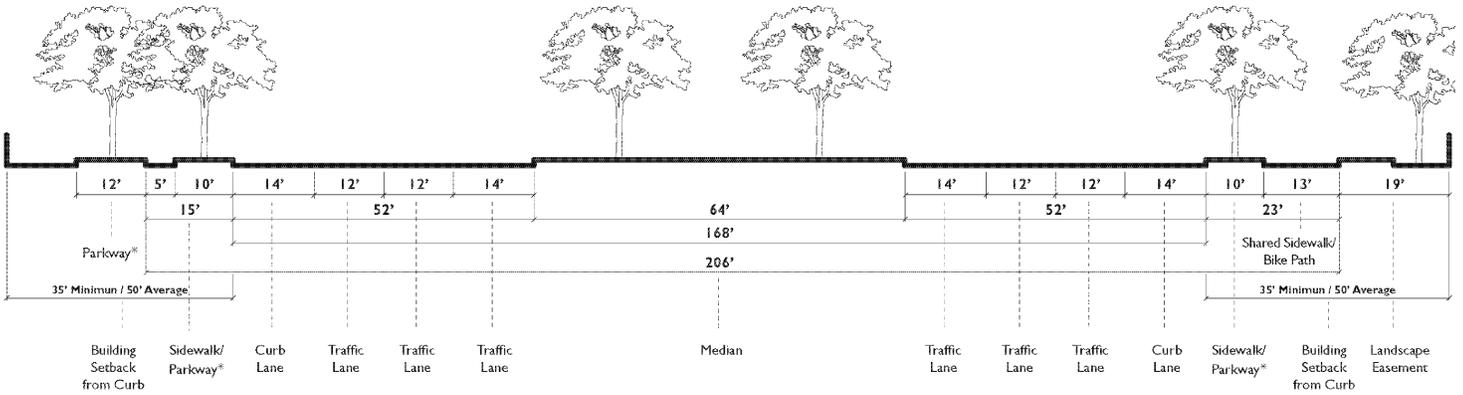


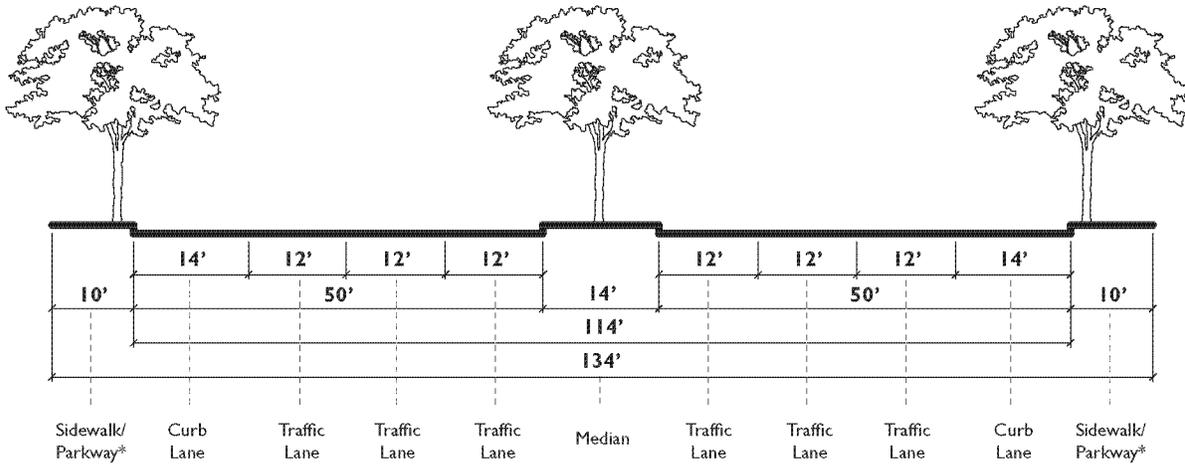
EXHIBIT 3-7 (1 of 2): CITY OF CHINO GENERAL PLAN ROADWAY CROSS-SECTIONS

Major Arterial (Expressway): Typical 8 Lane
Provides 8 traffic lanes and a wide median without parking



Major Arterial: Minimum 8 Lane

Provides 8 traffic lanes and 2 bicycle lanes separated by a median without parking



Major Arterial: Minimum 6 Lane

Provides 6 traffic lanes and 2 bicycle lanes separated by a median without parking

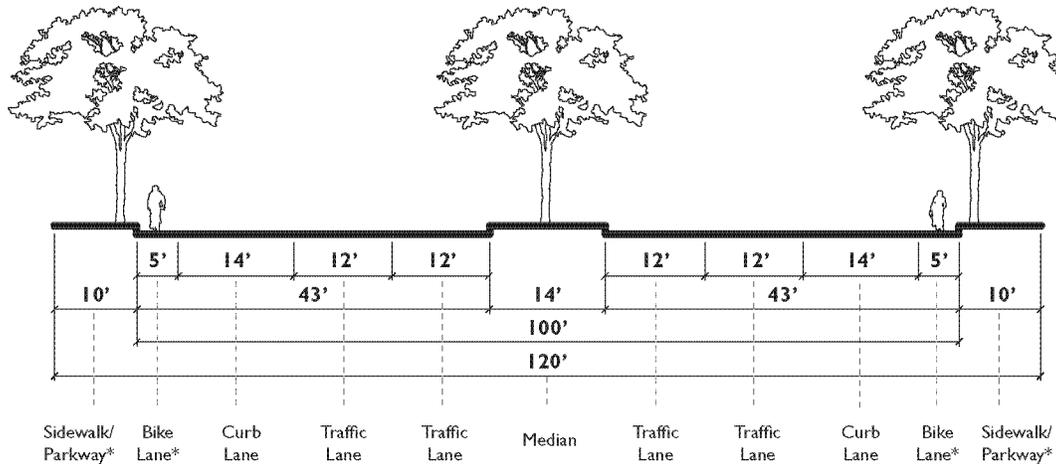
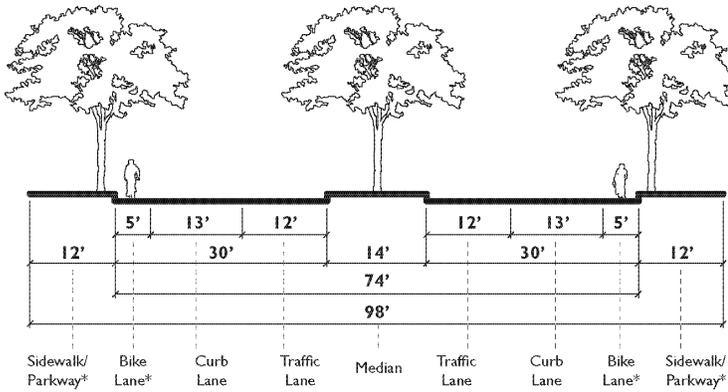


EXHIBIT 3-7 (2 of 2): CITY OF CHINO GENERAL PLAN ROADWAY CROSS-SECTIONS

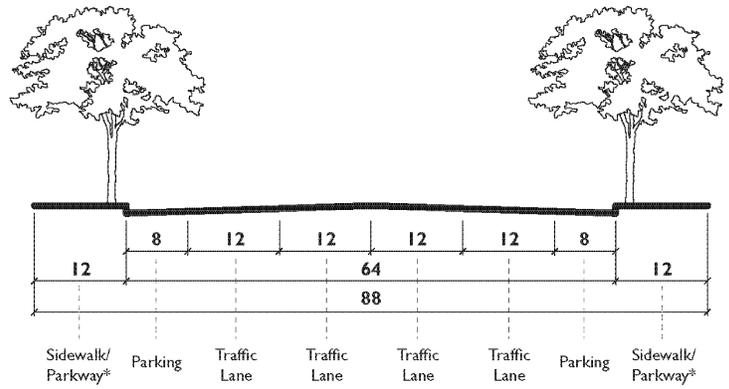
Primary Arterial: Typical 4 Lane

Provides 4 traffic lanes and 2 bicycle lanes separated by a median without parking



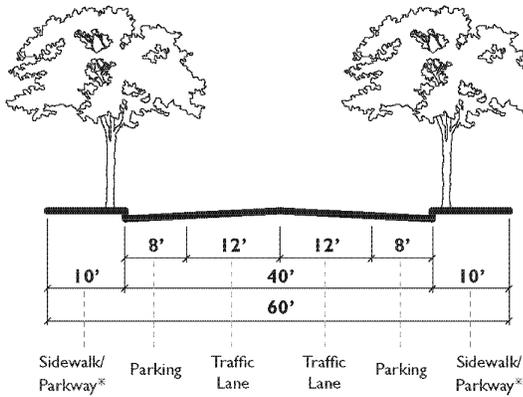
Secondary Arterial

Provides 4 traffic lanes with parking



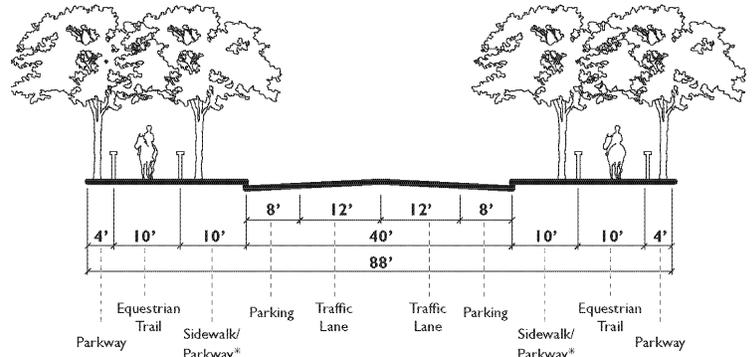
Urban Residential/Rural Collector

Provides 2 traffic lanes with parking and shared bicycle access



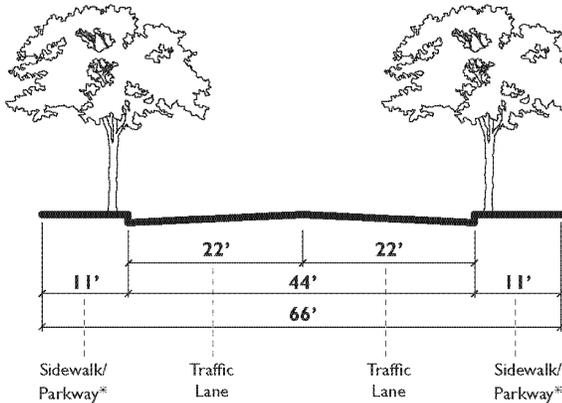
Urban Residential/Rural Collector with Equestrian Trails

Provides 2 traffic lanes and 2 equestrian trails with parking and shared bicycle access



Urban Industrial Collector

Provides 2 traffic lanes



Local Street

Provides 2 traffic lanes

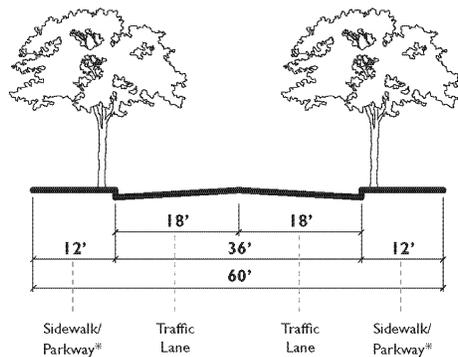
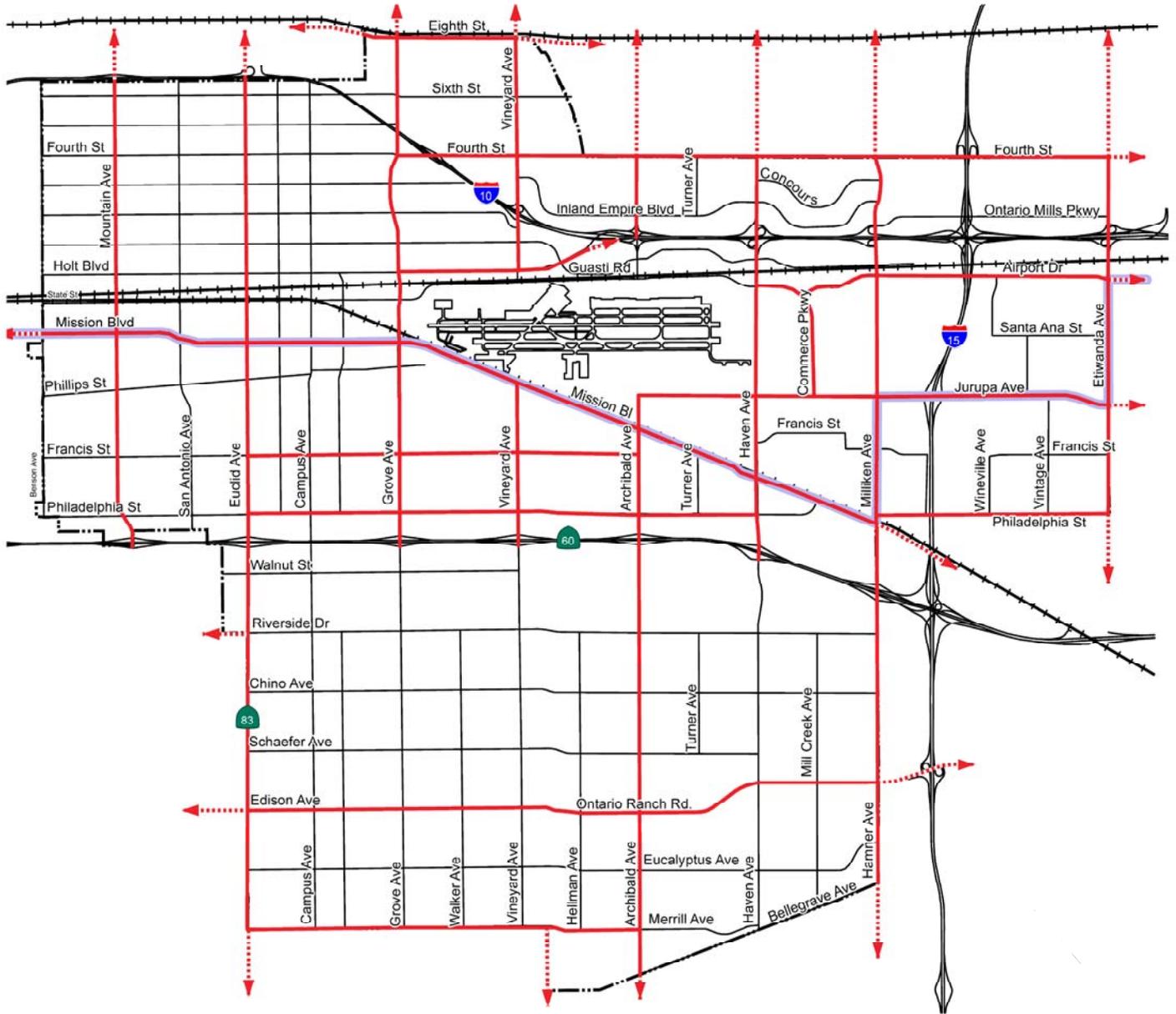


EXHIBIT 3-8: CITY OF ONTARIO TRUCK ROUTES



LEGEND:

- Truck Routes
- State of California DOT Extralegal Load Network
- Railroad
- - - Adjacent Agency Truck Route



EXHIBIT 3-9: CITY OF CHINO TRUCK ROUTES

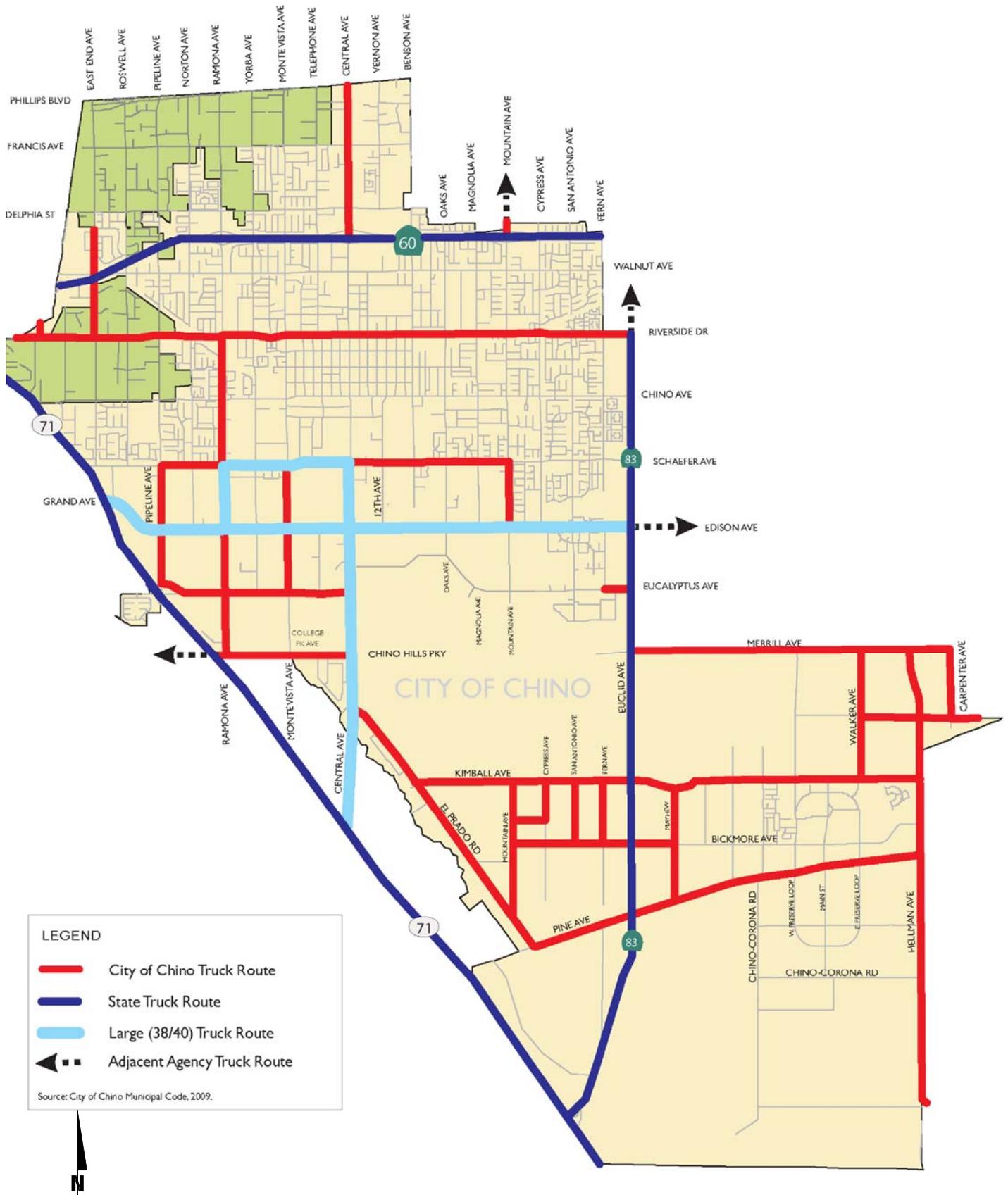
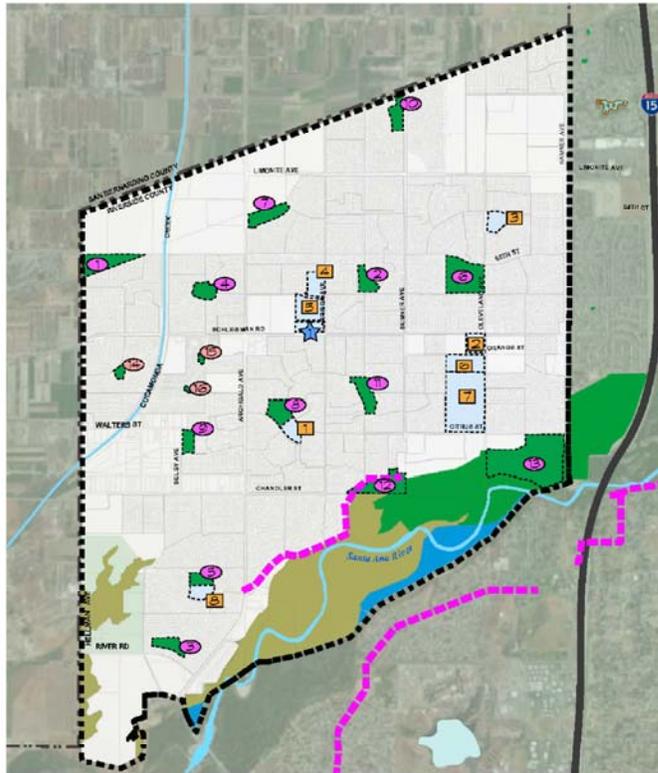


EXHIBIT 3-10: EASTVALE AREA TRAILS AND BIKEWAYS SYSTEM



Existing JCSD Parks

- 1 American Heroes Park
- 2 Cedar Creek Park
- 3 Darland Park
- 4 Deer Creek Park
- 5 Half Moon Park
- 6 Harada Heritage Park
- 7 James C. Huber Park
- 8 McGuire Family Park
- 9 Mountain View Park
- 10 Orchard Park
- 11 Providence Ranch Park
- 12 Riverwalk Park

Planned JCSD Parks

- 13 Eastvale Community Park

Private Parks

- 14 Apollo Park
- 15 Private Park 2
- 16 Private Park 3

Community Center

- 17 Eastvale Community Center

Existing Trails and Bikeways

Santa Ana River Trail Master Plan (2012)

- Existing (Off-street Class I)

Schools

Existing Elementary

- 1 Clara Barton Elementary
- 2 Eastvale Elementary
- 3 Harada Elementary
- 4 Rosa Parks Elementary

Intermediate

- 5 Augustine Ramirez Intermediate
- 6 River Heights Intermediate

High School

- 7 Eleanor Roosevelt High School

Planned Elementary

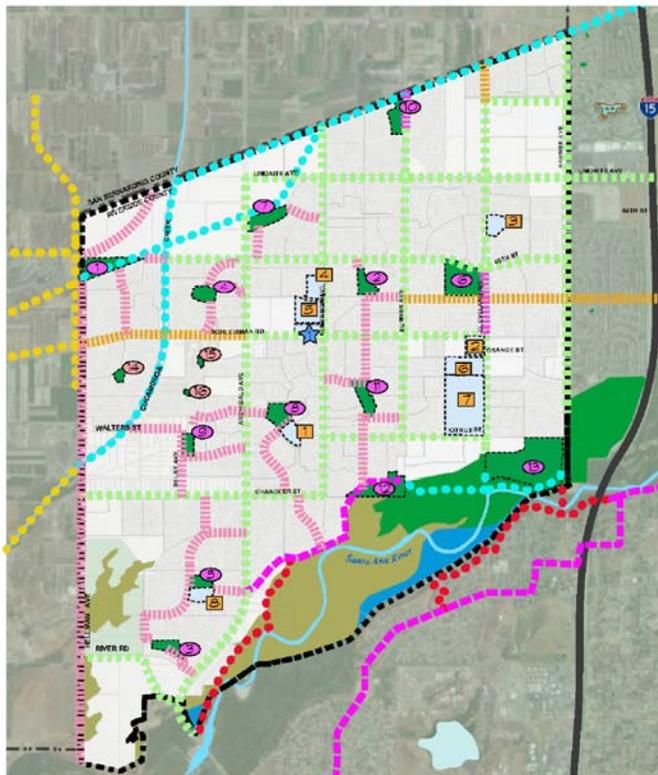
- 8 Yorba Elementary

Land Use

- Agriculture
- Conservation
- Open Space - Recreation
- Open Space - Water
- Schools (Public Facility Land Use)

Land Use Data:
County of Riverside, Transportation and Land Management Agency,
County Wide GIS Data - 12/2011
(Revised to reflect recent changes in land use data)

Exhibit 2.8-1 Existing Trails



Existing JCSD Parks

- 1 American Heroes Park
- 2 Cedar Creek Park
- 3 Canyon Park
- 4 Deer Creek Park
- 5 Half Moon Park
- 6 Harada Heritage Park
- 7 James C. Huber Park
- 8 McGuire Family Park
- 9 Mountain View Park
- 10 Orchard Park
- 11 Providence Ranch Park
- 12 Riverwalk Park

Planned JCSD Parks

- 13 Eastvale Community Park

Private Parks

- 14 Apollo Park
- 15 Private Park 2
- 16 Private Park 3

Community Center

- 17 Eastvale Community Center

Trails and Bikeways

Santa Ana River Trail Master Plan (2012)

- Existing (Off-street Class I)
- Planned (Off-street Class I)

JCSD Planned Multi-Use Trail

- Planned (Off-street Class I)

City of China General Plan (2012)

- Planned (Off-street Class I)

JCSD Planned Trails & Bikeways

- Off-street Class I
- Off-street Class II

Riverside County General Plan (Draft 2010)

- Planned (On-street Class I)

Schools

Existing Elementary

- 1 Clara Barton Elementary
- 2 Eastvale Elementary
- 3 Harada Elementary
- 4 Rosa Parks Elementary

Intermediate

- 5 Augustine Ramirez Intermediate
- 6 River Heights Intermediate

High School

- 7 Eleanor Roosevelt High School

Planned Elementary

- 8 Yorba Elementary

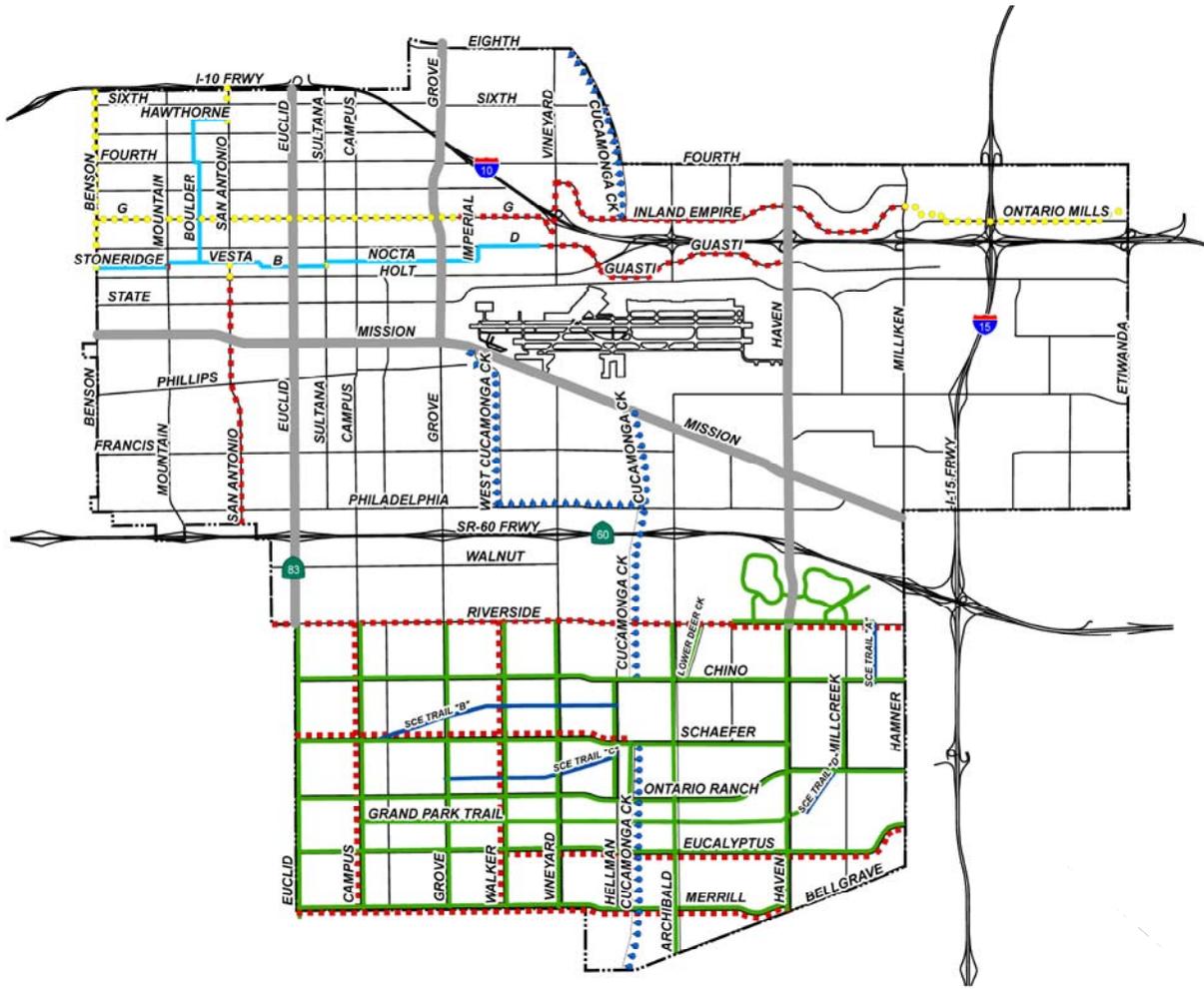
Land Use

- Agriculture
- Conservation
- Open Space - Recreation
- Open Space - Water
- Schools (Public Facility Land Use)

Land Use Data:
County of Riverside, Transportation and Land Management Agency,
County Wide GIS Data - 12/2011
(Revised to reflect recent changes in land use data)

Exhibit 2.8-2 Planned Trails

EXHIBIT 3-11: CITY OF ONTARIO GENERAL PLAN TRAILS AND BIKEWAY SYSTEMS



LEGEND:

-  Freeway
-  Streets
-  Multipurpose Trail
-  Class I
-  Class II
-  Class III
-  Sharrow/Bike Boulevard
-  SCE Trail
-  Bicycle Corridor



EXHIBIT 3-12: CITY OF CHINO FUTURE BICYCLE FACILITIES

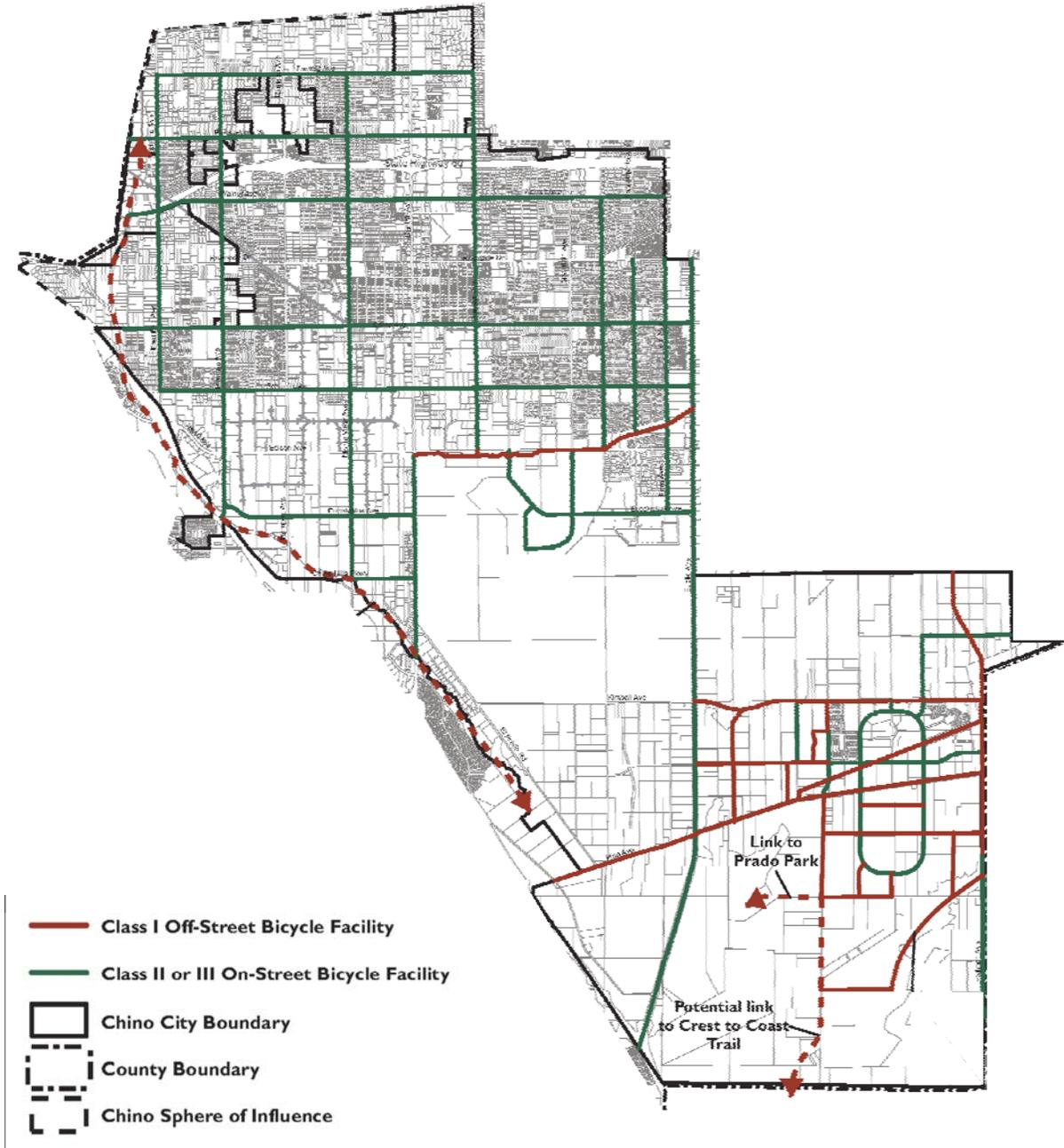
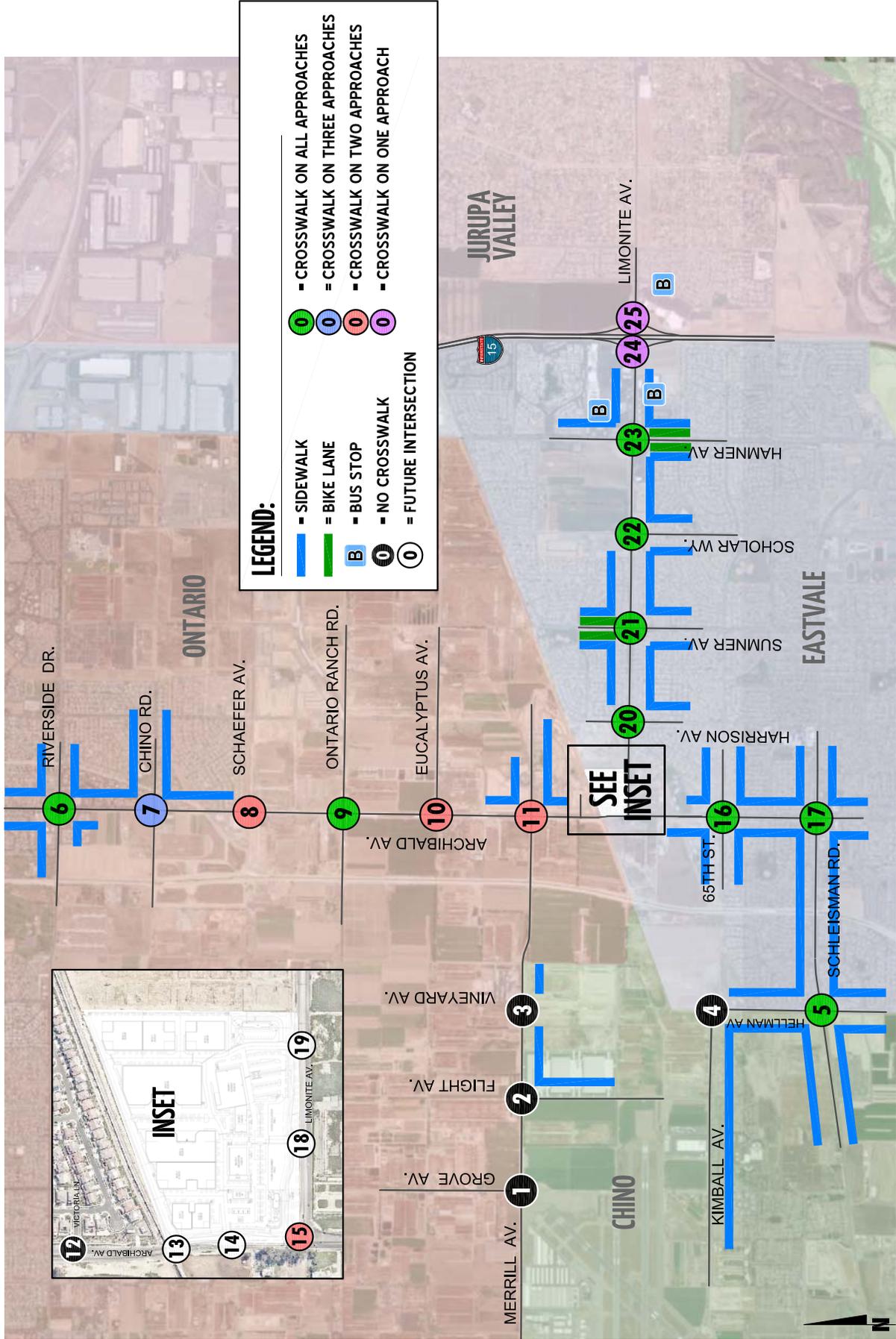


EXHIBIT 3-13: EXISTING PEDESTRIAN FACILITIES



3.6 TRANSIT SERVICE

The Riverside Transit Authority (RTA) serves the City of Eastvale. Transit service is reviewed and updated by RTA periodically to address ridership, budget and community demand needs. The study area within the City of Ontario and City of Chino is currently served by Omnitrans, a public transit agency serving various jurisdictions within San Bernardino County. Based on a review of the existing transit routes within the vicinity of the proposed Project, Omnitrans Route 81 operates on Riverside Drive north of the site, and RTA Routes 3 and 29 operate on Limonite Avenue and Hamner Avenue. However, there are no existing bus routes near the vicinity of the Project. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate. As such, it is recommended that the applicant work in conjunction with RTA to potentially provide additional bus service to the site. Existing transit routes in the vicinity of the study area are illustrated on Exhibit 3-14.

3.7 EXISTING (2018) TRAFFIC COUNTS

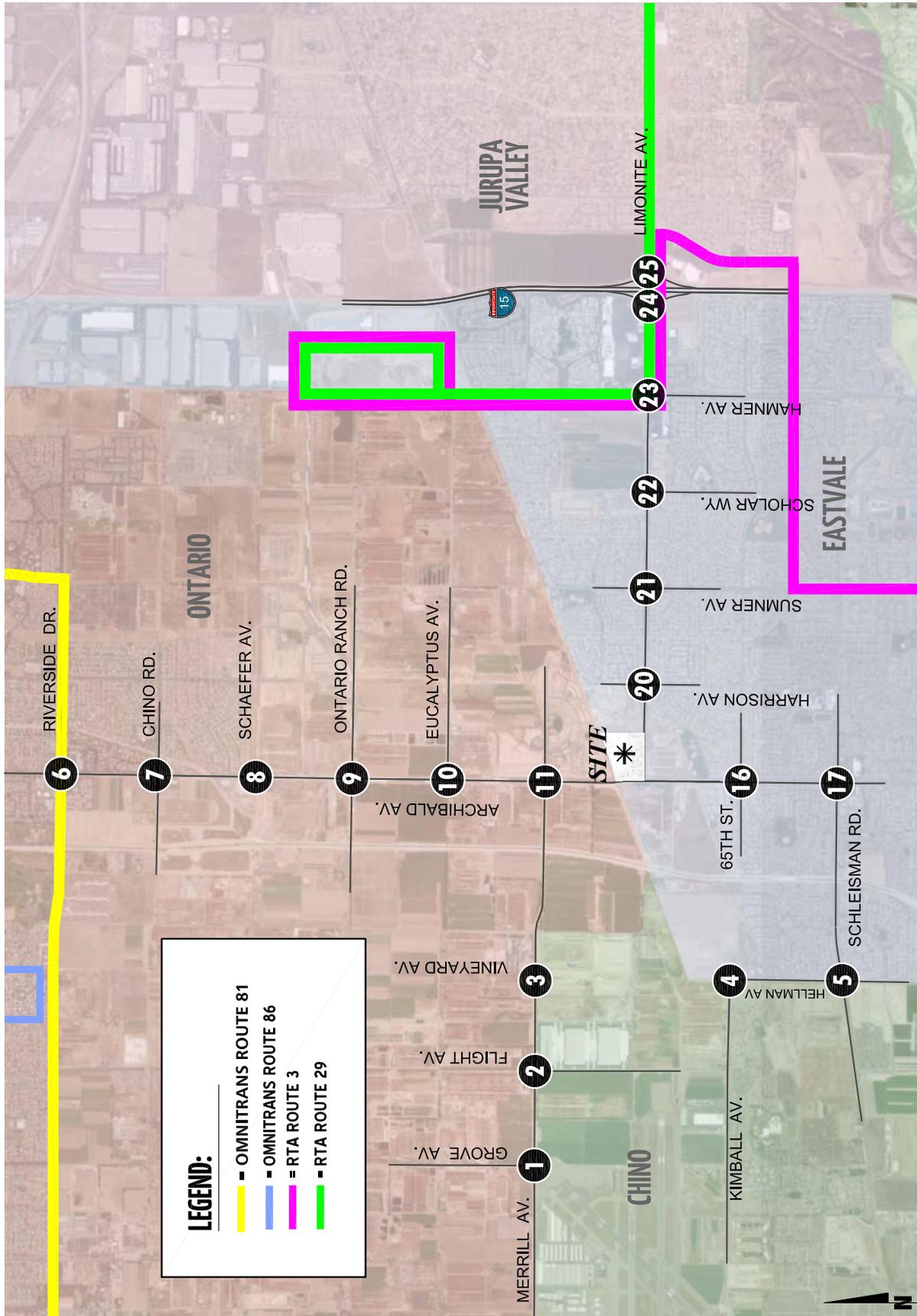
The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in April 2018. The following peak hours were selected for analysis:

- 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)

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

The traffic counts collected in April 2018 include the following vehicle classifications: Passenger Cars, 2-Axle Trucks, 2-Axle Trucks, and 4 or More Axle Trucks. To represent the impact large trucks, buses and recreational vehicles have on traffic flow; all trucks were converted into PCE. By their size alone, these vehicles occupy the same space as two or more passenger cars. In addition, the time it takes for them to accelerate and slow-down is much longer than for passenger cars and varies depending on the type of vehicle and number of axles. For the purpose of this analysis, a PCE factor of 1.5 has been applied to 2-axle trucks, 2.0 for 3-axle trucks, and 3.0 for 4+-axle trucks to estimate each turning movement.

EXHIBIT 3-14: EXISTING TRANSIT ROUTES



Existing weekday ADT volumes are shown on Exhibit 3-15. Where actual 24-hour tube count data was not available, Existing ADT volumes were based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

$$\text{Weekday PM Peak Hour (Approach Volume + Exit Volume)} \times 15.4665 = \text{Leg Volume}$$

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 6.47 percent. As such, the above equation utilizing a factor of 15.4665 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 6.47 percent (i.e., $1/0.0647 = 15.4665$) 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 (in PCE) are shown on Exhibit 3-16.

3.8 INTERSECTION OPERATIONS ANALYSIS

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

- Flight Av. & Merrill Av. (#2) – LOS F AM peak hour only
- Hellman Av. & Kimball Av. (#4) – LOS F AM peak hour; LOS E PM peak hour

Consistent with Table 3-1, a summary of the peak hour intersection LOS for Existing conditions are shown on Exhibit 3-17. The intersection operations analysis worksheets are included in Appendix 3.2 of this TIA.

3.9 EXISTING CONDITIONS ROADWAY SEGMENT CAPACITY ANALYSIS

The City of Eastvale General Plan provides roadway volume capacity values presented previously in Table 2-3. The roadway segment capacities are approximate figures only and are used at the General Plan level to assist in determining the roadway functional classification (number of through lanes) needed to meet traffic demand. Table 3-2 provides a summary of the Existing (2018) conditions roadway segment capacity analysis based on the City of Eastvale General Plan Roadway Segment Capacity Thresholds identified previously in Table 2-3. As shown in Table 3-2, the following study area roadway segments currently operate at an unacceptable LOS based on the City's planning level daily roadway capacity thresholds:

- Limonite Av., Sumner Av. to Hamner Av. (#2) – LOS E
- Archibald Av., Victoria Ln. to Limonite Av. (#4) – LOS F

EXHIBIT 3-15: EXISTING (2018) AVERAGE DAILY TRAFFIC (ADT)

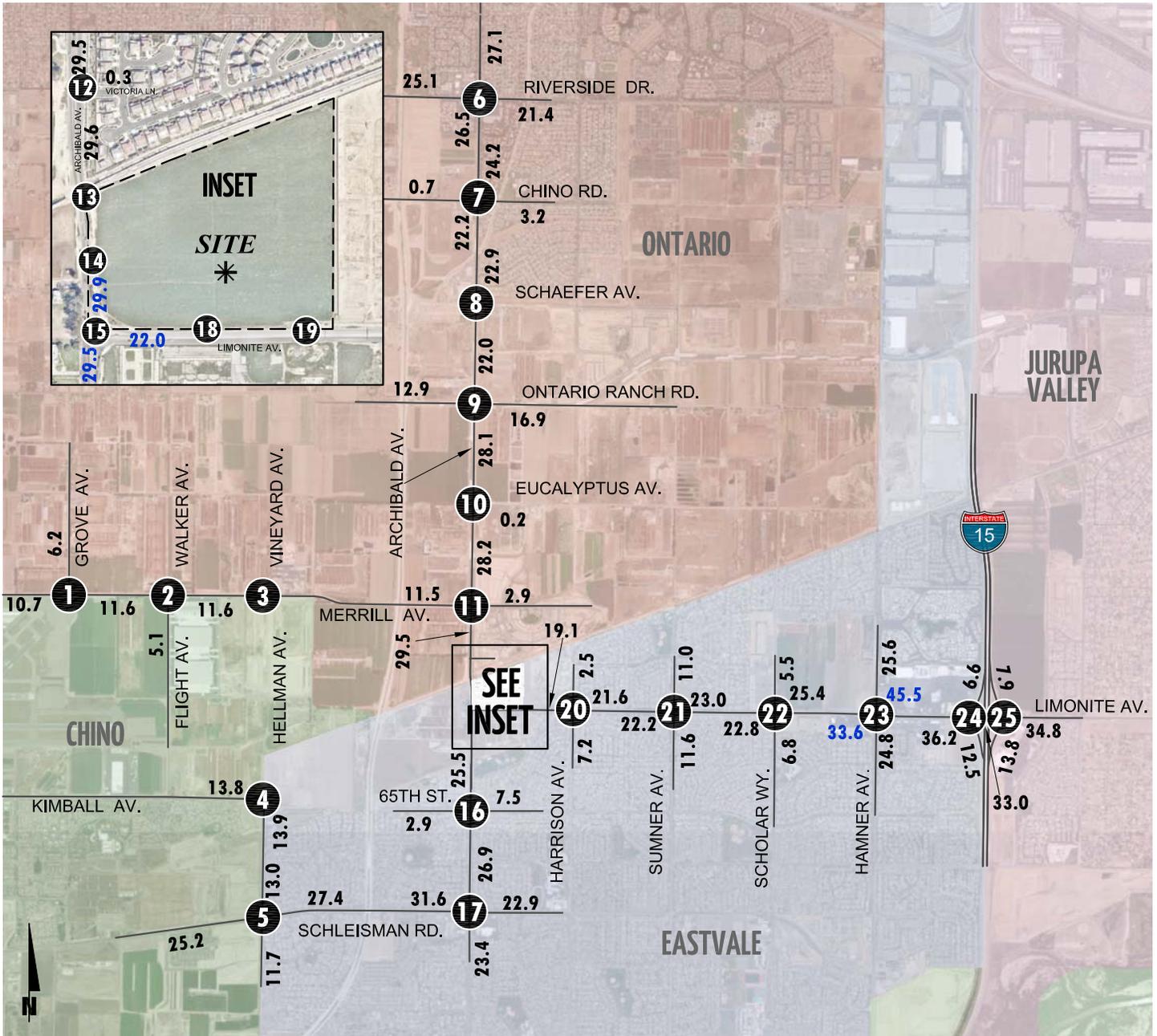


EXHIBIT 3-16: EXISTING (2018) TRAFFIC VOLUMES (IN PCE)

<p>1 Grove Av. & Merrill Av.</p>	<p>2 Flight Av. & Merrill Av.</p>	<p>3 Hellman Av. & Merrill Av.</p> <p>Future Intersection</p>	<p>4 Hellman Av. & Kimball Av.</p>	<p>5 Hellman Av. & Pine Av. /</p>	<p>6 Archibald Av. & Riverside Dr.</p>
<p>7 Archibald Av. & Chlno Av.</p>	<p>8 Archibald Av. & Schaefer Av.</p> <p>Future Intersection</p>	<p>9 Archibald Av. & Ontario Ranch Rd.</p>	<p>10 Archibald Av. & Eucalyptus Av.</p>	<p>11 Archibald Av. & Merrill Av.</p>	<p>12 Archibald Av. & Victoria Ln.</p>
<p>13 Archibald Av. & Dwy. 1</p> <p>Future Intersection</p>	<p>14 Archibald Av. & Dwy. 2</p> <p>Future Intersection</p>	<p>15 Archibald Av. & Limonite Av.</p>	<p>16 Archibald Av. & 65th St.</p>	<p>17 Archibald Av. & Schleisman Rd.</p>	<p>18 Dwy. 3 & Limonite Av.</p> <p>Future Intersection</p>
<p>19 Dwy. 4 & Limonite Av.</p> <p>Future Intersection</p>	<p>20 Harrison Av. & Limonite Av.</p>	<p>21 Sumner Av. & Limonite Av.</p>	<p>22 Scholar Wy. & Limonite Av.</p>	<p>23 Hamner Av. & Limonite Av.</p>	<p>24 I-15 SB Ramps & Limonite Av.</p>
<p>25 I-15 NB Ramps & Limonite Av.</p>					

LEGEND:

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

EXHIBIT 3-17: EXISTING (2018) SUMMARY OF LOS

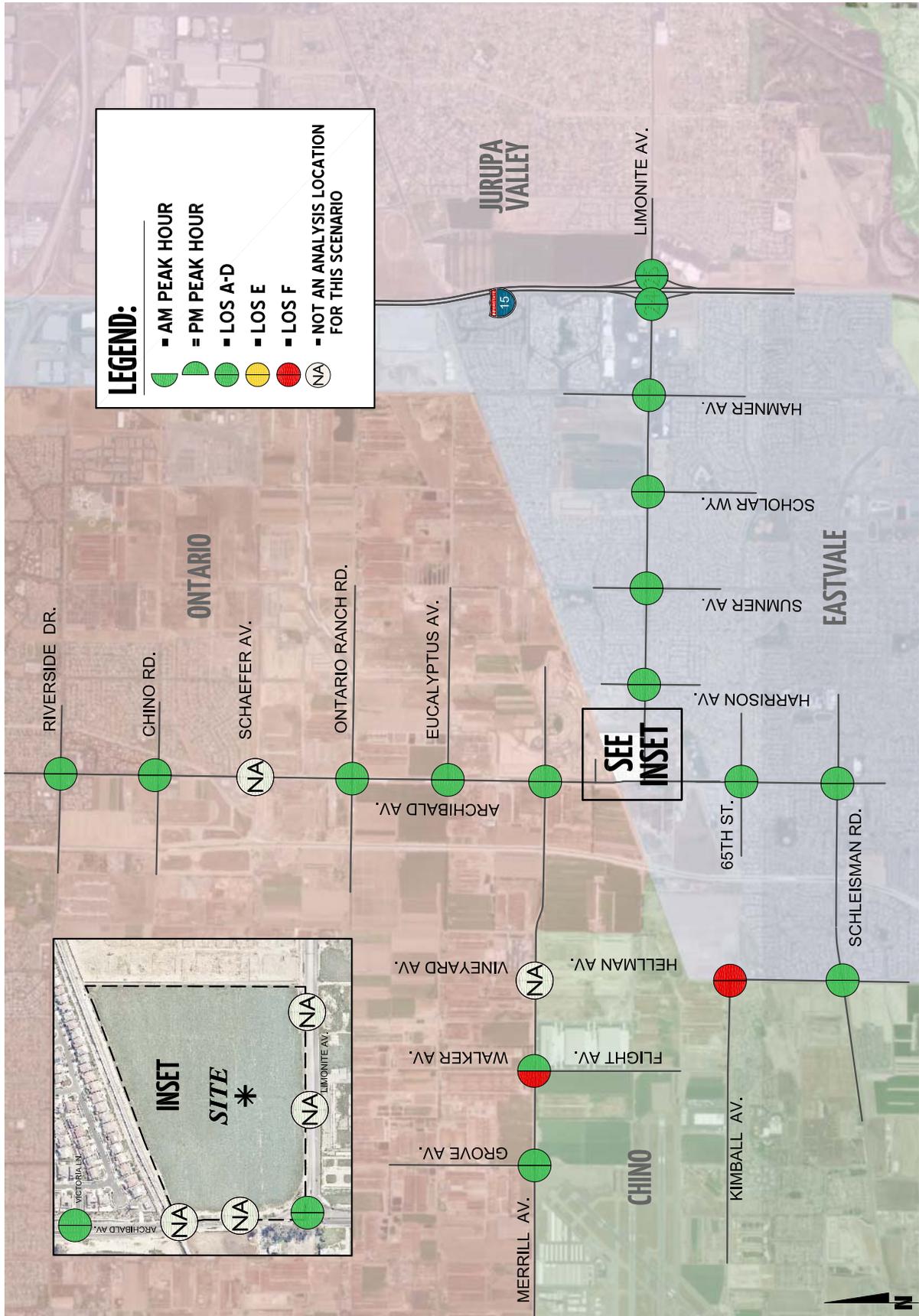


Table 3-1

Intersection Analysis for Existing (2018) Conditions

#	Intersection	Traffic Control ³	Intersection Approach Lanes ¹												Delay ² (secs.)		Level of Service		Acceptable LOS
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM	
			L	T	R	L	T	R	L	T	R	L	T	R					
1	Grove Av. & Merrill Av.	AWS	0	0	0	0	1	0	0	1	0	0	1	0	26.4	25.4	D	D	D
2	Flight Av. & Merrill Av.	CSS	0	1	0	0	0	0	0	1	1	1	1	0	61.2	28.4	F	D	D
3	Hellman Av. & Merrill Av.		Future Intersection																D
4	Hellman Av. & Kimball Av.	AWS	1	0	0	0	0	0	0	0	1	0	0	0	97.9	47.8	F	E	D
5	Hellman Av. & Pine Av.	TS	2	2	1	2	2	1	2	3	1>	2	3	1>	22.4	23.6	C	C	D
6	Archibald Av. & Riverside Dr.	TS	1	3	0	1	3	0	1	2	d	1	2	d	48.2	48.9	D	D	E
7	Archibald Av. & Chino Av.	TS	1	3	0	1	2	0	1	1	0	1	1	1	14.4	13.6	B	B	E
8	Archibald Av. & Schaefer Av.		Future Intersection																E
9	Archibald Av. & Ontario Ranch Rd.	TS	1	2	1	1	2	1	2	2	1>>	2	1	1	25.9	32.3	C	C	E
10	Archibald Av. & Eucalyptus Av.	TS	0	2	0	1	2	0	0	0	0	0	1	0	6.4	5.5	A	A	E
11	Archibald Av. & Merrill Av.	TS	1	2	1	2	2	d	1	1	1	1	1	1	40.2	35.2	D	D	E
12	Archibald Av. & Victoria Ln.	CSS	0	2	0	0	1	0	0	0	0	0	0	1	17.7	11.1	C	B	E
13	Archibald Av. & Driveway 1		Future Intersection																D
14	Archibald Av. & Driveway 2		Future Intersection																D
15	Archibald Av. & Limonite Av.	TS	0	1	1>	1	1	0	0	0	0	1	0	1>	44.2	39.4	D	D	D
16	Archibald Av. & 65th St.	TS	1	2	1	1	3	0	1	2	0	1	1	1	25.0	20.4	C	C	D
17	Archibald Av. & Schleisman Rd.	TS	2	3	1	2	3	1	2	3	1	2	3	1	29.3	25.6	C	C	D
18	Driveway 3 & Limonite Av.		Future Intersection																D
19	Driveway 4 & Limonite Av.		Future Intersection																D
20	Harrison Av. & Limonite Av.	TS	1	1	1	1	1	0	1	3	d	1	2	1	22.5	17.8	C	B	D
21	Sumner Av. & Limonite Av.	TS	1	2	0	1	2	0	2	3	0	2	3	1	17.0	18.0	B	B	D
22	Scholar Way & Limonite Av.	TS	1	1	1	1	2	1	1	2	1	1	2	1	17.8	15.6	B	B	D
23	Hamner Av. & Limonite Av.	TS	2	3	1	2	2	1	2	3	1	2	2	1	27.5	33.1	C	C	D
24	I-15 SB Ramps & Limonite Av.	TS	0	0	0	1	1	1	0	2	1	2	2	0	29.7	27.2	C	C	D
25	I-15 NB Ramps & Limonite Av.	TS	1	1	1	0	0	0	2	2	0	0	2	1	27.3	31.2	C	C	D

* **BOLD** = Level of Service (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; > = Right-Turn Overlap Phasing; >> = Free-Right Turn Lane; d= Defacto Right Turn Lane

² Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. HCM delay reported in seconds. HCM 6th Edition has been used for the operations analysis for Intersections #6, #24, and #25.

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

Table 3-2

Roadway Segment Capacity Analysis for Existing (2018) Conditions

#	Roadway	Segment Limits	Roadway Section	LOS Capacity ¹	Existing 2018	V/C ²	LOS ³	Acceptable LOS
1	Limonite Av.	Archibald Av. to Sumner Av.	4D	35,900	21,999	0.61	B	D
2		Sumner Av. to Hamner Av.	4D	35,900	33,559	0.93	E	D
3		Hamner Av. to I-15 Freeway	6D	53,900	45,529	0.84	D	D
4	Archibald Av.	Victoria Ln. to Limonite Av.	2D	17,950	29,902	1.67	F	D
5		Limonite Av. to 65th St.	4U	35,900	29,449	0.82	D	D

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

¹ These maximum roadway capacities have been obtained from the City of Eastvale's General Plan (Table C-1).

² V/C = Volume to Capacity Ratio

³ LOS = Level of Service

3.10 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:

- Grove Av. & Merrill Av. (#1)
- Flight Av. & Merrill Av. (#2)
- Hellman Av. & Kimball Av. (#4)

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

3.11 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the I-15 Freeway and Limonite Avenue 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 3-3. 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 3-3, 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.

3.12 BASIC FREEWAY SEGMENT ANALYSIS

Existing (2018) mainline directional volumes for the AM and PM peak hours are provided on Exhibit 3-18. As shown in Table 3-4, the I-15 Freeway segments analyzed for this study were found to operate at an acceptable LOS (i.e., LOS D or better) during the peak hours for Existing (2018) traffic conditions, with exception of the following:

- I-15 Freeway Southbound, South of Limonite Av. (#2) – LOS E AM and PM peak hours

Existing (2018) basic freeway segment analysis worksheets are provided in Appendix 3.5.

3.13 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for Existing (2018) conditions and the results of this analysis are presented in Table 3-5. As shown in Table 3-5, the following merge and diverge areas currently do not operate at LOS D or better during the peak hours under Existing (2018) traffic conditions:

- I-15 Freeway, Southbound On-Ramp at Limonite Av. (#3) – LOS E AM peak hour only

Existing (2018) freeway ramp junction operations analysis worksheets are provided in Appendix 3.6.

Table 3-3

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

Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)		Acceptable? ¹	
			AM Peak Hour	PM Peak Hour	AM	PM
I-15 SB Ramps / Limonite Avenue	SBL	400	160	141	Yes	Yes
	SBL/T/R	400	86	108	Yes	Yes
	SBR	1,200	69	106	Yes	Yes
I-15 NB Ramps / Limonite Avenue	NBL	450	181	307	Yes	Yes
	NBL/T/R	1,235	79	264	Yes	Yes
	NBR	400	61	242	Yes	Yes

¹ Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

Table 3-4

Basic Freeway Segment Analysis for Existing (2018) Conditions

Freeway	Direction ¹	Mainline Segment	Lanes ²	Volume		Truck %		Density ³		LOS ⁴	
				AM	PM	AM	PM	AM	PM	AM	PM
I-15	SB	North of Limonite Av.	3	5,070	5,100	10%	8%	32.5	31.8	D	D
		South of Limonite Av.	3	5,636	5,588	10%	7%	39.2	36.6	E	E
	NB	North of Limonite Av.	3	5,530	4,540	1%	2%	32.6	24.9	D	C
		South of Limonite Av.	3	4,971	4,995	1%	2%	27.7	28.3	D	D

* **BOLD** = Unacceptable Level of Service

¹ NB = Northbound; SB = Southbound

² Number of lanes are in the specified direction and is based on existing conditions.

³ Density is measured by passenger cars per mile per lane (pc/mi/ln).

⁴ LOS = Level of Service

Table 3-5

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

Freeway	Direction ¹	Ramp or Segment	Lanes on Freeway ²	AM Peak Hour		PM Peak Hour	
				Density ³	LOS ⁴	Density ³	LOS ⁴
I-15	SB	Off-Ramp at Limonite Av.	3	31.5	D	31.1	D
		On-Ramp at Limonite Av.	3	40.1	E	38.1	D
	NB	On-Ramp at Limonite Av.	3	34.7	D	27.2	C
		Off-Ramp at Limonite Av.	3	28.3	D	29.4	D

* **BOLD** = Unacceptable Level of Service

¹ NB = Northbound; SB = Southbound

² Number of lanes are in the specified direction and is based on existing conditions

³ Density is measured by passenger cars per mile per lane (pc/mi/ln).

⁴ LOS = Level of Service

EXHIBIT 3-18: EXISTING (2018) FREEWAY MAINLINE VOLUMES



LEGEND:

← 100/200 = AM/PM PEAK HOUR VOLUMES
NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)



4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project's trip assignment onto the study area roadway network. The Project is proposed to consist of the following uses:

- 336,501 square feet of warehousing use
- 4,750 square feet of shopping center use
- 30,000 square foot supermarket (grocery store)
- 14,600 square foot pharmacy/drug store use with drive-through window
- 16 vehicle fueling position gas station with convenience market
- 4,000 square foot automated car wash
- 7,750 square feet of fast-food restaurant without drive-through window use
- 6,000 square feet of fast-food restaurant with drive-through window use
- 2,500 square foot coffee/donut shop with drive-through window use

Regional access to the Project site is provided via the SR-60 Freeway at Archibald Avenue and the I-15 Freeway at Limonite Avenue interchange. The Project is located on the northeast corner of Archibald Avenue and Limonite Avenue in the City of Eastvale. Vehicular and truck traffic access will be provided via the following driveways:

- Archibald Avenue & Driveway 1 – Right-in/right-out/left-in driveway providing access to both passenger cars and trucks
- Archibald Avenue & Driveway 2 – Right-in/right-out driveway providing access to passenger cars only
- Driveway 3 & Limonite Avenue – Right-in/right-out driveway providing access to passenger cars only
- Driveway 4 & Limonite Avenue – Signalized full access driveway providing access to both passenger cars and trucks. This driveway is proposed to align with a future driveway to the south.

4.1 PROJECT TRIP GENERATION

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

Trip generation rates used to estimate Project traffic are shown in Table 4-1. A summary of the Project's trip generation based on PCE is shown in Table 4-2 while the trip generation based on actual vehicles is shown in Table 4-3 for informational purposes. The trip generation rates used for this analysis are based upon information collected by the Institute of Transportation Engineers (ITE) as provided in their Trip Generation Manual, 10th Edition, 2017. (4)

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	
Project Trip Generation Rates (PCE)									
Warehouse ³	TSF	150	0.131	0.039	0.170	0.051	0.139	0.190	1.740
Passenger Cars (80.00%)			0.105	0.031	0.136	0.041	0.111	0.152	1.392
2-Axle Trucks (3.34%) (PCE = 1.5) ⁵			0.006	0.002	0.008	0.003	0.008	0.011	0.087
3-Axle Trucks (4.14%) (PCE = 2.0) ⁵			0.010	0.004	0.014	0.004	0.012	0.016	0.144
4-Axle+ Trucks (12.52%) (PCE = 3.0) ⁵			0.048	0.015	0.063	0.018	0.051	0.069	0.654

Land Use ¹	Units ²	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Project Trip Generation Rates (Actual Vehicles)									
Warehouse ³	TSF	150	0.131	0.039	0.170	0.051	0.139	0.190	1.740
Passenger Cars (80.00%)			0.105	0.031	0.136	0.041	0.111	0.152	1.392
2-Axle Trucks (3.34%)			0.004	0.001	0.005	0.002	0.005	0.007	0.058
3-Axle Trucks (4.14%)			0.005	0.002	0.007	0.002	0.006	0.008	0.072
4-Axle+ Trucks (12.52%)			0.016	0.005	0.021	0.006	0.017	0.023	0.218
Shopping Center	TSF	820	0.583	0.357	0.940	1.829	1.981	3.810	37.750
Supermarket	TSF	850	2.292	1.528	3.820	4.712	4.528	9.240	106.780
Pharmacy/Drugstore w/Drive-Thru Window	TSF	881	2.035	1.805	3.840	5.150	5.140	10.290	109.160
Fast-Food Restaurant without Drive-Through Window	TSF	933	15.060	10.040	25.100	14.170	14.170	28.340	346.230
Fast-Food Restaurant with Drive-Through Window	TSF	934	20.497	19.693	40.190	16.988	15.682	32.670	470.950
Coffee/Donut Shop with Drive-Through Window	TSF	937	45.385	43.605	88.990	21.690	21.690	43.380	820.380
Gasoline/Service Station w/Convenience Mkt.	VFP	945	10.135	10.130	20.270	11.180	11.180	22.360	198.160
Automated Car Wash ⁴	TSF	948	N/A	N/A	N/A	7.100	7.100	14.200	142.000

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

² TSF = thousand square feet

³ Warehouse Vehicle Mix Source: Total truck percentage source from ITE Trip Generation Manual.

Truck mix (by axle type) Source: SCAQMD Warehouse Truck Trip Study Data Results and Usage (2014).

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

⁵ PCE rates are per the SBCTA.

Table 4-2

Project Trip Generation Summary (PCE)

Project Land Uses	Quantity	Units ¹	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Warehousing	336,501	TSF							
Passenger Cars:			35	10	45	14	37	51	468
Internal Capture (Office to Retail) ³ :			-1	-3	-4	-4	-7	-11	-101
Internal Capture (Office to Restaurant) ³ :			-5	-6	-11	-4	-1	-5	-46
- Net Passenger Car Trips			29	1	30	6	29	35	321
Truck Trips:									
2-axle:			2	1	3	1	3	4	29
3-axle:			3	1	4	1	4	5	48
4+-axle:			16	5	21	6	17	23	220
- Total Truck Trips (PCE)			21	7	28	8	24	32	297
Warehousing Total ² :			50	8	58	14	53	67	618
Shopping Center	4,750	TSF	3	2	5	9	9	18	179
Internal Capture (Retail to Office) ³ :			0	0	0	0	0	0	-2
Internal Capture (Retail to Restaurant) ³ :			-1	-1	-2	-4	-2	-6	-21
Net External Trips:			2	1	3	5	7	12	156
Pass-by Reduction (PM/Daily: 34%):			0	0	0	-2	-2	-4	-53
Shopping Center Total:			2	1	3	3	5	8	103
Supermarket	30,000	TSF	69	46	115	141	136	277	3,203
Internal Capture (Retail to Office) ³ :			-1	-1	-2	-3	-2	-5	-40
Internal Capture (Retail to Restaurant) ³ :			-7	-10	-17	-36	-26	-62	-368
Net External Trips:			61	35	96	102	108	210	2,795
Pass-by Reduction (PM/Daily: 36%):			0	0	0	-37	-37	-74	-1,006
Supermarket Total:			61	35	96	65	71	136	1,789
Gasoline/Service Station w/Convenience Mkt.	16	VFP	162	162	324	179	179	358	3,171
Internal Capture (Retail to Office) ³ :			-1	0	-1	-3	-2	-5	-39
Internal Capture (Retail to Restaurant) ³ :			-9	-13	-22	-46	-34	-80	-365
Net External Trips:			152	149	301	130	143	273	2,767
Pass-by Reduction (AM: 62%; PM/Daily: 56%):			-92	-92	-184	-73	-73	-146	-1,549
Gasoline/Service Station w/Conven. Mkt. Total:			60	57	117	57	70	127	1,218
Pharmacy/Drugstore w/Drive-Thru Window	14,600	TSF	30	26	56	75	75	150	1,594
Internal Capture (Retail to Office) ³ :			0	0	0	-1	0	-1	-20
Internal Capture (Retail to Restaurant) ³ :			-4	-6	-10	-20	-15	-35	-183
Net External Trips:			26	20	46	54	60	114	1,391
Pass-by Reduction (PM/Daily: 49%):			0	0	0	-26	-26	-52	-682
Pharmacy/Drugstore w/Drive-Thru Window Total:			26	20	46	28	34	62	709
Fast-Food Restaurant with Drive-Through Window	6,000	TSF	123	118	241	102	94	196	2,826
Internal Capture (Restaurant to Retail) ³ :			-11	-7	-18	-27	-38	-65	-937
Internal Capture (Restaurant to Office) ³ :			-3	-2	-5	-1	-2	-3	-43
Net External Trips:			109	109	218	74	54	128	1,846
Pass-by Reduction (AM: 49%, PM: 50%, Daily: 50%):			-53	-53	-106	-27	-27	-54	-923
Fast-Food Restaurant with Drive-Through Window Total:			56	56	112	47	27	74	923
Automated Car Wash	4,000	TSF	N/A	N/A	N/A	28	28	56	568
Fast-Food Restaurant without Drive-Through Window	7,750	TSF	117	78	195	110	110	220	2,683
Internal Capture (Restaurant to Retail) ³ :			-14	-9	-23	-33	-45	-78	-951
Internal Capture (Restaurant to Office) ³ :			-3	-3	-6	-1	-2	-3	-37
Net External Trips:			100	66	166	76	63	139	1,695
Pass-by Reduction (AM: 49%, PM: 50%, Daily: 50%):			-32	-32	-64	-32	-32	-64	-848
Fast-Food Restaurant without Drive-Through Window Total:			68	34	102	44	31	75	847
Coffee/Donut Shop with Drive-Through Window	2,500	TSF	113	109	222	54	54	108	2,051
Internal Capture (Restaurant to Retail) ³ :			-7	-5	-12	-16	-22	-38	-722
Internal Capture (Restaurant to Office) ³ :			-2	-2	-4	-1	-1	-2	-38
Net External Trips:			104	102	206	37	31	68	1,291
Pass-by Reduction (AM/PM/Daily: 89%):			-91	-91	-182	-28	-28	-56	-1,149
Coffee/Donut Shop with Drive-Through Window Total:			13	11	24	9	3	12	142
Total Net Trips (PCE)			336	222	558	295	322	617	6,917

¹ TSF = thousand square feet² TOTAL NET TRIPS (PCE) = Net Passenger Cars + Total Truck Trips (PCE).³ Internal capture calculated from NCHRP 684 Internal Trip Capture Estimation Tool.

Table 4-3

Project Trip Generation Summary (Actual Vehicles)

Project Land Uses	Quantity	Units ¹	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Warehousing	336.501	TSF							
Passenger Cars:			35	10	45	14	37	51	468
Internal Capture (Office to Retail) ³ :			-1	-3	-4	-4	-7	-11	-101
Internal Capture (Office to Restaurant) ³ :			-5	-6	-11	-4	-1	-5	-46
- Net Passenger Car Trips			29	1	30	6	29	35	321
Truck Trips:									
2-axle:			1	0	1	1	2	3	20
3-axle:			2	1	3	1	2	3	24
4+-axle:			5	2	7	2	6	8	73
- Total Truck Trips (Actual Vehicles)			8	3	11	4	10	14	117
Warehousing Total ² :			37	4	41	10	39	49	438
Shopping Center	4.750	TSF	3	2	5	9	9	18	179
Internal Capture (Retail to Office) ³ :			0	0	0	0	0	0	-2
Internal Capture (Retail to Restaurant) ³ :			-1	-1	-2	-4	-2	-6	-21
Net External Trips:			2	1	3	5	7	12	156
Pass-by Reduction (PM/Daily: 34%):			0	0	0	-2	-2	-4	-53
Shopping Center Total:			2	1	3	3	5	8	103
Supermarket	30.000	TSF	69	46	115	141	136	277	3,203
Internal Capture (Retail to Office) ³ :			-1	-1	-2	-3	-2	-5	-40
Internal Capture (Retail to Restaurant) ³ :			-7	-10	-17	-36	-26	-62	-368
Net External Trips:			61	35	96	102	108	210	2,795
Pass-by Reduction (PM/Daily: 36%):			0	0	0	-37	-37	-74	-1,006
Supermarket Total:			61	35	96	65	71	136	1,789
Gasoline/Service Station w/Convenience Mkt.	16	VFP	162	162	324	179	179	358	3,171
Internal Capture (Retail to Office) ³ :			-1	0	-1	-3	-2	-5	-39
Internal Capture (Retail to Restaurant) ³ :			-9	-13	-22	-46	-34	-80	-365
Net External Trips:			152	149	301	130	143	273	2,767
Pass-by Reduction (AM: 62%; PM/Daily: 56%):			-92	-92	-184	-73	-73	-146	-1,549
Gasoline/Service Station w/Conven. Mkt. Total:			60	57	117	57	70	127	1,218
Pharmacy/Drugstore w/Drive-Thru Window	14.600	TSF	30	26	56	75	75	150	1,594
Internal Capture (Retail to Office) ³ :			0	0	0	-1	0	-1	-20
Internal Capture (Retail to Restaurant) ³ :			-4	-6	-10	-20	-15	-35	-183
Net External Trips:			26	20	46	54	60	114	1,391
Pass-by Reduction (PM/Daily: 49%):			0	0	0	-26	-26	-52	-682
Pharmacy/Drugstore w/Drive-Thru Window Total:			26	20	46	28	34	62	709
Fast-Food Restaurant with Drive-Through Window	6.000	TSF	123	118	241	102	94	196	2,826
Internal Capture (Restaurant to Retail) ³ :			-11	-7	-18	-27	-38	-65	-937
Internal Capture (Restaurant to Office) ³ :			-3	-2	-5	-1	-2	-3	-43
Net External Trips:			109	109	218	74	54	128	1,846
Pass-by Reduction (AM: 49%, PM: 50%, Daily: 50%):			-53	-53	-106	-27	-27	-54	-923
Fast-Food Restaurant with Drive-Through Window Total:			56	56	112	47	27	74	923
Automated Car Wash	4.000	TSF	N/A	N/A	N/A	28	28	56	568
Fast-Food Restaurant without Drive-Through Window	7.750	TSF	117	78	195	110	110	220	2,683
Internal Capture (Restaurant to Retail) ³ :			-14	-9	-23	-33	-45	-78	-951
Internal Capture (Restaurant to Office) ³ :			-3	-3	-6	-1	-2	-3	-37
Net External Trips:			100	66	166	76	63	139	1,695
Pass-by Reduction (AM: 49%, PM: 50%, Daily: 50%):			-32	-32	-64	-32	-32	-64	-848
Fast-Food Restaurant without Drive-Through Window Total:			68	34	102	44	31	75	847
Coffee/Donut Shop with Drive-Through Window	2.500	TSF	113	109	222	54	54	108	2,051
Internal Capture (Restaurant to Retail) ³ :			-7	-5	-12	-16	-22	-38	-722
Internal Capture (Restaurant to Office) ³ :			-2	-2	-4	-1	-1	-2	-38
Net External Trips:			104	102	206	37	31	68	1,291
Pass-by Reduction (AM/PM/Daily: 89%):			-91	-91	-182	-28	-28	-56	-1,149
Coffee/Donut Shop with Drive-Through Window Total:			13	11	24	9	3	12	142
Total Net Trips (Actual Vehicles)			323	218	541	291	308	599	6,737

¹ TSF = thousand square feet² TOTAL NET TRIPS (Actual Vehicles) = Net Passenger Cars + Total Truck Trips (Actual Vehicles).³ Internal capture calculated from NCHRP 684 Internal Trip Capture Estimation Tool.

The trip generation rates are based upon data collected by the ITE for Warehouse (ITE Land Use Code 150), Shopping Center (ITE Land Use Code 820), Supermarket (ITE Land Use Code 850), Pharmacy/Drugstore w/ Drive-Through Window (ITE Land Use Code 881), Fast-Food without Drive-Through Window Restaurant (ITE Land Use Code 933), Fast-Food with Drive-Through Window Restaurant (ITE Land Use Code 934), Coffee Shop with Drive-Through Window (ITE Land Use Code 937), Gas Station/Service Station with Convenience Market (ITE Land Use Code 945), and Automated Car Wash (ITE Land Use Code 948).

Trip generation for heavy trucks was further broken down by truck type (or axle type). The total truck percentage is comprised of 3 different truck types: 2-axle, 3-axle, and 4+-axle trucks. For the purposes of this analysis, the percentage of trucks, by axle type, were obtained from the South Coast Air Quality Management District (SCAQMD) [Warehouse Truck Trip Study Data Results and Usage](#). (9) Lastly, PCE factors were applied to the trip generation rates for heavy trucks (large 2-axles, 3-axles, 4+-axles). PCEs allow the typical “real-world” mix of vehicle types to be represented as a single, standardized unit, such as the passenger car, to be used for the purposes of capacity and level of service analyses. The PCE factors are consistent with the recommended PCE factors in Appendix B of the San Bernardino County CMP 2016 Update, which are more conservative than the PCE of 2.0 recommended in the County of Riverside’s traffic study guidelines.

As shown in Table 4-2, the proposed Project is anticipated to generate a net total of 6,917 PCE trip-ends per day, 558 PCE AM peak hour trips and 617 PCE PM peak hour trips. In comparison, the proposed Project is anticipated to generate a net total of 6,737 actual vehicle trip-ends per day with 541 AM peak hour trips and 599 PM peak hour trips (see Table 4-3).

4.2 PROJECT TRIP DISTRIBUTION

The Project trip distribution and assignment process represents the directional orientation of traffic to and from the Project site. The trip distribution pattern of passenger cars is heavily influenced by the geographical location of the site, the location of surrounding uses, and the proximity to the regional freeway system. The trip distribution pattern for truck traffic is also influenced by the local truck routes approved by the City of Eastvale, City of Ontario, City of Chino, and Caltrans. Given these differences, separate trip distributions were generated for both passenger cars and truck trips.

The Opening Year Cumulative distribution patterns utilize the existing roadway system in comparison to the Horizon Year trip distribution patterns, which assumes future roadway connections. The Project trip distribution patterns are also affected by near-term development patterns in the vicinity of the Project site. The extension of Hellman Avenue north of Merrill Avenue, Carpenter Avenue north of Merrill Avenue, Schaefer Avenue at Archibald Avenue, and Limonite Avenue/Kimball Avenue extension between Hellman Avenue and Archibald Avenue will also be assumed for Horizon Year conditions only.

Exhibit 4-1 illustrates the E+P and Opening Year Cumulative passenger car trip distribution patterns. Exhibit 4-2 illustrates the passenger car trip distribution patterns for Horizon Year Without Limonite Avenue Extension traffic conditions and Exhibit 4-3 illustrates the passenger car trip distribution patterns for Horizon Year With Limonite Avenue Extension traffic conditions. Exhibit 4-4 illustrates the truck trip distribution patterns for E+P, Opening Year Cumulative, and Horizon Year Without and With Limonite Avenue Extension conditions. As shown on Exhibit 4-4, trucks are anticipated to utilize designated truck routes such as Merrill Avenue, Archibald Avenue, and Limonite Avenue to reach regional freeways such as the SR-60 and I-15 Freeways. These travel patterns are not anticipated to change with the addition of new future facilities for Horizon Year traffic conditions.

4.3 MODAL SPLIT

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

4.4 PROJECT TRIP ASSIGNMENT

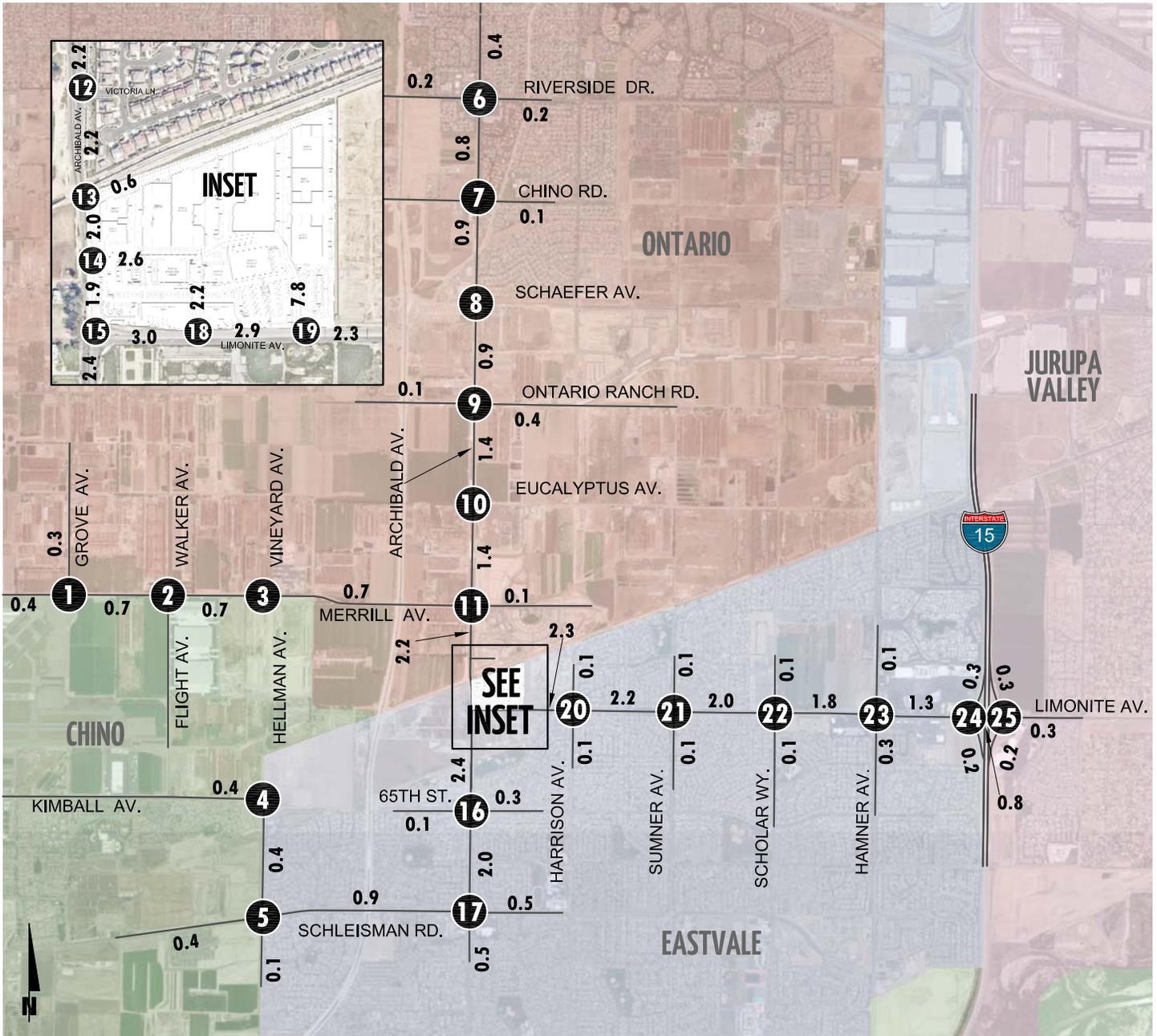
The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project traffic generation and trip distribution patterns, Project ADT and peak hour intersection turning movement volumes are shown on Exhibits 4-5 and 4-6 for near-term (E+P and Opening Year Cumulative) traffic conditions, Project ADT and peak hour intersection turning movement volumes are shown on Exhibits 4-7 and 4-8 for Horizon Year (2040) Without Limonite Avenue Extension traffic conditions, and Project ADT and peak hour intersection turning movement volumes are shown on Exhibits 4-9 and 4-10 for Horizon Year (2040) With Limonite Avenue Extension traffic conditions.

4.5 BACKGROUND TRAFFIC

4.5.1 OPENING YEAR CUMULATIVE CONDITIONS

Future year traffic forecasts have been based upon background (ambient) growth at 1.6% per year for 2021 traffic conditions. The ambient growth factor is intended to approximate regional traffic growth. The total ambient growth is 4.88% for 2021 traffic conditions (growth of 1.6 percent per year over 3 years). 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 4-5: PROJECT ONLY (E+P AND OPENING YEAR CUMULATIVE) AVERAGE DAILY TRAFFIC (ADT)



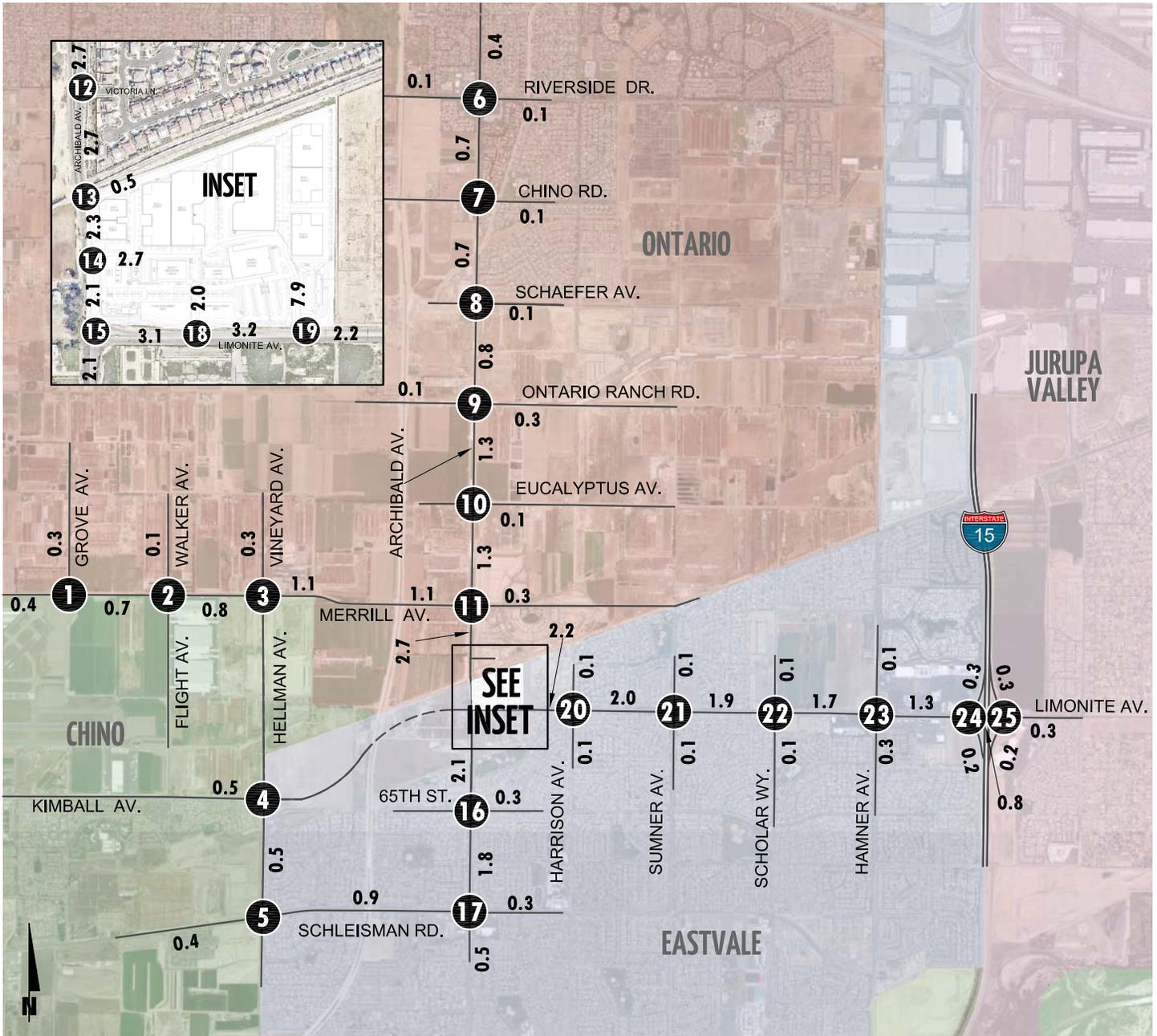
LEGEND:

10.0 = ESTIMATED VEHICLES PER DAY (1000'S)

EXHIBIT 4-6: PROJECT ONLY (E+P AND OPENING YEAR CUMULATIVE) TRAFFIC VOLUMES (IN PCE)

<p>1 Grove Av. & Merrill Av.</p>	<p>2 Flight Av. & Merrill Av.</p>	<p>3 Vineyard Av. & Merrill Av.</p> <p>Future Intersection</p>	<p>4 Hellman Av. & Kimball Av.</p>	<p>5 Hellman Av. & Pine Av.</p>	<p>6 Archibald Av. & Riverside Dr.</p>
<p>7 Archibald Av. & Chlno Av.</p>	<p>8 Archibald Av. & Schaefer Av.</p> <p>Future Intersection</p>	<p>9 Archibald Av. & Ontario Ranch Rd.</p>	<p>10 Archibald Av. & Eucalyptus Av.</p>	<p>11 Archibald Av. & Merrill Av.</p>	<p>12 Archibald Av. & Victoria Ln.</p>
<p>13 Archibald Av. & Dwy. 1</p>	<p>14 Archibald Av. & Dwy. 2</p>	<p>15 Archibald Av. & Limonite Av.</p>	<p>16 Archibald Av. & 65th St.</p>	<p>17 Archibald Av. & Schleisman Rd.</p>	<p>18 Dwy. 3 & Limonite Av.</p>
<p>19 Dwy. 4 & Limonite Av.</p>	<p>20 Harrison Av. & Limonite Av.</p>	<p>21 Sumner Av. & Limonite Av.</p>	<p>22 Scholar Wy. & Limonite Av.</p>	<p>23 Hamner Av. & Limonite Av.</p>	<p>24 I-15 SB Ramps & Limonite Av.</p>
<p>25 I-15 NB Ramps & Limonite Av.</p>	<p>LEGEND: 10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES</p>				

EXHIBIT 4-7: PROJECT ONLY (HORIZON YEAR WITHOUT LIMONITE AVENUE EXTENSION) AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

10.0 = ESTIMATED VEHICLES PER DAY (1000'S)

EXHIBIT 4-8: PROJECT ONLY (HORIZON YEAR WITHOUT LIMONITE AVENUE EXTENSION) TRAFFIC VOLUMES (IN PCE)

<p>1 Grove Av. & Merrill Av.</p>	<p>2 Flight Av. & Merrill Av.</p>	<p>3 Vineyard Av. & Merrill Av.</p>	<p>4 Hellman Av. & Kimball Av.</p>	<p>5 Hellman Av. & Pine Av.</p>	<p>6 Archibald Av. & Riverside Dr.</p>
<p>7 Archibald Av. & Chlno Av.</p>	<p>8 Archibald Av. & Schaefer Av.</p>	<p>9 Archibald Av. & Ontario Ranch Rd.</p>	<p>10 Archibald Av. & Eucalyptus Av.</p>	<p>11 Archibald Av. & Merrill Av.</p>	<p>12 Archibald Av. & Victoria Ln.</p>
<p>13 Archibald Av. & Dwy. 1</p>	<p>14 Archibald Av. & Dwy. 2</p>	<p>15 Archibald Av. & Limonite Av.</p>	<p>16 Archibald Av. & 65th St.</p>	<p>17 Archibald Av. & Schleisman Rd.</p>	<p>18 Dwy. 3 & Limonite Av.</p>
<p>19 Dwy. 4 & Limonite Av.</p>	<p>20 Harrison Av. & Limonite Av.</p>	<p>21 Sumner Av. & Limonite Av.</p>	<p>22 Scholar Wy. & Limonite Av.</p>	<p>23 Hamner Av. & Limonite Av.</p>	<p>24 I-15 SB Ramps & Limonite Av.</p>
<p>25 I-15 NB Ramps & Limonite Av.</p>	<p>LEGEND: 10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES</p>				

EXHIBIT 4-10: PROJECT ONLY (HORIZON YEAR WITH LIMONITE AVENUE EXTENSION) TRAFFIC VOLUMES (IN PCE)

<p>1 Grove Av. & Merrill Av.</p>	<p>2 Flight Av. & Merrill Av.</p>	<p>3 Vineyard Av. & Merrill Av.</p>	<p>4 Hellman Av. & Kimball Av.</p>	<p>5 Hellman Av. & Pine Av.</p>	<p>6 Archibald Av. & Riverside Dr.</p>
<p>7 Archibald Av. & Chlno Av.</p>	<p>8 Archibald Av. & Schaefer Av.</p>	<p>9 Archibald Av. & Ontario Ranch Rd.</p>	<p>10 Archibald Av. & Eucalyptus Av.</p>	<p>11 Archibald Av. & Merrill Av.</p>	<p>12 Archibald Av. & Victoria Ln.</p>
<p>13 Archibald Av. & Dwy. 1</p>	<p>14 Archibald Av. & Dwy. 2</p>	<p>15 Archibald Av. & Limonite Av.</p>	<p>16 Archibald Av. & 65th St.</p>	<p>17 Archibald Av. & Schleisman Rd.</p>	<p>18 Dwy. 3 & Limonite Av.</p>
<p>19 Dwy. 4 & Limonite Av.</p>	<p>20 Harrison Av. & Limonite Av.</p>	<p>21 Sumner Av. & Limonite Av.</p>	<p>22 Scholar Wy. & Limonite Av.</p>	<p>23 Hamner Av. & Limonite Av.</p>	<p>24 I-15 SB Ramps & Limonite Av.</p>
<p>25 I-15 NB Ramps & Limonite Av.</p>	<p>LEGEND: 10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES</p>				

Opening Year Cumulative (2021) traffic volumes are provided in Section 6 *Opening Year Cumulative (2021)* of this report. The traffic generated by the proposed Project was then manually added to the base volume to determine Opening Year Cumulative “With Project” forecasts for 2021.

4.5.2 HORIZON YEAR (2040) CONDITIONS

The adopted *Southern California Association of Governments (SCAG) 2016 Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS)* (April 2016) growth forecasts for the City of Eastvale identifies projected growth in population of 56,500 in 2012 to 65,400 in 2040, or a 15.75% increase over the 28-year period. (10) The change in population equates to roughly a 0.52% growth rate, compounded annually. Similarly, growth over the same 28-year period in households is projected to increase by 17.02%, or a 0.56% annual growth rate. Finally, growth in employment over the same 28-year period is projected to increase by 127.91%, or a 2.99% annual growth rate.

Based on a comparison of Existing (2018) traffic volumes to the Horizon Year (2040) forecasts, the average growth rate is estimated at approximately 3.21%, compounded annually between Existing (2018) and 2040 traffic conditions. The annual growth rate at each individual intersection is not lower than 0.70% compounded annually to as high as 6.32% compounded annually over the same time period.

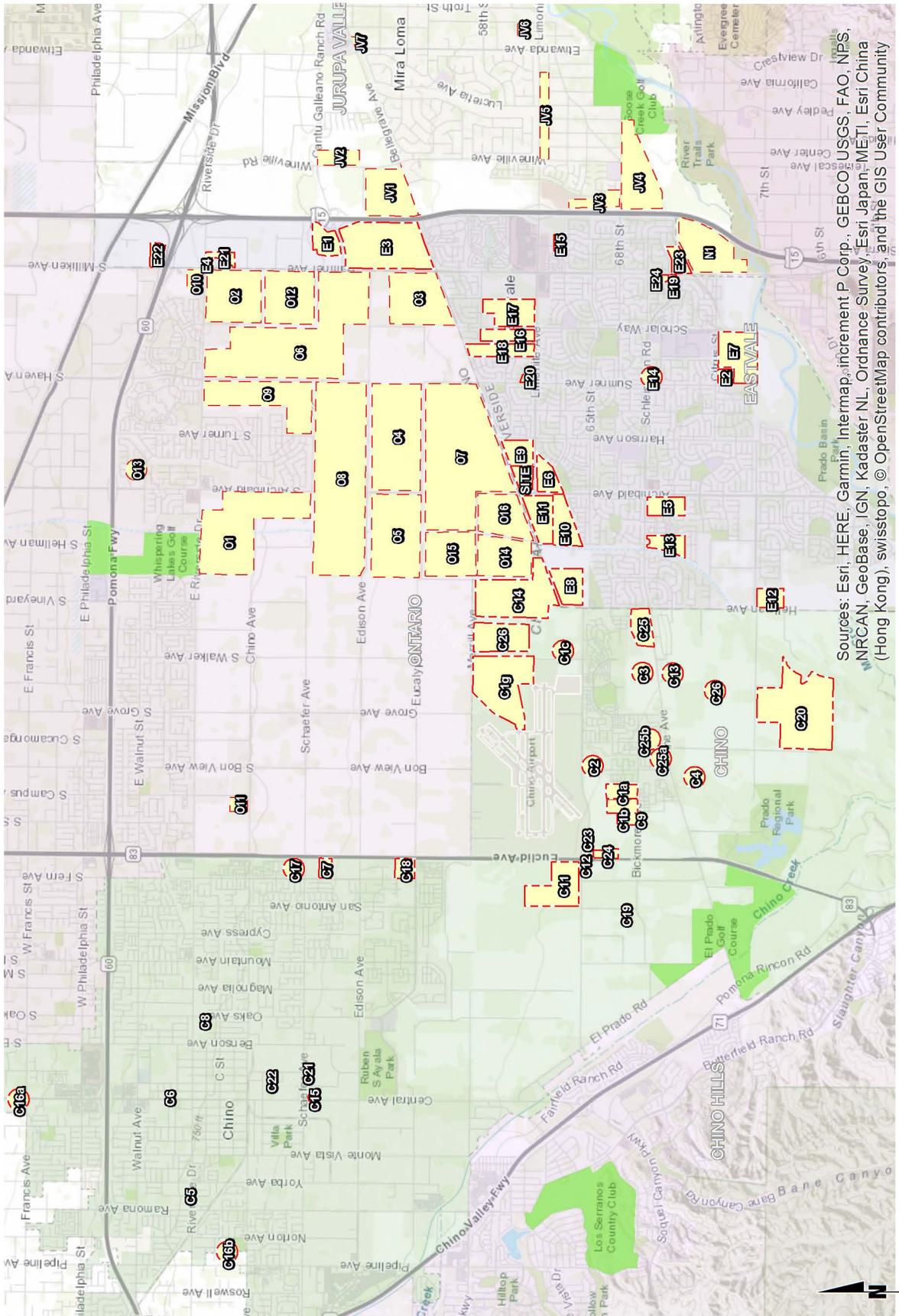
Therefore, the annual growth rate utilized for the purposes of this analysis would appear to conservatively approximate the anticipated regional growth in traffic volumes in the City of Eastvale for Opening Year Cumulative and Horizon Year (2040) traffic conditions, especially when considered along with 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 impacts to traffic and circulation. Horizon Year (2040) With Project traffic forecasts reflects buildout of the Project.

4.6 CUMULATIVE DEVELOPMENT TRAFFIC

California Environmental Quality Act (CEQA) guidelines require that other reasonably foreseeable development projects which are either approved or being processed concurrently in the study area also be included as part of a cumulative analysis scenario. A cumulative project list was developed for the purposes of this analysis through consultation with planning and engineering staff from the City of Eastvale. The neighboring jurisdictions of Chino, Ontario, and Jurupa Valley have also been contacted to include key projects in their respective cities.

Exhibit 4-11 illustrates the cumulative development location map. A summary of cumulative development projects and their proposed land uses are shown in Table 4-4. If applicable, the traffic generated by individual cumulative projects was manually added to the Opening Year Cumulative forecasts to ensure that traffic generated by the listed cumulative development projects in Table 4-4 are reflected as part of the background traffic. Cumulative ADT and peak hour intersection turning movement volumes are shown on Exhibits 4-12 and 4-13 for near-term traffic conditions.

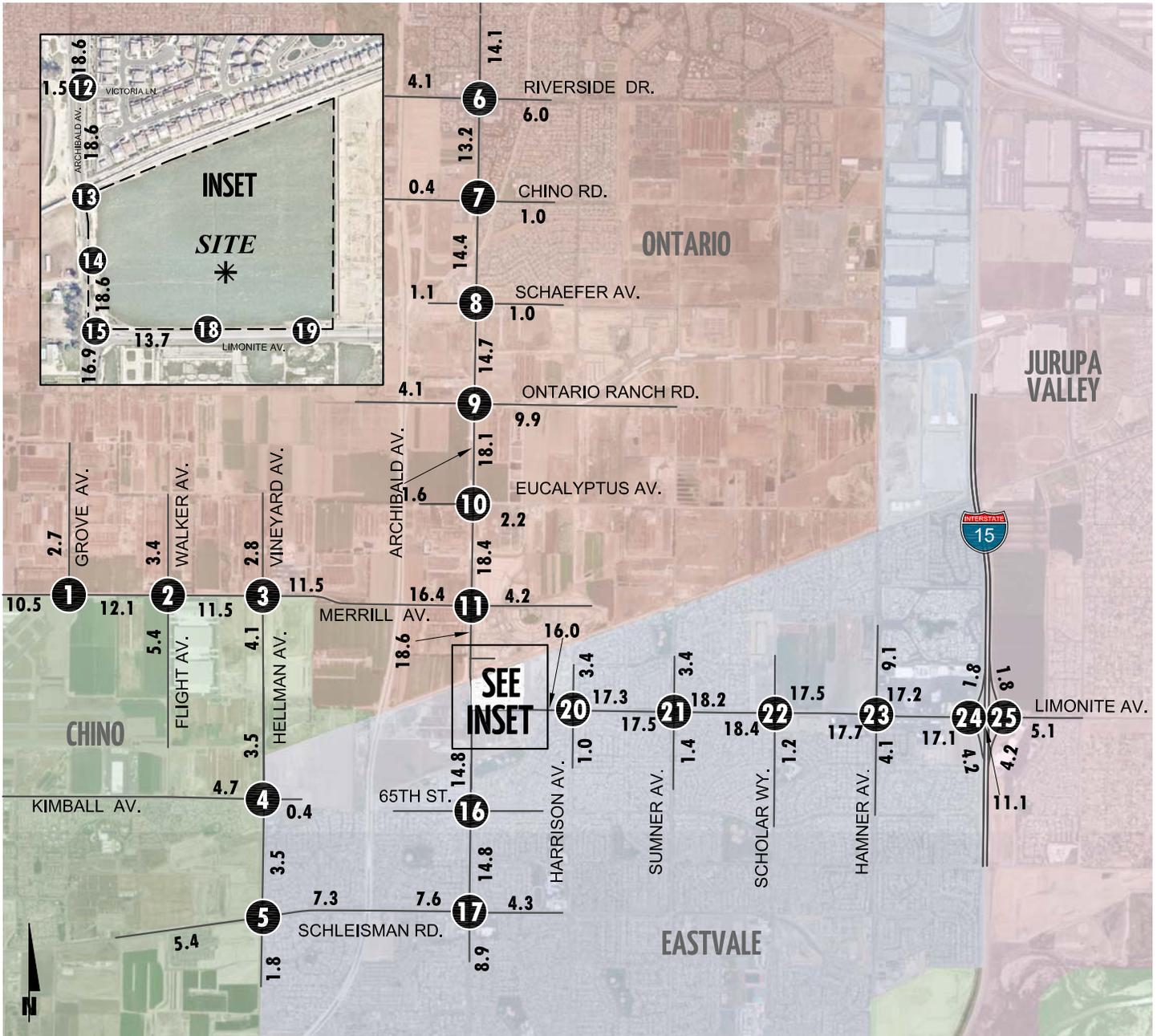
EXHIBIT 4-11: CUMULATIVE DEVELOPMENT LOCATION MAP



Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community



EXHIBIT 4-12: CUMULATIVE DEVELOPMENT ONLY AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

10.0 = ESTIMATED VEHICLES PER DAY (1000'S)

EXHIBIT 4-13: CUMULATIVE DEVELOPMENT ONLY TRAFFIC VOLUMES (IN PCE)

<p>1 Grove Av. & Merrill Av.</p> <p>3(5) 348(383)</p>	<p>2 Flight Av. & Merrill Av.</p> <p>54(39) 294(261) 93(111)</p>	<p>3 Vineyard Av. & Merrill Av.</p> <p>30(21) 266(324) 61(31)</p>	<p>4 Hellman Av. & Kimball Av.</p> <p>121(49) 5(2) 72(103)</p>	<p>5 Hellman Av. & Pine Av.</p> <p>22(9) 153(224) 15(11)</p>	<p>6 Archibald Av. & Riverside Dr.</p> <p>14(9) 65(91) 98(77)</p>
<p>7 Archibald Av. & Chlno Av.</p> <p>0(0) 0(0) 15(16)</p>	<p>8 Archibald Av. & Schaefer Av.</p> <p>6(9) 9(30) 23(21)</p>	<p>9 Archibald Av. & Ontario Ranch Rd.</p> <p>5(5) 91(172) 20(19)</p>	<p>10 Archibald Av. & Eucalyptus Av.</p> <p>29(19) 0(0) 67(44)</p>	<p>11 Archibald Av. & Merrill Av.</p> <p>197(483) 57(134) 203(374)</p>	<p>12 Archibald Av. & Victoria Ln.</p> <p>22(77) 0(0) 8(29)</p>
<p>13 Archibald Av. & Dwy. 1</p> <p>Future Intersection</p>	<p>14 Archibald Av. & Dwy. 2</p> <p>Future Intersection</p>	<p>15 Archibald Av. & Limonite Av.</p> <p>305(550) 146(317)</p>	<p>16 Archibald Av. & 65th St.</p> <p>0(0) 0(0) 0(0)</p>	<p>17 Archibald Av. & Schleisman Rd.</p> <p>193(253) 36(74) 10(39)</p>	<p>18 Dwy. 3 & Limonite Av.</p> <p>Future Intersection</p>
<p>19 Dwy. 4 & Limonite Av.</p> <p>312(674) 85(92)</p>	<p>20 Harrison Av. & Limonite Av.</p> <p>23(63) 403(775) 11(15)</p>	<p>21 Sumner Av. & Limonite Av.</p> <p>19(34) 523(841) 12(18)</p>	<p>22 Scholar Wy. & Limonite Av.</p> <p>0(0) 582(882) 36(44)</p>	<p>23 Hamner Av. & Limonite Av.</p> <p>107(115) 443(722) 47(60)</p>	<p>24 I-15 SB Ramps & Limonite Av.</p> <p>288(417) 263(489)</p>
<p>25 I-15 NB Ramps & Limonite Av.</p> <p>103(188) 186(229)</p>					

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

Table 4-4
Page 1 of 4

Cumulative Development Land Use Summary

#	Project/Location	Land Use ¹	Quantity	Units ²
City of Eastvale				
E1	14-1077 - Grainger Site (APN:156-050-025, 156-050-026, 156-020-027)	Industrial	546.000	TSF
E2	10-0117 (TM36373)	SFDR	51	DU
E3	10-0271 - Eastvale Commerce Center (Phase 1 and 2)	Shopping Center	249.000	TSF
		Hotel	130	RM
		Business Park	610.000	TSF
E4	11-0354 - Arco Gas Station	Gas Station w/ convenience store and car wash	18.000	VFP
		Fast-Food w/o Drive-Thru	2.800	TSF
		Fast-Food with Drive-Thru	2.100	TSF
E5	The Marketplace at Enclave	Shopping Center	42.000	TSF
E6	Eastvale Shopping Center	Free-Standing Discount Superstore	192.000	TSF
		Specialty Retail	9.200	TSF
		Fast-Food Without Drive-Thru	7.200	TSF
		Coffee/Donut Shop w/ Drive Thru	2.000	TSF
		Fast-Food with Drive-Thru	3.500	TSF
E7	11-0363 TTM 36382 (Altfillisch Residential Project ⁵)	Gas Station w/ convenience store and car wash	16	VFP
		SFDR	146	DU
E8	SP00358 - The Ranch at Eastvale	Shopping Center	267.200	TSF
		General Light Industrial	801.500	TSF
		Business Park	1,121.100	TSF
E9	SC Limonite, LLC	SFDR	330	TSF
E10	13-0395 - 65th Street Residential (Copper Sky)	SFDR	250	DU
E11	PP23219 (PM35865)	General Light Industrial	738.430	TSF
E12	TR29997	SFDR	122	DU
E13	TR35751	Condo/Townhouse	243	DU
E14	13-0632 - Sumner Residential (Stratham Homes)	SFDR	129	DU
E15	14-0046 - Kasbergen/William Lyons Homes	Condo/Townhouse	220	DU
E16	TR32821	Condo/Townhouse	350	DU
E17	TR32909	SFDR	140	DU
E18	10-0124 - TR31252 (The Lodge)	SFDR	205	DU
City of Ontario				
O1	Countryside	SFDR	819	DU
	Armstrong Ranch	SFDR	994	DU
O2	Edenglen	SFDR	310	DU
		Multi-Family Attached (Condo)	274	DU
		Shopping Center	217.520	TSF
O3	Esperanza	Business Park	550.000	TSF
		SFDR	914	DU
O4	Grand Park	Multi-Family Attached (Apartments)	496	DU
		SFDR	484	DU
O5	Parkside	Multi-Family Attached (Apartments)	843	DU
		SFDR	437	DU
		Shopping Center	115.000	TSF

Table 4-4
Page 2 of 4

Cumulative Development Land Use Summary

#	Project/Location	Land Use ¹	Quantity	Units ²
O6	Rich Haven	SFDR	2,732	DU
		Multi-Family Attached (Condo)	1,524	DU
		Shopping Center	317.400	TSF
O7	Subarea 29 & Amendment	SFDR	2,149	DU
		Shopping Center	87.000	TSF
O8	The Avenue	SFDR	2,020	DU
		Multi-Family Attached (Apartments)	586	DU
		Shopping Center	250.000	TSF
O9	West Haven	SFDR	753	DU
		Shopping Center	87.000	TSF
O10	Tuscana Village	SFDR	176	DU
		Shopping Center	26.000	TSF
O11	PDEV10-011	SFDR	11	DU
O12	PDEV10-008 - Dry Food Storage	Mini-Warehouse	17.000	TSF
O13	PDEV08-008	Shopping Center	3.920	TSF
O14	Colony Commerce West	High-Cube Warehouse	2213.360	TSF
		Manufacturing	737.786	TSF
O15	West Ontario Commerce Center SP	High-Cube Warehouse	1976.535	TSF
		Manufacturing	658.845	TSF
		Business Park	548.856	TSF
O16	Colony Commerce East	High-Cube Warehouse	998.680	TSF
		Manufacturing	233.129	TSF
		Warehousing	699.387	TSF
City of Chino				
C1a	Bickmore Street Residential (TM 18858)	SFDR	185	DU
C1b	Barthelemy	SFDR	193	DU
		Condo/Townhouse	198	DU
		Apartments	288	DU
C1c	Farmer Boys	Fast-food w/ Drive-Thru	3.218	TSF
		Shopping Center	2.300	TSF
C1d	TM17635	SFDR	67	DU
C1e	Bouma Residential	SFDR	106	DU
		Condo/Townhouse	94	DU
C1f	Kimball Business Park	Light Industrial	140.500	TSF
		Warehousing	564.000	TSF
		High-Cube Warehouse	352.000	TSF
		Business Park	146.550	TSF
C1g	Chino Parcel Delivery	Parcel Delivery Facility	765.274	TSF
C1h	Kimball Business Center	Warehousing	715.000	TSF
		Light Industrial	255.000	TSF
		Business Park	233.000	TSF
		Self-Storage	110.000	TSF
C2	TM17574	Condo/Townhouse	108	DU

Table 4-4
Page 3 of 4

Cumulative Development Land Use Summary

#	Project/Location	Land Use ¹	Quantity	Units ²
C3	Falloncrest at the Preserve	SFDR	204	DU
		Condo/Townhouse	786	DU
		Apartments	412	DU
		Shopping Center	77.597	TSF
		General Office	77.597	TSF
C4	TM18778	SFDR	65	DU
C5	PL11-0047	Apartments	135	DU
	TM 18873	Condo/Townhouse	149	DU
	TM 16838-2 PA 7B	SFDR	67	DU
C6	TM17898	SFDR	77	DU
	TM 17899	SFDR	66	DU
	PL 13-0435	SFDR	41	DU
C7	SA 07-07 RV Storage	RV Storage	313	SPC
C8	Chaffey College Expansion	Junior/Community College	93.50	AC
	College Park Commercial	Commercial	7.50	AC
	TM 18891	SFDR	118	DU
	TM 17893	SFDR	34	DU
	TM 17894	SFDR	39	DU
	TM 17897	SFDR	93	DU
C9	PL13-0601	SFDR	209	DU
C10	South of Pine	SFDR	1,351	DU
		Condo/Townhouse	732	DU
		Apartments	670	DU
C11	Majestic Gateway	High-Cube Warehouse	1,490.400	TSF
		Warehousing	180.000	TSF
		Specialty Retail	25.000	TSF
		Pharmacy/Drugstore with Drive-Thru	13.000	TSF
		Fast-Food with Drive-Thru	8.600	TSF
C12	PM18635	General Light Industrial	99.164	TSF
		High-Cube Warehouse	2,077.594	TSF
C13a	TM 18890	Condo/Townhouse	94	DU
C13b	TM 19980 Homecoming Phase 4 Apartments	Apartments	454	DU
C14	Watson Industrial Park	High-Cube Warehouse	3,889.900	TSF
C15	Chino Business Park	General Light Industrial	165.500	TSF
		Business Park	21.500	TSF
C16	Flores Site	Shopping Center	4.000	TSF
		Gas Station w/ convenience store	16	VFP
		Express Car Wash	5.000	TSF
C17	Brewart Residential (TM 18923)	SFDR	127	DU
C18	Fern and Riverside Residential (TM 18901)	SFDR	94	DU
C19a	Borba Chino Residential (TM 18957)	SFDR	84	DU
C20	Edgewater Communities	SFDR	415	DU
		Condo/Townhouse	659	DU
		Museum/Retail	6.500	TSF
		Church	15.200	TSF
		Park	15.0	AC

Table 4-4
Page 4 of 4

Cumulative Development Land Use Summary

#	Project/Location	Land Use ¹	Quantity	Units ²
C21	TM 18480 Harvest	SFDR	600	DU
C22	Church	Church	47.979	TSF
		Daycare	190	STU
City of Chino Hills				
CH1	Vila Borba Specific Plan	SFDR	176	DU
City of Norco				
N1	Silverlakes Equestrian ⁶	Soccer Field	14	Fields
		Soccer Field	10	Fields
		Equestrian Facility	400	Stalls
City of Jurupa Valley				
JV1	Thoroughbred Farms	General Light Industrial	42.6	AC
		Business Park	35.5	AC
		Commercial	19.1	AC
JV2	Harmony Trails	SFDR	176	DU
JV3	Vernola Marketplace Apartments	Apartments	397	DU
JV4	Riverbend	Residential	466	DU
JV5	Wineville Marketplace	Commercial	37.657	TSF
JV6	Express Car Wash	Car Wash	4.702	TSF
JV7	Shops @ Bellegrave	Commercial	10.000	TSF

¹ SFDR = Single Family Detached Residential

² TSF = Ten Thousand Square Feet; DU = Dwelling Unit; VFP = Vehicle Fueling Position ; AC = Acres

³ Source: Eastvale South Trip Generation Analysis, Albert A. Webb Associates, May 27, 2011

⁴ Source: Trip Generation Comparison for Cloverdale Marketplace, Phase II, Eastvale CA, Albert A. Webb Associates, August 15, 2011.

⁵ Source: Altfillisch Residential Project TIA Memorandum, LSA Associates, Inc., July 25, 2011.

⁶ Source: From Silverlakes TIA (Revised), Kunzman Associates, September 25, 2008.

4.7 HORIZON YEAR (2040) VOLUME DEVELOPMENT

Traffic projections for Horizon Year (2040) without Project conditions were derived from the Riverside Transportation Analysis Model (RivTAM) and San Bernardino Transportation Analysis Model (SBTAM) using accepted procedures for model forecast refinement and smoothing for study area intersections located within the County of Riverside and San Bernardino, respectively. The current version of the SBTAM reflects the local input in the adopted 2016 SCAG RTP within the County of San Bernardino.

The traffic forecasts reflect the area-wide growth anticipated between Existing (2018) conditions and Horizon Year (2040) traffic conditions. In most instances the traffic model zone structure is not designed to provide accurate turning movements along arterial roadways unless refinement and reasonableness checking is performed. Therefore, the Horizon Year (2040) peak hour forecasts were refined using the model derived long range forecasts, base (validation) year model forecasts, along with existing peak hour traffic count data collected at each analysis location in April of 2018. The SBTAM has a base (validation) year of 2012 and a horizon (future forecast) year of 2040. The difference in model volumes (2040-2012) defines the growth in traffic over the 28-year period. The Riverside Transportation Analysis Model (RivTAM) has a base (validation) year of 2008 and a horizon (future forecast) year of 2035. The RivTAM 2035 model utilized for the purposes of this analysis assumes buildout of the City of Eastvale. A compounded growth rate consistent with the SCAG RTP/SCS has been applied to the Eastvale locations to determine 2040 forecasts.

The refined future peak hour approach and departure volumes obtained from the model output data are then entered into a spreadsheet program consistent with the National Cooperative Highway Research Program (NCHRP Report 255), along with initial estimates of turning movement proportions. A linear programming algorithm is used to calculate individual turning movements which match the known directional roadway segment forecast volumes computed in the previous step. This program computes a likely set of intersection turning movements from intersection approach counts and the initial turning proportions from each approach leg.

The SBTAM uses an AM peak period-to-peak hour factor of 0.35 and a PM peak period-to-peak hour factor of 0.28. These factors represent the relationship of the highest single AM peak hour to the modeled 3-hour AM peak period (an even distribution would result in a factor of 0.33) and the highest single PM peak hour to the modeled 4-hour PM peak period (an even distribution would result in a factor of 0.25). These factors were applied as the SBTAM data represents peak period, as opposed to peak hour. The model data from RivTAM represents peak hour data and therefore did not require adjustments.

Typically, the model growth is prorated and is subsequently added to the existing (base validation) traffic volumes to represent Horizon Year traffic conditions. In an effort to conduct a conservative analysis, reductions to traffic forecasts from either Existing or Opening Year Cumulative traffic conditions were not assumed as part of this analysis. As such, in conjunction with the addition of cumulative projects that are not consistent with the General Plan, additional growth has also been applied on a movement-by-movement basis, where applicable, to estimate reasonable Horizon Year (2040) forecasts. Horizon Year (2040) turning volumes were compared

to Opening Year Cumulative (2021) volumes in order to ensure a minimum growth as a part of the refinement process. The minimum growth includes any additional growth between Opening Year Cumulative (2021) and Horizon Year (2040) traffic conditions that is not accounted for by the traffic generated by cumulative development projects and ambient growth rates assumed between Existing (2018) and Opening Year Cumulative (2021) conditions. Adjustments have not been made to study area intersections that may be affected by new future roadway connections (such as the extension of Limonite Avenue), where travel patterns would likely get affected and forecasts may potentially decrease from the Opening Year cumulative conditions. Future estimated peak hour traffic data was used for new intersections and intersections with an anticipated change in travel patterns to further refine the Horizon Year (2040) peak hour forecasts.

The future Horizon Year (2040) without Project peak hour turning movements were then reviewed by Urban Crossroads, Inc. for reasonableness, and in some cases, were adjusted to achieve flow conservation, reasonable growth, and reasonable diversion between parallel routes. Flow conservation checks ensure that traffic flow between two closely spaced intersections, such as two adjacent driveway locations, is verified to make certain that vehicles leaving one intersection are entering the adjacent intersection and that there is no unexplained loss of vehicles. The result of this traffic forecasting procedure is a series of traffic volumes which are suitable for traffic operations analysis.

The RivTAM and SBTAM do not include a truck component or have data that is unusually low. As such, in an effort to conduct a conservative analysis, the presence of trucks has been accounted for based on the manual volume adjustments made to demonstrate growth above Opening Year Cumulative (2021) traffic forecasts, which are presented and evaluated in PCE (see Section 3.6 Existing Traffic Counts for discussion on PCE). As such, the Horizon Year (2040) forecasts are also assumed to be in PCE for the purposes of this analysis. Horizon Year (2040) With Project traffic forecasts reflects buildout of the Project. Post-processing worksheets for Horizon Year (2040) Without Project traffic conditions are provided in Appendix 4.1.

5 E+P TRAFFIC CONDITIONS

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

5.1 ROADWAY IMPROVEMENTS

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

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

5.2 EXISTING PLUS PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus Project traffic. The ADT volumes which can be expected for E+P traffic conditions are shown on Exhibit 5-1. E+P weekday AM and PM peak hour intersection turning movement volumes are shown on Exhibit 5-2.

5.3 INTERSECTION OPERATIONS ANALYSIS

E+P peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TIA. The intersection analysis results are summarized in Table 5-1, which indicates the following additional study area intersection is anticipated to operate at unacceptable LOS with the addition of Project traffic, in addition to the locations identified previously for Existing traffic conditions:

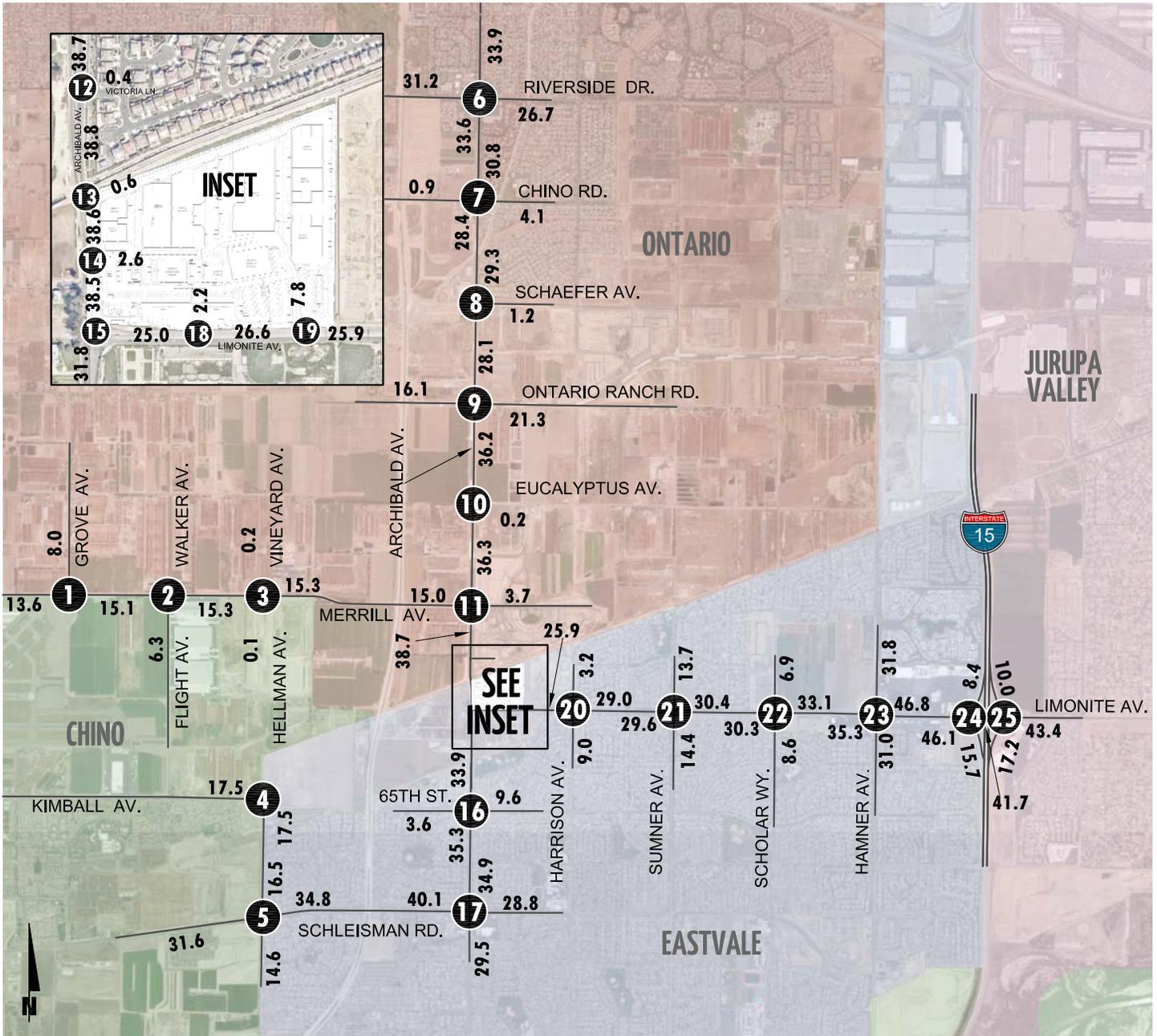
- Archibald Av. & Limonite Av. (#15) – LOS E AM peak hour; LOS F PM peak hour

Consistent with Table 5-1, a summary of the peak hour intersection LOS for E+P conditions is shown on Exhibit 5-3. The intersection operations analysis worksheets for E+P traffic conditions are included in Appendix 5.1 of this TIA.

5.4 ROADWAY SEGMENT CAPACITY ANALYSIS

As noted previously, the City of Eastvale stated roadway segment capacities are approximate figures only and are used at the General Plan level to assist in determining the roadway functional classification (number of through lanes) needed to meet future traffic demand. Table 5-2 provides a summary of the E+P conditions roadway segment capacity analysis based on the City of Eastvale General Plan Roadway Segment Capacity Thresholds identified previously in Table 2-3. As shown in Table 5-2, the Project would contribute traffic to existing deficient conditions. These are cumulatively significant impacts. The additional lane improvements shown for E+P traffic conditions are consistent with the planned Project site adjacent improvements (i.e., additional lane along the frontage).

EXHIBIT 5-1: E+P AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

10.0 = ESTIMATED VEHICLES PER DAY (1000'S)

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

<p>1 Grove Av. & Merrill Av.</p> <p>126(85) 109(199) 236(115) 434(209)</p> <p>67(123) 168(473)</p>	<p>2 Flight Av. & Merrill Av.</p> <p>475(229) 113(90)</p> <p>192(563) 85(110)</p> <p>195(95) 131(112)</p>	<p>3 Vineyard Av. & Merrill Av.</p> <p>Future Intersection</p>	<p>4 Hellman Av. & Kimball Av.</p> <p>0(0) 0(0) 0(0)</p> <p>0(0) 0(0) 238(871)</p> <p>0(0) 0(0) 882(270)</p>	<p>5 Hellman Av. & Pine Av.</p> <p>16(22) 108(282) 112(509)</p> <p>407(136) 972(453) 24(36)</p> <p>22(17) 425(1092) 299(332)</p> <p>426(137) 416(114) 51(43)</p>	<p>6 Archibald Av. & Riverside Dr.</p> <p>186(205) 338(820) 146(271)</p> <p>236(132) 519(434) 102(185)</p> <p>184(207) 279(634) 148(277)</p> <p>300(267) 1057(568) 64(78)</p>
<p>7 Archibald Av. & Chlno Av.</p> <p>22(15) 477(1074) 96(129)</p> <p>214(81) 4(0) 46(27)</p> <p>28(13) 7(0) 8(8)</p> <p>22(23) 1096(699) 54(31)</p>	<p>8 Archibald Av. & Schaefer Av.</p> <p>Future Intersection</p>	<p>9 Archibald Av. & Ontario Ranch Rd.</p> <p>86(73) 424(923) 23(78)</p> <p>75(42) 347(156) 251(343)</p> <p>27(106) 223(491) 65(129)</p> <p>159(88) 1008(619) 386(278)</p>	<p>10 Archibald Av. & Eucalyptus Av.</p> <p>735(1391) 5(3)</p> <p>5(2) 2(6)</p> <p>1548(983) 9(4)</p>	<p>11 Archibald Av. & Merrill Av.</p> <p>213(139) 476(1201) 49(57)</p> <p>109(47) 38(8) 60(48)</p> <p>205(228) 13(48) 147(424)</p> <p>401(141) 1245(713) 34(32)</p>	<p>12 Archibald Av. & Victoria Ln.</p> <p>683(1672)</p> <p>21(7)</p> <p>1659(879) 4(17)</p>
<p>13 Archibald Av. & Dwy. 1</p> <p>0(0) 165(184)</p> <p>126(105)</p> <p>0(0) 0(0)</p>	<p>14 Archibald Av. & Dwy. 2</p> <p>651(1648)</p> <p>104(107)</p> <p>1555(770) 114(99)</p>	<p>15 Archibald Av. & Limonite Av.</p> <p>364(947) 287(701)</p> <p>814(320) 348(421)</p> <p>855(549) 982(790) 267(333)</p>	<p>16 Archibald Av. & 65th St.</p> <p>15(69) 652(1127) 46(172)</p> <p>86(51) 29(30) 250(127)</p> <p>55(41) 64(29) 77(21)</p> <p>36(47) 982(790) 199(219)</p>	<p>17 Archibald Av. & Schleisman Rd.</p> <p>506(359) 437(679) 115(185)</p> <p>128(84) 626(289) 213(102)</p> <p>408(432) 531(1091) 129(230)</p> <p>300(215) 772(567) 198(127)</p>	<p>18 Dwy. 3 & Limonite Av.</p> <p>83(94)</p> <p>97(86) 1080(647)</p> <p>554(1034)</p>
<p>19 Dwy. 4 & Limonite Av.</p> <p>119(129) 165(184)</p> <p>126(105) 1058(604)</p> <p>219(192) 335(842)</p>	<p>20 Harrison Av. & Limonite Av.</p> <p>68(29) 93(36) 23(10)</p> <p>34(8) 950(632) 168(210)</p> <p>47(76) 436(888) 17(62)</p> <p>165(48) 83(50) 222(178)</p>	<p>21 Sumner Av. & Limonite Av.</p> <p>79(156) 122(283) 92(90)</p> <p>21(41) 687(679) 145(224)</p> <p>99(167) 523(838) 20(66)</p> <p>132(63) 161(148) 187(148)</p>	<p>22 Scholar Wy. & Limonite Av.</p> <p>55(44) 189(163) 57(69)</p> <p>30(64) 743(817) 81(130)</p> <p>31(65) 810(986) 67(60)</p> <p>105(36) 139(48) 138(122)</p>	<p>23 Hamner Av. & Limonite Av.</p> <p>110(203) 264(606) 202(288)</p> <p>84(191) 600(574) 208(412)</p> <p>147(317) 811(777) 51(89)</p> <p>134(201) 521(457) 445(247)</p>	<p>24 I-15 SB Ramps & Limonite Av.</p> <p>418(422) 0(1) 142(128)</p> <p>621(950) 629(508)</p> <p>1051(1130) 513(514)</p>
<p>25 I-15 NB Ramps & Limonite Av.</p> <p>375(184) 1063(1092)</p> <p>699(472) 495(785)</p> <p>187(365) 0(2) 305(750)</p>	<p>LEGEND:</p> <p>10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES</p>				

EXHIBIT 5-3: E+P SUMMARY OF LOS

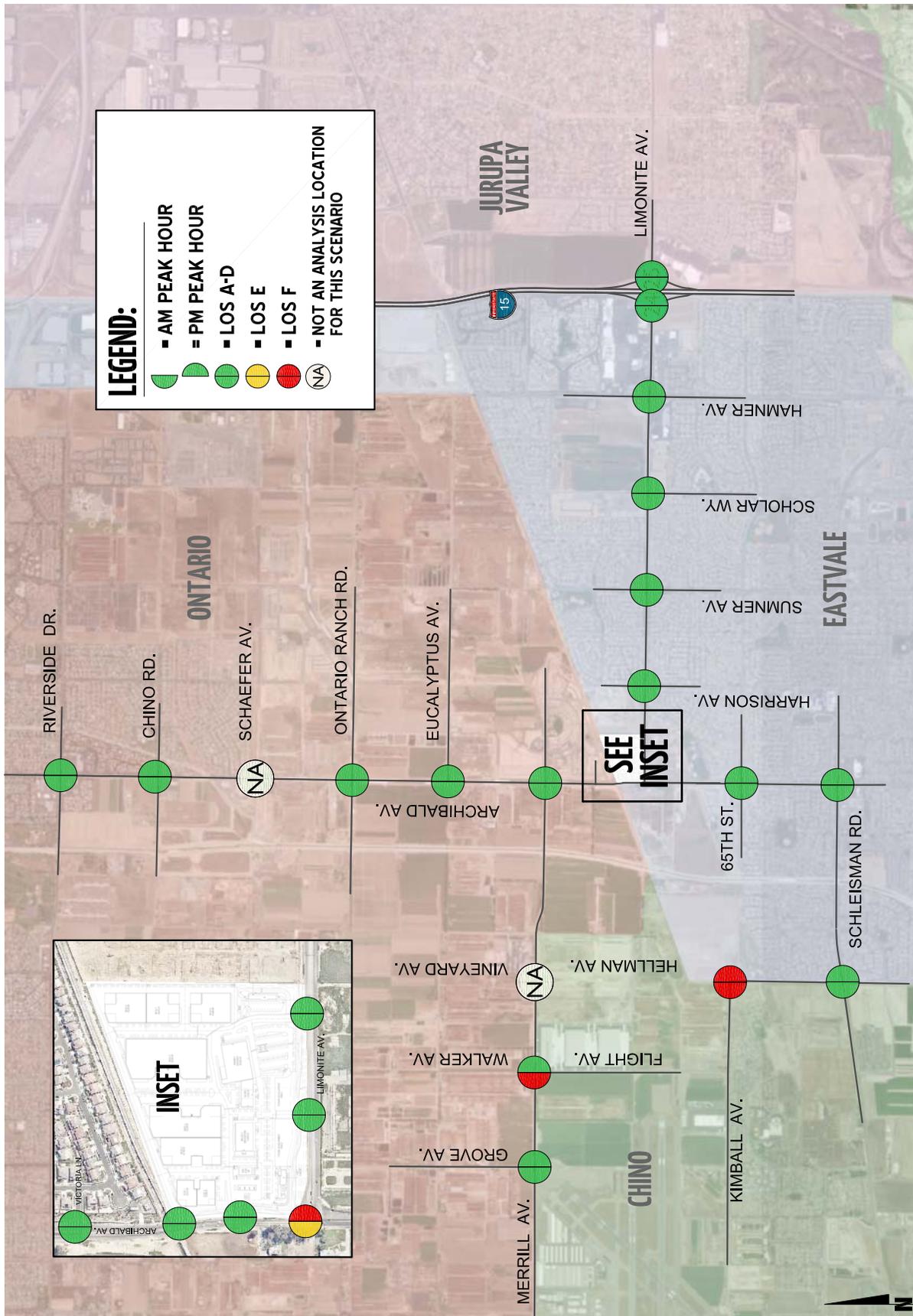


Table 5-1

Intersection Analysis for E+P Conditions

#	Intersection	Traffic Control ²	Existing (2018)				E+P				Change in Delay (secs.) ³		Acceptable LOS
			Delay ¹ (secs.)		Level of Service		Delay ¹ (secs.)		Level of Service		AM	PM	
			AM	PM	AM	PM	AM	PM	AM	PM			
1	Grove Av. & Merrill Av.	AWS	26.4	25.4	D	D	32.8	30.3	D	D	--	--	D
2	Flight Av. & Merrill Av.	CSS	61.2	28.4	F	D	83.7	33.0	F	D	22.5	--	D
3	Hellman Av. & Merrill Av.		Future Intersection				Future Intersection				--	--	D
4	Hellman Av. & Kimball Av.	AWS	97.9	47.8	F	E	107.3	56.3	F	F	9.4	8.5	D
5	Hellman Av. & Pine Av.	TS	22.4	23.6	C	C	22.7	24.2	C	C	--	--	D
6	Archibald Av. & Riverside Dr.	TS	48.2	48.9	D	D	49.7	51.9	D	D	--	--	E
7	Archibald Av. & Chino Av.	TS	14.4	13.6	B	B	14.7	14.1	B	B	--	--	E
8	Archibald Av. & Schaefer Av.		Future Intersection				Future Intersection				--	--	E
9	Archibald Av. & Ontario Ranch Rd.	TS	25.9	32.3	C	C	26.7	36.1	C	D	--	--	E
10	Archibald Av. & Eucalyptus Av.	TS	6.4	5.5	A	A	6.5	5.5	A	A	--	--	E
11	Archibald Av. & Merrill Av.	TS	40.2	35.2	D	D	41.7	44.6	D	D	--	--	E
12	Archibald Av. & Victoria Ln.	CSS	17.7	11.1	C	B	18.6	11.6	C	B	--	--	E
13	Archibald Av. & Driveway 1	CSS	Project Improvement				18.5	11.8	C	B	--	--	D
14	Archibald Av. & Driveway 2	CSS	Project Improvement				23.1	12.6	C	B	--	--	D
15	Archibald Av. & Limonite Av.	TS	44.2	39.4	D	D	61.3	81.2	E	F	17.1	41.8	D
16	Archibald Av. & 65th St.	TS	25.0	20.4	C	C	26.5	21.1	C	C	--	--	D
17	Archibald Av. & Schleisman Rd.	TS	29.3	25.6	C	C	32.4	26.4	C	C	--	--	D
18	Driveway 3 & Limonite Av.	CSS	Project Improvement				16.9	12.9	C	B	--	--	D
19	Driveway 4 & Limonite Av.	TS	Project Improvement				14.3	11.6	B	B	--	--	D
20	Harrison Av. & Limonite Av.	TS	22.5	17.8	C	B	23.5	18.0	C	B	--	--	D
21	Sumner Av. & Limonite Av.	TS	17.0	18.0	B	B	17.3	18.4	B	B	--	--	D
22	Scholar Way & Limonite Av.	TS	17.8	15.6	B	B	18.3	15.9	B	B	--	--	D
23	Hamner Av. & Limonite Av.	TS	27.5	33.1	C	C	27.9	34.4	C	C	--	--	D
24	I-15 SB Ramps & Limonite Av.	TS	29.7	27.2	C	C	38.4	35.3	D	D	--	--	D
25	I-15 NB Ramps & Limonite Av.	TS	27.3	31.2	C	C	33.2	39.1	C	D	--	--	D

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

¹ Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. HCM delay reported in seconds. HCM 6th Edition has been used for the operations analysis for Intersections #6, #24, and #25.

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

³ The change in delay is calculated between Without Project and With Project scenarios for City of Eastvale intersections already operating at an unacceptable LOS in Without Project conditions.

Table 5-2

Roadway Segment Capacity Analysis for E+P Conditions

#	Roadway	Segment Limits	Roadway Section	LOS Capacity ¹	Existing 2018	V/C ²	LOS ³	Roadway Section	LOS Capacity ¹	E+P	V/C ²	LOS ³	Change in V/C ⁴	Acceptable LOS
1	Archibald Av. to Sumner Av.		4D	35,900	21,999	0.61	B	5D	44,917	24,978	0.56	A	--	D
2	Limonite Av.		4D	35,900	33,559	0.93	E	4D	35,900	35,598	0.99	F	0.06	D
3		Hamner Av. to I-15 Freeway	6D	53,900	45,529	0.84	D	6D	53,900	46,839	0.87	D	--	D
4	Archibald Av.	Victoria Ln. to Limonite Av.	2D	17,950	29,902	1.67	F	3D	26,925	32,132	1.19	F	-0.47	D
5		Limonite Av. to 65th St.	4U	35,900	29,449	0.82	D	4U	35,900	31,833	0.89	D	--	D

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

¹ These maximum roadway capacities have been obtained from the City of Eastvale's General Plan (Table C-1).

² V/C = Volume to Capacity Ratio

³ LOS = Level of Service

⁴ The change in V/C is calculated between Without Project and With Project scenarios for roadway segments operating at an unacceptable LOS under pre-project conditions.

5.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

The intersection of Driveway 4 on Limonite Avenue is anticipated to warrant a planning level (daily volume based) traffic signal under E+P traffic conditions, in addition to those previously warranted under Existing (2018) traffic conditions (see Appendix 5.2).

5.6 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for E+P are presented in Table 5-3. As shown in Table 5-3, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows with the addition of Project traffic. Worksheets for E+P traffic conditions off-ramp queuing analysis are provided in Appendix 5.3.

5.7 BASIC FREEWAY SEGMENT ANALYSIS

E+P mainline directional volumes for the AM and PM peak hours are provided on Exhibit 5-4. As shown in Table 5-4, no additional freeway segments analyzed for this TIA are were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for E+P traffic conditions, in addition to those previously identified under Existing traffic conditions. The Project is anticipated to contribute less than 25 one-way peak hour trips to the deficient segment. E+P basic freeway segment analysis worksheets are provided in Appendix 5.4.

5.8 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for E+P conditions and the results of this analysis are presented in Table 5-5. As shown in Table 5-5, there are no additional merge and diverge areas that currently operate at LOS E or LOS F for E+P in addition to those previously listed under Existing traffic conditions. The Project is anticipated to contribute less than 25 peak hour trips to the deficient ramp junction. E+P freeway ramp junction operations analysis worksheets are provided in Appendices 5.5.

Table 5-3

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

Intersection	Movement	Available Stacking Distance (Feet)	Existing (2018)				E+P			
			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 Ramps / Limonite Avenue	SBL	400	160	141	Yes	Yes	160	137	Yes	Yes
	SBL/T/R	400	86	108	Yes	Yes	89	132	Yes	Yes
	SBR	1,200	69	106	Yes	Yes	72	121	Yes	Yes
I-15 NB Ramps / Limonite Avenue	NBL	450	181	307	Yes	Yes	200	322	Yes	Yes
	NBL/T/R	1,235	79	264	Yes	Yes	81	274	Yes	Yes
	NBR	400	61	242	Yes	Yes	62	248	Yes	Yes

¹ Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

Table 5-4

Basic Freeway Segment Analysis for E+P Conditions

Freeway	Direction ¹	Mainline Segment	Lanes ²	Existing (2018)				E+P			
				Density ³		LOS ⁴		Density ³		LOS ⁴	
				AM	PM	AM	PM	AM	PM	AM	PM
I-15	SB	North of Limonite Av.	3	32.5	31.8	D	D	32.8	32.1	D	D
		South of Limonite Av.	3	39.2	36.6	E	E	39.4	36.8	E	E
	NB	North of Limonite Av.	3	32.6	24.9	D	C	32.7	25.1	D	C
		South of Limonite Av.	3	27.7	28.3	D	D	27.9	28.4	D	D

* **BOLD** = Unacceptable Level of Service

¹ NB = Northbound; SB = Southbound

² Number of lanes are in the specified direction and is based on existing conditions.

³ Density is measured by passenger cars per mile per lane (pc/mi/ln).

⁴ LOS = Level of Service

Table 5-5

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

Freeway	Direction ¹	Ramp or Segment	Lanes on Freeway ²	Existing (2018)				E+P			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density ³	LOS ⁴						
I-15	SB	Off-Ramp at Limonite Av.	3	31.5	D	31.1	D	31.7	D	31.3	D
		On-Ramp at Limonite Av.	3	40.1	E	38.1	D	40.2	E	38.3	D
	NB	On-Ramp at Limonite Av.	3	34.7	D	27.2	C	34.9	D	27.4	C
		Off-Ramp at Limonite Av.	3	28.3	D	29.4	D	28.4	D	29.4	D

* **BOLD** = Unacceptable Level of Service
¹ NB = Northbound; SB = Southbound
² Number of lanes are in the specified direction and is based on existing conditions
³ Density is measured by passenger cars per mile per lane (pc/mi/ln).
⁴ LOS = Level of Service

EXHIBIT 5-4: E+P FREEWAY MAINLINE VOLUMES



LEGEND:

← 100/200 = AM/PM PEAK HOUR VOLUMES
 NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)



5.9 PROJECT IMPACTS AND RECOMMENDED IMPROVEMENTS

This section provides a summary of Project impacts and recommended improvements. Based on the City of Eastvale significance criteria discussed in Section 2.9 *Thresholds of Significance*, the following intersections were found to be impacted by Project. Improvements necessary to reduce project-related traffic impacts to less than significant are also discussed below.

5.9.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

The effectiveness of the proposed recommended mitigation measures is shown in Table 5-6 for E+P traffic conditions. With the implementation of the intersection mitigation measures discussed below, there are no project-related impacts anticipated to the study area intersections. The intersection operations analysis worksheets for E+P traffic conditions, with improvements, are included in Appendix 5.6 of this TIA.

Improvements listed in Table 5-6 would resolve identified intersection deficiencies projected to occur under E+P traffic conditions. For the improvements that are not included in a pre-existing fee program, it was determined that the improvement recommendations are within the General Plan classifications for each roadway type. The following mitigation measure is incorporated.

Mitigation Measure 1.1 – Prior to the issuance of building permits, the Project Applicant shall pay that building’s fair share fee amounts toward the construction of City of Eastvale improvements required under the E+P analysis scenario listed in Table 5-6. Where intersection improvements require additional through lanes, fees shall also be applied to construction of required through lane/roadway segment improvements. The greatest fair share fee shall be paid at each potentially affected facility.

5.9.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON ROADWAY SEGMENTS

As shown in Table 5-7, the segment of Limonite Avenue from Sumner Avenue and Hamner Avenue would accommodate the anticipated daily traffic flows once the section is widened to a six-lane section and the segment along Archibald Avenue would improve the daily capacity (as compared to Existing conditions) with the planned site adjacent improvements to be implemented by the Project Applicant. The more detailed peak hour intersection operations shown in Table 5-1 indicates that the intersections on either side of these segments could process peak hour traffic flows with Limonite Avenue as a 4-lane roadway and Archibald Avenue as a planned 3-lane roadway. As such, additional roadway widening has not been recommended for E+P traffic conditions.

5.9.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON OFF-RAMP QUEUES

As shown previously in Table 5-3, there are no peak hour queuing issues at the I-15 Freeway and Limonite Avenue interchange. As such, no improvements have been recommended.

Table 5-6

Intersection Analysis for E+P Conditions With Improvements

#	Intersection	Traffic Control ³	Intersection Approach Lanes ¹												Delay ² (secs.)		Level of Service		
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM	
			L	T	R	L	T	R	L	T	R	L	T	R					
2	Flight Av. & Merrill Av. - Existing (2018) - E+P	CSS	0	1	0	0	0	0	0	1	1	1	1	1	0	61.2	28.4	F	D
	Without Improvements:	CSS	0	1	0	0	0	0	0	1	1	1	1	1	0	83.7	33.0	F	D
	With Improvements:	TS	0	1	0	0	0	0	0	1	1	1	1	1	0	14.9	15.9	B	B
4	Hellman Av. & Kimball Av. - Existing (2018) - E+P	AWS	1	0	0	0	0	0	0	0	1	0	0	0	97.9	47.8	F	E	
	Without Improvements:	AWS	1	0	0	0	0	0	0	1	0	0	0	107.3	56.3	F	F		
	With Improvements:	TS	1	0	0	0	0	0	0	1	0	0	0	0.0	0.0	A	A		
15	Archibald Av. & Limonite Av. - Existing (2018) - E+P	TS	0	1	1>	1	1	0	0	0	0	1	0	1>	44.2	39.4	D	D	
	Without Improvements:	TS	0	1	1>	1	1	0	0	0	0	1	0	1>	65.6	87.3	E	F	
	With Improvements:	TS	0	1	1>	<u>2</u>	1	0	0	0	0	1	0	<u>2></u>	37.1	30.3	D	D	

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

L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing; 1 = Improvement

² Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

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

Table 5-7

Roadway Segment Capacity Analysis for E+P Conditions With Improvements

#	Roadway	Segment Limits	Roadway Section	LOS Capacity ¹	Existing 2018	V/C ²	LOS ³	Roadway Section	LOS Capacity ¹	E+P	V/C ²	LOS ³	Change in V/C ⁴	Acceptable LOS
2	Limonite Av.	Sumner Av. to Hammer Av.	6D	53,900	33,559	0.62	B	6D	53,900	35,598	0.66	B	--	D
4	Archibald Av.	Victoria Ln. to Limonite Av.	2D	17,950	29,902	1.67	F	3D	26,925	32,132	1.19	F	-0.47	D

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

¹ These maximum roadway capacities have been obtained from the City of Eastvale's General Plan (Table C-1).

² V/C = Volume to Capacity Ratio

³ LOS = Level of Service

⁴ The change in V/C is calculated between Without Project and With Project scenarios for roadway segments operating at an unacceptable LOS under pre-project conditions.

5.9.4 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

There are planned improvements for the I-15 Freeway at Limonite Avenue Interchange, which would consist of a new 8-lane overcrossing along Limonite Avenue (3 through lanes in each direction plus 2 right turn lanes at each ramp), widening of the off-ramps from 2 to 4 lanes, the addition of 2 new loop on-ramps, and additional widening of Limonite Avenue to 4 lanes in each direction between Hamner Avenue and Wineville Avenue. The construction is anticipated to begin mid to late 2018 with completion of construction to occur in 2019. However, this planned improvement does not widen the existing freeway mainline segments. There is a separate I-15 Freeway project that includes the construction of 2 tolled Express Lanes between the SR-60 Freeway and Cajalco Road. The Express Lanes are not anticipated to be completed until Year 2020. As such, no improvements have been recommended to address the E+P deficiencies on the SHS.

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6 OPENING YEAR CUMULATIVE (2021) TRAFFIC CONDITIONS

This section discusses the methods used to develop Opening Year Cumulative (2021) Without and With Project traffic forecasts, and the resulting intersection operations, roadway segment capacity, freeway mainline operations, and traffic signal warrant analyses.

6.1 ROADWAY IMPROVEMENTS

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

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for Opening Year Cumulative conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for Opening Year Cumulative conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways such as the northern extension of Hellman Avenue north of Kimball Avenue).
- The I-15 Freeway & Limonite Avenue interchange project is anticipated to be completed by Year 2019. However, for the purposes of this analysis, the existing interchange was evaluated first and improvements were recommended to address any deficiencies are consistent with the interchange improvements, as shown on Exhibit 6-1.

6.2 OPENING YEAR CUMULATIVE (2021) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth factor of 4.88% plus traffic from pending and approved but not yet constructed known development projects in the area. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Opening Year Cumulative (2021) Without Project traffic conditions are shown on Exhibits 6-2 and 6-3, respectively.

6.3 OPENING YEAR CUMULATIVE (2021) WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Opening Year Cumulative (2021) Without Project traffic in conjunction with the addition of Project traffic. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Opening Year Cumulative (2021) With Project traffic conditions are shown on Exhibits 6-4 and 6-5, respectively.

EXHIBIT 6-1: I-15 / LIMONITE AVENUE INTERCHANGE PROJECT

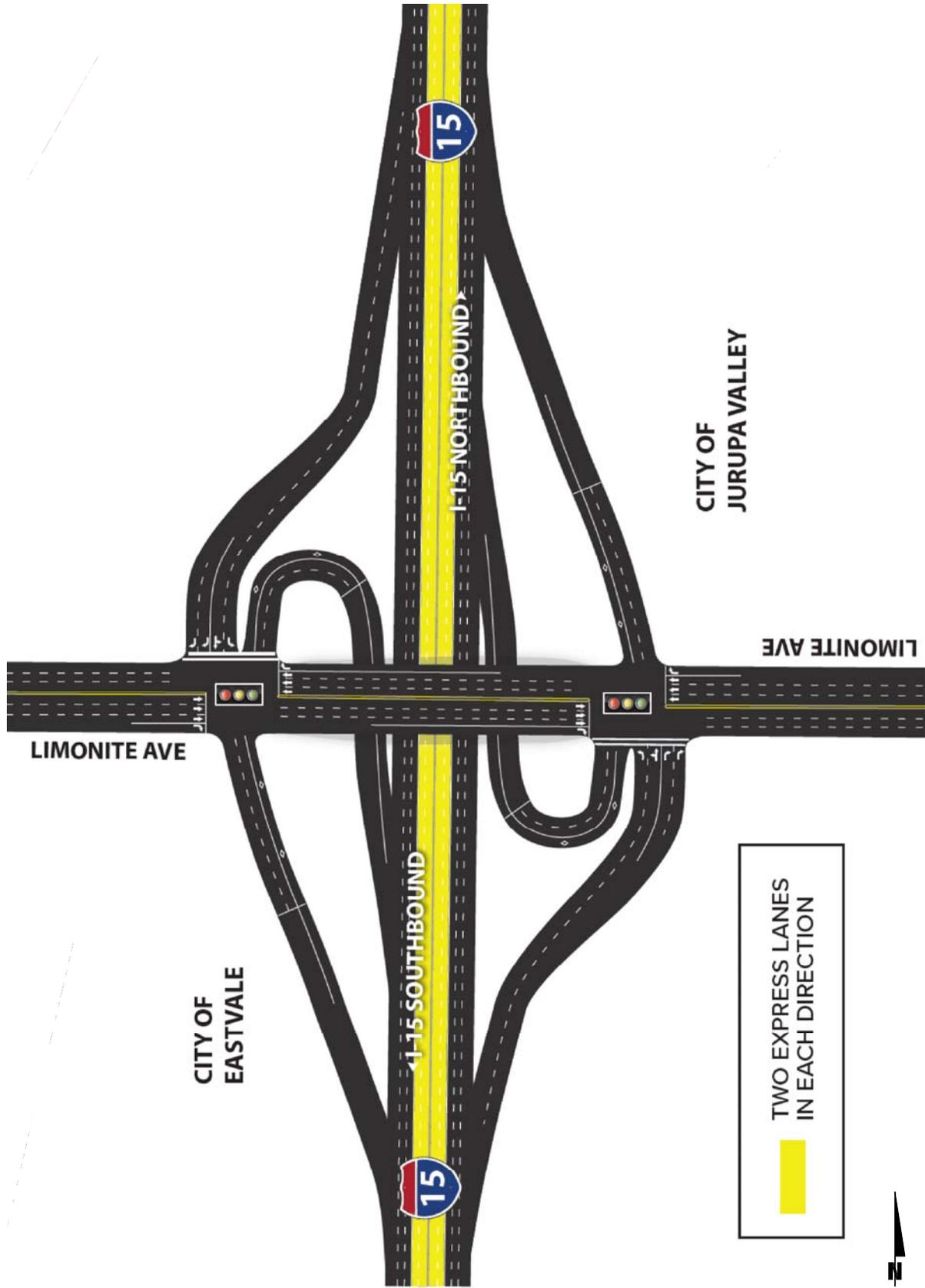
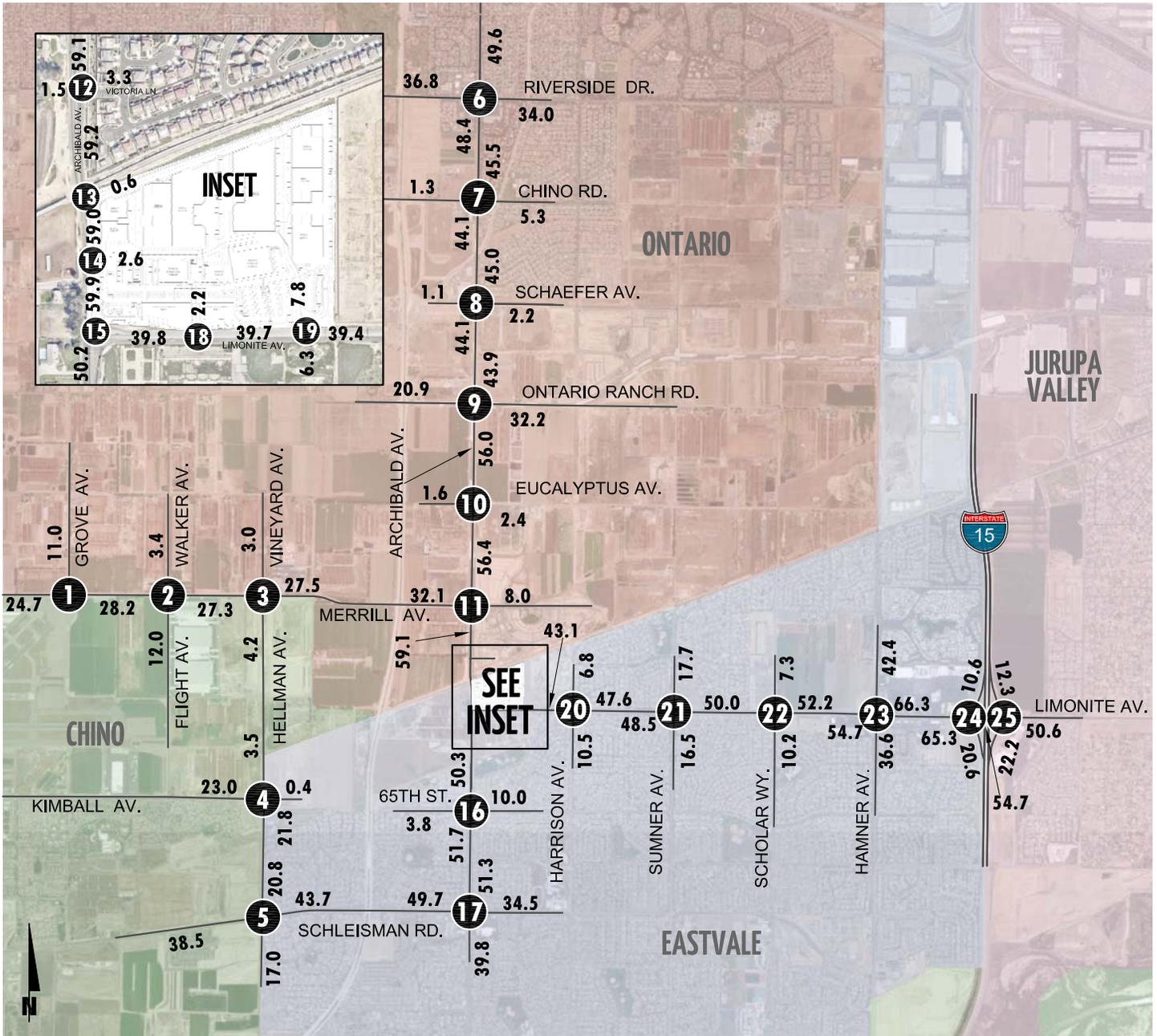


EXHIBIT 6-3: OPENING YEAR CUMULATIVE (2021) WITHOUT PROJECT TRAFFIC VOLUMES (IN PCE)

<p>1 Grove Av. & Merrill Av.</p> <p>137(93) ↓ 212(311) ↓ 328(239) ← 764(645) ←</p> <p>73(134) → 503(862) →</p>	<p>2 Flight Av. & Merrill Av.</p> <p>20(89) ↓ 6(34) ↓ 54(39) ← 725(550) ← 192(174) ←</p> <p>54(39) → 457(819) → 182(226) →</p> <p>291(206) ↑ 17(14) ↑ 199(202) ↑</p>	<p>3 Vineyard Av. & Merrill Av.</p> <p>13(55) ↓ 6(34) ↓ 12(121) ↓ 66(50) ← 909(610) ← 141(60) ←</p> <p>30(21) → 582(1016) → 61(35) →</p> <p>26(72) ↑ 17(14) ↑ 43(151) ↑</p>	<p>4 Hellman Av. & Kimball Av.</p> <p>253(201) ↓ 132(369) ↓ 15(6) ↓ 4(16) ← 1(5) ← 3(10) ←</p> <p>229(342) → 5(2) → 84(414) →</p> <p>373(138) ↑ 501(171) ↑ 10(4) ↑</p>	<p>5 Hellman Av. & Pine Av.</p> <p>24(47) ↓ 138(350) ↓ 162(627) ↓ 519(203) ← 1179(648) ← 32(48) ←</p> <p>45(26) → 579(1351) → 329(359) →</p> <p>451(160) ↑ 494(155) ↑ 60(54) ↑</p>	<p>6 Archibald Av. & Riverside Dr.</p> <p>200(230) ↓ 779(1290) ↓ 259(463) ↓ 377(309) ← 605(551) ← 126(220) ←</p> <p>206(226) → 357(756) → 243(358) →</p> <p>349(385) ↑ 1451(1119) ↑ 88(104) ↑</p>
<p>7 Archibald Av. & Chlno Av.</p> <p>23(16) ↓ 1028(1639) ↓ 103(145) ↓ 233(90) ← 4(0) ← 70(60) ←</p> <p>29(14) → 7(0) → 23(24) →</p> <p>34(40) ↑ 1538(1378) ↑ 77(63) ↑</p>	<p>8 Archibald Av. & Schaefer Av.</p> <p>4(10) ↓ 1115(1663) ↓ 31(90) ↓ 12(13) ← 25(19) ← 11(12) ←</p> <p>6(9) → 9(30) → 23(21) →</p> <p>24(21) ↑ 1561(1479) ↑ 10(12) ↑</p>	<p>9 Archibald Av. & Ontario Ranch Rd.</p> <p>92(84) ↓ 954(1453) ↓ 66(149) ↓ 105(121) ← 474(320) ← 509(566) ←</p> <p>33(116) → 325(686) → 82(147) →</p> <p>176(107) ↑ 1427(1265) ↑ 538(592) ↑</p>	<p>10 Archibald Av. & Eucalyptus Av.</p> <p>10(32) ↓ 1505(2050) ↓ 30(84) ↓ 73(52) ← 0(0) ← 51(42) ←</p> <p>29(19) → 0(0) → 67(44) →</p> <p>22(75) ↑ 2037(1892) ↑ 27(62) ↑</p>	<p>11 Archibald Av. & Merrill Av.</p> <p>658(401) ↓ 904(1647) ↓ 60(89) ↓ 138(67) ← 148(106) ← 143(108) ←</p> <p>411(722) → 70(184) → 319(787) →</p> <p>731(353) ↑ 1538(1240) ↑ 64(128) ↑</p>	<p>12 Archibald Av. & Victoria Ln.</p> <p>30(13) ↓ 1303(2507) ↓ 33(22) ↓ 141(33) ← 0(0) ← 54(50) ←</p> <p>22(77) → 0(0) → 8(29) →</p> <p>78(33) ↑ 2170(1611) ↑ 174(156) ↑</p>
<p>13 Archibald Av. & Dwy. 1</p> <p>Future Intersection</p>	<p>14 Archibald Av. & Dwy. 2</p> <p>Future Intersection</p>	<p>15 Archibald Av. & Limonite Av.</p> <p>895(1475) ↓ 470(1111) ↓ 1236(622) ← 552(522) ←</p> <p>1186(1179) ↑ 374(617) ↑</p>	<p>16 Archibald Av. & 65th St.</p> <p>14(69) ↓ 1136(1744) ↓ 37(165) ↓ 73(39) ← 30(31) ← 262(133) ←</p> <p>55(40) → 67(30) → 81(21) →</p> <p>38(49) ↑ 1410(1427) ↑ 209(230) ↑</p>	<p>17 Archibald Av. & Schleisman Rd.</p> <p>691(574) ↓ 751(1059) ↓ 120(209) ↓ 140(94) ← 724(349) ← 223(107) ←</p> <p>574(664) → 593(1218) → 145(280) →</p> <p>352(238) ↑ 1040(976) ↑ 207(133) ↑</p>	<p>18 Dwy. 3 & Limonite Av.</p> <p>Future Intersection</p>
<p>19 Dwy. 4 & Limonite Av.</p> <p>1653(955) ↓ 165(176) ↓</p> <p>759(1636) → 85(92) →</p> <p>135(189) ↑ 92(124) ↑</p>	<p>20 Harrison Av. & Limonite Av.</p> <p>125(69) ↓ 107(44) ↓ 154(95) ↓ 78(154) ← 1579(1098) ← 187(248) ←</p> <p>70(139) → 787(1599) → 27(77) →</p> <p>183(62) ↑ 90(62) ↑ 249(211) ↑</p>	<p>21 Sumner Av. & Limonite Av.</p> <p>103(193) ↓ 160(331) ↓ 178(165) ↓ 56(148) ← 1327(1285) ← 155(245) ←</p> <p>120(206) → 1003(1619) → 30(84) →</p> <p>152(80) ↑ 185(201) ↑ 205(161) ↑</p>	<p>22 Scholar Wy. & Limonite Av.</p> <p>51(40) ↓ 198(170) ↓ 60(72) ↓ 31(67) ← 1411(1512) ← 87(146) ←</p> <p>28(62) → 1372(1828) → 102(101) →</p> <p>132(82) ↑ 146(50) ↑ 154(133) ↑</p>	<p>23 Hamner Av. & Limonite Av.</p> <p>173(350) ↓ 319(795) ↓ 329(490) ↓ 244(356) ← 1178(1096) ← 218(432) ←</p> <p>257(441) → 1250(1471) → 88(138) →</p> <p>172(254) ↑ 651(600) ↑ 467(259) ↑</p>	<p>24 I-15 SB Ramps & Limonite Av.</p> <p>576(547) ↓ 0(1) ↓ 149(134) ↓ 1216(1532) ← 660(532) ←</p> <p>1359(1555) → 788(1007) →</p>
<p>25 I-15 NB Ramps & Limonite Av.</p> <p>393(193) ↓ 1262(1379) ↓</p> <p>816(653) → 693(1037) →</p> <p>614(686) ↑ 0(2) ↑ 319(786) ↑</p>	<p>LEGEND: 10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES</p>				

EXHIBIT 6-4: OPENING YEAR CUMULATIVE (2021) WITH PROJECT AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

10.0 = ESTIMATED VEHICLES PER DAY (1000'S)

EXHIBIT 6-5: OPENING YEAR CUMULATIVE (2021) WITH PROJECT TRAFFIC VOLUMES (IN PCE)

<p>1 Grove Av. & Merrill Av.</p> <p>↓ 137(93) ↓ 228(325) ← 339(254) ← 776(665)</p> <p>73(134) → 523(878) →</p>	<p>2 Flight Av. & Merrill Av.</p> <p>↓ 20(89) ↓ 6(34) ← 54(39) ← 748(585) ← 192(174)</p> <p>54(39) → 493(849) → 182(226) →</p> <p>291(206) ↑ 17(14) ↑ 199(202) ↑</p>	<p>3 Vineyard Av. & Merrill Av.</p> <p>↓ 13(55) ↓ 6(34) ↓ 12(121) ← 66(50) ← 932(645) ← 141(60)</p> <p>30(21) → 618(1046) → 61(35) →</p> <p>26(72) ↑ 17(14) ↑ 43(151) ↑</p>	<p>4 Hellman Av. & Kimball Av.</p> <p>↓ 253(201) ↓ 132(369) ↓ 15(6) ← 4(16) ← 1(5) ← 3(10)</p> <p>229(342) → 5(2) → 103(431) →</p> <p>386(156) ↑ 501(171) ↑ 10(4) ↑</p>	<p>5 Hellman Av. & Pine Av.</p> <p>↓ 24(47) ↓ 138(350) ↓ 181(644) ← 532(221) ← 1192(666) ← 34(51)</p> <p>45(26) → 598(1368) → 329(359) →</p> <p>451(160) ↑ 494(155) ↑ 63(57) ↑</p>	<p>6 Archibald Av. & Riverside Dr.</p> <p>↓ 200(230) ↓ 800(1305) ↓ 259(463) ← 377(309) ← 605(551) ← 135(229)</p> <p>206(226) → 357(756) → 252(367) →</p> <p>355(394) ↑ 1462(1141) ↑ 94(113) ↑</p>
<p>7 Archibald Av. & Chino Av.</p> <p>↓ 23(16) ↓ 1068(1671) ↓ 103(145) ← 233(90) ← 4(0) ← 76(66)</p> <p>29(14) → 7(0) → 23(24) →</p> <p>34(40) ↑ 1562(1417) ↑ 81(69) ↑</p>	<p>8 Archibald Av. & Schaefer Av.</p> <p>↓ 4(10) ↓ 1161(1701) ↓ 31(89) ← 12(13) ← 25(19) ← 11(12)</p> <p>6(9) → 9(30) → 23(21) →</p> <p>24(21) ↑ 1590(1524) ↑ 10(12) ↑</p>	<p>9 Archibald Av. & Ontario Ranch Rd.</p> <p>↓ 92(84) ↓ 1000(1491) ↓ 66(149) ← 105(121) ← 474(320) ← 528(583)</p> <p>33(116) → 325(686) → 88(153) →</p> <p>180(113) ↑ 1456(1310) ↑ 551(610) ↑</p>	<p>10 Archibald Av. & Eucalyptus Av.</p> <p>↓ 10(32) ↓ 1576(2111) ↓ 30(84) ← 73(52) ← 0(0) ← 51(42)</p> <p>29(19) → 0(0) → 67(44) →</p> <p>22(75) ↑ 2083(1961) ↑ 27(62) ↑</p>	<p>11 Archibald Av. & Merrill Av.</p> <p>↓ 658(401) ↓ 975(1708) ↓ 60(89) ← 138(67) ← 148(106) ← 146(111)</p> <p>411(722) → 70(184) → 355(817) →</p> <p>754(388) ↑ 1584(1309) ↑ 66(131) ↑</p>	<p>12 Archibald Av. & Victoria Ln.</p> <p>↓ 30(13) ↓ 1413(2601) ↓ 33(22) ← 141(33) ← 0(0) ← 54(50)</p> <p>22(77) → 0(0) → 8(29) →</p> <p>78(33) ↑ 2241(1718) ↑ 174(156) ↑</p>
<p>13 Archibald Av. & Dwy. 1</p> <p>↓ 1443(2656) ↓ 33(24) ← 20(33)</p> <p>2473(1873) ↑ 16(14) ↑</p>	<p>14 Archibald Av. & Dwy. 2</p> <p>↓ 1443(2656) ← 104(107)</p> <p>2385(1781) ↑ 114(99) ↑</p>	<p>15 Archibald Av. & Limonite Av.</p> <p>↓ 895(1475) ↓ 548(1181) ← 1250(645) ← 629(629)</p> <p>1249(1236) ↑ 424(663) ↑</p>	<p>16 Archibald Av. & 65th St.</p> <p>↓ 16(72) ↓ 1201(1833) ↓ 48(180) ← 89(53) ← 30(31) ← 262(133)</p> <p>58(43) → 67(30) → 81(21) →</p> <p>38(49) ↑ 1505(1513) ↑ 209(230) ↑</p>	<p>17 Archibald Av. & Schleisman Rd.</p> <p>↓ 721(616) ↓ 768(1083) ↓ 137(233) ← 165(117) ← 724(349) ← 223(107)</p> <p>618(704) → 593(1218) → 145(280) →</p> <p>352(238) ↑ 1065(999) ↑ 207(133) ↑</p>	<p>18 Dwy. 3 & Limonite Av.</p> <p>↓ 83(94) ← 97(86) ← 1797(1180)</p> <p>972(1844) →</p>
<p>19 Dwy. 4 & Limonite Av.</p> <p>↓ 119(129) ↓ 0(0) ↓ 165(184) ← 126(105) ← 1640(948) ← 165(176)</p> <p>219(192) → 668(1560) → 85(92) →</p> <p>135(189) ↑ 0(0) ↑ 92(124) ↑</p>	<p>20 Harrison Av. & Limonite Av.</p> <p>↓ 128(72) ↓ 107(44) ↓ 154(95) ← 78(154) ← 1685(1190) ← 187(248)</p> <p>72(142) → 856(1701) → 29(80) →</p> <p>186(65) ↑ 90(62) ↑ 249(211) ↑</p>	<p>21 Sumner Av. & Limonite Av.</p> <p>↓ 106(196) ↓ 160(331) ↓ 178(165) ← 56(148) ← 1427(1371) ← 155(245)</p> <p>122(209) → 1068(1715) → 32(87) →</p> <p>155(83) ↑ 185(201) ↑ 205(161) ↑</p>	<p>22 Scholar Wy. & Limonite Av.</p> <p>↓ 57(46) ↓ 198(170) ↓ 60(72) ← 31(67) ← 1498(1587) ← 87(146)</p> <p>32(68) → 1429(1912) → 106(107) →</p> <p>138(88) ↑ 146(50) ↑ 154(133) ↑</p>	<p>23 Hamner Av. & Limonite Av.</p> <p>↓ 179(356) ↓ 319(795) ↓ 329(490) ← 244(356) ← 1243(1151) ← 218(432)</p> <p>261(447) → 1292(1534) → 99(153) →</p> <p>188(268) ↑ 651(600) ↑ 467(259) ↑</p>	<p>24 I-15 SB Ramps & Limonite Av.</p> <p>↓ 605(572) ↓ 0(1) ↓ 149(134) ← 1252(1562) ← 660(532)</p> <p>1388(1599) → 800(1027) →</p>
<p>25 I-15 NB Ramps & Limonite Av.</p> <p>← 393(193) ← 1278(1393)</p> <p>835(682) → 704(1052) →</p> <p>634(702) ↑ 0(2) ↑ 319(786) ↑</p>	<p>LEGEND: 10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES</p>				

6.4 INTERSECTION OPERATIONS ANALYSIS

6.4.1 OPENING YEAR CUMULATIVE (2021) WITHOUT PROJECT TRAFFIC CONDITIONS

LOS calculations were conducted for the study intersections to evaluate their operations under Opening Year Cumulative (2021) Without Project conditions with roadway and intersection geometrics consistent with Section 6.1 *Roadway Improvements*. As shown in Table 6-1, the following additional study area intersections are anticipated to operate at an unacceptable LOS under Opening Year Cumulative (2021) Without Project traffic conditions:

- Grove Av. & Merrill Av. (#1) – LOS F AM and PM peak hours
- Flight Av. & Merrill Av. (#2) – LOS F AM and PM peak hours
- Hellman Av. & Merrill Av. (#3) – LOS F AM and PM peak hours
- Hellman Av. & Kimball Av. (#4) – LOS E AM and PM peak hours
- Archibald Av. & Riverside Dr. (#6) – LOS F AM and PM peak hours
- Archibald Av. & Schaefer Av. (#8) – LOS F AM and PM peak hours
- Archibald Av. & Ontario Ranch Rd. (#9) – LOS F AM and PM peak hours
- Archibald Av. & Merrill Av. (#11) – LOS F AM and PM peak hours
- Archibald Av. & Victoria Ln. (#12) – LOS E AM peak hour only
- Archibald Av. & Limonite Av. (#15) – LOS F AM and PM peak hours
- Archibald Av. & 65th St. (#16) – LOS E AM peak hour only
- Archibald Av. & Schleisman Rd. (#17) – LOS E AM and PM peak hours
- Hamner Av. & Limonite Av. (#23) – LOS E PM peak hour only
- I-15 Southbound Ramps & Limonite Av. (#24) – LOS E AM peak hour only

A summary of the peak hour intersection LOS for Opening Year Cumulative (2021) Without Project conditions is shown on Exhibit 6-6. The intersection operations analysis worksheets for Opening Year Cumulative (2021) Without Project traffic conditions are included in Appendix 6.1 of this TIA.

6.4.2 OPENING YEAR CUMULATIVE (2021) WITH PROJECT TRAFFIC CONDITIONS

As shown in Table 6-1 and illustrated on Exhibit 6-7, the following additional study area intersections are anticipated to experience unacceptable LOS with the addition of Project traffic during the peak hours:

- Harrison Av. & Limonite Av. (#20) – LOS E AM peak hour only
- I-15 Northbound Ramps & Limonite Av. (#25) – LOS E AM and PM peak hour

The intersection operations analysis worksheets for Opening Year Cumulative (2021) With Project traffic conditions are included in Appendix 6.2 of this TIA.

Table 6-1

Intersection Analysis for Opening Year Cumulative (2021) Conditions

#	Intersection	Traffic Control ²	2021 Without Project				2021 With Project				Change in Delay (secs.) ³		Acceptable LOS
			Delay ¹ (secs.)		Level of Service		Delay ¹ (secs.)		Level of Service		AM	PM	
			AM	PM	AM	PM	AM	PM	AM	PM			
1	Grove Av. & Merrill Av.	AWS	>200.0	>200.0	F	F	>200.0	>200.0	F	F	16.0	>25.0	D
2	Flight Av. & Merrill Av.	CSS	>200.0	>200.0	F	F	>200.0	>200.0	F	F	>25.0	>25.0	D
3	Hellman Av. & Merrill Av.	CSS	>200.0	>200.0	F	F	>200.0	>200.0	F	F	>25.0	>25.0	D
4	Hellman Av. & Kimball Av.	AWS	42.2	35.1	E	E	41.2	35.0	E	D	-1.0	-0.1	D
5	Hellman Av. & Pine Av.	TS	25.9	36.8	C	D	26.1	39.3	C	D	--	--	D
6	Archibald Av. & Riverside Dr.	TS	123.5	143.6	F	F	127.1	149.9	F	F	3.6	6.3	E
7	Archibald Av. & Chino Av.	TS	16.7	17.2	B	B	27.6	18.1	C	B	--	--	E
8	Archibald Av. & Schaefer Av.	CSS	>200.0	>200.0	F	F	>200.0	>200.0	F	F	>25.0	0.0	E
9	Archibald Av. & Ontario Ranch Rd.	TS	128.0	140.8	F	F	137.4	151.7	F	F	9.4	10.9	E
10	Archibald Av. & Eucalyptus Av.	TS	23.9	28.3	C	C	25.4	30.0	C	C	--	--	E
11	Archibald Av. & Merrill Av.	TS	>200.0	>200.0	F	F	>200.0	>200.0	F	F	>25.0	>25.0	E
12	Archibald Av. & Victoria Ln.	TS	55.5	37.0	E	D	60.9	52.1	E	D	5.4	--	E
13	Archibald Av. & Driveway 1	CSS	Project Improvement				33.9	18.5	D	C	--	--	D
14	Archibald Av. & Driveway 2	CSS	Project Improvement				16.6	13.9	C	B	--	--	D
15	Archibald Av. & Limonite Av.	TS	>200.0	>200.0	F	F	>200.0	>200.0	F	F	16.2	6.4	D
16	Archibald Av. & 65th St.	TS	55.1	46.4	E	D	70.7	59.9	E	E	15.6	13.5	D
17	Archibald Av. & Schleisman Rd.	TS	76.4	65.6	E	E	86.7	76.0	F	E	10.3	10.4	D
18	Driveway 3 & Limonite Av.	CSS	Project Improvement				13.4	11.7	B	B	--	--	D
19	Driveway 4 & Limonite Av.	TS	11.8	20.2	B	C	23.7	24.5	C	C	--	--	D
20	Harrison Av. & Limonite Av.	TS	53.2	25.5	D	C	65.9	26.7	E	C	12.7	--	D
21	Sumner Av. & Limonite Av.	TS	23.6	26.5	C	C	24.4	27.7	C	C	--	--	D
22	Scholar Way & Limonite Av.	TS	25.8	35.3	C	D	28.0	44.9	C	D	--	--	D
23	Hamner Av. & Limonite Av.	TS	44.6	72.2	D	E	48.4	76.4	D	E	--	4.2	D
24	I-15 SB Ramps & Limonite Av.	TS	61.4	55.4	E	E	67.4	58.5	E	E	--	--	D
25	I-15 NB Ramps & Limonite Av.	TS	51.7	51.6	D	D	71.7	78.8	E	E	--	--	D

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

¹ Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. HCM delay reported in seconds. HCM 6th Edition has been used for the operations analysis for Intersections #6, #24, and #25.

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

³ The change in delay is calculated between Without Project and With Project scenarios for City of Eastvale intersections already operating at an unacceptable LOS in Without Project conditions.

EXHIBIT 6-6: OPENING YEAR CUMULATIVE (2021) WITHOUT PROJECT SUMMARY OF LOS

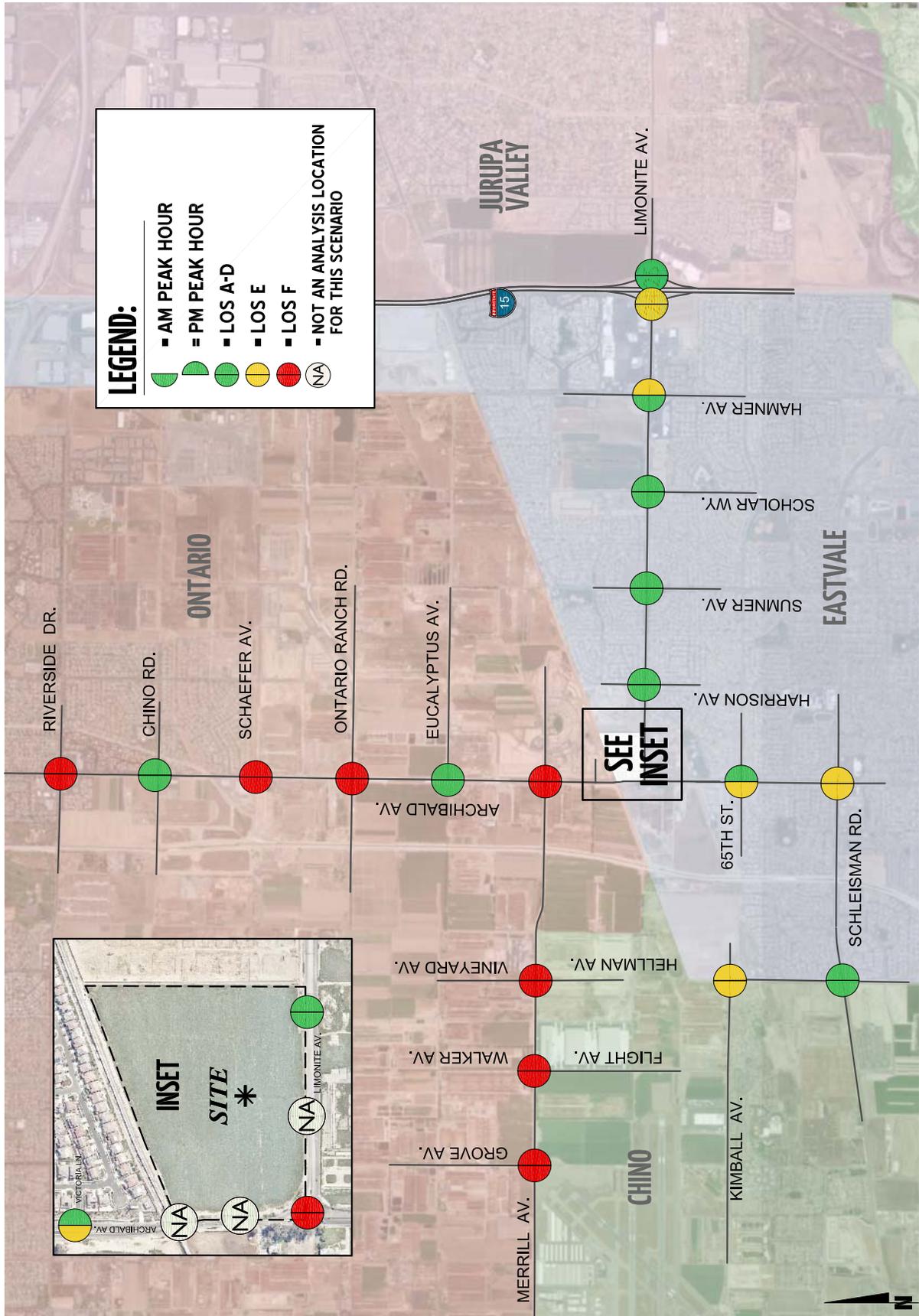
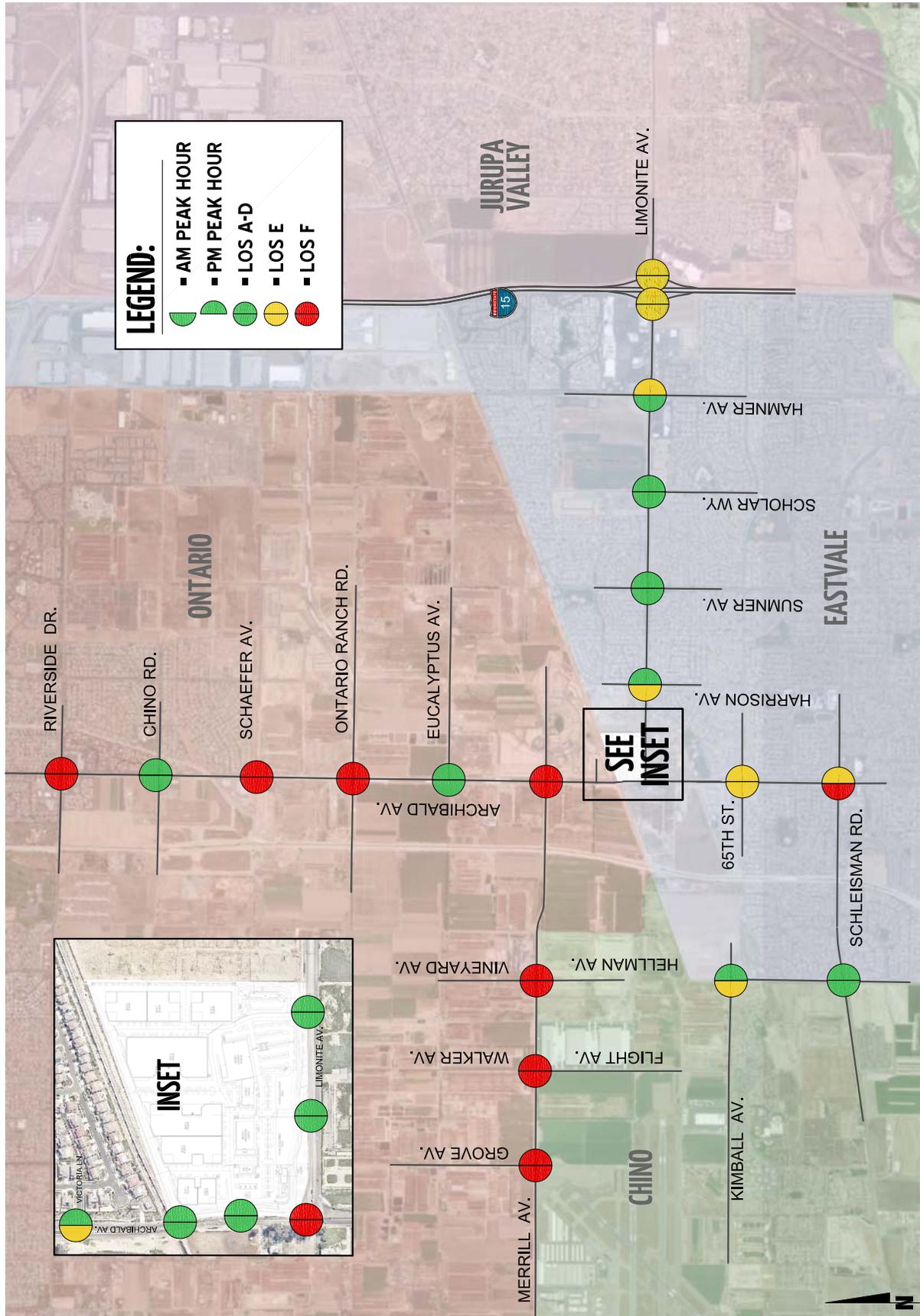


EXHIBIT 6-7: OPENING YEAR CUMULATIVE (2021) WITH PROJECT SUMMARY OF LOS



Based on the significance criteria for each applicable agency, the following intersections are anticipated to be cumulatively impacted by the Project for Opening Year Cumulative (2021) traffic conditions:

- Grove Av. & Merrill Av. (#1)
- Flight Av. & Merrill Av. (#2)
- Hellman Av. & Merrill Av. (#3)
- Archibald Av. & Riverside Dr. (#6)
- Archibald Av. & Schaefer Av. (#8)
- Archibald Av. & Ontario Ranch Rd. (#9)
- Archibald Av. & Merrill Av. (#11)
- Archibald Av. & Victoria Ln. (#12)
- Archibald Av. & Limonite Av. (#15)
- Archibald Av. & 65th St. (#16)
- Archibald Av. & Schleisman Rd. (#17)
- Harrison Av. & Limonite Av. (#20)
- I-15 Southbound Ramps & Limonite Av. (#24)
- I-15 Northbound Ramps & Limonite Av. (#25)

6.5 ROADWAY SEGMENT CAPACITY ANALYSIS

As noted previously, the roadway segment capacities are approximate figures only, and are typically used at the General Plan level to assist in determining the roadway functional classification (number of through lanes) needed to meet future forecasted traffic demand. Table 6-2 provides a summary of the Opening Year Cumulative (2021) conditions roadway segment capacity analysis based on the City of Eastvale General Plan Roadway Segment Capacity Thresholds identified previously in Table 2-3. As shown in Table 6-2, all of the study area roadway segments are anticipated to operate at unacceptable LOS (based on daily roadway segment capacities) under Opening Year Cumulative (2021) Without Project traffic conditions.

With the addition of site adjacent roadway improvements to be constructed by the Project, Limonite Avenue from Archibald Avenue to Sumner Avenue would operate at an acceptable LOS (LOS D) once widened to a 5-lane roadway under Opening Year Cumulative (2021) With Project traffic conditions.

A peak hour assessment of intersections located on either side of a deficient roadway segment has been conducted to determine if peak hour traffic flows can be accommodated by the potentially deficient roadway segment. If it is determined that peak traffic flows can be accommodated at the City's stated LOS thresholds, then roadway segment widening is typically not recommended.

Table 6-2

Roadway Segment Capacity Analysis for Opening Year Cumulative (2021) Conditions

#	Roadway	Segment Limits	Roadway Section	LOS Capacity ¹	2021 Without Project	V/C ²	LOS ³	Roadway Section	LOS Capacity ¹	2021 With Project	V/C ²	LOS ³	Change in V/C ⁴	Acceptable LOS
1	Archibald Av. to Sumner Av.		4D	35,900	36,788	1.02	F	5D	44,917	39,767	0.89	D	--	D
2	Limonite Av.		4D	35,900	52,909	1.47	F	4D	35,900	54,948	1.53	F	0.06	D
3		Hamner Av. to I-15 Freeway	6D	53,900	64,961	1.21	F	6D	53,900	66,271	1.23	F	0.02	D
4	Archibald Av.	Victoria Ln. to Limonite Av.	2D	17,950	49,958	2.78	F	4D	35,900	52,188	1.45	F	--	D
5		Limonite Av. to 65th St.	4U	35,900	47,823	1.33	F	4U	35,900	50,207	1.40	F	0.07	D

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

¹ These maximum roadway capacities have been obtained from the City of Eastvale's General Plan (Table C-1).

² V/C = Volume to Capacity Ratio

³ LOS = Level of Service

⁴ The change in V/C is calculated between Without Project and With Project scenarios for roadway segments operating at an unacceptable LOS under pre-project conditions.

6.6 TRAFFIC SIGNAL WARRANTS ANALYSIS

The intersections of Hellman Avenue at Merrill Avenue and Archibald Avenue at Schaefer Avenue are anticipated to warrant a traffic signal under Opening Year Cumulative (2021) Without Project traffic conditions in addition to those previously warranted under Existing and E+P traffic conditions. No additional intersections are anticipated to warrant a traffic signal under Opening Year Cumulative (2021) With Project traffic conditions in addition to those previously warranted under Opening Year Cumulative (2021) Without traffic conditions (see Appendices 6.3 and 6.4).

6.7 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for Opening Year Cumulative (2021) Without and With Project traffic conditions are shown in Table 6-3. As shown in Table 6-3, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Opening Year Cumulative (2021) Without and With Project traffic conditions. Worksheets for Opening Year Cumulative (2021) Without and With Project traffic conditions off-ramp queuing analysis are provided in Appendices 6.5 and 6.6, respectively.

6.8 BASIC FREEWAY SEGMENT ANALYSIS

Opening Year Cumulative (2021) Without and With Project mainline directional volumes for the AM and PM peak hours are provided on Exhibits 6-8 and 6-9, respectively. As shown in Table 6-4, the following additional freeway segments are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for both Opening Year Cumulative (2021) Without and With Project conditions:

- I-15 Freeway Southbound, North of Limonite Av. (#1) – LOS E AM and PM peak hours
- I-15 Freeway Southbound, South of Limonite Av. (#2) – LOS F AM and PM peak hours
- I-15 Freeway Northbound, North of Limonite Av. (#3) – LOS E AM peak hour only

The Project is anticipated to contribute more than 25 one-way peak hour trips to the segments north of Limonite Avenue and would therefore result in a cumulative impact on these segments. However, the Project is anticipated to contribute less than 25 one-way peak hour trips to the segments south of Limonite Avenue. As such, the impact is less than significant for Segment #2. Opening Year Cumulative (2021) Without and With Project basic freeway segment analysis worksheets are provided in Appendix 6.7 and 6.8, respectively.

Table 6-3

Peak Hour Freeway Off-Ramp Queuing Summary for Opening Year Cumulative (2021) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	2021 Without Project				2021 With Project			
			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 Ramps / Limonite Avenue	SBL	400	167	131	Yes	Yes	167	131	Yes	Yes
	SBL/T/R	400	364 ²	307 ²	Yes	Yes	406 ²	336 ²	Yes	Yes
	SBR	1,200	335 ²	249	Yes	Yes	373 ²	264	Yes	Yes
I-15 NB Ramps / Limonite Avenue	NBL	450	491 ²	633 ²	Yes ³	Yes ³	509 ²	641 ²	Yes ³	Yes ³
	NBL/T/R	1,235	424 ²	561 ²	Yes	Yes	439 ²	586 ²	Yes	Yes
	NBR	400	82	480 ²	Yes	Yes ³	84	484 ²	Yes	Yes ³

¹ Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

² 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

³ Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the I-15 Freeway mainline.

Table 6-4

Basic Freeway Segment Analysis for Opening Year Cumulative (2021) Conditions

Freeway	Direction ¹	Mainline Segment	Lanes ²	2021 Without Project				2021 With Project			
				Density ³		LOS ⁴		Density ³		LOS ⁴	
				AM	PM	AM	PM	AM	PM	AM	PM
I-15	SB	North of Limonite Av.	3	37.4	35.9	E	E	38.0	36.2	E	E
		South of Limonite Av.	3	-- ⁵	-- ⁵	F	F	-- ⁵	-- ⁵	F	F
	NB	North of Limonite Av.	3	37.0	28.2	E	D	37.3	28.4	E	D
		South of Limonite Av.	3	33.9	33.2	D	D	34.0	33.3	D	D

* **BOLD** = Unacceptable Level of Service

¹ NB = Northbound; SB = Southbound

² Number of lanes are in the specified direction and is based on existing conditions.

³ Density is measured by passenger cars per mile per lane (pc/mi/ln).

⁴ LOS = Level of Service

⁵ HCS7 does not report density for freeway facilities operating at LOS F.

**EXHIBIT 6-8: OPENING YEAR CUMULATIVE (2021) WITHOUT PROJECT WITH IMPROVEMENTS
 FREEWAY MAINLINE VOLUMES**



LEGEND:

← 100/200 = AM/PM PEAK HOUR VOLUMES
 NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)



**EXHIBIT 6-9: OPENING YEAR CUMULATIVE (2021) WITH PROJECT WITH IMPROVEMENTS
 FREEWAY MAINLINE VOLUMES**



LEGEND:

← 100/200 = AM/PM PEAK HOUR VOLUMES
 NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)



6.9 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for Opening Year Cumulative (2021) conditions and the results of this analysis are presented in Table 6-5. As shown in Table 6-5, all merge and diverge ramps are anticipated operate at LOS E or LOS F for Opening Year Cumulative (2021) Without and With Project traffic conditions. The Project is anticipated to contribute more than 25 peak hour trips to the I-15 Southbound Off-Ramp and I-15 Northbound On-Ramp at Limonite Avenue, resulting in a cumulative impact on these ramp junctions. However, the Project is anticipated to contribute less than 25 peak hour trips to the I-15 Southbound On-Ramp and I-15 Northbound Off-Ramp junctions at Limonite Avenue. As such, the Project's impact to these ramp junctions is less than significant. Opening Year Cumulative (2021) Without and With Project freeway ramp junction operations analysis worksheets are provided in Appendices 6.9 and 6.10, respectively.

6.10 RECOMMENDED IMPROVEMENTS

6.10.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as significantly impacted by the Project, in an effort to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS D or better). Significant cumulative impacts have been identified at deficient intersections if the Project contributes 50 or more peak hours or if the addition of Project traffic increases the delay by 5.0 seconds or more (for the intersections in Eastvale only).

The effectiveness of the recommended improvement strategies discussed below to address Opening Year Cumulative (2021) traffic deficiencies are presented in Table 6-6. Worksheets for Opening Year Cumulative (2021) With Project conditions, with improvements, HCM calculation worksheets are provided in Appendix 6.11.

Table 6-5

Freeway Ramp Junction Merge/Diverge Analysis for Opening Year Cumulative (2021) Conditions

Freeway	Direction ¹	Ramp or Segment	Lanes on Freeway ²	2021 Without Project				2021 With Project			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density ³	LOS ⁴						
I-15	SB	Off-Ramp at Limonite Av.	3	34.5	E	33.6	E	34.9	E	33.8	E
		On-Ramp at Limonite Av.	3	-- ⁵	F						
	NB	On-Ramp at Limonite Av.	3	38.4	E	30.4	D	38.7	E	30.6	D
		Off-Ramp at Limonite Av.	3	32.8	E	33.0	E	32.9	E	33.1	E

* **BOLD** = Unacceptable Level of Service

¹ NB = Northbound; SB = Southbound

² Number of lanes are in the specified direction and is based on existing conditions

³ Density is measured by passenger cars per mile per lane (pc/mi/ln).

⁴ LOS = Level of Service

⁵ HCS7 does not report density for freeway facilities operating at LOS F.

Table 6-6

Intersection Analysis for Opening Year Cumulative (2021) Conditions With Improvements

#	Intersection	Traffic Control ³	Intersection Approach Lanes ¹												Delay ² (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
1	Grove Av. & Merrill Av.																	
	- Without Improvements	AWS	0	0	0	0	1	0	0	1	0	0	1	0	>200.0	>200.0	F	F
	- With Improvements	TS	0	0	0	<u>1</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>2</u>	0	0	<u>2</u>	<u>1</u>	13.4	14.8	B	B
2	Flight Av. & Merrill Av.																	
	- Without Improvements	CSS	<u>1</u>	1	0	<u>1</u>	<u>1</u>	0	<u>1</u>	1	1	1	1	0	>200.0	>200.0	F	F
	- With Improvements	TS	<u>1</u>	1	0	<u>1</u>	<u>1</u>	0	<u>1</u>	<u>2</u>	1	1	<u>2</u>	0	34.0	50.6	C	D
3	Hellman Av. & Merrill Av.																	
	- Without Improvements	CSS	<u>1</u>	<u>1</u>	0	<u>1</u>	<u>1</u>	0	<u>1</u>	<u>2</u>	<u>1</u>	<u>1</u>	1	0	>200.0	>200.0	F	F
	- With Improvements	TS	<u>1</u>	<u>1</u>	0	<u>1</u>	<u>1</u>	0	<u>1</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>2</u>	0	19.8	22.9	B	C
6	Archibald Av. & Riverside Dr.																	
	- Without Improvements	TS	1	3	0	1	3	0	1	2	d	1	2	d	127.1	149.9	F	F
	- With Improvements	TS	<u>2</u>	3	0	<u>2</u>	3	0	1	2	d	1	2	<u>1</u> >	62.0	70.1	E	E
8	Archibald Av. & Schaefer Av.																	
	- Without Improvements	CSS	<u>1</u>	2	0	1	2	0	<u>1</u>	<u>1</u>	0	<u>1</u>	<u>1</u>	0	>200.0	>200.0	F	F
	- With Improvements	TS	<u>1</u>	2	0	1	2	0	<u>1</u>	<u>1</u>	0	<u>1</u>	<u>1</u>	0	21.3	30.1	C	C
9	Archibald Av. & Ontario Ranch Rd.																	
	- Without Improvements	TS	1	2	1	1	2	1	2	2	1>>	2	1	1	137.4	151.7	F	F
	- With Improvements	TS	<u>2</u>	<u>3</u>	<u>1</u> >	1	<u>3</u>	1	2	2	1>>	2	<u>2</u>	1	41.9	62.3	D	E
11	Archibald Av. & Merrill Av.																	
	- Without Improvements	TS	1	2	1	2	2	d	1	1	1	1	1	1	>200.0	>200.0	F	F
	- With Improvements	TS	<u>2</u>	<u>3</u>	1	2	<u>3</u>	<u>1</u> >	<u>2</u>	1	<u>1</u> >>	1	1	1	50.4	76.8	D	E
12	Archibald Av. & Victoria Ln.																	
	- Without Improvements	TS	<u>1</u>	2	0	<u>1</u>	<u>2</u>	<u>1</u>	0	<u>1</u>	0	0	1	0	60.9	52.1	E	D
	- With Improvements	TS	<u>1</u>	<u>3</u>	0	<u>1</u>	<u>3</u>	<u>1</u>	0	<u>1</u>	0	0	1	0	15.0	10.6	B	B
15	Archibald Av. & Limonite Av.																	
	- Without Improvements	TS	0	1	1>	1	1	0	0	0	0	1	0	1>	>200.0	>200.0	F	F
	- With Improvements	TS	0	<u>2</u>	1>	<u>2</u>	<u>2</u>	0	0	0	0	<u>2</u>	0	<u>2</u> >	33.6	54.8	C	D
16	Archibald Av. & 65th St.																	
	- Without Improvements	TS	1	2	1	1	3	0	1	2	0	1	1	1	70.7	59.9	E	E
	- With Improvements	TS	1	<u>3</u>	1	1	3	0	1	2	0	1	1	1	25.3	23.9	C	C
17	Archibald Av. & Schleisman Rd.																	
	- Without Improvements	TS	2	3	1	2	3	1	2	3	1	2	3	1	86.7	76.0	F	E
	- With Improvements	TS	2	3	<u>1</u> >	2	3	<u>1</u> >	2	3	<u>1</u> >	2	3	<u>1</u> >	46.1	32.4	D	C
20	Harrison Av. & Limonite Av.																	
	- Without Improvements	TS	1	1	1	1	1	0	1	3	d	1	2	1	65.9	26.7	E	C
	- With Improvements	TS	1	1	1	1	1	0	1	3	d	1	<u>3</u>	1	35.3	26.1	D	C
24	I-15 SB Ramps & Limonite Av.																	
	- Without Improvements	TS	0	0	0	1	1	1	0	2	1	2	2	0	28.0	44.9	C	D
	- With Improvements ⁴	TS	0	0	0	1	1	<u>2</u>	0	<u>3</u>	<u>1</u> >>	<u>0</u>	<u>3</u>	<u>1</u> >>	15.5	17.1	B	B
25	I-15 NB Ramps & Limonite Av.																	
	- Without Improvements	TS	1	1	1	0	0	0	2	2	0	0	2	1	71.7	78.8	E	E
	- With Improvements ⁴	TS	1	1	<u>2</u>	0	0	0	<u>0</u>	<u>3</u>	<u>1</u> >>	<u>0</u>	<u>3</u>	<u>1</u> >>	21.3	19.6	C	B

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

L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing; >> = Free-Right Turn Lane; 1 = Improvement

² Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

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

⁴ Improvements shown are consistent with the planned I-15/Limonite Avenue interchange project, which is anticipated to be completed by Year 2019.

6.10.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON ROADWAY SEGMENTS

As shown in Table 6-6, the Opening Year Cumulative peak hour analysis indicates that the adjacent study area intersections on either side of the deficient roadway segments are anticipated to operate at acceptable LOS with the recommended intersection improvements shown. These intersection improvements consist of installation of traffic signals, additional turn lanes, additional through lanes, and traffic signal modifications to accommodate right turn overlap phasing. Table 6-7 shows the LOS for each of the applicable roadway segments with improvements consistent with those shown in Table 6-6 for the adjacent study area intersections, where roadway widening through additional through lanes has been recommended. In other words, only the roadway segments adjacent to study area intersections where additional through lanes have been recommended in Table 6-6 are shown in Table 6-7.

As shown in Table 6-7, all roadway segments shown are anticipated to improve in LOS to acceptable levels, with the exception of the segment of Limonite Avenue between Hamner Avenue and the I-15 Freeway. However, more detailed peak hour intersection operations shown in Table 6-1 and Table 6-6 indicate that the intersections on either side of this segment could process peak hour traffic flows. As such, additional roadway widening has not been recommended for Opening Year Cumulative (2021) traffic conditions.

6.10.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON OFF-RAMP QUEUES

As shown previously in Table 6-3, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Opening Year Cumulative (2021) traffic conditions. However, Table 6-8 shows the queuing results with the proposed intersection improvements shown previously in Table 6-6 which are consistent with the planned I-15/Limonite Avenue interchange project. Worksheets for Opening Year Cumulative (2021) With Project traffic conditions, with improvements, off-ramp queuing analysis are provided in Appendix 6.12.

6.10.4 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

There are planned improvements for the I-15 Freeway at Limonite Avenue Interchange, which would consist of a new 8-lane overcrossing along Limonite Avenue (3 through lanes in each direction plus 2 right turn lanes at each ramp), widening of the off-ramps from 2 to 4 lanes, the addition of 2 new loop on-ramps, and additional widening of Limonite Avenue to 4 lanes in each direction between Hamner Avenue and Wineville Avenue. The construction is anticipated to begin mid to late 2018 with completion of construction to occur in 2019. However, this planned improvement does not widen the existing freeway mainline segments. There is a separate I-15 Freeway project that includes the construction of 2 tolled Express Lanes between the SR-60 Freeway and Cajalco Road. The Express Lanes are not anticipated to be completed until Year 2020.

Table 6-7

Roadway Segment Capacity Analysis for Opening Year Cumulative (2021) Conditions With Improvements

#	Roadway	Segment Limits	Roadway Section	LOS Capacity ¹	2021 With Project	V/C ²	LOS ³	Change in V/C ⁴	Acceptable LOS
1	Limonite Av.	Archibald Av. to Sumner Av.	6D	53,900	39,767	0.74	D	--	D
2		Sumner Av. to Hamner Av.	6D	53,900	54,948	1.02	F	-0.45	D
3		Hamner Av. to I-15 Freeway	6D	53,900	66,271	1.23	F	0.02	D
4	Archibald Av.	Victoria Ln. to Limonite Av.	6D	53,900	52,188	0.97	E	--	D
5		Limonite Av. to 65th St.	6D	53,900	50,207	0.93	E	-1.73	D

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

¹ These maximum roadway capacities have been obtained from the City of Eastvale's General Plan (Table C-1).

² V/C = Volume to Capacity Ratio

³ LOS = Level of Service

Table 6-8

Peak Hour Freeway Off-Ramp Queuing Summary for Opening Year Cumulative (2021) Conditions With Improvements

Intersection	Movement	Available Stacking Distance (Feet)	2021 With Project			
			95th Percentile Queue (Feet)		Acceptable? ¹	
			AM Peak Hour	PM Peak Hour	AM	PM
I-15 SB Ramps / Limonite Avenue	SBL	1,765	77	71	Yes	Yes
	SBL/T/R	1,765	78	73	Yes	Yes
	SBR	425	270	255	Yes	Yes
I-15 NB Ramps / Limonite Avenue	NBL	1,765	287	264	Yes	Yes
	NBL/T/R	1,765	287	267	Yes	Yes
	NBR	475	53	280	Yes	Yes

¹ Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

² 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

Caltrans typically assumes a reduction of 14 percent to the freeway mainline through volumes in this region to account for vehicles utilizing the carpool (high-occupancy vehicle) lanes. The reduction to the I-15 Freeway mainline volumes has been applied to account for the proposed Express Toll lanes. The analysis has been performed assuming the same number of mixed-flow lanes as existing baseline conditions at the I-15 Freeway at Limonite Avenue interchange. Reductions to mainline volumes have been taken into account for the Express Toll lanes, however, HCM analyses for the freeway facility only considers the traffic in the mixed-flow lanes.

As shown in Table 6-9, the I-15 Freeway mainline segments are anticipated to operate at an acceptable LOS with the improvements discussed above with the exception of the following segment:

- I-15 Freeway Southbound, South of Limonite Av. (#2) – LOS E AM and PM peak hours

Table 6-10 shows that the I-15 Freeway ramp junctions are anticipated to operate at an acceptable LOS with the improvements discussed above (i.e., LOS D or better). Worksheets for Opening Year Cumulative (2021) Without and With Project conditions freeway mainline level of service analysis, with improvements, are provided in Appendix 6.13 and Appendix 6.14. Opening Year Cumulative (2021) Without and With Project freeway ramp junction level of service analysis worksheets, with improvements, are provided in Appendix 6.15 and Appendix 6.16.

Table 6-9

Basic Freeway Segment Analysis for Opening Year Cumulative (2021) Conditions With Improvements

Freeway	Direction ¹	Mainline Segment	Lanes ²	2021 Without Project				2021 With Project			
				Density ³		LOS ⁴		Density ³		LOS ⁴	
				AM	PM	AM	PM	AM	PM	AM	PM
I-15	SB	North of Limonite Av.	3	29.3	28.3	D	D	29.6	28.4	D	D
		South of Limonite Av.	3	36.7	37.2	E	E	36.8	37.4	E	E
	NB	North of Limonite Av.	3	29.0	23.2	D	C	29.2	23.4	D	C
		South of Limonite Av.	3	27.0	27.5	D	D	27.2	27.7	D	D

* **BOLD** = Unacceptable Level of Service

¹ NB = Northbound; SB = Southbound

² Number of lanes are in the specified direction and is based on existing lanes plus forecasts reflect the proposed Express Lanes.

³ Density is measured by passenger cars per mile per lane (pc/mi/ln).

⁴ LOS = Level of Service

Table 6-10

Freeway Ramp Junction Merge/Diverge Analysis for Opening Year Cumulative (2021) Conditions With Improvements

Freeway	Direction ¹	Ramp or Segment	Lanes on Freeway ²	2021 Without Project				2021 With Project			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density ³	LOS ⁴						
I-15	SB	Off-Ramp at Limonite Av.	3	29.7	D	28.8	D	29.9	D	29.0	D
		Loop On-Ramp at Limonite Av.	3	31.1	D	29.6	D	31.1	D	29.6	D
		On-Ramp at Limonite Av.	3	37.6	D	38.3	D	37.8	D	38.5	D
	NB	On-Ramp at Limonite Av.	3	30.9	D	25.4	C	31.1	D	25.5	C
		Loop On-Ramp at Limonite Av.	3	28.2	C	24.3	C	28.4	C	24.4	C
		Off-Ramp at Limonite Av.	3	28.2	D	29.2	D	28.3	D	29.3	D

* **BOLD** = Unacceptable Level of Service

¹ NB = Northbound; SB = Southbound

² Number of lanes are in the specified direction and is based on existing lanes plus forecasts reflect the proposed Express Lanes and I-15/Limonite interchange configuration.

³ Density is measured by passenger cars per mile per lane (pc/mi/ln).

⁴ LOS = Level of Service

⁵ Improvements include the proposed configuration for the I-15 Freeway/Limonite Avenue interchange, which is anticipated to be completed by Year 2019.

7 HORIZON YEAR (2040) TRAFFIC CONDITIONS

This section discusses the methods used to develop Horizon Year (2040) Without and With Project traffic forecasts, and the resulting intersection operations, roadway segment capacity, freeway mainline operations, and traffic signal warrant analyses.

7.1 ROADWAY IMPROVEMENTS

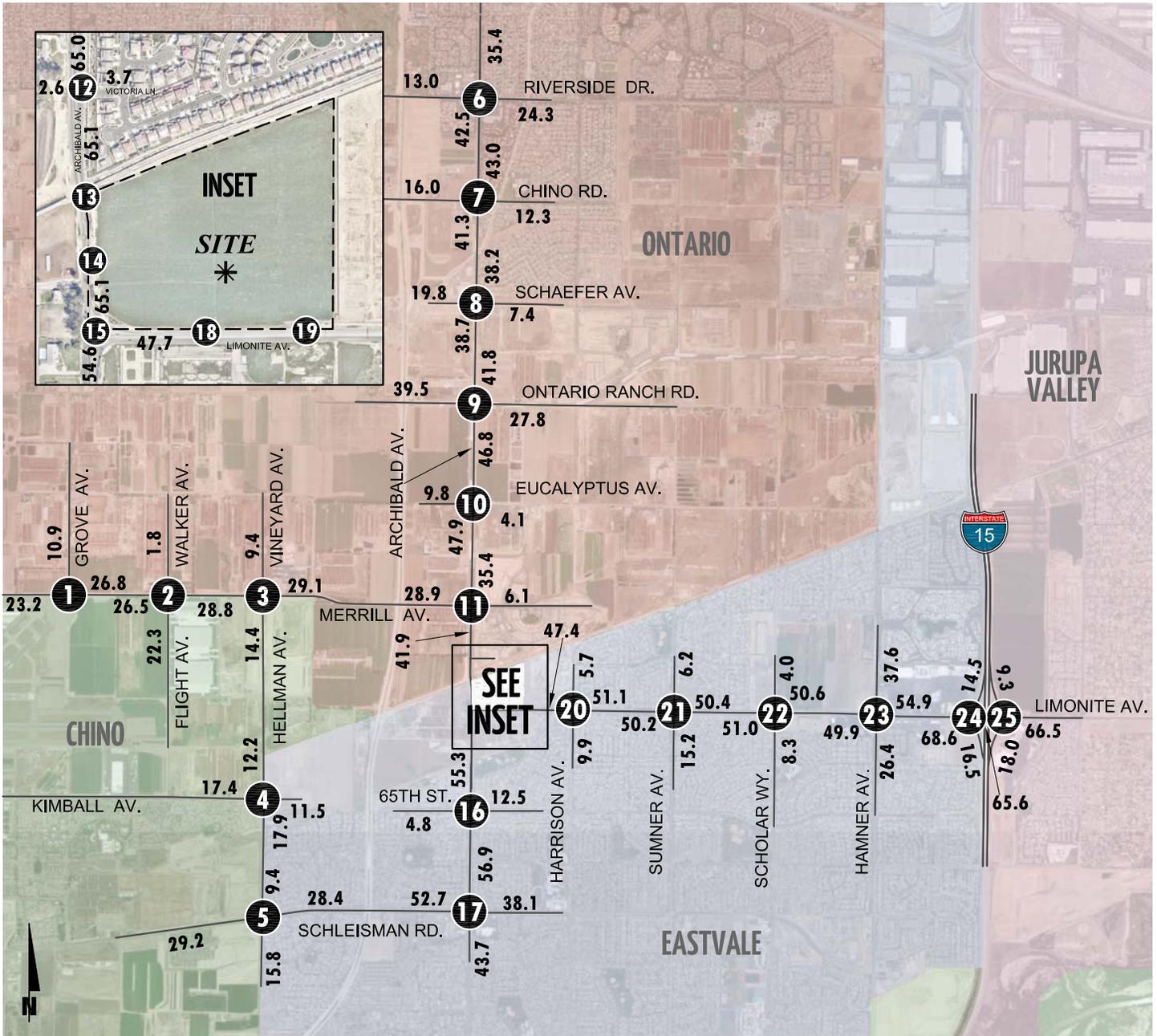
The lane configurations and traffic controls assumed to be in place for Horizon Year (2040) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for Horizon Year conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for Horizon Year conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways such as the northern extension of Hellman Avenue north of Kimball Avenue).
- Other parallel facilities, that although not evaluated for the purposes of this analysis, are anticipated to be in place for Horizon Year traffic conditions and would affect the travel patterns within the study area (e.g., new future roadways within the New Model Colony area such as Schaefer Avenue east of Archibald Avenue, Eucalyptus Avenue east of Archibald Avenue, Merrill Avenue east of Archibald Avenue, The Preserve Specific Plan roadway network within the City of Chino, the Pine Avenue extension between its El Prado Road and the SR-71 Freeway etc.).
- The I-15 Freeway & Limonite Avenue interchange project is anticipated to be completed by Year 2019. However, for the purposes of this analysis, the existing interchange was evaluated first and improvements were recommended to address any deficiencies are consistent with the interchange improvements, as shown previously on Exhibit 6-1.

7.2 HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-process volumes obtained from the RivTAM and SBTAM (see Section 4.7 *Horizon Year (2040) Volume Development* of this TIA for a detailed discussion on the post-processing methodology). The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Horizon Year (2040) Without Project traffic conditions are shown on Exhibits 7-1 and 7-2 (Without Limonite Avenue Extension) and on Exhibits 7-5 and 7-6 (With Limonite Avenue Extension).

EXHIBIT 7-1: HORIZON YEAR (2040) WITHOUT PROJECT (WITHOUT LIMONITE AVENUE EXTENSION) AVERAGE DAILY TRAFFIC (ADT)



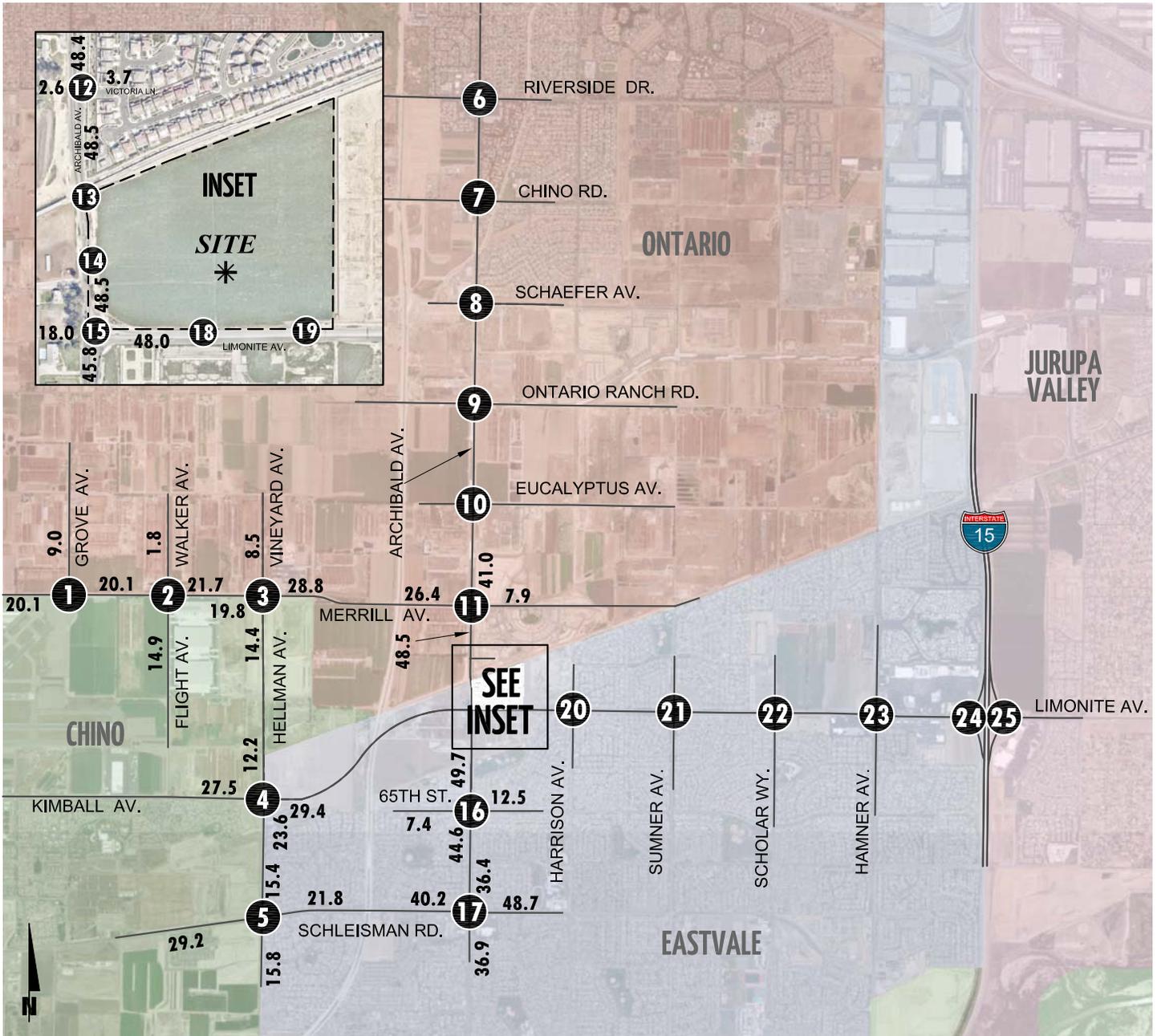
LEGEND:

10.0 = ESTIMATED VEHICLES PER DAY (1000'S)

EXHIBIT 7-2: HORIZON YEAR (2040) WITHOUT PROJECT (WITHOUT LIMONITE AVENUE EXTENSION) TRAFFIC VOLUMES (IN PCE)

<p>1 Grove Av. & Merrill Av.</p> <p>124(53) 283(322) 463(372) 615(542)</p> <p>68(139) 580(749)</p>	<p>2 Flight Av. & Merrill Av.</p> <p>31(16) 22(15) 41(18) 10(45) 697(662) 380(368)</p> <p>5(42) 635(694) 301(412)</p> <p>416(302) 10(15) 274(442)</p>	<p>3 Vineyard Av. & Merrill Av.</p> <p>72(192) 44(75) 122(235) 300(113) 528(664) 307(109)</p> <p>127(122) 633(671) 191(365)</p> <p>487(219) 78(66) 167(424)</p>	<p>4 Hellman Av. & Kimball Av.</p> <p>186(124) 135(367) 21(43) 50(37) 261(341) 99(110)</p> <p>256(186) 175(299) 137(494)</p> <p>190(208) 521(175) 148(148)</p>	<p>5 Hellman Av. & Pine Av.</p> <p>131(352) 185(326) 114(286) 173(192) 990(938) 85(38)</p> <p>162(188) 529(1465) 359(468)</p> <p>511(178) 436(188) 61(50)</p>	<p>6 Archibald Av. & Riverside Dr.</p> <p>120(189) 731(1302) 242(313) 270(133) 284(364) 242(317)</p> <p>211(145) 411(544) 200(303)</p> <p>186(326) 1435(982) 245(233)</p>
<p>7 Archibald Av. & Chlno Av.</p> <p>117(280) 770(1107) 96(174) 110(133) 140(288) 99(118)</p> <p>204(232) 212(312) 184(206)</p> <p>112(232) 850(996) 92(144)</p>	<p>8 Archibald Av. & Schaefer Av.</p> <p>199(269) 1018(1313) 31(111) 97(108) 103(447) 116(77)</p> <p>174(284) 107(111) 137(188)</p> <p>287(314) 941(1309) 33(127)</p>	<p>9 Archibald Av. & Ontario Ranch Rd.</p> <p>283(354) 772(848) 108(168) 199(196) 676(1019) 365(415)</p> <p>239(416) 720(1209) 401(514)</p> <p>371(486) 641(893) 144(235)</p>	<p>10 Archibald Av. & Eucalyptus Av.</p> <p>354(36) 1250(1476) 88(45) 139(82) 33(15) 130(70)</p> <p>112(64) 54(28) 301(104)</p> <p>306(95) 1089(1513) 54(99)</p>	<p>11 Archibald Av. & Merrill Av.</p> <p>551(349) 1231(1689) 46(58) 86(43) 131(112) 139(329)</p> <p>325(663) 69(162) 476(884)</p> <p>841(611) 999(1536) 388(193)</p>	<p>12 Archibald Av. & Victoria Ln.</p> <p>40(17) 1769(2861) 36(24) 155(36) 0(0) 59(55)</p> <p>42(147) 0(0) 12(42)</p> <p>125(52) 2031(2157) 191(172)</p>
<p>13 Archibald Av. & Dwy. 1</p> <p>Future Intersection</p>	<p>14 Archibald Av. & Dwy. 2</p> <p>Future Intersection</p>	<p>15 Archibald Av. & Limonite Av.</p> <p>1179(1961) 662(997) 1144(1339) 475(612)</p> <p>1203(1042) 759(838)</p>	<p>16 Archibald Av. & 65th St.</p> <p>47(145) 1616(2016) 77(261) 154(50) 38(40) 336(170)</p> <p>150(51) 86(39) 104(28)</p> <p>48(63) 1694(1574) 268(295)</p>	<p>17 Archibald Av. & Schleisman Rd.</p> <p>793(678) 845(1191) 131(217) 182(129) 841(388) 287(137)</p> <p>680(775) 714(1467) 173(309)</p> <p>404(289) 1172(1099) 266(171)</p>	<p>18 Dwy. 3 & Limonite Av.</p> <p>Future Intersection</p>
<p>19 Dwy. 4 & Limonite Av.</p> <p>1484(1763) 165(176)</p> <p>1286(1690) 135(145)</p> <p>135(188) 92(124)</p>	<p>20 Harrison Av. & Limonite Av.</p> <p>136(144) 30(109) 164(109) 82(93) 1394(1660) 38(251)</p> <p>71(78) 1250(1526) 57(210)</p> <p>119(135) 57(58) 144(157)</p>	<p>21 Sumner Av. & Limonite Av.</p> <p>96(88) 140(166) 126(93) 22(66) 1331(1836) 165(489)</p> <p>100(114) 1602(1611) 295(541)</p> <p>388(422) 212(79) 276(321)</p>	<p>22 Scholar Wy. & Limonite Av.</p> <p>58(66) 194(95) 39(34) 21(47) 1345(2025) 90(214)</p> <p>45(65) 1699(1563) 85(195)</p> <p>124(267) 147(34) 218(186)</p>	<p>23 Hamner Av. & Limonite Av.</p> <p>272(409) 437(983) 660(633) 506(648) 910(1346) 162(362)</p> <p>316(330) 1352(1091) 95(181)</p> <p>129(229) 657(1010) 317(363)</p>	<p>24 I-15 SB Ramps & Limonite Av.</p> <p>258(498) 0(0) 424(517) 1057(913) 1501(2194)</p> <p>1946(1654) 783(705)</p>
<p>25 I-15 NB Ramps & Limonite Av.</p> <p>413(480) 1941(2513)</p> <p>1988(1913) 382(257)</p> <p>617(594) 0(0) 654(910)</p>	<p>LEGEND: 10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES</p>				

EXHIBIT 7-3: HORIZON YEAR (2040) WITHOUT PROJECT (WITH LIMONITE AVENUE EXTENSION) AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

10.0 = ESTIMATED VEHICLES PER DAY (1000'S)

EXHIBIT 7-4: HORIZON YEAR (2040) WITHOUT PROJECT (WITH LIMONITE AVENUE EXTENSION) TRAFFIC VOLUMES (IN PCE)

<p>1 Grove Av. & Merrill Av.</p> <p>124(53) 233(273) 344(273) 615(542)</p> <p>68(139) 580(749)</p>	<p>2 Flight Av. & Merrill Av.</p> <p>31(16) 22(15) 41(18) 10(45) 564(549) 163(254)</p> <p>5(42) 573(634) 235(346)</p> <p>363(250) 10(15) 195(205)</p>	<p>3 Vineyard Av. & Merrill Av.</p> <p>72(192) 44(75) 47(235) 180(113) 179(638) 307(109)</p> <p>127(122) 492(669) 191(365)</p> <p>487(219) 78(66) 167(424)</p>	<p>4 Hellman Av. & Kimball Av.</p> <p>186(124) 135(367) 21(43) 50(37) 770(768) 331(503)</p> <p>256(186) 487(1060) 133(274)</p> <p>169(203) 521(175) 298(448)</p>	<p>5 Hellman Av. & Pine Av.</p> <p>363(545) 185(326) 95(283) 164(162) 758(745) 85(38)</p> <p>312(488) 379(1165) 359(468)</p> <p>511(178) 436(188) 61(50)</p>	<p>6 Archibald Av. & Riverside Dr.</p> <p>120(189) 731(1302) 242(313) 270(133) 284(364) 242(317)</p> <p>211(145) 411(544) 200(303)</p> <p>186(326) 1435(982) 245(233)</p>
<p>7 Archibald Av. & Chlno Av.</p> <p>117(280) 770(1107) 96(174) 110(133) 140(288) 99(118)</p> <p>204(232) 212(312) 184(206)</p> <p>112(232) 850(996) 92(144)</p>	<p>8 Archibald Av. & Schaefer Av.</p> <p>199(269) 1018(1313) 31(111) 97(108) 103(447) 116(77)</p> <p>174(284) 107(111) 137(188)</p> <p>287(314) 941(1309) 33(127)</p>	<p>9 Archibald Av. & Ontario Ranch Rd.</p> <p>283(354) 772(848) 108(169) 199(196) 676(1019) 365(415)</p> <p>239(416) 720(1209) 401(514)</p> <p>371(486) 641(893) 144(235)</p>	<p>10 Archibald Av. & Eucalyptus Av.</p> <p>354(36) 1250(1476) 88(145) 139(82) 33(15) 130(70)</p> <p>112(64) 54(28) 301(104)</p> <p>306(95) 1089(1513) 54(99)</p>	<p>11 Archibald Av. & Merrill Av.</p> <p>551(349) 1231(1689) 85(83) 86(43) 131(112) 213(187)</p> <p>325(663) 69(162) 260(533)</p> <p>371(283) 1160(1536) 388(193)</p>	<p>12 Archibald Av. & Victoria Ln.</p> <p>40(17) 1628(2368) 36(24) 155(36) 0(0) 59(55)</p> <p>42(147) 0(0) 12(42)</p> <p>125(52) 172(1829) 191(172)</p>
<p>13 Archibald Av. & Dwy. 1</p> <p>Future Intersection</p>	<p>14 Archibald Av. & Dwy. 2</p> <p>Future Intersection</p>	<p>15 Archibald Av. & Limonite Av.</p> <p>223(237) 1151(1761) 325(467) 574(855) 799(792) 246(304)</p> <p>230(285) 828(984) 92(108)</p> <p>120(82) 1234(913) 268(384)</p>	<p>16 Archibald Av. & 65th St.</p> <p>58(148) 1261(1778) 95(237) 161(86) 62(113) 334(271)</p> <p>166(63) 116(54) 104(32)</p> <p>59(99) 1330(1256) 264(295)</p>	<p>17 Archibald Av. & Schleisman Rd.</p> <p>137(216) 1126(1035) 643(672) 279(247) 1108(1357) 519(474)</p> <p>665(405) 1164(1613) 241(523)</p> <p>299(357) 722(1290) 778(482)</p>	<p>18 Dwy. 3 & Limonite Av.</p> <p>Future Intersection</p>
<p>19 Dwy. 4 & Limonite Av.</p> <p>1484(1763) 165(176)</p> <p>1286(1690) 135(145)</p> <p>135(188) 92(124)</p>	<p>20 Harrison Av. & Limonite Av.</p> <p>136(144) 30(109) 164(109) 82(93) 1394(1660) 38(251)</p> <p>71(78) 1250(1526) 57(210)</p> <p>119(135) 57(58) 144(157)</p>	<p>21 Sumner Av. & Limonite Av.</p> <p>96(88) 140(166) 126(93) 22(66) 1331(1836) 165(489)</p> <p>100(114) 1602(1611) 295(541)</p> <p>388(422) 212(79) 276(321)</p>	<p>22 Scholar Wy. & Limonite Av.</p> <p>58(66) 194(95) 39(34) 21(47) 1345(2025) 90(214)</p> <p>45(65) 1699(1563) 85(195)</p> <p>124(267) 147(34) 218(186)</p>	<p>23 Hamner Av. & Limonite Av.</p> <p>272(409) 437(983) 660(633) 506(648) 910(1346) 162(362)</p> <p>316(330) 1352(1091) 95(181)</p> <p>129(229) 657(1010) 317(363)</p>	<p>24 I-15 SB Ramps & Limonite Av.</p> <p>258(498) 0(0) 424(517) 1057(913) 1501(2194)</p> <p>1946(1654) 783(705)</p>
<p>25 I-15 NB Ramps & Limonite Av.</p> <p>413(480) 1941(2513)</p> <p>1988(1913) 382(257)</p> <p>617(594) 0(0) 654(970)</p>					

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

7.3 HORIZON YEAR (2040) WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-process volumes obtained from the RivTAM and SBTAM, plus the traffic generated by the proposed Project (see Section 4.7 *Horizon Year (2040) Volume Development* of this TIA for a detailed discussion on the post-processing methodology). Horizon Year (2040) With Project traffic forecasts reflects buildout of the Project. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Horizon Year (2040) With Project traffic conditions are shown on Exhibits 7-3 and 7-4 (Without Limonite Avenue Extension) and on Exhibits 7-7 and 7-8 (With Limonite Avenue Extension).

7.4 INTERSECTION OPERATIONS ANALYSIS

7.4.1 HORIZON YEAR (2040) WITHOUT PROJECT (WITHOUT LIMONITE AVENUE EXTENSION) CONDITIONS

LOS calculations were conducted for the study intersections to evaluate their operations under Horizon Year (2040) Without Project (Without Limonite Avenue Extension) conditions with roadway and intersection geometrics consistent with Section 7.1 *Roadway Improvements*. As shown in Table 7-1, the following study area intersections are anticipated to operate at an unacceptable LOS under Horizon Year (2040) Without Project (Without Limonite Avenue Extension) traffic conditions:

- Grove Av. & Merrill Av. (#1) – LOS F AM and PM peak hours
- Flight Av. & Merrill Av. (#2) – LOS F AM and PM peak hours
- Hellman Av. & Merrill Av. (#3) – LOS F AM and PM peak hours
- Hellman Av. & Kimball Av. (#4) – LOS F AM and PM peak hours
- Archibald Av. & Riverside Dr. (#6) – LOS F AM and PM peak hours
- Archibald Av. & Chino Av. (#7) – LOS F PM peak hour only
- Archibald Av. & Schaefer Av. (#8) – LOS F AM and PM peak hours
- Archibald Av. & Ontario Ranch Rd. (#9) – LOS F AM and PM peak hours
- Archibald Av. & Eucalyptus Av. (#10) – LOS F AM peak hour only
- Archibald Av. & Merrill Av. (#11) – LOS F AM and PM peak hours
- Archibald Av. & Victoria Ln. (#12) – LOS F PM peak hour only
- Archibald Av. & Limonite Av. (#15) – LOS F AM and PM peak hours
- Archibald Av. & 65th St. (#16) – LOS F AM and PM peak hours
- Archibald Av. & Schleisman Rd. (#17) – LOS F AM and PM peak hours
- Sumner Av. & Limonite Av. (#21) – LOS E AM peak hour; LOS F PM peak hour
- Scholar Way & Limonite Av. (#22) – LOS E PM peak hour only
- Hamner Av. & Limonite Av. (#23) – LOS E PM peak hour only
- I-15 Southbound Ramps & Limonite Av. (#24) – LOS F AM peak hour; LOS E PM peak hour
- I-15 Northbound Ramps & Limonite Av. (#25) – LOS F AM and PM peak hours

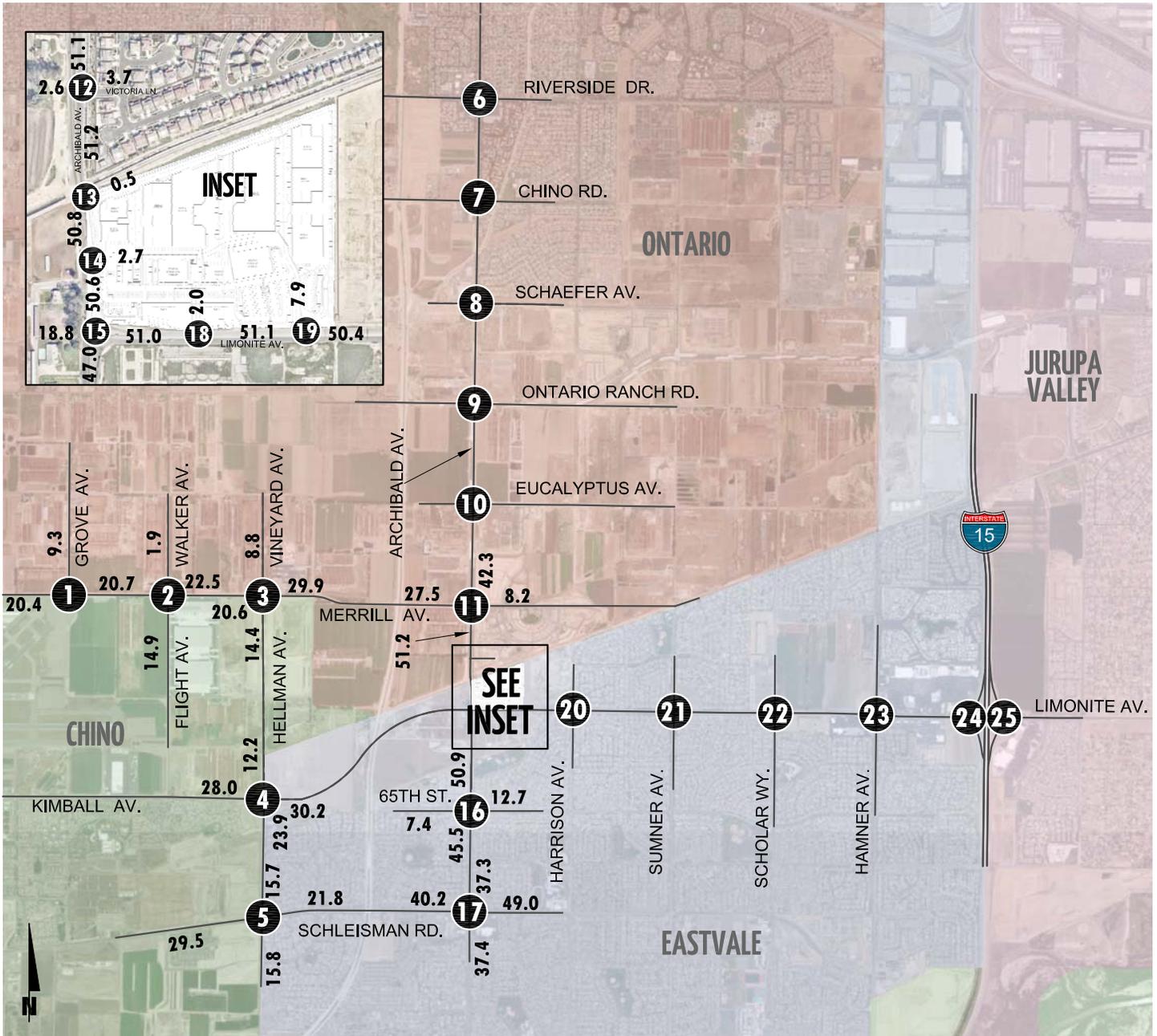
EXHIBIT 7-6: HORIZON YEAR (2040) WITH PROJECT (WITHOUT LIMONITE AVENUE EXTENSION) TRAFFIC VOLUMES (IN PCE)

<p>1 Grove Av. & Merrill Av.</p> <p>124(53) 296(333) 472(384) 627(562)</p> <p>68(139) 600(765)</p>	<p>2 Flight Av. & Merrill Av.</p> <p>31(16) 22(15) 47(24) 14(51) 718(694) 380(368)</p> <p>5(42) 668(721) 301(412)</p> <p>416(302) 10(15) 274(442)</p>	<p>3 Vineyard Av. & Merrill Av.</p> <p>72(192) 44(75) 138(249) 311(128) 553(702) 307(109)</p> <p>127(122) 672(704) 191(365)</p> <p>487(219) 78(66) 167(424)</p>	<p>4 Hellman Av. & Kimball Av.</p> <p>186(124) 135(367) 21(43) 50(37) 261(341) 99(110)</p> <p>256(186) 175(299) 159(514)</p> <p>205(229) 521(175) 148(148)</p>	<p>5 Hellman Av. & Pine Av.</p> <p>131(352) 185(326) 136(306) 188(213) 1003(956) 85(38)</p> <p>162(188) 548(1482) 359(468)</p> <p>511(178) 436(188) 61(50)</p>	<p>6 Archibald Av. & Riverside Dr.</p> <p>120(189) 752(1317) 242(313) 270(133) 284(364) 248(323)</p> <p>211(145) 411(544) 206(309)</p> <p>190(332) 1446(1004) 249(239)</p>
<p>7 Archibald Av. & Chino Av.</p> <p>117(280) 804(1133) 96(174) 110(133) 140(288) 102(121)</p> <p>204(232) 212(312) 184(206)</p> <p>112(232) 870(1029) 94(147)</p>	<p>8 Archibald Av. & Schaefer Av.</p> <p>199(269) 1055(1342) 31(111) 97(108) 103(447) 119(80)</p> <p>174(284) 107(111) 137(188)</p> <p>287(314) 963(1345) 35(130)</p>	<p>9 Archibald Av. & Ontario Ranch Rd.</p> <p>283(354) 812(880) 108(169) 199(196) 676(1019) 381(429)</p> <p>239(416) 720(1209) 407(520)</p> <p>375(492) 665(932) 155(250)</p>	<p>10 Archibald Av. & Eucalyptus Av.</p> <p>354(36) 1312(1528) 88(145) 139(82) 33(15) 133(73)</p> <p>112(64) 54(28) 301(104)</p> <p>306(95) 1128(1573) 56(102)</p>	<p>11 Archibald Av. & Merrill Av.</p> <p>551(349) 1296(1744) 46(58) 86(43) 131(112) 152(340)</p> <p>325(663) 69(162) 531(932)</p> <p>877(663) 1040(1599) 397(205)</p>	<p>12 Archibald Av. & Victoria Ln.</p> <p>40(17) 1901(2975) 36(24) 155(36) 0(0) 59(55)</p> <p>42(147) 0(0) 12(42)</p> <p>125(52) 2117(2285) 191(172)</p>
<p>13 Archibald Av. & Dwy. 1</p> <p>1931(3039) 42(33) 24(39)</p> <p>2409(2469) 6(6)</p>	<p>14 Archibald Av. & Dwy. 2</p> <p>1931(3039) 110(116)</p> <p>2305(2359) 114(99)</p>	<p>15 Archibald Av. & Limonite Av.</p> <p>1179(1961) 752(1078) 1163(1368) 542(704)</p> <p>1257(1091) 803(878)</p>	<p>16 Archibald Av. & 65th St.</p> <p>47(145) 867(2096) 86(273) 167(61) 38(40) 336(170)</p> <p>150(51) 86(39) 104(28)</p> <p>48(63) 1779(1651) 268(295)</p>	<p>17 Archibald Av. & Schleisman Rd.</p> <p>823(720) 862(1215) 142(232) 198(143) 841(388) 287(137)</p> <p>724(815) 714(1467) 173(309)</p> <p>404(289) 1197(1122) 266(171)</p>	<p>18 Dwy. 3 & Limonite Av.</p> <p>72(79) 97(86) 1632(1993)</p> <p>1555(1956)</p>
<p>19 Dwy. 4 & Limonite Av.</p> <p>123(135) 0(0) 160(178) 119(100) 1471(1756) 165(176)</p> <p>225(197) 1195(1614) 135(145)</p> <p>135(188) 0(0) 92(124)</p>	<p>20 Harrison Av. & Limonite Av.</p> <p>139(147) 30(109) 164(109) 82(93) 1494(1746) 38(251)</p> <p>73(81) 1315(1622) 59(213)</p> <p>122(138) 57(58) 144(157)</p>	<p>21 Sumner Av. & Limonite Av.</p> <p>99(91) 140(166) 126(93) 22(66) 1424(1917) 165(489)</p> <p>102(117) 1663(1701) 297(544)</p> <p>391(425) 212(79) 276(321)</p>	<p>22 Scholar Wy. & Limonite Av.</p> <p>64(72) 194(95) 39(34) 21(47) 1429(2097) 90(214)</p> <p>49(71) 1753(1644) 87(198)</p> <p>127(270) 147(34) 218(186)</p>	<p>23 Hamner Av. & Limonite Av.</p> <p>278(415) 437(983) 660(633) 506(648) 975(1401) 162(362)</p> <p>320(336) 1394(1154) 104(193)</p> <p>142(240) 657(1010) 317(363)</p>	<p>24 I-15 SB Ramps & Limonite Av.</p> <p>287(523) 0(0) 424(517) 1057(913) 1537(2224)</p> <p>1975(1698) 795(725)</p>
<p>25 I-15 NB Ramps & Limonite Av.</p> <p>413(480) 1957(2527)</p> <p>1999(1928) 401(286)</p> <p>637(610) 0(0) 654(970)</p>					

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

EXHIBIT 7-7: HORIZON YEAR (2040) WITH PROJECT (WITH LIMONITE AVENUE EXTENSION) AVERAGE DAILY TRAFFIC (ADT)



LEGEND:

10.0 = ESTIMATED VEHICLES PER DAY (1000'S)

EXHIBIT 7-8: HORIZON YEAR (2040) WITH PROJECT (WITH LIMONITE AVENUE EXTENSION) TRAFFIC VOLUMES (IN PCE)

<p>1 Grove Av. & Merrill Av.</p> <p>124(53) 246(284) 353(285) 627(562)</p> <p>68(139) 600(765)</p>	<p>2 Flight Av. & Merrill Av.</p> <p>31(16) 22(15) 47(24) 14(51) 585(581) 163(254)</p> <p>5(42) 606(661) 235(346)</p> <p>363(250) 10(15) 195(205)</p>	<p>3 Vineyard Av. & Merrill Av.</p> <p>72(192) 44(75) 63(249) 191(128) 204(676) 307(109)</p> <p>127(122) 531(702) 191(365)</p> <p>487(219) 78(66) 167(424)</p>	<p>4 Hellman Av. & Kimball Av.</p> <p>186(124) 135(367) 21(43) 50(37) 785(789) 342(518)</p> <p>256(186) 509(1080) 133(274)</p> <p>169(203) 521(175) 314(462)</p>	<p>5 Hellman Av. & Pine Av.</p> <p>374(560) 185(326) 95(283) 164(162) 758(745) 85(38)</p> <p>328(502) 379(1165) 359(468)</p> <p>511(178) 436(188) 61(50)</p>	<p>6 Archibald Av. & Riverside Dr.</p> <p>120(189) 752(1317) 242(313) 270(133) 284(364) 248(323)</p> <p>211(145) 411(544) 206(309)</p> <p>190(332) 1446(1004) 249(239)</p>
<p>7 Archibald Av. & Chino Av.</p> <p>117(280) 804(1133) 96(174) 110(133) 140(288) 102(121)</p> <p>204(232) 212(312) 184(206)</p> <p>112(232) 870(1029) 94(147)</p>	<p>8 Archibald Av. & Schaefer Av.</p> <p>199(269) 1055(1342) 31(111) 97(108) 103(447) 119(80)</p> <p>174(284) 107(111) 137(188)</p> <p>287(314) 963(1345) 35(130)</p>	<p>9 Archibald Av. & Ontario Ranch Rd.</p> <p>283(354) 812(880) 108(169) 199(196) 676(1019) 381(429)</p> <p>239(416) 720(1209) 407(520)</p> <p>375(492) 665(932) 155(250)</p>	<p>10 Archibald Av. & Eucalyptus Av.</p> <p>354(36) 1312(1528) 88(145) 139(82) 33(15) 133(73)</p> <p>112(64) 54(28) 301(104)</p> <p>306(95) 1128(1573) 56(102)</p>	<p>11 Archibald Av. & Merrill Av.</p> <p>551(349) 1296(1744) 85(83) 86(43) 131(112) 226(198)</p> <p>325(663) 69(162) 315(581)</p> <p>407(335) 1201(1599) 397(205)</p>	<p>12 Archibald Av. & Victoria Ln.</p> <p>40(17) 1760(2482) 36(24) 155(36) 0(0) 59(55)</p> <p>42(147) 0(0) 12(42)</p> <p>125(52) 1808(1957) 191(172)</p>
<p>13 Archibald Av. & Dwy. 1</p> <p>1789(2546) 42(33) 24(39)</p> <p>2100(2141) 6(6)</p>	<p>14 Archibald Av. & Dwy. 2</p> <p>1789(2546) 110(116)</p> <p>1996(2031) 114(99)</p>	<p>15 Archibald Av. & Limonite Av.</p> <p>223(237) 1151(1761) 415(548) 593(884) 827(831) 285(358)</p> <p>252(305) 847(1001) 92(108)</p> <p>120(82) 1266(942) 293(407)</p>	<p>16 Archibald Av. & 65th St.</p> <p>58(148) 1291(1820) 104(249) 174(97) 62(113) 334(271)</p> <p>166(63) 116(54) 104(32)</p> <p>59(99) 1374(1296) 264(295)</p>	<p>17 Archibald Av. & Schleisman Rd.</p> <p>139(219) 1143(1059) 654(687) 295(261) 1108(1357) 519(474)</p> <p>668(408) 1164(1613) 241(523)</p> <p>299(357) 747(1313) 778(482)</p>	<p>18 Dwy. 3 & Limonite Av.</p> <p>72(79) 97(86) 1632(1993)</p> <p>1555(1956)</p>
<p>19 Dwy. 4 & Limonite Av.</p> <p>123(135) 0(0) 160(178) 119(100) 1471(1756) 165(176)</p> <p>225(197) 1195(1614) 135(145)</p> <p>135(188) 0(0) 92(124)</p>	<p>20 Harrison Av. & Limonite Av.</p> <p>139(147) 30(109) 164(109) 82(93) 1494(1746) 38(251)</p> <p>73(81) 1315(1622) 59(213)</p> <p>122(138) 57(58) 144(157)</p>	<p>21 Sumner Av. & Limonite Av.</p> <p>99(91) 140(166) 126(93) 22(66) 1424(1917) 165(489)</p> <p>102(117) 1663(1701) 297(544)</p> <p>391(425) 212(79) 276(321)</p>	<p>22 Scholar Wy. & Limonite Av.</p> <p>64(72) 194(95) 39(34) 21(47) 1429(2097) 90(214)</p> <p>49(71) 1753(1644) 87(198)</p> <p>127(270) 147(34) 218(186)</p>	<p>23 Hamner Av. & Limonite Av.</p> <p>278(415) 437(983) 660(633) 506(648) 975(1401) 162(362)</p> <p>320(336) 1394(1154) 104(193)</p> <p>142(240) 657(1010) 317(363)</p>	<p>24 I-15 SB Ramps & Limonite Av.</p> <p>287(523) 0(0) 424(517) 1057(913) 1537(2224)</p> <p>1975(1698) 795(725)</p>
<p>25 I-15 NB Ramps & Limonite Av.</p> <p>413(480) 1957(2527)</p> <p>1999(1928) 401(286)</p> <p>637(610) 0(0) 654(970)</p>					

LEGEND:

10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

Table 7-1

Intersection Analysis for Horizon Year (2040) Without Limonite Avenue Extension Conditions

#	Intersection	Traffic Control ²	2040 Without Project - w/o Limonite				2040 With Project - w/o Limonite				Change in Delay (secs.) ³		Acceptable LOS
			Delay ¹ (secs.)		Level of Service		Delay ¹ (secs.)		Level of Service		AM	PM	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
1	Grove Av. & Merrill Av.	AWS	>200.0	>200.0	F	F	>200.0	>200.0	F	F	20.2	23.0	D
2	Flight Av. & Merrill Av.	CSS	>200.0	>200.0	F	F	>200.0	>200.0	F	F	>25.0	>25.0	D
3	Hellman Av. & Merrill Av.	CSS	>200.0	>200.0	F	F	>200.0	>200.0	F	F	>25.0	>25.0	D
4	Hellman Av. & Kimball Av.	AWS	111.4	142.4	F	F	110.8	157.1	F	F	--	14.7	D
5	Hellman Av. & Pine Av.	TS	28.3	30.0	C	C	31.1	33.8	C	C	--	--	D
6	Archibald Av. & Riverside Dr.	TS	111.9	101.1	F	F	134.2	129.5	F	F	22.3	28.4	E
7	Archibald Av. & Chino Av.	TS	61.0	158.9	E	F	75.7	159.5	E	F	--	0.6	E
8	Archibald Av. & Schaefer Av.	CSS	>200.0	>200.0	F	F	>200.0	>200.0	F	F	>25.0	23.3	E
9	Archibald Av. & Ontario Ranch Rd.	TS	135.0	>200.0	F	F	162.1	>200.0	F	F	27.1	>25.0	E
10	Archibald Av. & Eucalyptus Av.	TS	180.1	26.9	F	C	182.1	32.4	F	C	2.0	--	E
11	Archibald Av. & Merrill Av.	TS	>200.0	>200.0	F	F	>200.0	>200.0	F	F	>25.0	>25.0	E
12	Archibald Av. & Victoria Ln.	TS	54.3	120.6	D	F	57.2	127.1	E	F	2.9	6.5	E
13	Archibald Av. & Driveway 1	CSS	Project Improvement				33.6	29.4	D	D	--	--	D
14	Archibald Av. & Driveway 2	CSS	Project Improvement				16.4	17.0	C	C	--	--	D
15	Archibald Av. & Limonite Av.	TS	>200.0	>200.0	F	F	>200.0	>200.0	F	F	7.8	10.4	D
16	Archibald Av. & 65th St.	TS	105.8	87.9	F	F	121.0	102.6	F	F	15.2	14.7	D
17	Archibald Av. & Schleisman Rd.	TS	111.5	106.1	F	F	123.5	116.7	F	F	12.0	10.6	D
18	Driveway 3 & Limonite Av.	CSS	Project Improvement				12.6	14.0	B	B	--	--	D
19	Driveway 4 & Limonite Av.	TS	13.1	18.9	B	B	21.4	27.6	C	C	--	--	D
20	Harrison Av. & Limonite Av.	TS	45.2	53.3	D	D	30.9	63.7	C	E	--	--	D
21	Sumner Av. & Limonite Av.	TS	57.2	106.0	E	F	63.5	113.7	E	F	6.3	7.7	D
22	Scholar Way & Limonite Av.	TS	38.5	62.9	D	E	44.3	70.8	D	E	--	7.9	D
23	Hamner Av. & Limonite Av.	TS	69.2	97.0	E	F	69.3	100.6	E	F	0.1	3.6	D
24	I-15 SB Ramps & Limonite Av.	TS	119.9	66.6	F	E	124.9	72.0	F	E	--	--	D
25	I-15 NB Ramps & Limonite Av.	TS	82.9	131.9	F	F	86.0	136.3	F	F	--	--	D

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

¹ Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. HCM delay reported in seconds. HCM 6th Edition has been used for the operations analysis for Intersections #6, #24, and #25.

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

³ The change in delay is calculated between Without Project and With Project scenarios for City of Eastvale intersections already operating at an unacceptable LOS in Without Project conditions.

A summary of the peak hour intersection LOS for Horizon Year (2040) Without Project (Without Limonite Avenue Extension) conditions is shown on Exhibit 7-9. The intersection operations analysis worksheets for Horizon Year (2040) Without Project (Without Limonite Avenue Extension) traffic conditions are included in Appendix 7.1 of this TIA.

7.4.2 HORIZON YEAR (2040) WITHOUT PROJECT (WITH LIMONITE AVENUE EXTENSION) CONDITIONS

LOS calculations were conducted for the study intersections to evaluate their operations under Horizon Year (2040) Without Project (With Limonite Avenue Extension) conditions with roadway and intersection geometrics consistent with Section 7.1 *Roadway Improvements*. Only the intersections shown in Table 7-2 are affected by the future Limonite Avenue extension. All other intersection operations analysis results are consistent with those shown previously in Table 7-1. As shown in Table 7-1 and Table 7-2, the following study area intersections are anticipated to operate at an unacceptable LOS under Horizon Year (2040) Without Project (With Limonite Avenue Extension) traffic conditions:

- Grove Av. & Merrill Av. (#1) – LOS F AM and PM peak hours
- Flight Av. & Merrill Av. (#2) – LOS F AM and PM peak hours
- Hellman Av. & Merrill Av. (#3) – LOS F AM and PM peak hours
- Hellman Av. & Kimball Av. (#4) – LOS F AM and PM peak hours
- Hellman Av. & Pine Av./Schleisman Rd. (#5) – LOS E AM peak hour; LOS F PM peak hour
- Archibald Av. & Riverside Dr. (#6) – LOS F AM and PM peak hours
- Archibald Av. & Chino Av. (#7) – LOS F PM peak hour only
- Archibald Av. & Schaefer Av. (#8) – LOS F AM and PM peak hours
- Archibald Av. & Ontario Ranch Rd. (#9) – LOS F AM and PM peak hours
- Archibald Av. & Eucalyptus Av. (#10) – LOS F AM peak hour only
- Archibald Av. & Merrill Av. (#11) – LOS F AM and PM peak hours
- Archibald Av. & Limonite Av. (#15) – LOS F AM and PM peak hours
- Archibald Av. & 65th St. (#16) – LOS E AM and PM peak hours
- Archibald Av. & Schleisman Rd. (#17) – LOS F AM and PM peak hours
- Sumner Av. & Limonite Av. (#21) – LOS E AM peak hour; LOS F PM peak hour
- Scholar Way & Limonite Av. (#22) – LOS E PM peak hour only
- Hamner Av. & Limonite Av. (#23) – LOS E PM peak hour only
- I-15 Southbound Ramps & Limonite Av. (#24) – LOS F AM peak hour; LOS E PM peak hour
- I-15 Northbound Ramps & Limonite Av. (#25) – LOS F AM and PM peak hours

A summary of the peak hour intersection LOS for Horizon Year (2040) Without Project (With Limonite Avenue Extension) conditions is shown on Exhibit 7-11. The intersection operations analysis worksheets for Horizon Year (2040) Without Project (With Limonite Avenue Extension) traffic conditions are included in Appendix 7.3 of this TIA.

EXHIBIT 7-9: HORIZON YEAR (2040) WITHOUT PROJECT (WITHOUT LIMONITE AVENUE EXTENSION) SUMMARY OF LOS

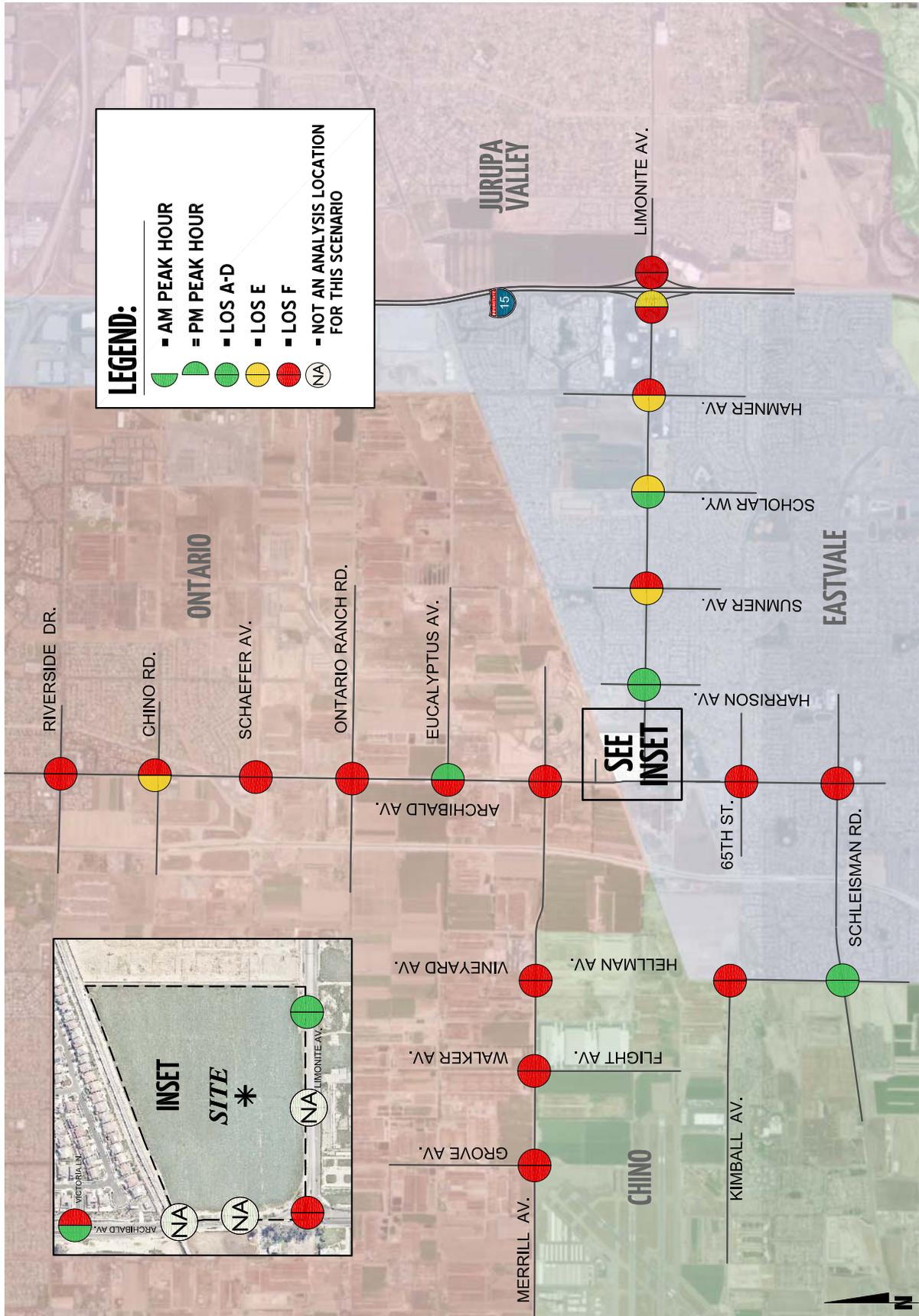


EXHIBIT 7-10: HORIZON YEAR (2040) WITHOUT PROJECT (WITH LIMONITE AVENUE EXTENSION) SUMMARY OF LOS

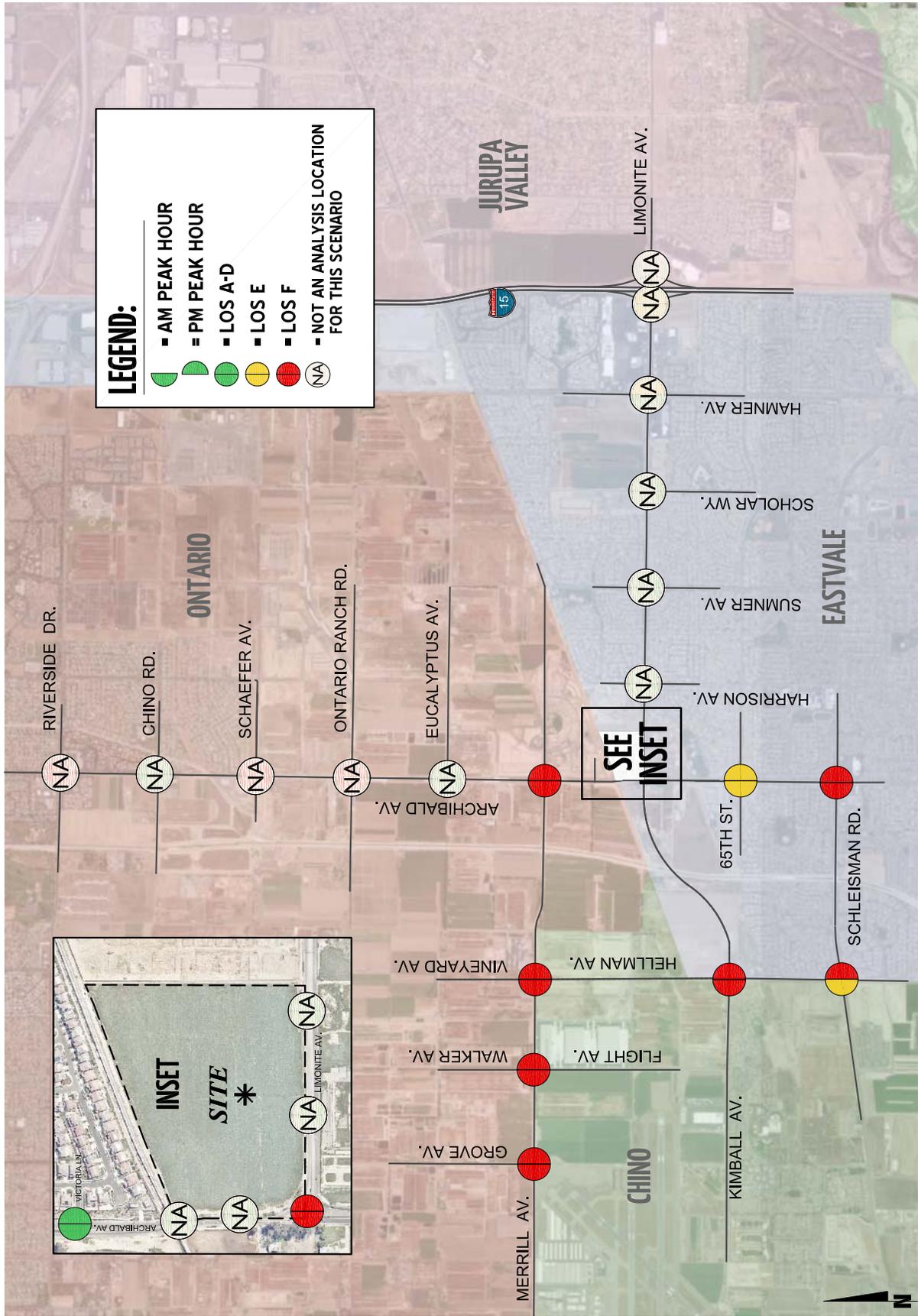


EXHIBIT 7-1.1: HORIZON YEAR (2040) WITH PROJECT (WITHOUT LIMONITE AVENUE EXTENSION) SUMMARY OF LOS

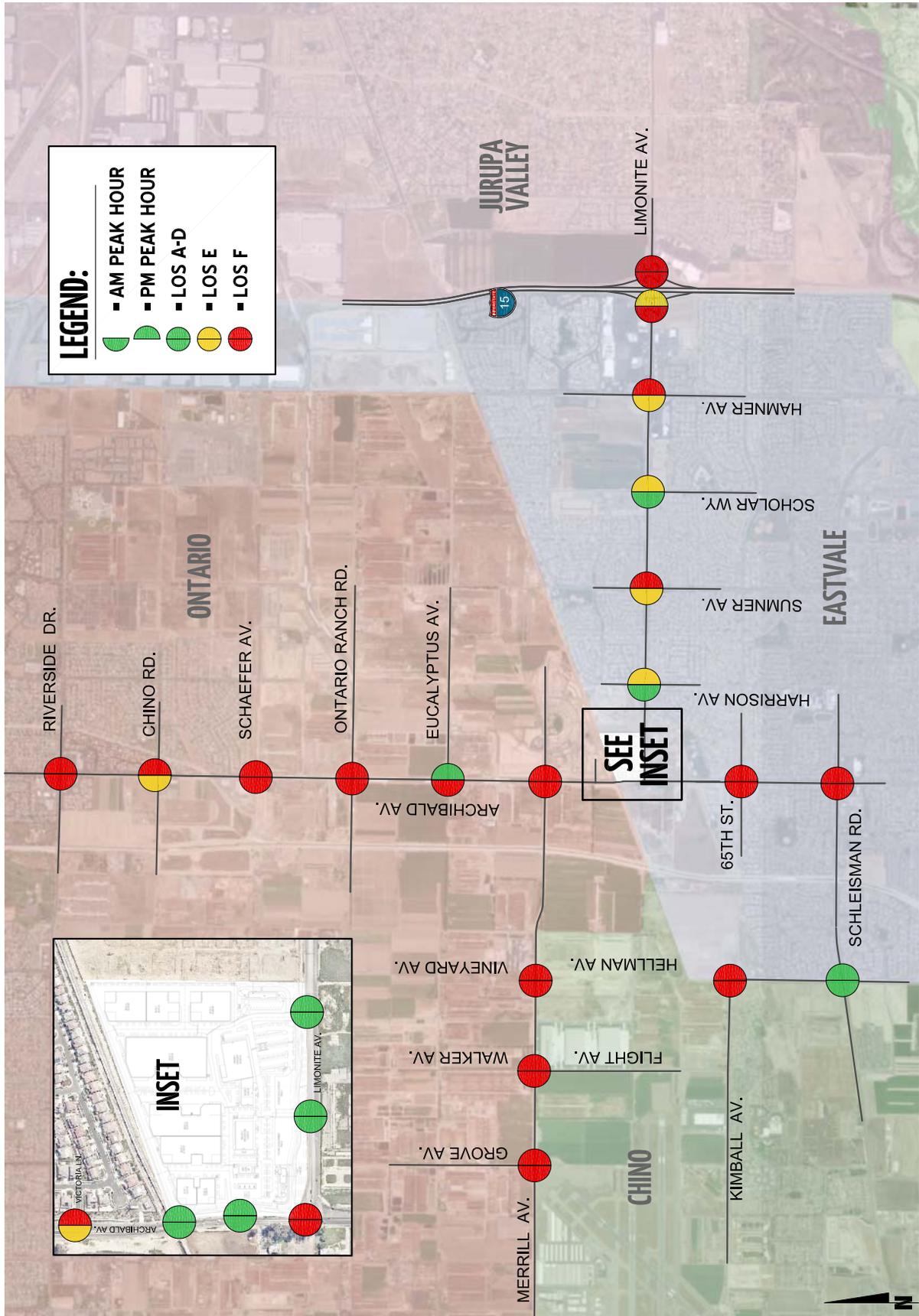


EXHIBIT 7-12: HORIZON YEAR (2040) WITH PROJECT (WITH LIMONITE AVENUE EXTENSION) SUMMARY OF LOS

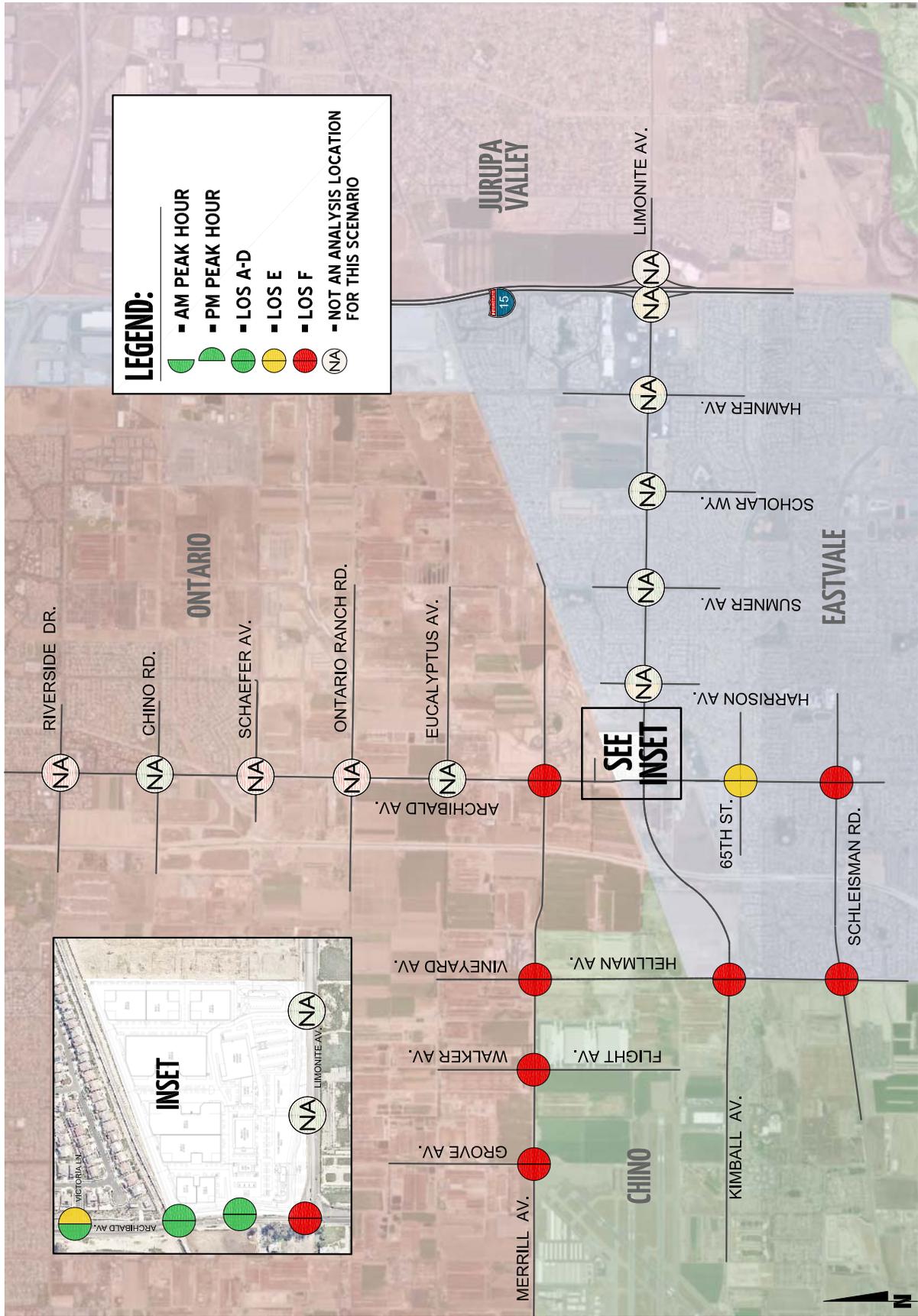


Table 7-2

Intersection Analysis for Horizon Year (2040) With Limonite Avenue Extension Conditions

#	Intersection	Traffic Control ²	2040 Without Project - w/ Limonite				2040 With Project - w/ Limonite				Change in Delay (secs.) ³		Acceptable LOS
			Delay ¹ (secs.)		Level of Service		Delay ¹ (secs.)		Level of Service		AM	PM	
			AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	
1	Grove Av. & Merrill Av.	AWS	>200.0	>200.0	F	F	>200.0	>200.0	F	F	18.9	20.7	D
2	Flight Av. & Merrill Av.	CSS	>200.0	>200.0	F	F	>200.0	>200.0	F	F	>25.0	>25.0	D
3	Hellman Av. & Merrill Av.	CSS	>200.0	>200.0	F	F	>200.0	>200.0	F	F	>25.0	>25.0	D
4	Hellman Av. & Kimball Av.	AWS	>200.0	>200.0	F	F	>200.0	>200.0	F	F	14.0	22.9	D
5	Hellman Av. & Pine Av.	TS	77.1	140.8	E	F	97.7	175.0	F	F	20.6	>25.0	D
11	Archibald Av. & Merrill Av.	TS	148.0	>200.0	F	F	>200.0	>200.0	F	F	>25.0	>25.0	E
12	Archibald Av. & Victoria Ln.	TS	31.0	53.4	C	D	32.8	58.5	C	E	--	--	E
13	Archibald Av. & Driveway 1	CSS	Project Improvement				25.3	22.8	D	C	--	--	D
14	Archibald Av. & Driveway 2	CSS	Project Improvement				14.9	15.2	B	C	--	--	D
15	Archibald Av. & Limonite Av.	TS	>200.0	>200.0	F	F	>200.0	>200.0	F	F	>25.0	>25.0	D
16	Archibald Av. & 65th St.	TS	58.3	57.6	E	E	62.6	64.1	E	E	4.3	6.5	D
17	Archibald Av. & Schleisman Rd.	TS	>200.0	134.7	F	F	>200.0	137.0	F	F	5.9	2.3	D

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

¹ Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. HCM delay reported in seconds.

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

³ The change in delay is calculated between Without Project and With Project scenarios for City of Eastvale intersections already operating at an unacceptable LOS in Without Project conditions.

7.4.3 HORIZON YEAR (2040) WITH PROJECT (WITHOUT LIMONITE AVENUE EXTENSION) CONDITIONS

As shown in Table 7-1 and illustrated on Exhibit 7-10, the following additional study area intersection is anticipated to experience unacceptable LOS with the addition of Project traffic during one or more peak hours, in addition to those previously identified under Horizon Year (2040) Without Project (Without Limonite Avenue Extension) traffic conditions:

- Harrison Av. & Limonite Av. (#20) – LOS E PM peak hour only

The intersection operations analysis worksheets for Horizon Year (2040) With Project (Without Limonite Avenue Extension) traffic conditions are included in Appendix 7.2 of this TIA.

Based on the significance criteria for each applicable agency, the following intersections are anticipated to be cumulatively impacted for Horizon Year (2040) (Without Limonite Avenue Extension) traffic conditions:

- Grove Av. & Merrill Av. (#1)
- Flight Av. & Merrill Av. (#2)
- Hellman Av. & Merrill Av. (#3)
- Hellman Av. & Kimball Av. (#4)
- Archibald Av. & Riverside Dr. (#6)
- Archibald Av. & Chino Av. (#7)
- Archibald Av. & Schaefer Av. (#8)
- Archibald Av. & Ontario Ranch Rd. (#9)
- Archibald Av. & Eucalyptus Av. (#10)
- Archibald Av. & Merrill Av. (#11)
- Archibald Av. & Victoria Ln. (#12)
- Archibald Av. & Limonite Av. (#15)
- Archibald Av. & 65th St. (#16)
- Archibald Av. & Schleisman Rd. (#17)
- Harrison Av. & Limonite Av. (#20)
- Sumner Av. & Limonite Av. (#21)
- Scholar Way & Limonite Av. (#22)
- I-15 Southbound Ramps & Limonite Av. (#24)
- I-15 Northbound Ramps & Limonite Av. (#25)

7.4.4 HORIZON YEAR (2040) WITH PROJECT (WITH LIMONITE AVENUE EXTENSION) CONDITIONS

As shown in Table 7-1 and Table 7-2 and illustrated on Exhibit 7-12, the following additional study area intersections are anticipated to experience unacceptable LOS with the addition of Project traffic during one or more peak hours, in addition to those previously identified under Horizon Year (2040) Without Project (With Limonite Avenue Extension) traffic conditions:

- Archibald Av. & Victoria Ln. (#12) – LOS E PM peak hour only

- Harrison Av. & Limonite Av. (#20) – LOS E PM peak hour only

The intersection operations analysis worksheets for Horizon Year (2040) With Project (Without Limonite Avenue Extension) traffic conditions are included in Appendix 7.4 of this TIA.

Based on the significance criteria for each applicable agency, the following intersections are anticipated to be cumulatively impacted for Horizon Year (2040) (With Limonite Avenue Extension) traffic conditions:

- Grove Av. & Merrill Av. (#1)
- Flight Av. & Merrill Av. (#2)
- Hellman Av. & Merrill Av. (#3)
- Hellman Av. & Kimball Av. (#4)
- Hellman Av. & Pine Av./Schleisman Rd. (#5)
- Archibald Av. & Riverside Dr. (#6)
- Archibald Av. & Chino Av. (#7)
- Archibald Av. & Schaefer Av. (#8)
- Archibald Av. & Ontario Ranch Rd. (#9)
- Archibald Av. & Eucalyptus Av. (#10)
- Archibald Av. & Merrill Av. (#11)
- Archibald Av. & Victoria Ln. (#12)
- Archibald Av. & Limonite Av. (#15)
- Archibald Av. & 65th St. (#16)
- Archibald Av. & Schleisman Rd. (#17)
- Harrison Av. & Limonite Av. (#20)
- Sumner Av. & Limonite Av. (#21)
- Scholar Way & Limonite Av. (#22)
- I-15 Southbound Ramps & Limonite Av. (#24)
- I-15 Northbound Ramps & Limonite Av. (#25)

7.5 ROADWAY SEGMENT CAPACITY ANALYSIS

As noted previously, the roadway segment capacities are approximate figures only, and are typically used at the General Plan level to assist in determining the roadway functional classification (number of through lanes) needed to meet future forecasted traffic demand.

Table 7-3

Roadway Segment Capacity Analysis for Horizon Year (2040) Conditions

#	Roadway	Segment Limits	Roadway Section	LOS Capacity ¹	2040 Without Project	V/C ²	LOS ³	Roadway Section	LOS Capacity ¹	2040 With Project	V/C ²	LOS ³	Change in V/C ⁴	Acceptable LOS
Without Limonite Avenue Extension:														
1		Archibald Av. to Sumner Av.	4D	35,900	47,688	1.33	F	5D	44,917	50,753	1.13	F	--	D
2	Limonite Av.	Sumner Av. to Hamner Av.	4D	35,900	50,414	1.40	F	4D	35,900	52,320	1.46	F	0.05	D
3		Hamner Av. to I-15 Freeway	6D	53,900	54,882	1.02	F	6D	53,900	56,192	1.04	F	0.02	D
4	Archibald Av.	Victoria Ln. to Limonite Av.	2D	17,950	65,141	3.63	F	4D	35,900	67,836	1.89	F	--	D
5		Limonite Av. to 65th St.	2D	17,950	55,287	3.08	F	2D	17,950	56,479	3.15	F	0.07	D
With Limonite Avenue Extension:														
4	Archibald Av.	Victoria Ln. to Limonite Av.	2D	17,950	48,475	2.70	F	4D	35,900	51,170	1.43	F	--	D
5		Limonite Av. to 65th St.	4U	35,900	49,723	1.39	F	4U	35,900	50,915	1.42	F	0.03	D

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

¹ These maximum roadway capacities have been obtained from the City of Eastvale's General Plan (Table C-1).

² V/C = Volume to Capacity Ratio

³ LOS = Level of Service

⁴ The change in V/C is calculated between Without Project and With Project scenarios for roadway segments operating at an unacceptable LOS under pre-project conditions.

Table 7-2 provides a summary of the Horizon Year (2040) conditions roadway segment capacity analysis based on the City of Eastvale General Plan Roadway Segment Capacity Thresholds identified previously in Table 2-3. As shown in Table 7-3, all of the study area roadway segments are anticipated to operate at unacceptable LOS (based on daily roadway segment capacities) under Horizon Year (2040) Without and With Project (both Without and With Limonite Avenue Extension) traffic conditions.

A peak hour assessment of intersections located on either side of a deficient roadway segment has been conducted to determine if peak hour traffic flows can be accommodated by the potentially deficient roadway segment. If it is determined that peak traffic flows can be accommodated at the City's stated LOS thresholds, then roadway segment widening is typically not recommended.

7.6 TRAFFIC SIGNAL WARRANTS ANALYSIS

No traffic signal warrant analysis was performed for Horizon Year (2040) Without Project traffic conditions as all unsignalized study area intersections are warranted in a previous scenario. No additional study area intersections are anticipated to meet ADT based traffic signal warrants for Horizon Year (2040) With Project traffic conditions in addition to those previously warranted under Existing, E+P, and Opening Year Cumulative (2021) traffic conditions (see Appendix 7.5).

7.7 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for Horizon Year (2040) traffic conditions are presented in Table 7-4. As shown in Table 7-4, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Horizon Year (2040) Without and With Project traffic conditions. Worksheets for Horizon Year (2040) Without and With Project traffic conditions off-ramp queuing analysis are provided in Appendices 7.6 and 7.7, respectively.

7.8 BASIC FREEWAY SEGMENT ANALYSIS

Horizon Year (2040) Without and With Project mainline directional volumes for the AM and PM peak hours are provided on Exhibits 7-13 and 7-14, respectively. As shown in Table 7-5, the following freeway segments analyzed for this study are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for Horizon Year (2040) Without Project traffic conditions:

- I-15 Freeway Southbound, North of Limonite Av. (#1) – LOS E AM peak hour only
- I-15 Freeway Southbound, South of Limonite Av. (#2) – LOS F AM peak hour only

Table 7-4

Peak Hour Freeway Off-Ramp Queuing Summary for Horizon Year (2040) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	2040 Without Project				2040 With Project			
			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 Ramps / Limonite Avenue	SBL	400	254	428 ²	Yes	Yes ³	361 ²	448 ²	Yes	Yes ³
	SBL/T/R	400	216	371 ²	Yes	Yes	286 ²	391 ²	Yes	Yes
	SBR	1,200	186	330 ²	Yes	Yes	250 ²	342 ²	Yes	Yes
I-15 NB Ramps / Limonite Avenue	NBL	450	525 ²	646 ²	Yes ³	Yes ³	708 ²	660 ²	Yes ³	Yes ³
	NBL/T/R	1,235	491 ²	609 ²	Yes	Yes	651 ²	606 ²	Yes	Yes
	NBR	400	432 ²	546 ²	Yes ³	Yes ³	587 ²	560 ²	Yes ³	Yes ³

¹ Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

² 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

³ Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the I-15 Freeway mainline.

Table 7-5

Basic Freeway Segment Analysis for Horizon Year (2040) Conditions

Freeway	Direction ¹	Mainline Segment	Lanes ²	2040 Without Project				2040 With Project			
				Density ³		LOS ⁴		Density ³		LOS ⁴	
				AM	PM	AM	PM	AM	PM	AM	PM
I-15	SB	North of Limonite Av.	3	39.5	26.3	E	D	39.9	26.5	E	D
		South of Limonite Av.	3	-- ⁵	31.4	F	D	-- ⁵	31.4	F	D
	NB	North of Limonite Av.	3	29.2	23.6	D	C	29.3	23.8	D	C
		South of Limonite Av.	3	33.6	29.3	D	D	33.7	29.5	D	D

* **BOLD** = Unacceptable Level of Service

¹ NB = Northbound; SB = Southbound

² Number of lanes are in the specified direction and is based on existing conditions.

³ Density is measured by passenger cars per mile per lane (pc/mi/ln).

⁴ LOS = Level of Service

⁵ HCS7 does not report density for freeway facilities operating at LOS F.

EXHIBIT 7-13: HORIZON YEAR (2040) WITHOUT PROJECT WITH IMPROVEMENTS FREEWAY MAINLINE VOLUMES



LEGEND:

← 100/200 = AM/PM PEAK HOUR VOLUMES
 NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)



EXHIBIT 7-14: HORIZON YEAR (2040) WITH PROJECT WITH IMPROVEMENTS FREEWAY MAINLINE VOLUMES



LEGEND:

← 100/200 = AM/PM PEAK HOUR VOLUMES
 NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)



There are no additional freeway segments that are anticipated to operate at an unacceptable LOS during the peak hours with the addition of Project traffic conditions. The Project is anticipated to contribute more than 25 one-way peak hour trips to the segment north of Limonite Avenue (Segment #1) and would therefore result in a cumulative impact on this segment. However, the Project is anticipated to contribute less than 25 one-way peak hour trips to the segment south of Limonite Avenue (Segment #2). As such, the impact is less than significant for Segment #2. Horizon Year (2040) Without and With Project basic freeway segment analysis worksheets are provided in Appendix 7.8 and 7.9, respectively.

7.9 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for Horizon Year (2040) conditions and the results of this analysis are presented in Table 7-6. As shown in Table 7-6, the following merge and diverge areas are anticipated to operate at LOS E or LOS F for Horizon Year (2040) Without Project traffic conditions:

- I-15 Freeway Southbound, Off-Ramp at Limonite Av. (#1) – LOS E AM peak hour only
- I-15 Freeway Southbound, On-Ramp at Limonite Av. (#3) – LOS F AM peak hour only

There are no additional merge and diverge areas that are anticipated to operate at an unacceptable LOS during the peak hours with the addition of Project traffic. The Project is anticipated to contribute more than 25 peak hour trips to the I-15 Southbound Off-Ramp at Limonite Avenue, resulting in a cumulative impact on this ramp junction. However, the Project is anticipated to contribute less than 25 peak hour trips to the I-15 Southbound On-Ramp at Limonite Avenue. As such, the Project's impact to this ramp junction is less than significant. Horizon Year (2040) Without and With Project freeway ramp junction operations analysis worksheets are provided in Appendices 7.10 and 7.11, respectively.

7.10 HORIZON YEAR (2040) DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

7.10.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as significantly impacted by the Project, in an effort to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS D or better). Significant impacts have been identified at deficient intersections if the Project contributes 50 or more peak hours or if the addition of Project traffic increases the delay by 5.0 seconds or more (for the intersections in Eastvale only). The effectiveness of the recommended improvement strategies discussed below to address Horizon Year (2040) traffic deficiencies is presented in Table 7-7 for both the Without and With Limonite Avenue Extension alternatives.

Table 7-6

Freeway Ramp Junction Merge/Diverge Analysis for Horizon Year (2040) Conditions

Freeway	Direction ¹	Ramp or Segment	Lanes on Freeway ²	2040 Without Project				2040 With Project			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density ³	LOS ⁴						
I-15	SB	Off-Ramp at Limonite Av.	3	35.6	E	27.5	C	35.6	E	27.7	C
		On-Ramp at Limonite Av.	3	-- ⁵	F	34.3	D	-- ⁵	F	34.5	D
	NB	On-Ramp at Limonite Av.	3	31.1	D	25.6	C	31.3	D	25.8	C
		Off-Ramp at Limonite Av.	3	32.9	D	30.4	D	33.0	D	30.5	D

* **BOLD** = Unacceptable Level of Service
¹ NB = Northbound; SB = Southbound
² Number of lanes are in the specified direction and is based on existing conditions
³ Density is measured by passenger cars per mile per lane (pc/mi/ln).
⁴ LOS = Level of Service
⁵ HCS7 does not report density for freeway facilities operating at LOS F.

Table 7-7
Page 1 of 3

Intersection Analysis for Horizon Year (2040) Conditions With Improvements

#	Intersection	Traffic Control ³	Intersection Approach Lanes ¹												Delay ² (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
1	Grove Av. & Merrill Av.																	
	<i>Without Limonite Extension:</i>																	
	- Without Improvements	AWS	0	0	0	0	1	0	0	1	0	0	1	0	>200.0	>200.0	F	F
	- With Improvements	TS	0	0	0	<u>1</u>	<u>0</u>	<u>1</u>	<u>1</u>	<u>2</u>	0	0	<u>2</u>	<u>1</u>	17.6	17.5	B	B
2	Flight Av. & Merrill Av.																	
	<i>Without Limonite Extension:</i>																	
	- Without Improvements	CSS	<u>1</u>	1	0	<u>1</u>	<u>1</u>	0	<u>1</u>	1	1	1	1	0	>200.0	>200.0	F	F
	- With Improvements	TS	<u>1</u>	1	<u>1></u>	<u>1</u>	<u>1</u>	0	<u>1</u>	<u>2</u>	<u>1></u>	1	<u>2</u>	0	54.3	34.5	D	C
3	Hellman Av. & Merrill Av.																	
	<i>Without Limonite Extension:</i>																	
	- Without Improvements	CSS	<u>1</u>	<u>1</u>	0	<u>1</u>	<u>1</u>	0	<u>1</u>	<u>2</u>	<u>1</u>	<u>1</u>	1	0	>200.0	>200.0	F	F
	- With Improvements	TS	<u>2</u>	<u>1</u>	<u>1></u>	<u>1</u>	<u>1</u>	0	<u>1</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>2</u>	<u>1</u>	39.9	42.9	D	D
4	Hellman Av. & Kimball Av.																	
	<i>Without Limonite Extension:</i>																	
	- Without Improvements	AWS	1	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	1	<u>1</u>	<u>1</u>	0	110.8	157.1	F	F
	- With Improvements	TS	<u>2</u>	<u>2</u>	<u>0</u>	<u>1</u>	<u>2</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1></u>	<u>1</u>	<u>1</u>	0	28.0	26.9	C	C
5	Hellman Av. & Pine Av.																	
	<i>Without Limonite Extension:</i>																	
	<i>With Limonite Extension:</i>																	
	- Without Improvements	TS	2	2	1	2	2	1	2	3	1>	2	3	1>	97.7	175.0	F	F
6	Archibald Av. & Riverside Dr.																	
	<i>Without Limonite Extension:</i>																	
	- Without Improvements	TS	1	3	0	1	3	0	1	2	d	1	2	d	134.2	129.5	F	F
	- With Improvements	TS	<u>2</u>	3	0	<u>2</u>	3	0	1	2	d	1	2	<u>1></u>	72.3	74.9	E	E
7	Archibald Av. & Chino Av.																	
	<i>Without Limonite Extension:</i>																	
	- Without Improvements	TS	1	3	0	1	2	0	1	1	0	1	1	1	75.7	159.5	E	F
	- With Improvements	TS	1	3	0	1	3	0	1	1	0	1	1	1	32.3	66.7	C	E
8	Archibald Av. & Schaefer Av.																	
	<i>Without Limonite Extension:</i>																	
	- Without Improvements	CSS	<u>1</u>	2	0	1	2	0	<u>1</u>	<u>1</u>	0	<u>1</u>	<u>1</u>	0	>200.0	>200.0	F	F
	- With Improvements	TS	<u>1</u>	<u>3</u>	0	1	3	<u>1></u>	<u>1</u>	<u>2</u>	0	<u>1</u>	<u>2</u>	0	31.4	75.3	C	E

Table 7-7
Page 2 of 3

Intersection Analysis for Horizon Year (2040) Conditions With Improvements

#	Intersection	Traffic Control ³	Intersection Approach Lanes ¹												Delay ² (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
9	Archibald Av. & Ontario Ranch Rd.																	
	- Without Improvements	TS	1	2	1	1	2	1	2	2	1>>	2	1	1	162.1	>200.0	F	F
	- With Improvements	TS	<u>2</u>	<u>3</u>	<u>1></u>	1	<u>3</u>	<u>1></u>	2	<u>3</u>	1>>	2	<u>3</u>	1	36.4	67.6	D	E
10	Archibald Av. & Eucalyptus Av.																	
	- Without Improvements	TS	1	2	0	1	2	0	0	0	0	0	1	0	182.1	32.4	F	C
	- With Improvements	TS	1	<u>3</u>	0	1	<u>3</u>	0	<u>1</u>	<u>1</u>	0	<u>1</u>	1	0	54.7	18.1	D	B
11	Archibald Av. & Merrill Av.																	
	<i>Without Limonite Extension:</i>																	
	- Without Improvements	TS	1	2	1	2	2	d	1	1	1	1	1	1	>200.0	>200.0	F	F
	- With Improvements	TS	<u>2</u>	<u>3</u>	<u>1></u>	2	<u>3</u>	<u>1></u>	<u>2</u>	<u>2</u>	<u>1>></u>	<u>2</u>	<u>2</u>	1	45.2	73.8	D	E
<i>With Limonite Extension:</i>																		
- Without Improvements	TS	1	2	1	2	2	d	1	1	1	1	1	1	>200.0	>200.0	F	F	
- With Improvements	TS	<u>2</u>	<u>3</u>	<u>1></u>	2	<u>3</u>	<u>1></u>	<u>2</u>	<u>2</u>	<u>1>></u>	<u>2</u>	<u>2</u>	1	25.4	53.7	C	D	
12	Archibald Av. & Victoria Ln.																	
	<i>Without Limonite Extension:</i>																	
	- Without Improvements	<u>TS</u>	<u>1</u>	2	0	<u>1</u>	<u>2</u>	<u>1</u>	0	<u>1</u>	0	0	1	0	57.2	127.1	E	F
	- With Improvements	<u>TS</u>	<u>1</u>	<u>3</u>	0	<u>1</u>	<u>3</u>	<u>1</u>	0	<u>1</u>	0	0	1	0	16.7	17.9	B	B
<i>With Limonite Extension:</i>																		
- Without Improvements	<u>TS</u>	<u>1</u>	2	0	<u>1</u>	<u>2</u>	<u>1</u>	0	<u>1</u>	0	0	1	0	32.8	58.5	C	E	
- With Improvements	<u>TS</u>	<u>1</u>	<u>3</u>	0	<u>1</u>	<u>3</u>	<u>1</u>	0	<u>1</u>	0	0	1	0	15.2	13.9	B	B	
15	Archibald Av. & Limonite Av.																	
	<i>Without Limonite Extension:</i>																	
	- Without Improvements	TS	0	1	1>	1	1	0	0	0	0	1	0	1>	>200.0	>200.0	F	F
	- With Improvements	TS	0	<u>2</u>	1>	<u>2</u>	<u>2</u>	0	0	0	0	<u>2</u>	0	<u>2></u>	40.9	50.5	D	D
<i>With Limonite Extension:</i>																		
- Without Improvements	TS	<u>1</u>	1	1>	1	1	0	<u>1</u>	<u>1</u>	0	1	<u>1</u>	1>	>200.0	>200.0	F	F	
- With Improvements	TS	<u>1</u>	<u>3</u>	1>	<u>2</u>	<u>3</u>	<u>1</u>	<u>2</u>	<u>2</u>	0	<u>2</u>	<u>2</u>	<u>2></u>	46.7	54.8	D	D	
16	Archibald Av. & 65th St.																	
	<i>Without Limonite Extension:</i>																	
	- Without Improvements	TS	1	2	1	1	3	0	1	2	0	1	1	1	121.0	102.6	F	F
	- With Improvements	TS	1	<u>3</u>	1	1	3	0	1	2	0	1	1	1	38.1	34.6	D	C
<i>With Limonite Extension:</i>																		
- Without Improvements	TS	1	2	1	1	3	0	1	2	0	1	1	1	62.6	64.1	E	E	
- With Improvements	TS	1	<u>3</u>	1	1	3	0	1	2	0	1	1	1	34.6	43.1	C	D	
17	Archibald Av. & Schleisman Rd.																	
	<i>Without Limonite Extension:</i>																	
	- Without Improvements	TS	2	3	1	2	3	1	2	3	1	2	3	1	123.5	116.7	F	F
	- With Improvements	TS	2	3	<u>1></u>	2	3	<u>1></u>	2	3	<u>1></u>	2	3	<u>1></u>	48.7	39.9	D	D
<i>With Limonite Extension:</i>																		
- Without Improvements	TS	2	3	1	2	3	1	2	3	1	2	3	1	>200.0	137.0	F	F	
- With Improvements	TS	2	3	<u>1></u>	2	3	<u>1></u>	2	3	<u>1></u>	2	3	<u>1></u>	53.5	54.9	D	D	

Table 7-7
Page 3 of 3

Intersection Analysis for Horizon Year (2040) Conditions With Improvements

#	Intersection	Traffic Control ³	Intersection Approach Lanes ¹												Delay ² (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound			AM	PM	AM	PM
			L	T	R	L	T	R	L	T	R	L	T	R				
20	Harrison Av. & Limonite Av.																	
	- Without Improvements	TS	1	1	1	1	1	0	1	3	d	1	2	1	30.9	63.7	C	E
	- With Improvements	TS	1	1	1	1	1	0	1	3	d	1	3	1	22.4	37.7	C	D
21	Sumner Av. & Limonite Av.																	
	- Without Improvements	TS	1	2	0	1	2	0	2	3	0	2	3	1	63.5	113.7	E	F
	- With Improvements	TS	2	2	0	1	2	0	2	3	1>	2	3	1	27.7	35.5	C	D
22	Scholar Way & Limonite Av.																	
	- Without Improvements	TS	1	1	1	1	2	1	1	2	1	1	2	1	44.3	70.8	D	E
	- With Improvements	TS	1	1	1	1	2	1	1	3	1	1	3	1	22.1	30.1	C	C
24	I-15 SB Ramps & Limonite Av.																	
	- Without Improvements	TS	0	0	0	1	1	1	0	2	1	2	2	0	28.0	44.9	C	D
	- With Improvements ⁴	TS	0	0	0	1	1	2	0	3	1>>	0	3	1>>	18.3	15.7	B	B
25	I-15 NB Ramps & Limonite Av.																	
	- Without Improvements	TS	1	1	1	0	0	0	2	2	0	0	2	1	71.7	78.8	E	E
	- With Improvements ⁴	TS	1	1	2	0	0	0	0	3	1>>	0	3	1>>	22.9	24.7	C	C

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

L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing; >> = Free-Right Turn Lane; **1** = Improvement

² Per the 2010 Highway Capacity Manual, overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown. HCM 6th Edition has been used for the operations analysis for Intersections #6, #24, and #25.

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

⁴ Improvements shows are consistent with the planned I-15/Limonite Avenue interchange project, which is anticipated to be completed by Year 2019.

The Project Applicant shall participate in the funding of off-site improvements, including traffic signals that are needed to serve cumulative traffic conditions through the payment of City of Eastvale DIF (if the improvements are included in the DIF program), TUMF, RBBB, or on a fair share basis (if the improvements are not included in a pre-existing fee program). These fees shall be collected by the City of Eastvale, with the proceeds solely used as part of a funding mechanism aimed at ensuring that regional highways and arterial expansions keep pace with the projected population increases. Each of the improvements shown in Table 7-7 have been identified as being included as part of a pre-existing fee program or fair share contribution in Section 1.5 *Local and Regional Funding Mechanisms* of this TIA.

Worksheets for Horizon Year (2040) With Project conditions, with improvements, HCM calculation worksheets are provided in Appendix 7.12 and Appendix 7.13 for Without and With Limonite Avenue Extension, respectively.

7.10.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON ROADWAY SEGMENTS

The intersection improvements shown in Table 7-7 consist of installation of traffic signals, additional turn lanes, additional through lanes, and traffic signal modifications to accommodate right turn overlap phasing. Table 7-8 shows the LOS for each of the applicable roadway segments with improvements consistent with those shown in Table 7-7 for the adjacent study area intersections, where roadway widening through additional through lanes has been recommended. In other words, only the roadway segments adjacent to study area intersections where additional through lanes have been recommended in Table 7-7 are shown in Table 7-8. As shown in Table 7-8, although all of the roadway segments shown are anticipated to continue to operate at an unacceptable LOS, the LOS is expected to improve from the without improvement conditions. However, roadway segment widening does not appear necessary to address the deficiencies at the identified roadway segments based on the peak hour intersection operations analysis shown in Table 7-7, which demonstrates that the intersections (choke points along the segment) is anticipated to process peak hour traffic flows with the improvements shown.

7.10.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON OFF-RAMP QUEUES

As shown previously in Table 7-4, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Horizon Year (2040) traffic conditions. However, Table 7-9 shows the queuing results with the proposed intersection improvements shown previously in Table 7-7 which are consistent with the planned I-15/Limonite Avenue interchange project. Worksheets for Horizon Year (2040) With Project traffic conditions, with improvements, off-ramp queuing analysis are provided in Appendix 7.14.

Table 7-8

Roadway Segment Capacity Analysis for Horizon Year (2040) Conditions With Improvements

#	Roadway	Segment Limits	Roadway Section	LOS Capacity ¹	2040 With Project	V/C ²	LOS ³	Acceptable LOS
Without Limonite Avenue Extension:								
1	Limonite Av.	Archibald Av. to Sumner Av.	6D	53,900	50,753	0.94	E	D
2		Sumner Av. to Hamner Av.	6D	53,900	52,320	0.97	E	D
3		Hamner Av. to I-15 Freeway	6D	53,900	56,192	1.04	F	D
4	Archibald Av.	Victoria Ln. to Limonite Av.	6D	53,900	67,836	1.26	F	D
5		Limonite Av. to 65th St.	6D	53,900	56,479	1.05	F	D
With Limonite Avenue Extension:								
4	Archibald Av.	Victoria Ln. to Limonite Av.	6D	53,900	51,170	0.95	E	D
5		Limonite Av. to 65th St.	6D	53,900	50,915	0.94	E	D

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

¹ These maximum roadway capacities have been obtained from the City of Eastvale's General Plan (Table C-1).

² V/C = Volume to Capacity Ratio

³ LOS = Level of Service

Table 7-9

Peak Hour Freeway Off-Ramp Queuing Summary for Horizon Year (2040) Conditions With Improvements

Intersection	Movement	Available Stacking Distance (Feet)	2040 With Project			
			95th Percentile Queue (Feet)		Acceptable? ¹	
			AM Peak Hour	PM Peak Hour	AM	PM
I-15 SB Ramps / Limonite Avenue	SBL	1,765	228	254	Yes	Yes
	SBL/T/R	1,765	228	254	Yes	Yes
	SBR	425	128	243	Yes	Yes
I-15 NB Ramps / Limonite Avenue	NBL	1,765	294	267	Yes	Yes
	NBL/T/R	1,765	294	267	Yes	Yes
	NBR	475	295	467 ²	Yes	Yes

¹ Stacking Distance is acceptable if the required stacking distance is less than or equal to the stacking distance provided. An additional 15 feet of stacking which is assumed to be provided in the transition for turn pockets is reflected in the stacking distance shown on this table, where applicable.

² 95th percentile volume exceeds capacity, queue may be longer. Queue shown is maximum after two cycles.

7.10.4 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

There are planned improvements for the I-15 Freeway at Limonite Avenue Interchange, which would consist of a new 8-lane overcrossing along Limonite Avenue (3 through lanes in each direction plus 2 right turn lanes at each ramp), widening of the off-ramps from 2 to 4 lanes, the addition of 2 new loop on-ramps, and additional widening of Limonite Avenue to 4 lanes in each direction between Hamner Avenue and Wineville Avenue. The construction is anticipated to begin mid to late 2018 with completion of construction to occur in 2019. However, this planned improvement does not widen the existing freeway mainline segments. There is a separate I-15 Freeway project that includes the construction of 2 tolled Express Lanes between the SR-60 Freeway and Cajalco Road. The Express Lanes are not anticipated to be completed until Year 2020.

Caltrans typically assumes a reduction of 14 percent to the freeway mainline through volumes in this region to account for vehicles utilizing the carpool (high-occupancy vehicle) lanes. The reduction to the I-15 Freeway mainline volumes has been applied to account for the proposed Express Toll lanes. The analysis has been performed assuming the same number of mixed-flow lanes as existing baseline conditions at the I-15 Freeway at Limonite Avenue interchange. Reductions to mainline volumes have been taken into account for the Express Toll lanes, however, HCM analyses for the freeway facility only considers the traffic in the mixed-flow lanes.

As shown in Table 7-10, the I-15 Freeway mainline segments are anticipated to operate at an acceptable LOS with the improvements discussed above. Table 7-11 shows that the I-15 Freeway ramp junctions are anticipated to operate at an acceptable LOS with the improvements discussed above (i.e., LOS D or better), with the exception of the following ramp junctions:

- I-15 Freeway Southbound, On-Ramp at Limonite Av. (#3) – LOS E AM peak hour only
- I-15 Freeway Northbound, Off-Ramp at Limonite Av. (#6) – LOS E AM peak hour only

Worksheets for Horizon Year (2040) Without and With Project conditions freeway mainline level of service analysis, with improvements, are provided in Appendix 7.15 and Appendix 7.16. Horizon Year (2040) Without and With Project freeway ramp junction level of service analysis worksheets, with improvements, are provided in Appendix 7.17 and Appendix 7.18.

Table 7-10

Basic Freeway Segment Analysis for Horizon Year (2040) Conditions With Improvements

Freeway	Direction ¹	Mainline Segment	Lanes ²	2040 Without Project				2040 With Project			
				Density ³		LOS ⁴		Density ³		LOS ⁴	
				AM	PM	AM	PM	AM	PM	AM	PM
I-15	SB	North of Limonite Av.	3	30.9	22.1	D	C	31.1	22.3	D	C
		South of Limonite Av.	3	31.4	20.2	D	C	31.5	20.3	D	C
	NB	North of Limonite Av.	3	23.8	19.8	C	C	24.0	20.0	C	C
		South of Limonite Av.	3	30.8	26.6	D	D	31.0	26.7	D	D

¹ NB = Northbound; SB = Southbound

² Number of lanes are in the specified direction and is based on existing lanes plus forecasts reflect the proposed Express Lanes.

³ Density is measured by passenger cars per mile per lane (pc/mi/ln).

⁴ LOS = Level of Service

Table 7-11

Freeway Ramp Junction Merge/Diverge Analysis for Horizon Year (2040) Conditions With Improvements

Freeway	Direction ¹	Ramp or Segment	Lanes on Freeway ²	2040 Without Project				2040 With Project			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density ³	LOS ⁴						
I-15	SB	Off-Ramp at Limonite Av.	3	31.5	D	24.2	D	31.7	D	24.4	D
		Loop On-Ramp at Limonite Av.	3	35.9	D	23.9	C	35.9	D	23.9	C
		On-Ramp at Limonite Av.	3	43.7	E	28.6	C	43.9	E	28.7	C
	NB	On-Ramp at Limonite Av.	3	26.1	C	21.9	C	26.1	C	21.9	C
		Loop On-Ramp at Limonite Av.	3	23.2	C	18.8	B	23.2	C	18.8	B
		Off-Ramp at Limonite Av.	3	31.4	E	28.6	D	31.5	E	28.7	D

* **BOLD** = Unacceptable Level of Service

¹ NB = Northbound; SB = Southbound

² Number of lanes are in the specified direction and is based on existing lanes plus forecasts reflect the proposed Express Lanes and I-15/Limonite interchange configuration.

³ Density is measured by passenger cars per mile per lane (pc/mi/ln).

⁴ LOS = Level of Service

8 REFERENCES

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