Appendix L Transportation

Appendix L1: Traffic Impact Analysis

Appendix L2: Vehicle Miles Travelled Assessment

Appendices

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Ontario Ranch Business Park

TRAFFIC IMPACT ANALYSIS

CITY OF ONTARIO

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DECEMBER 5, 2019

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LIST OF ABBREVIATED TERMS

(1)	Reference
ADT	Average Daily Traffic
CAMUTCD	California Manual on Uniform Traffic Control Devices
Caltrans	California Department of Transportation
CCI	Construction Cost Index
CMP	Congestion Management Program
DIF	Development Impact Fee
E+P	Existing Plus Project
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
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	Ontario Ranch Business Park
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

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1 SUMMARY OF FINDINGS

This report presents the results of the traffic impact analysis (TIA) for the proposed Ontario Ranch Business Park development ("Project"), which is located on the northeast corner of Euclid Avenue (SR-83) and Merrill Avenue in the City of Ontario, 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 where necessary recommend improvements to achieve acceptable operations consistent with General Plan level of service goals and policies. This traffic study has been prepared in accordance with the San Bernardino County Congestion Management Program (CMP) Guidelines for CMP Traffic Impact Analysis Reports (Appendix B, 2016 Update), the California Department of Transportation (Caltrans) Guide for the Preparation of Traffic Impact Studies (December 2002), and consultation with City staff during the traffic study scoping process. (1) (2) The City approved Project Traffic Study Scoping agreement is provided in Appendix 1.1 of this TIA.

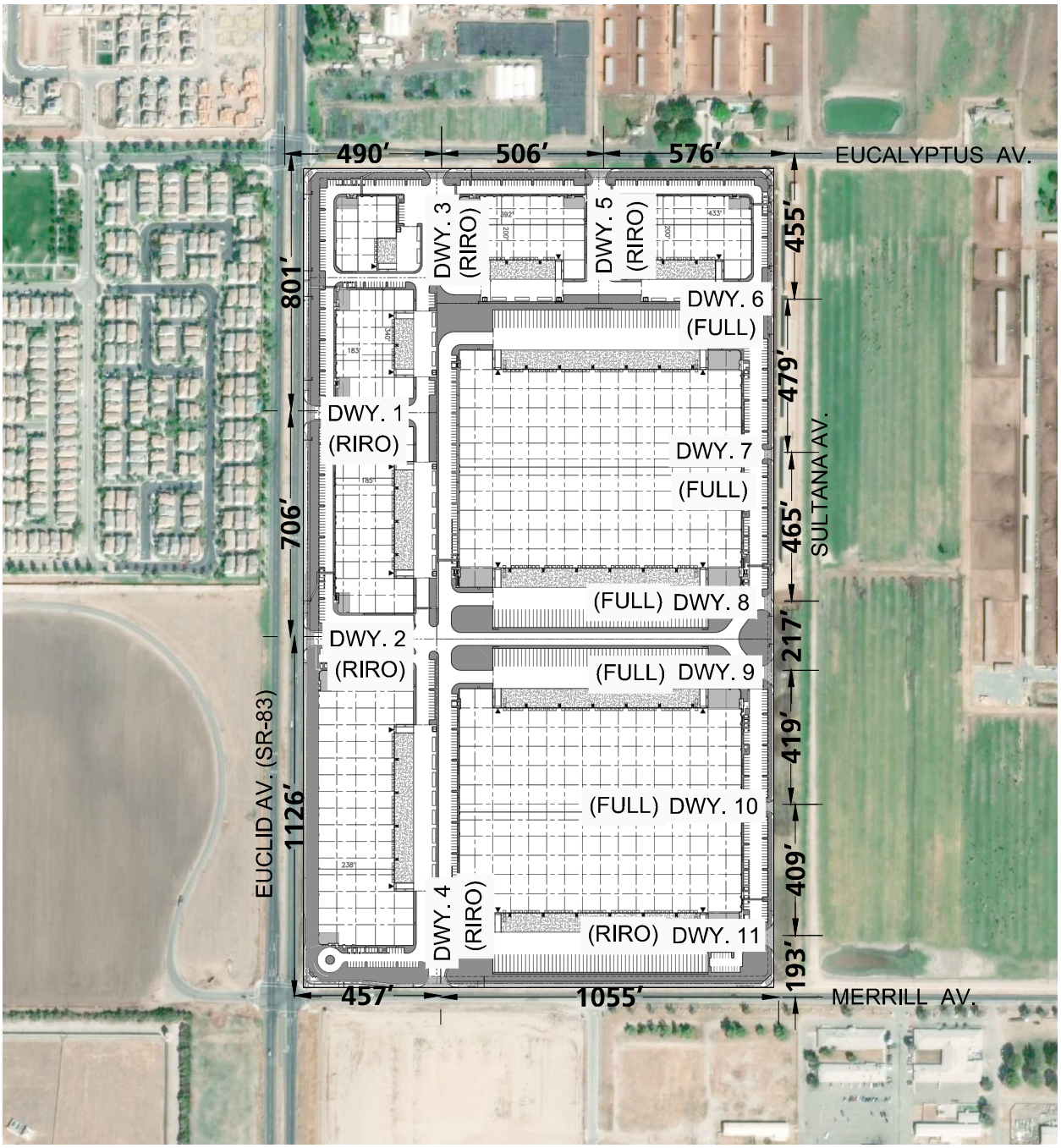
1.1 PROJECT OVERVIEW

Exhibit 1-1 illustrates the preliminary Project site plan. For the purposes of this traffic study, the Project is assumed to be developed in a single phase with an anticipated Opening Year of 2022. As indicated on Exhibit 1-1, the total development is proposed to consist of:

- High-Cube Fulfillment Center Warehouse: 1,019,317 square feet
- High-Cube Cold Storage Warehouse: 200,000 square feet
- Warehousing: 357,836 square feet
- Business Park: 327,874 square feet of a mix of uses including merchant wholesale, professional services, professional office, warehouse/storage, and research and development uses (as would fall under ITE Land Use Code 130).
- **Total of 1,905,027 square feet**

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 and the Transportation Uniform Mitigation Fee (TUMF) High-Cube Warehouse Trip Generation Study (WSP, January 29, 2019). (3) (4) The proposed Project is anticipated to generate a net total of 4,328 actual trip-ends per day, 342 AM peak hour trips and 392 PM peak hour trips. The assumptions and methods used to estimate the Project's trip generation characteristics are discussed in greater detail in Section 4.1 *Project Trip Generation* of this report.

EXHIBIT 1-1: PRELIMINARY SITE PLAN



LEGEND:

RIRO = RIGHT-IN/RIGHT-OUT ONLY ACCESS
FULL = FULL ACCESS

N

12248 - siteplan.dwg

1.2 ANALYSIS SCENARIOS

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

- Existing (2019)
- Existing plus Project (E+P)
- Opening Year Cumulative (2022) Without Project
- Opening Year Cumulative (2022) With Project
- Horizon Year (2040) Without Project
- Horizon Year (2040) With Project

1.2.1 EXISTING (2019) CONDITIONS

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

1.2.2 EXISTING PLUS PROJECT CONDITIONS

The Existing plus Project (E+P) analysis determines traffic deficiencies that would occur on the existing roadway system with the addition of Project traffic. E+P traffic conditions has been evaluated in order to determine any potential off-site improvements.

1.2.3 OPENING YEAR CUMULATIVE (2022) CONDITIONS

The Opening Year Cumulative conditions analysis determines the potential near-term cumulative circulation system deficiencies. To account for background traffic growth, traffic associated with other known cumulative development projects in conjunction with an ambient growth factor from Existing conditions of 2% per year (compounded annually) are included for Opening Year Cumulative (2022) traffic conditions. This comprehensive list was compiled from information provided by the City of Ontario and other near-by agencies.

1.2.4 HORIZON YEAR (2040) CONDITIONS

Traffic projections for Horizon Year (2040) with Project conditions were derived from the San Bernardino Transportation Analysis Model (SBTAM) modified to represent buildout of the City of Ontario. The Horizon Year (2040) conditions analysis will be utilized to determine if improvements funded through regional transportation mitigation fee programs, such as the City's Development Impact Fee (DIF) program, or other approved funding mechanisms can accommodate the long-range cumulative traffic at the target level of service (LOS) identified by the City of Ontario (lead agency). It should be noted that the City of Ontario has updated their DIF program to also include appropriate contributions towards regionally significant improvements that have been identified via the San Bernardino County CMP regional fee program study. If the planned and funded improvements can provide the target LOS, then the Project's payment into established fee programs will be considered as improvements to address

cumulative deficiencies. Other improvements needed beyond the "funded" improvements (such as localized improvements to non-DIF facilities) are identified as such.

1.3 STUDY AREA

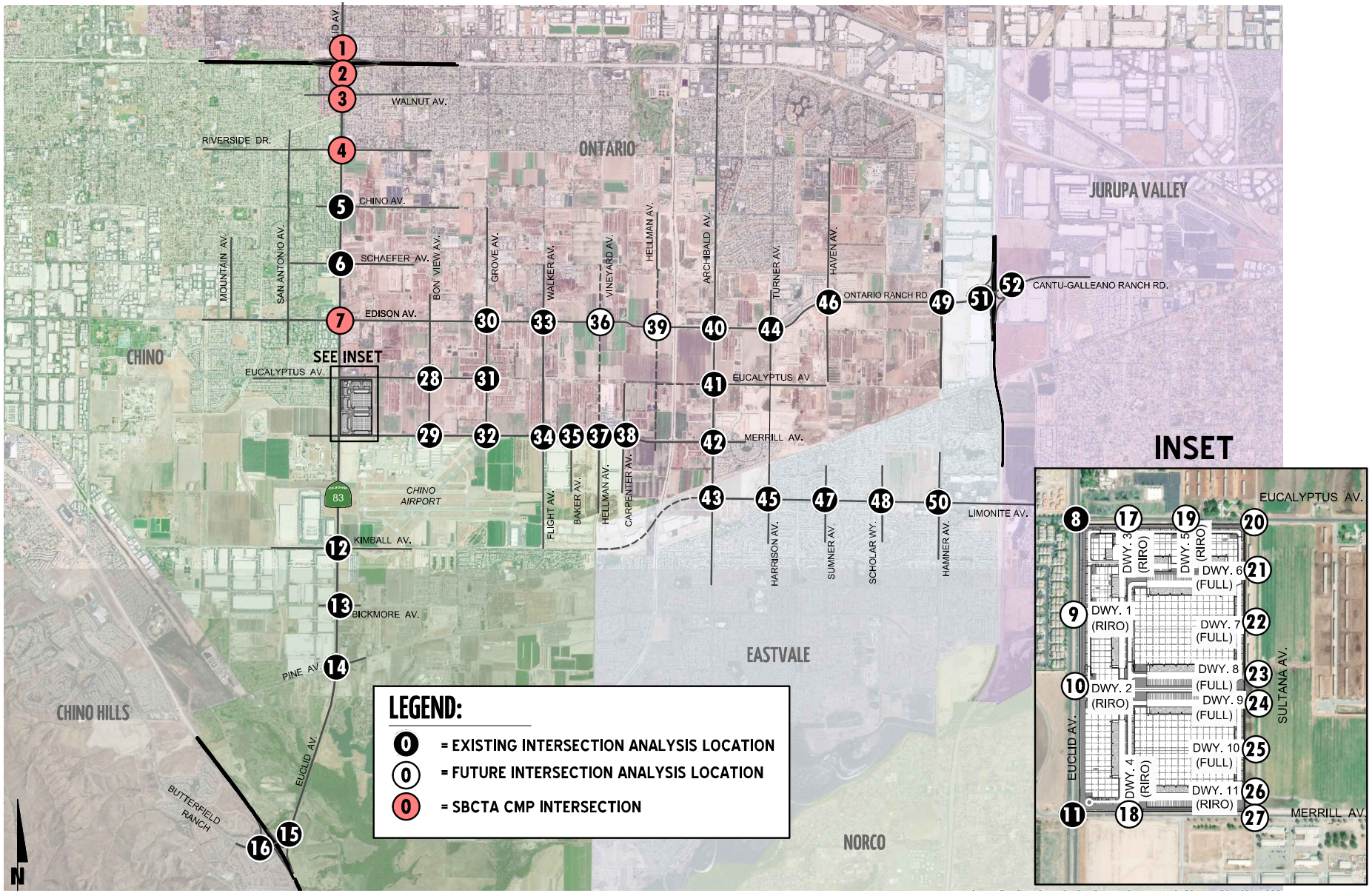
To ensure that this TIA satisfies the City of Ontario's traffic study requirements, Urban Crossroads, Inc. prepared a project traffic study scoping package for review by City staff prior to the preparation of this report. The Agreement provides an outline of the Project study area, trip generation, trip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

1.3.1 INTERSECTIONS

The following 52 study area intersections shown on Exhibit 1-2 and listed on Table 1-1 were selected for this TIA based on consultation with City of Ontario staff. The "50 peak hour trip" criterion utilized by the City of Ontario is consistent with the methodology employed by the County of San Bernardino, and generally represents a minimum number of trips at which a typical intersection would have the potential to be affected 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 influence (i.e., study area). The "50 peak hour trip" criterion is also utilized by the County of Riverside, including the City of Eastvale. 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.

The intent of a CMP is to more directly link land use, transportation, and air quality, thereby prompting reasonable growth management programs that will effectively utilize new transportation funds, alleviate traffic congestion and related deficiencies, and improve air quality. Counties within California have developed CMPs with varying methods and strategies to meet the intent of the CMP legislation. Study area intersections that are identified as CMP facilities in the County of San Bernardino per the San Bernardino County Transportation Authority (SBCTA) CMP are indicated on Table 1-1. (1)

EXHIBIT 1-2: LOCATION MAP



URBAN CROSSROADS

TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction	SBCTA CMP?
1	Euclid Av. (SR-83) & SR-60 WB Ramps	Ontario, Caltrans	Yes
2	Euclid Av. (SR-83) & SR-60 EB Ramps	Ontario, Caltrans	Yes
3	Euclid Av. (SR-83) & Walnut Av.	Chino, Ontario, Caltrans	Yes
4	Euclid Av. (SR-83) & Riverside Dr.	Chino, Ontario, Caltrans	Yes
5	Euclid Av. (SR-83) & Chino Av.	Chino, Ontario, Caltrans	No
6	Euclid Av. (SR-83) & Schaefer Av.	Chino, Ontario, Caltrans	No
7	Euclid Av. (SR-83) & Edison Av.	Chino, Ontario, Caltrans	Yes
8	Euclid Av. (SR-83) & Eucalyptus Av.	Chino, Ontario, Caltrans	No
9	Euclid Av. (SR-83) & Driveway 1 – Future Intersection	Chino, Ontario, Caltrans	No
10	Euclid Av. (SR-83) & Driveway 2 – Future Intersection	Chino, Ontario, Caltrans	No
11	Euclid Av. (SR-83) & Merrill Av.	Chino, Ontario, Caltrans	No
12	Euclid Av. (SR-83) & Kimball Av.	Chino, Caltrans	No
13	Euclid Av. (SR-83) & Bickmore Av.	Chino, Caltrans	No
14	Euclid Av. (SR-83) & Pine Av.	Chino, Caltrans	No
15	SR-71 NB Ramps & Euclid Av. (SR-83)	Chino, Caltrans	No
16	SR-71 SB Ramps & Butterfield Ranch Rd.	Chino Hills, Caltrans	No
17	Driveway 3 & Eucalyptus Av. – Future Intersection	Ontario	No
18	Driveway 4 & Merrill Av. – Future Intersection	Chino, Ontario	No
19	Driveway 5 & Eucalyptus Av. – Future Intersection	Ontario	No
20	Sultana Av. & Eucalyptus Av. – Future Intersection	Ontario	No
21	Sultana Av. & Driveway 6 – Future Intersection	Ontario	No
22	Sultana Av. & Driveway 7 – Future Intersection	Ontario	No
23	Sultana Av. & Driveway 8 – Future Intersection	Ontario	No
24	Sultana Av. & Driveway 9 – Future Intersection	Ontario	No
25	Sultana Av. & Driveway 10 – Future Intersection	Ontario	No
26	Sultana Av. & Driveway 11 – Future Intersection	Ontario	No
27	Sultana Av. & Merrill Av. – Future Intersection	Chino, Ontario	No
28	Bon View Av. & Eucalyptus Av.	Ontario	No
29	Bon View Av. & Merrill Av.	Chino, Ontario	No
30	Grove Av. & Edison Av.	Ontario	No
31	Grove Av. & Eucalyptus Av.	Ontario	No
32	Grove Av. & Merrill Av.	Chino, Ontario	No
33	Walker Av. & Edison Av.	Ontario	No
34	Walker Av./Flight Av. & Merrill Av.	Chino, Ontario	No
35	Baker Av./Van Vliet Av. & Merrill Av.	Chino, Ontario	No
36	Vineyard Av. & Edison Av. – 2040 Analysis Location Only	Ontario	No
37	Vineyard Av./Hellman Av. & Merrill Av.	Chino, Ontario	No
38	Carpenter Av. & Merrill Av.	Chino, Ontario	No

ID	Intersection Location	Jurisdiction	SBCTA CMP?
39	Hellman Av. & Edison Av. – 2040 Analysis Location Only	Ontario	No
40	Archibald Av. & Ontario Ranch Rd.	Ontario	No
41	Archibald Av. & Eucalyptus Av.	Ontario	No
42	Archibald Av. & Merrill Av.	Ontario	No
43	Archibald Av. & Limonite Av.	Eastvale	No
44	Turner Av. & Ontario Ranch Rd.	Ontario	No
45	Harrison Av. & Limonite Av.	Eastvale	No
46	Haven Av. & Ontario Ranch Rd.	Ontario	No
47	Sumner Av. & Limonite Av.	Eastvale	No
48	Scholar Wy. & Limonite Av.	Eastvale	No
49	Hamner Av. & Ontario Ranch Rd./Cantu Galleano Ranch Rd.	Eastvale, Ontario	No
50	Hamner Av. & Limonite Av.	Eastvale	No
51	I-15 SB Ramps & Cantu Galleano Ranch Rd.	Eastvale, Caltrans	No
52	I-15 NB Ramps & Cantu Galleano Ranch Rd.	Jurupa Valley, Caltrans	No

1.3.2 FREEWAY MAINLINE AND RAMP JUNCTION ANALYSIS

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 deficiencies 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 1-2):

TABLE 1-2: FREEWAY FACILITY ANALYSIS LOCATIONS

ID	Freeway Facilities
1	SR-71 Freeway, Southbound – Southbound Loop On-Ramp at Euclid Avenue (SR-83)
2	SR-71 Freeway, Southbound – South of Euclid Avenue (SR-83)
3	SR-71 Freeway, Northbound – Northbound Off-Ramp at Euclid Avenue (SR-83)
4	SR-71 Freeway, Northbound – South of Euclid Avenue (SR-83)
5	SR-60 Freeway, Westbound – West of Euclid Avenue (SR-83)
6	SR-60 Freeway, Westbound – Westbound On-Ramp at Euclid Avenue (SR-83)
7	SR-60 Freeway, Westbound – Westbound Off-Ramp at Euclid Avenue (SR-83)
8	SR-60 Freeway, Westbound – East of Euclid Avenue (SR-83)
9	SR-60 Freeway, Eastbound – West of Euclid Avenue (SR-83)
10	SR-60 Freeway, Eastbound – Eastbound Off-Ramp at Euclid Avenue (SR-83)
11	SR-60 Freeway, Eastbound – Eastbound On-Ramp at Euclid Avenue (SR-83)
12	SR-60 Freeway, Eastbound – East of Euclid Avenue (SR-83)
13	I-15 Freeway, Southbound – North of Cantu Galleano Ranch Road
14	I-15 Freeway, Southbound – Southbound Off-Ramp at Cantu Galleano Ranch Road

ID	Freeway Facilities
15	I-15 Freeway, Northbound – North of Cantu Galleano Ranch Road
16	I-15 Freeway, Northbound – Northbound On-Ramp at Cantu Galleano Ranch Road

1.4 PROJECT DEFICIENCIES

This section provides a summary of Project deficiencies. Section 2 *Methodologies* provides information on the methodologies used in the analysis and Section 5 *E+P Traffic Analysis*, Section 6 *Opening Year Cumulative (2022) Traffic Analysis*, and Section 7 *Horizon Year (2040) Traffic Analysis* includes the detailed analysis. A summary of LOS results for all analysis scenarios is presented on Exhibit 1-3.

1.4.1 E+P CONDITIONS

Based on a comparison of Existing to E+P traffic conditions, the addition of Project traffic is anticipated to contribute towards existing deficiencies at a number of off-site study area intersections.

Euclid Avenue (SR-83) & Riverside Drive (#4) – This intersection was found to operate at an unacceptable LOS (LOS E or worse) during the peak hours under Existing traffic conditions and is anticipated to continue to operate at an unacceptable LOS during the one or more peak hours with the addition of Project traffic resulting in a cumulative deficiency.

Grove Avenue & Edison Avenue (#30) – This intersection was found to operate at an unacceptable LOS (LOS F) during the peak hours under Existing traffic conditions and is anticipated to continue to operate at an unacceptable LOS during the one or more peak hours with the addition of Project traffic resulting in a cumulative deficiency.

Grove Avenue & Eucalyptus Avenue (#31) – This intersection was found to operate at an unacceptable LOS (LOS F) during the peak hours under Existing traffic conditions and is anticipated to continue to operate at an unacceptable LOS during the one or more peak hours with the addition of Project traffic resulting in a cumulative deficiency.

Grove Avenue & Merrill Avenue (#32) – This intersection was found to operate at an unacceptable LOS (LOS E or worse) during the peak hours under Existing traffic conditions and is anticipated to continue to operate at an unacceptable LOS during the one or more peak hours with the addition of Project traffic resulting in a cumulative deficiency.

Walker Avenue & Edison Avenue (#33) – This intersection was found to operate at an unacceptable LOS (LOS F) during the peak hours under Existing traffic conditions and is anticipated to continue to operate at an unacceptable LOS during the one or more peak hours with the addition of Project traffic resulting in a cumulative deficiency.

Carpenter Avenue & Merrill Avenue (#38) – This intersection was found to operate at an unacceptable LOS (LOS E or worse) during the peak hours under Existing traffic conditions and is anticipated to continue to operate at an unacceptable LOS during the one or more peak hours with the addition of Project traffic resulting in a cumulative deficiency.

Hamner Avenue & Ontario Ranch Road (#46) – This intersection was found to operate at an unacceptable LOS (LOS E or worse) during the peak hours under Existing traffic conditions, and is anticipated to continue to operate at an unacceptable LOS during the one or more peak hours with the addition of Project traffic resulting in a cumulative deficiency.

1.4.2 OPENING YEAR CUMULATIVE (2022) CONDITIONS

The following study area intersections are anticipated to operate at a deficient LOS during one or both peak hours for Opening Year Cumulative (2022) Without Project traffic conditions. The Project is anticipated to contribute to these deficiencies by adding traffic (as measured by 50 or more peak hours trips) to already deficient intersections resulting in an increase to peak hour delays. Cumulative deficiencies are not directly caused by the Project. The Project would, however, contribute traffic to these deficient facilities along with other cumulative development projects.

- Euclid Avenue (SR-83) & Riverside Drive (#4) – LOS E PM peak hour only
- Euclid Avenue (SR-83) & Pine Avenue (#14) – LOS E PM peak hour only
- Grove Avenue & Edison Avenue (#30) – LOS F AM and PM peak hours
- Grove Avenue & Eucalyptus Avenue (#31) – LOS F PM peak hour only
- Grove Avenue & Merrill Avenue (#32) – LOS F AM and PM peak hours
- Walker Avenue & Edison Avenue (#33) – LOS F PM peak hour only
- Walker Avenue/Flight Avenue & Merrill Avenue (#34) – LOS E AM and PM peak hours
- Carpenter Avenue & Merrill Avenue (#38) – LOS F AM and PM peak hours
- Archibald Avenue & Limonite Avenue (#43) – LOS E AM peak hour only
- Hamner Avenue & Ontario Ranch Road (#46) – LOS F PM peak hour only

The following study area intersections are anticipated to operate at a deficient LOS during one or both peak hours for Opening Year Cumulative (2022) With Project traffic conditions with the addition of Project traffic, in addition to the locations identified above for Opening Year Cumulative (2022) Without Project traffic conditions.

- Euclid Avenue (SR-83) & Merrill Avenue (#11) – LOS E PM peak hour only
- Vineyard Avenue/Hellman Avenue & Merrill Avenue (#37) – LOS E AM peak hour only

1.4.3 HORIZON YEAR (2040) CONDITIONS

The following study area intersections are anticipated to operate at a deficient LOS during one or both peak hours for Horizon Year (2040) Without Project traffic conditions. The Project is anticipated to contribute to these deficiencies by adding traffic (as measured by 50 or more peak hours trips) to already deficient intersections resulting in an incase to peak hour delays. Cumulative deficiencies are not directly caused by the Project. The Project would, however, contribute traffic to these deficient facilities along with other cumulative development projects.

- Euclid Avenue (SR-83) & SR-60 Westbound Ramps (#1) – LOS E AM and PM peak hours
- Euclid Avenue (SR-83) & SR-60 Eastbound Ramps (#2) – LOS F AM peak hour; LOS E PM peak hour

- Euclid Avenue (SR-83) & Riverside Drive (#4) – LOS F AM and PM peak hours
- Euclid Avenue (SR-83) & Chino Avenue (#5) – LOS F PM peak hour only
- Euclid Avenue (SR-83) & Schaefer Avenue (#6) – LOS F AM and PM peak hours
- Euclid Avenue (SR-83) & Edison Avenue (#7) – LOS F AM and PM peak hours
- Euclid Avenue (SR-83) & Eucalyptus Avenue (#8) – LOS F PM peak hour only
- Euclid Avenue (SR-83) & Merrill Avenue (#11) – LOS F AM and PM peak hours
- Euclid Avenue (SR-83) & Kimball Avenue (#12) – LOS F AM and PM peak hours
- Euclid Avenue (SR-83) & Pine Avenue (#14) – LOS F AM and PM peak hours
- SR-71 Southbound Ramps & Butterfield Ranch Road (#16) – LOS E AM and PM peak hours
- Bon View Avenue & Eucalyptus Avenue (#28) – LOS F PM peak hour only
- Bon View Avenue & Merrill Avenue (#29) – LOS F AM and PM peak hours
- Grove Avenue & Edison Avenue (#30) – LOS F AM and PM peak hours
- Grove Avenue & Eucalyptus Avenue (#31) – LOS F AM and PM peak hours
- Grove Avenue & Merrill Avenue (#32) – LOS F AM and PM peak hours
- Walker Avenue & Edison Avenue (#33) – LOS F AM and PM peak hours
- Walker Avenue/Flight Avenue & Merrill Avenue (#34) – LOS F AM and PM peak hours
- Baker Avenue/Van Vliet Avenue & Merrill Avenue (#35) – LOS E AM peak hour; LOS F PM peak hour
- Vineyard Avenue & Edison Avenue (#36) – LOS F AM and PM peak hours
- Vineyard Avenue/Hellman Avenue & Merrill Avenue (#37) – LOS F AM and PM peak hours
- Carpenter Avenue & Merrill Avenue (#38) – LOS F AM and PM peak hours
- Hellman Avenue & Edison Avenue (#39) – LOS F AM and PM peak hours
- Archibald Avenue & Ontario Ranch Road (#40) – LOS F AM and PM peak hours
- Archibald Avenue & Eucalyptus Avenue (#41) – LOS F AM and PM peak hours
- Archibald Avenue & Merrill Avenue (#42) – LOS F AM and PM peak hours
- Archibald Avenue & Limonite Avenue (#43) – LOS F AM and PM peak hours
- Turner Avenue & Ontario Ranch Road (#44) – LOS F AM and PM peak hours
- Haven Avenue & Ontario Ranch Road (#45) – LOS F AM and PM peak hours
- Hamner Avenue & Ontario Ranch Road (#46) – LOS F AM and PM peak hours

The following study area intersection is anticipated to operate at a deficient LOS during one or both peak hours for Horizon Year (2040) With Project traffic conditions with the addition of Project traffic, in addition to the locations identified above for Horizon Year (2040) Without Project traffic conditions.

- Sultana Avenue & Merrill Avenue (#27) – LOS F PM peak hour only

EXHIBIT 1-3 (1OF2): SUMMARY OF DEFICIENT INTERSECTIONS BY ANALYSIS SCENARIO

#	Intersection	Existing (2019)	E+P	Opening Year Cumulative (2022) Without Project	Opening Year Cumulative (2022) With Project	Horizon Year (2040) Without Project	Horizon Year (2040) With Project
1	Euclid Av. (SR-83) & SR-60 WB Ramps						
2	Euclid Av. (SR-83) & SR-60 EB Ramps						
3	Euclid Av. (SR-83) & Walnut Av.						
4	Euclid Av. (SR-83) & Riverside Dr.						
5	Euclid Av. (SR-83) & Chino Av.						
6	Euclid Av. (SR-83) & Schaefer Av.						
7	Euclid Av. (SR-83) & Edison Av.						
8	Euclid Av. (SR-83) & Eucalyptus Av.						
9	Euclid Av. (SR-83) & Dwy. 1	NA		NA		NA	
10	Euclid Av. (SR-83) & Dwy. 2	NA		NA		NA	
11	Euclid Av. (SR-83) & Merrill Av.						
12	Euclid Av. (SR-83) & Kimball Av.						
13	Euclid Av. (SR-83) & Bickmore Av.						
14	Euclid Av. (SR-83) & Pine Av.						
15	SR-71 NB Ramps & Euclid Av. (SR-83)						
16	SR-71 SB Ramps & Butterfield Ranch Rd.						
17	Dwy. 3 & Eucalyptus Av.	NA		NA		NA	
18	Dwy. 4 & Merrill Av.	NA		NA		NA	
19	Dwy. 5 & Eucalyptus Av.	NA		NA		NA	
20	Sultana Av. & Eucalyptus Av.	NA		NA		NA	
21	Sultana Av. & Dwy. 6	NA		NA		NA	
22	Sultana Av. & Dwy. 7	NA		NA		NA	
23	Sultana Av. & Dwy. 8	NA		NA		NA	
24	Sultana Av. & Dwy. 9	NA		NA		NA	

LEGEND:

- = AM PEAK HOUR
- = PM PEAK HOUR
- = LOS A-E
- = LOS E
- = LOS F

NA = NOT AN ANALYSIS LOCATION FOR THIS SCENARIO

EXHIBIT 1-3 (2OF2): SUMMARY OF DEFICIENT INTERSECTIONS BY ANALYSIS SCENARIO

#	Intersection	Existing (2019)	E+P	Opening Year Cumulative (2022) Without Project	Opening Year Cumulative (2022) With Project	Horizon Year (2040) Without Project	Horizon Year (2040) With Project
25	Sultana Av. & Dwy. 10	NA		NA		NA	
26	Sultana Av. & Dwy. 11	NA		NA		NA	
27	Sultana Av. & Merrill Av.	NA		NA		NA	
28	Bon View Av. & Eucalyptus Av.						
29	Bon View Av. & Merrill Av.						
30	Grove Av. & Edison Av.						
31	Grove Av. & Eucalyptus Av.						
32	Grove Av. & Merrill Av.						
33	Walker Av. & Edison Av.						
34	Walker Av. / Flight Av. & Merrill Av.						
35	Baker Av. / Van Vliet Av. & Merrill Av.						
36	Vineyard Av. & Edison Av.	NA	NA	NA	NA		
37	Vineyard Av. / Hellman Av. & Merrill Av.						
38	Carpenter Av. & Merrill Av.						
39	Hellman Av. & Edison Av.	NA	NA	NA	NA		
40	Archibald Av. & Ontario Ranch Rd.						
41	Archibald Av. & Eucalyptus Av.						
42	Archibald Av. & Merrill Av.						
43	Archibald Av. & Limonite Av.						
44	Turner Av. & Ontario Ranch Rd.						
45	Harrison Av. & Limonite Av.						
46	Haven Av. & Ontario Ranch Rd.						
47	Sumner Av. & Limonite Av.						
48	Scholar Wy. & Limonite Av.						
49	Hamner Av. & Ontario Ranch Rd.						
50	Hamner Av. & Limonite Av.						
51	I-15 SB Ramps & Cantu Galleano Ranch Rd.						
52	I-15 NB Ramps & Cantu Galleano Ranch Rd.						

LEGEND:

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

1.5 RECOMMENDATIONS

The following improvements are needed to address the cumulative deficiencies identified under E+P, Opening Year Cumulative (2022), and Horizon Year (2040) traffic conditions. For those recommended improvements listed on Table 1-3 and not constructed as part of the Project, the Applicant's responsibility for the Project's contributions to deficient traffic conditions is fulfilled by payment of fair share fees and/or Development Impact Fees (DIF) that would be assigned to construction of the identified recommended improvements.

Preliminary cost estimates and fee assessments for these improvements are summarized on Table 1-3. The Project Applicant would be required to pay DIF and fair share fees consistent with the City requirements. Please refer to Section 8 *Local and Regional Funding Mechanisms*.

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Table 1-3

Summary of Improvements Recommended to Meet City of Ontario or Surrounding Agency LOS Requirements

#	Intersection Location	Jurisdiction	Existing (2019)	E+P	2022 Without Project	2022 With Project	2040 Without Project	2040 With Project	Improvements in City DIF?[1]	DIF Project #	Project Responsibility[6]	Total Cost[2,3,4]	Fair Share %[4]	Fair Share Cost[5]
1	Euclid Av. (SR-83) & SR-60 WB Ramps	Ontario, Caltrans	None	None	None	None	Add 2nd NB left turn lane	Same	Yes	ST-107	Fees	$0	-	$0
											Total	**$0**		**$0**
2	Euclid Av. (SR-83) & SR-60 EB Ramps	Ontario, Caltrans	None	None	None	None	Add EB right turn lane	Same	Yes	ST-107	Fees	$0	--	$0
							Add 2nd SB left turn lane	Same	Yes	ST-107	Fees	$0		$0
											Total	**$0**		**$0**
4	Euclid Av. (SR-83) & Riverside Dr.	Caltrans, Chino, Ontario	Add EB right turn lane	Same	Same	Same	Same	Same	No		Fair Share	$78,400	7.222%	$5,662
					Restripe the northbound approach to provide a left turn lane, two through lanes, and one shared through-right turn lane	Same	Same	Same	Yes	ST-012	Fees	$0		$0
					Add 3rd SB through lane	Same	Same	Same	No		Fair Share	$282,240		$20,384
							Add 2nd EB through lane	Same	No		Fair Share	$282,240		$20,384
							Add 2nd NB left turn lane	Same	No		Fair Share	$78,400		$5,662
							Add 2nd SB left turn lane	Same	No		Fair Share	$78,400		$5,662
							Add NB right turn lane	Same	No		Fair Share	$78,400		$5,662
											Total	**$878,080**		**$63,417**
5	Euclid Av. (SR-83) & Chino Av.	Caltrans, Chino, Ontario	None	None	None	None	Add 3rd NB through lane	Same	Yes	ST-012	Fees	$0	8.070%	$0
							Add 3rd SB through lane	Same	Yes	ST-012	Fees	$0		$0
							Add WB left turn lane	Same	No		Fair Share	$78,400		$6,327
											Total	**$78,400**		**$6,327**
6	Euclid Av. (SR-83) & Schaefer Av.	Caltrans, Chino, Ontario	None	None	None	None	Add 3rd NB through lane	Same	Yes	ST-012	Fees	$0	6.199%	$0
							Add 3rd SB through lane	Same	Yes	ST-012	Fees	$0		$0
							Add 2nd NB left turn lane	Same	No		Fair Share	$78,400		$4,860
							Add 2nd SB left turn lane	Same	No		Fair Share	$78,400		$4,860
							Add 2nd EB left turn lane	Same	No		Fair Share	$78,400		$4,860
											Total	**$235,200**		**$14,579**
7	Euclid Av. (SR-83) & Edison Av.	Caltrans, Chino, Ontario	None	None	None	Add WB right turn lane	Same	Same	No		Fair Share	$78,400	5.003%	$3,922
							Add 3rd NB through lane	Same	Yes	ST-012	Fees	$0		$0
							Add 3rd SB through lane	Same	Yes	ST-012	Fees	$0		$0
							Add 2nd NB left turn lane	Same	No		Fair Share	$78,400		$3,922
							Add 2nd SB left turn lane	Same	No		Fair Share	$78,400		$3,922
							Add 2nd EB left turn lane	Same	No		Fair Share	$78,400		$3,922
							Add 2nd EB through lane	Same	No		Fair Share	$282,240		$14,119
							Add 3rd EB through lane	Same	No		Fair Share	$282,240		$14,119
							Add 2nd WB left turn lane	Same	No		Fair Share	$78,400		$3,922
							Add 2nd WB through lane	Same	Yes	ST-007	Fees	$0		$0
							Modify the traffic signal to protect the EB and WB left turns, and implement overlap phasing for the SB and WB right turn lanes	Same	No		Fair Share	$117,600		$5,883
											Total	**$1,074,080**		**$53,732**

Summary of Improvements Recommended to Meet City of Ontario or Surrounding Agency LOS Requirements

#	Intersection Location	Jurisdiction	Existing (2019)	E+P	2022 Without Project	2022 With Project	2040 Without Project	2040 With Project	Improvements in City DIF?[1]	DIF Project #	Project Responsibility[6]	Total Cost[2,3,4]	Fair Share %[4]	Fair Share Cost[5]
8	Euclid Av. (SR-83) & Eucalyptus Av.	Caltrans, Chino, Ontario	None	None	None	None	Add 3rd NB through lane	Same	Yes	ST-012	Fees	$0	9.697%	$0
							Add 3rd SB through lane	Same	Yes	ST-012	Fees	$0		$0
							Add 2nd WB left turn lane	Same	No		Fair Share	$78,400		$7,602
							Add WB right turn lane	Same	No		Fair Share	$78,400		$7,602
											Total	**$156,800**		**$15,204**
11	Euclid Av. (SR-83) & Merrill Av.	Caltrans, Chino, Ontario	None	None	Add WB left turn lane	Same	Same	Same	No		Construct	$0	3.901%	$0
					Add WB right turn lane	Same	Same	Same	No		Construct	$0		$0
					Modify the traffic signal to implement overlap phasing for the WB right turn lane	Same	Same	Same	No		Construct	$0		$0
							Add 3rd NB through lane	Same	No		Fair Share	$282,240		$11,010
							Add 3rd SB through lane	Same	Yes	ST-012	Fees	$0		$0
							Add EB left turn lane	Same	No		Fair Share	$78,400		$3,058
							Add 2nd WB left turn lane	Same	No		Fair Share	$78,400		$3,058
							Modify the traffic signal to implement overlap phasing for the NB right turn lane	Same	No		Fair Share	$117,600		$4,587
											Total	**$556,640**		**$21,714**
12	Euclid Av. (SR-83) & Kimball Av.	Caltrans, Chino	None	None	None	None	Add 3rd NB through lane	Same	No		Fair Share	$282,240	2.308%	$6,513
							Add 3rd SB through lane	Same	No		Fair Share	$282,240		$6,513
							Add 2nd WB left turn lane	Same	No		Fair Share	$78,400		$1,809
							Add EB right turn lane	Same	No		Fair Share	$78,400		$1,809
							Add WB right turn lane	Same	No		Fair Share	$78,400		$1,809
							Modify the traffic signal to implement overlap phasing for the WB right turn lane	Same	No		Fair Share	$117,600		$2,714
											Total	**$917,280**		**$21,168**
14	Euclid Av. (SR-83) & Pine Av.	Caltrans, Chino	None	None	Add NB free right turn lane	Same	Same	Same	No		Fair Share	$117,600	2.815%	$3,310
					Add 3rd NB through lane	Same	Same	Same	No		Fair Share	$282,240		$7,944
					Add 3rd SB through lane	Same	Same	Same	No		Fair Share	$282,240		$7,944
							Add 2nd EB through lane	Same	No		Fair Share	$282,240		$7,944
							Add 2nd NB left turn lane	Same	No		Fair Share	$78,400		$2,207
							Add 2nd SB left turn lane	Same	No		Fair Share	$78,400		$2,207
							Add SB right turn lane	Same	No		Fair Share	$78,400		$2,207
							Add 2nd WB through lane	Same	No		Fair Share	$282,240		$7,944
							Add WB right turn lane	Same	No		Fair Share	$78,400		$2,207
											Total	**$1,560,160**		**$43,912**
27	Sultana Av. & Merrill Av.	Ontario, Chino	None	None	None	None	None	Add 2nd EB through lane	Yes	ST-015	Construct	$0	--	$0
								Add 2nd WB through lane	Yes	ST-015	Construct	$0		$0
											Total	**$0**		**$0**
28	Bon View Av. & Eucalyptus Av.	Ontario	None	None	None	None	Install a Traffic Signal	Same	No		Fair Share	$600,000	12.482%	$74,890
							Add EB left turn lane	Same	No		Fair Share	$78,400		$9,786
							Add WB left turn lane	Same	No		Fair Share	$78,400		$9,786
											Total	**$756,800**		**$94,461**

Summary of Improvements Recommended to Meet City of Ontario or Surrounding Agency LOS Requirements

#	Intersection Location	Jurisdiction	Existing (2019)	E+P	2022 Without Project	2022 With Project	2040 Without Project	2040 With Project	Improvements in City DIF?[1]	DIF Project #	Project Responsibility[6]	Total Cost[2,3,4]	Fair Share %[4]	Fair Share Cost[5]
29	Bon View Av. & Merrill Av.	Ontario, Chino	None	None	None	None	Install a Traffic Signal	Same	No		Fair Share	$600,000	11.187%	$67,125
							Add EB left turn lane	Same	No		Fair Share	$78,400		$8,771
							Add 2nd EB through lane	Same	Yes	ST-015	Fees	$0		$0
							Add 2nd WB through lane	Same	Yes	ST-015	Fees	$0		$0
											Total	**$678,400**		**$75,896**
30	Grove Av. & Edison Av.	Ontario	Install a Traffic Signal	Same	Same	None	Install a Traffic Signal	Same	Yes	ST-024	Fees	$0	2.733%	$0
							Add NB left turn lane	Same	No		Fair Share	$78,400		$2,143
							Add 2nd NB through lane	Same	Yes	ST-013	Fees	$0		$0
							Add NB right turn lane	Same	No		Fair Share	$50,000		$1,366
							Add SB left turn lane	Same	No		Fair Share	$78,400		$2,143
							Add 2nd SB through lane	Same	Yes	ST-013	Fees	$0		$0
							Add EB left turn lane	Same	No		Fair Share	$78,400		$2,143
							Add WB left turn lane	Same	No		Fair Share	$78,400		$2,143
							Add 2nd EB through lane	Same	Yes	ST-007	Fees	$0		$0
							Add 3rd EB through lane	Same	Yes	ST-007	Fees	$0		$0
							Add 2nd WB through lane	Same	Yes	ST-007	Fees	$0		$0
							Add 3rd WB through lane	Same	Yes	ST-007	Fees	$0		$0
											Total	**$363,600**		**$9,937**
31	Grove Av. & Eucalyptus Av.	Ontario	Install a Traffic Signal	Same	Same	Same	Same	Same	Yes	ST-024	Fees	$0	6.236%	$0
					Add 2nd NB through lane	Same	Same	Same	Yes	ST-013	Fees	$0		$0
							Add NB left turn lane	Same	No		Fair Share	$78,400		$4,889
							Add SB left turn lane	Same	No		Fair Share	$78,400		$4,889
							Add 2nd SB through lane	Same	Yes	ST-013	Fees	$0		$0
							Add EB left turn lane	Same	No		Fair Share	$78,400		$4,889
							Add WB left turn lane	Same	No		Fair Share	$78,400		$4,889
											Total	**$313,600**		**$19,555**
32	Grove Av. & Merrill Av.	Ontario, Chino	Install a Traffic Signal	Same	Same	Same	Same	Same	Yes	ST-024	Fees	$0	7.410%	$0
					Add EB left turn lane	Same	Same	Same	No		Fair Share	$78,400		$5,809
					Add 2nd WB through lane	Same	Same	Same	Yes	ST-015	Fees	$0		$0
							Add SB left turn lane	Same	No		Fair Share	$78,400		$5,809
							Add 2nd EB through lane	Same	Yes	ST-015	Fees	$0		$0
											Total	**$156,800**		**$11,618**
33	Walker Av. & Edison Av.	Ontario	Install a Traffic Signal	Same	Same	Same	Same	Same	Yes	ST-024	Fees	$0	2.455%	$0
							Add NB left turn lane	Same	No		Fair Share	$78,400		$1,925
							Add SB left turn lane	Same	No		Fair Share	$78,400		$1,925
							Add EB left turn lane	Same	No		Fair Share	$78,400		$1,925
							Add 2nd EB through lane	Same	Yes	ST-007	Fees	$0		$0
							Add 3rd EB through lane		Yes	ST-007	Fees	$0		$0
							Add WB left turn lane	Same	No		Fair Share	$78,400		$1,925
							Add 2nd WB through lane	Same	Yes	ST-008	Fees	$0		$0
							Add 3rd WB through lane	Same	Yes	ST-008	Fees	$0		$0
											Total	**$313,600**		**$7,699**

Table 1-3

Summary of Improvements Recommended to Meet City of Ontario or Surrounding Agency LOS Requirements

#	Intersection Location	Jurisdiction	Existing (2019)	E+P	2022 Without Project	2022 With Project	2040 Without Project	2040 With Project	Improvements in City DIF?[1]	DIF Project #	Project Responsibility[6]	Total Cost[2,3,4]	Fair Share %[4]	Fair Share Cost[5]
34	Walker Av./Flight Av. & Merrill Av.	Ontario, Chino	None	None	Install a Traffic Signal	Same	Same	Same	Yes	ST-024	Fees	$0	7.795%	$0
					Add NB left turn lane	Same	Same	Same	No		Fair Share	$78,400		$6,112
					Restripe the NB right turn lane to a shared through-right turn lane	Same	Same	Same	No		Fair Share	$39,200		$3,056
					Add SB left turn lane		Same	Same	No		Fair Share	$78,400		$6,112
					Add SB shared through-right turn lane	Same	Same	Same	No		Fair Share	$78,400		$6,112
					Add EB left turn lane	Same	Same	Same	No		Fair Share	$78,400		$6,112
					Add 2nd EB through lane	Same	Same	Same	Yes	ST-015	Fees	$0		$0
					Add 2nd WB through lane	Same	Same	Same	Yes	ST-015	Fees	$0		$0
											Total	**$352,800**		**$27,502**
35	Baker Av./Van Vliet Av. & Merrill Av.	Ontario, Chino	None	None	None	None	Add SB shared left-through-right turn lane	Same	No		Fair Share	$282,240	8.787%	$24,801
							Add EB left turn lane	Same	No		Fair Share	$78,400		$6,889
							Add 2nd WB through lane	Same	Yes	ST-015	Fees	$0		$0
							Install a Traffic Signal	Same	Yes	ST-024	Fees	$0		$0
											Total	**$360,640**		**$31,690**
36	Vineyard Av. & Edison Av.	Ontario	None	None	None	None	Add 2nd EB through lane	Same	Yes	ST-008	Fees	$0	1.609%	$0
							Add 3rd EB through lane	Same	Yes	ST-009	Fees	$0		$0
							Add EB left turn lane	Same	No		Fair Share	$78,400		$1,262
							Add 2nd WB through lane	Same	Yes	ST-009	Fees	$0		$0
							Add 3rd WB through lane	Same	Yes	ST-009	Fees	$0		$0
							Add WB left turn lane	Same	No		Fair Share	$78,400		$1,262
							Add NB left turn lane	Same	No		Fair Share	$78,400		$1,262
							Add NB through lane	Same	Yes	ST-022	Fees	$0		$0
							Add NB right turn lane	Same	No		Fair Share	$78,400		$1,262
							Add SB left turn lane	Same	No		Fair Share	$78,400		$1,262
							Add SB through lane	Same	Yes	ST-022	Fees	$0		$0
							Install a Traffic Signal	Same	Yes	ST-024	Fees	$0		$0
											Total	**$392,000**		**$6,308**
37	Vineyard Av./Hellman Av. & Merrill Av.	Ontario, Chino	None	None	Add NB through lane	Same	Same	Same	No		Fair Share	$282,240	5.158%	$14,557
					Add SB left turn lane	Same	Same	Same	No		Fair Share	$78,400		$4,044
					Add SB through lane	Same	Same	Same	Yes	ST-022	Fees	$0		$0
					Add EB left turn lane	Same	Same	Same	No		Fair Share	$78,400		$4,044
					Add 2nd WB through lane	Same	Same	Same	Yes	ST-015	Fees	$0		$0
							Install a Traffic Signal	Same	Yes	ST-024	Fees	$0		$0
							Add WB right turn lane	Same	No		Fair Share	$78,400		$4,044
							Add SB right turn lane	Same	No		Fair Share	$78,400		$4,044
											Total	**$595,840**		**$30,732**
38	Carpenter Av. & Merrill Av.	Ontario, Chino	Install a Traffic Signal	Same	Same	Same	Same	Same	Yes	ST-024	Fees	$0	--	$0
							Add 2nd EB through lane	Same	Yes	ST-015	Fees	$0		$0
							Add 2nd WB through lane	Same	Yes	ST-015	Fees	$0		$0
											Total	**$0**		**$0**

Summary of Improvements Recommended to Meet City of Ontario or Surrounding Agency LOS Requirements

#	Intersection Location	Jurisdiction	Existing (2019)	E+P	2022 Without Project	2022 With Project	2040 Without Project	2040 With Project	Improvements in City DIF?[1]	DIF Project #	Project Responsibility[6]	Total Cost[2,3,4]	Fair Share %[4]	Fair Share Cost[5]
39	Hellman Av. & Edison Av.	Ontario	None	None	None	None	Add 2nd EB through lane	Same	Yes	ST-009	Fees	$0	1.494%	$0
							Add 3rd EB through lane	Same	Yes	ST-009	Fees	$0		$0
							Add EB left turn lane	Same	No		Fair Share	$78,400		$1,171
							Add 2nd WB through lane	Same	Yes	ST-009	Fees	$0		$0
							Add 3rd WB through lane	Same	Yes	ST-009	Fees	$0		$0
							Add WB left turn lane	Same	No		Fair Share	$78,400		$1,171
							Add NB left turn lane	Same	No		Fair Share	$78,400		$1,171
							Add NB through lane	Same	Yes	ST-018	Fees	$0		$0
							Add SB left turn lane	Same	No		Fair Share	$78,400		$1,171
							Add SB through lane	Same	Yes	ST-018	Fees	$0		$0
							Install a Traffic Signal	Same	Yes	ST-024	Fees	$0		$0
											Total	**$313,600**		**$4,684**
40	Archibald Av. & Ontario Ranch Rd.	Ontario	None	None	None	None	Add 2nd WB through lane	Same	Yes	ST-010	Fees	$0	1.839%	$0
							Add 2nd NB left turn lane	Same	No		Fair Share	$78,400		$1,442
							Add 3rd NB through lane	Same	Yes	ST-002	Fees	$0		$0
							Add 3rd SB through lane	Same	Yes	ST-001	Fees	$0		$0
							Add 3rd EB through lane	Same	Yes	ST-010	Fees	$0		$0
							Add 4th EB through lane	Same	Yes	ST-010	Fees	$0		$0
							Add 3rd WB through lane	Same	Yes	ST-010	Fees	$0		$0
							Add 4th WB through lane	Same	Yes	ST-010	Fees	$0		$0
							Add 2nd SB left turn lane	Same	No		Fair Share	$78,400		$1,442
							Modify the traffic signal to implement overlap phasing for the SB right turn lane	Same	No		Fair Share	$117,600		$2,163
											Total	**$274,400**		**$5,046**
42	Archibald Av. & Merrill Av.	Ontario	None	None	None	None	Stripe SB right turn lane (in place of defacto)	Same	No		Fair Share	$39,200	4.652%	$1,824
							Modify the traffic signal to implement overlap phasing for the SB right turn lane	Same	No		Fair Share	$117,600		$5,471
							Add 2nd EB left turn lane	Same	No		Fair Share	$78,400		$3,647
							Add 3rd NB through lane	Same	Yes	ST-002	Fees	$0		$0
							Add 3rd SB through lane	Same	Yes	ST-002	Fees	$0		$0
							Add EB free right turn lane	Same	No		Fair Share	$117,600		$5,471
											Total	**$352,800**		**$16,413**
43	Archibald Av. & Limonite Av.	Eastvale	None	None	Add 2nd WB right turn lane	Same	No Longer Needed	No Longer Needed	No		Fair Share	$78,400	1.887%	$1,479
					Add 2nd SB left turn lane	Same	Same	Same	No		Fair Share	$78,400		$1,479
							Add NB left turn lane	Same	No		Fair Share	$78,400		$1,479
							Add 2nd WB left turn lane	Same	No		Fair Share	$78,400		$1,479
							Add 2nd NB through lane	Same	No		Fair Share	$282,240		$5,325
							Add 3rd NB through lane	Same	No		Fair Share	$282,240		$5,325
							Add 2nd SB through lane	Same	No		Fair Share	$282,240		$5,325
							Add 3rd SB through lane	Same	No		Fair Share	$282,240		$5,325
							Add 2nd EB left turn lane	Same	No		Fair Share	$78,400		$1,479
							Add 2nd EB through lane	Same	No		Fair Share	$282,240		$5,325
							Add 2nd WB through lane	Same	No		Fair Share	$282,240		$5,325
											Total	**$2,085,440**		**$39,348**
44	Turner Av. & Ontario Ranch Rd.	Ontario	None	None	None	None	Add 3rd EB through lane	Same	Yes	ST-010	Fees	$0	--	$0
							Add 3rd WB through lane	same	Yes	ST-010	Fees	$0		$0
											Total	**$0**		**$0**
46	Haven Av. & Ontario Ranch Rd.	Ontario	None	None	None	None	Add 2nd NB through lane	Same	Yes	ST-014	Fees	$0	--	$0
							Add 2nd SB through lane	Same	Yes	ST-014	Fees	$0		$0
							Add 3rd WB through lane	Same	Yes	ST-010	Fees	$0		$0
											Total	**$0**		**$0**

Table 1-3
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Summary of Improvements Recommended to Meet City of Ontario or Surrounding Agency LOS Requirements

#	Intersection Location	Jurisdiction	Existing (2019)	E+P	2022 Without Project	2022 With Project	2040 Without Project	2040 With Project	Improvements in City DIF?[1]	DIF Project #	Project Responsibility[6]	Total Cost[2,3,4]	Fair Share %[4]	Fair Share Cost[5]
49	Hamner Av. & Ontario Ranch Rd.	Ontario, Eastvale	Modify the traffic signal to extend the cycle length to 130 seconds	Same	Same	Same	Same	Same	No		Fair Share	$117,600	2.441%	$2,870
			Restripe the SB approach to provide two left turn lanes, two through lanes, and one shared through-right turn lane	Same	Same	Same	Same	Same	No		Fair Share	$39,200		$957
							Add 3rd WB through lane	Same	No		Fair Share	$282,240		$6,889
							Add EB right turn lane	Same	No		Fair Share	$78,400		$1,914
							Modify the traffic signal to implement overlap phasing for the NB and EB right turn lanes	Same	No		Fair Share	$117,600		$2,870
											Total	**$635,040**		**$15,500**
Total Costs for Horizon Year (2040) Improvements												**$13,402,000**		**$636,444**
Total Project Fair Share Contribution to the City of Ontario (non-DIF/other)[7]												**$371,802**		
Total Project Fair Share Contribution to the City of Chino[8]												**$216,970**		
Total Project Fair Share Contribution to the City of Eastvale[9]												**$47,672**		

[1] Improvements included in City of Ontario 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 per City direction except Traffic Signals.

[4] Program improvements constructed by project may be eligible for fee credit, at discretion of City. See Table 8-1 for Fair Share Calculations.

[5] Rough order of magnitude cost estimate.

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

[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 Ontario.

[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 Eastvale.

1.6 SITE ACCESS RECOMMENDATIONS

The following site adjacent roadway and site access improvements are necessary to facilitate site access. Exhibit 1-4 shows the improvements described below.

1.6.1 SITE ADJACENT ROADWAY RECOMMENDATIONS

Euclid Avenue (SR-83) – Euclid Avenue (SR-83) is a north-south oriented roadway located along the Project's western boundary. Construct Euclid Avenue (SR-83) from Eucalyptus Avenue to Merrill Avenue at its ultimate half-section width as an 8-lane other principal arterial (200-foot ultimate right-of-way) in compliance with the circulation recommendations found in City of Ontario General Plan. Improvements include curb and gutter, a 15-foot parkway including sidewalk, and a 33-foot half-width raised median. This raised median will prohibit left turns into and out of Driveways 1 and 2 on Euclid Avenue (SR-83).

Eucalyptus Avenue – Eucalyptus Avenue is an east-west oriented roadway located along the Project's northern boundary. Construct Eucalyptus Avenue from Euclid Avenue (SR-83) to Sultana Avenue at its ultimate half-section width as a 4-lane collector (108-foot ultimate right-of-way) in compliance with the circulation recommendations found in City of Ontario General Plan. Improvements include curb and gutter and a 12-foot parkway including sidewalk.

Merrill Avenue – Merrill Avenue is an east-west oriented roadway located along the Project's southern boundary. Construct Merrill Avenue from Euclid Avenue (SR-83) to Sultana Avenue at its ultimate half-section width as a 4-lane collector (108-foot ultimate right-of-way) in compliance with the circulation recommendations found in City of Ontario General Plan. Improvements include curb and gutter and a 12-foot parkway including sidewalk.

Sultana Avenue – Sultana Avenue is a north-south oriented roadway located along the Project's eastern boundary. Construct Sultana Avenue from Eucalyptus Avenue to Merrill Avenue at its ultimate half-section width as a 2-lane local street (84-foot ultimate right-of-way) in compliance with the circulation recommendations found in City of Ontario General Plan. Improvements would include 48-feet of pavement, 9-foot parkway, 5-foot sidewalk, and 4-feet of curb adjacent landscaping.

1.6.2 SITE ACCESS RECOMMENDATIONS

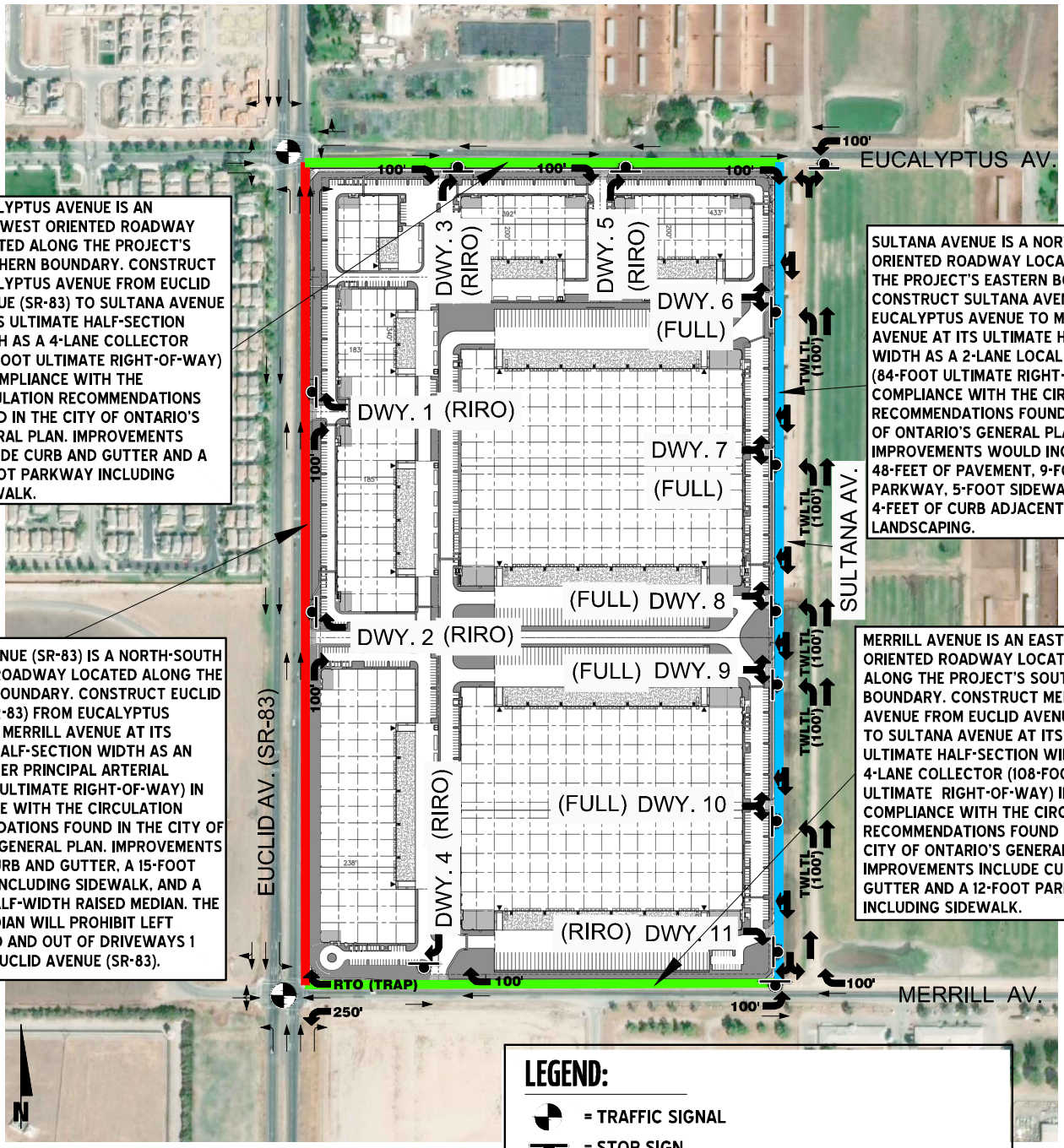
Euclid Avenue (SR-83) & Driveway 1 (#9) – The following improvements are necessary to accommodate site access:

- Install a stop control on the westbound approach and a westbound right turn lane.
- Add a northbound right turn lane with a minimum of 100-feet of storage.

Euclid Avenue (SR-83) & Driveway 2 (#10) – The following improvements are necessary to accommodate site access:

- Install a stop control on the westbound approach and a westbound right turn lane.
- Add a northbound right turn lane with a minimum of 100-feet of storage.

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



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 ONTARIO SIGHT DISTANCE STANDARDS AT THE TIME OF PREPARATION OF FINAL GRADING, LANDSCAPE AND STREET IMPROVEMENT PLANS.

Euclid Avenue (SR-83) & Merrill Avenue (#11) – The following improvements are necessary to reduce the Project's contribution towards a near-term cumulative deficiency:

- Add a westbound left turn lane with a minimum of 250-feet of storage.
- Add a westbound right turn lane and modify the traffic signal to implement overlap phasing on the westbound right turn lane.

Driveway 3 & Eucalyptus Avenue (#17) – The following improvements are necessary to accommodate site access:

- Install a stop control on the northbound approach and a northbound right turn lane. The intersection should be constructed to prohibit left turns in and out of this driveway.
- Add an eastbound right turn lane with a minimum of 100-feet of storage.

Driveway 4 & Merrill Avenue (#18) – The following improvements are necessary to accommodate site access:

- Install a stop control on the southbound approach and a northbound right turn lane. The intersection should be constructed to prohibit left turns in and out of this driveway.
- Add a westbound right turn lane with a minimum of 100-feet of storage.

Driveway 5 & Eucalyptus Avenue (#19) – The following improvements are necessary to accommodate site access:

- Install a stop control on the northbound approach and a northbound right turn lane. The intersection should be constructed to prohibit left turns in and out of this driveway.
- Add an eastbound right turn lane with a minimum of 100-feet of storage.

Sultana Avenue & Eucalyptus Avenue (#20) – The following improvements are necessary to accommodate site access:

- Install a stop control on the northbound approach and a northbound shared left-right turn lane.
- Add an eastbound right turn lane with a minimum of 100-feet of storage.
- Add a westbound left turn lane with a minimum of 150-feet of storage.

Sultana Avenue & Driveway 6 (#21) – The following improvements are necessary to accommodate site access:

- Install a stop control on the eastbound approach and an eastbound shared left-right turn lane.
- Add a northbound left turn lane with a minimum of 100-feet of storage in the two-way-left-turn lane and a northbound through lane.
- Add a southbound shared through-right turn lane.

Sultana Avenue & Driveway 7 (#22) – The following improvements are necessary to accommodate site access:

- Install a stop control on the eastbound approach and an eastbound shared left-right turn lane.

- Add a northbound left turn lane with a minimum of 100-feet of storage in the two-way-left-turn lane and a northbound through lane.
- Add a southbound shared through-right turn lane.

Sultana Avenue & Driveway 8 (#23) – The following improvements are necessary to accommodate site access:

- Install a stop control on the eastbound approach and an eastbound shared left-right turn lane.
- Add a northbound left turn lane with a minimum of 100-feet of storage in the two-way-left-turn lane and a northbound through lane.
- Add a southbound shared through-right turn lane.

Sultana Avenue & Driveway 9 (#24) – The following improvements are necessary to accommodate site access:

- Install a stop control on the eastbound approach and an eastbound shared left-right turn lane.
- Add a northbound left turn lane with a minimum of 100-feet of storage in the two-way-left-turn lane and a northbound through lane.
- Add a southbound shared through-right turn lane.

Sultana Avenue & Driveway 10 (#25) – The following improvements are necessary to accommodate site access:

- Install a stop control on the eastbound approach and an eastbound shared left-right turn lane.
- Add a northbound left turn lane with a minimum of 100-feet of storage in the two-way-left-turn lane and a northbound through lane.
- Add a southbound shared through-right turn lane.

Sultana Avenue & Driveway 11 (#26) – The following improvements are necessary to accommodate site access:

- Install a stop control on the eastbound approach and an eastbound right turn lane. The intersection should be constructed to prohibit left turns in and out of this driveway.
- Add a northbound through lane.
- Add a southbound shared through-right turn lane.

Sultana Avenue & Merrill Avenue (#27) – The following improvements are necessary to accommodate site access:

- Install a stop control on the southbound approach and a southbound shared left-right turn lane.
- Add an eastbound left turn lane with a minimum of 100-feet of storage.
- Add a westbound right turn lane with a minimum of 100-feet of storage.

1.7 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 intersections 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 on Exhibit 1-5, the following curb radius and driveway changes are necessary in order to accommodate the ingress and egress of heavy trucks:

- Driveway 4 on Merrill Avenue should be modified to provide a 50-foot curb radius on the northwest and northeast corners to accommodate WB-67 trucks.
- The intersection of Sultana Avenue and Eucalyptus Avenue should be modified to provide a 50-foot curb radius on the southwest corner of the intersection to accommodate WB-67 trucks.
- Driveway 6 on Sultana Avenue should be modified to provide a 35-foot curb radius on the northwest corner and a 40-foot curb radius on the southwest corner. In addition, modify the landscaped median 30-feet to the west in order to allow for WB-67 trucks to maneuver on site at Driveway 6.
- Driveway 8 on Sultana Avenue should be modified to provide a 40-foot curb radius on the northwest corner and a 45-foot radius on the southwest corner. In addition, modify the landscaped median on the southwest corner by 10-feet to accommodate WB-67 trucks.
- Driveway 9 on Sultana Avenue should be modified to provide a 40-foot curb radius on the northwest corner. In addition, modify the landscaped median to the northwest corner by 10-feet to accommodate WB-67 trucks.

The intersections of Driveway 3 and Driveway 5 on Eucalyptus Avenue are anticipated to accommodate WB-50 trucks. Driveway 11 on Sultana Avenue and the intersection of Sultana Avenue at Merrill Avenue are anticipated to accommodate WB-67 trucks.

EXHIBIT 1-5 (1OF2): TRUCK ACCESS

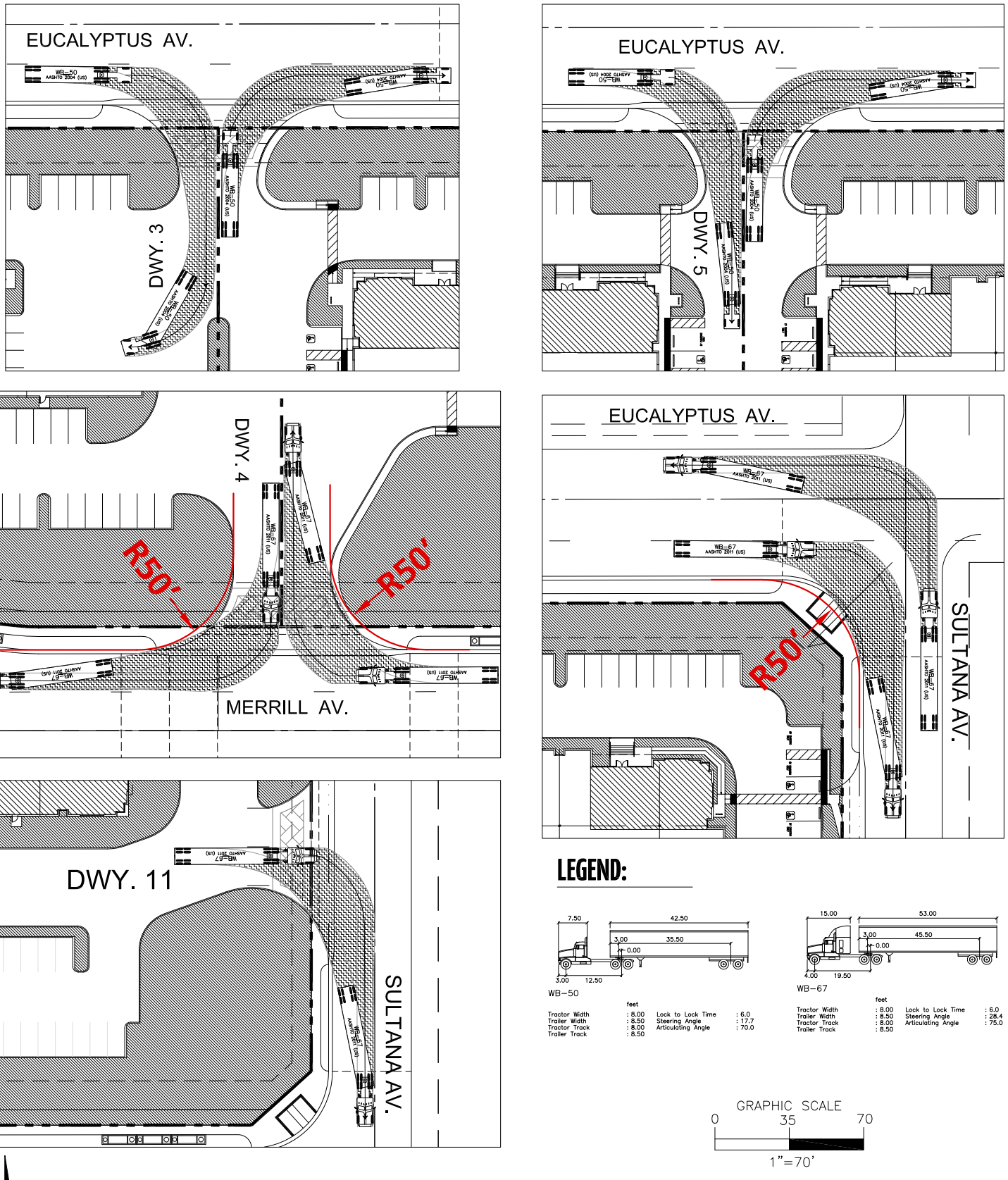
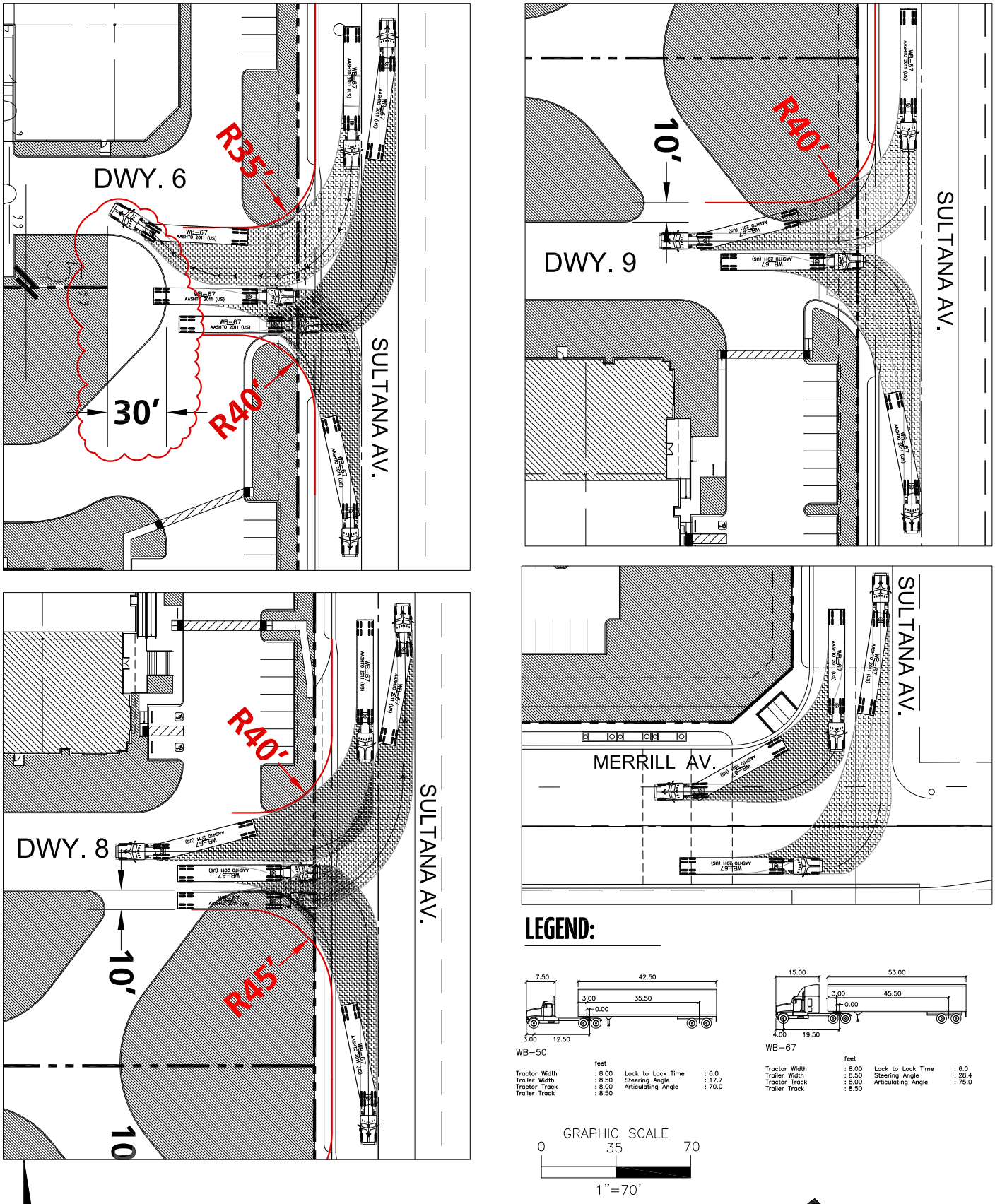


EXHIBIT 1-5 (2OF2): TRUCK ACCESS



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

2.2.1 SIGNALIZED INTERSECTIONS

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

The City of Ontario, City of Chino, City of Chino Hills, City of Eastvale, and City of Jurupa Valley require signalized intersection operations analysis based on the methodology described in the HCM. (5) Intersection LOS operations are based on an intersection's average control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections LOS is directly related to the average control delay per vehicle and is correlated to a LOS designation as described on Table 2-1.

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

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 longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.01 to 55.00	D	F
Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.01 to 80.00	E	F
Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	80.01 and up	F	F

Source: HCM (6th Edition)

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:

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 Ontario, City of Chino, City of Chino Hills, City of Eastvale, 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 x Peak 15-minute Flow Rate]). The use of a 15-minute PHF produces a more detailed analysis as compared to analyzing vehicles per hour. Existing PHFs have been used for all analysis scenarios. Per the HCM, PHF values over 0.95 often are indicative of high traffic volumes with capacity constraints on peak hour flows while lower PHF values are indicative of greater variability of flow during the peak hour. (5)

California Department of Transportation (Caltrans)

Per the Caltrans Guide for the Preparation of Traffic Impact Studies, the traffic modeling and signal timing optimization software package Synchro (Version 10) has also been utilized to analyze signalized intersections under Caltrans' jurisdiction, which include interchange to arterial ramps (i.e., SR-60 Freeway ramps at Euclid Avenue (SR-83), SR-71 Freeway ramps at Edison Avenue, I-15 Freeway ramps at Cantu Galleano Ranch Road, etc.). (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.

2.2.2 UNSIGNALIZED INTERSECTIONS

The City of Ontario, City of Chino, City of Chino Hills, City of Eastvale, and City of Jurupa Valley require the operations of unsignalized intersections be evaluated using the methodology described in the HCM. (5) The LOS rating is based on the weighted average control delay expressed in seconds per vehicle (see Table 2-2).

TABLE 2-2: UNSIGNALIZED INTERSECTION LOS THRESHOLDS

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

Source: HCM (6th Edition)

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

2.3 TRAFFIC SIGNAL WARRANT ANALYSIS METHODOLOGY

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

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

Future intersections that do not currently 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.

Traffic signal warrant analyses were performed for the following study area intersections shown on Table 2-3:

TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction	SBCTA CMP?
20	Sultana Av. & Eucalyptus Av. – Future Intersection	Ontario	No
21	Sultana Av. & Driveway 6 – Future Intersection	Ontario	No
22	Sultana Av. & Driveway 7 – Future Intersection	Ontario	No
23	Sultana Av. & Driveway 8 – Future Intersection	Ontario	No
24	Sultana Av. & Driveway 9 – Future Intersection	Ontario	No
25	Sultana Av. & Driveway 10 – Future Intersection	Ontario	No
26	Sultana Av. & Driveway 11 – Future Intersection	Ontario	No
27	Sultana Av. & Merrill Av. – Future Intersection	Chino, Ontario	No
28	Bon View Av. & Eucalyptus Av.	Ontario	No
29	Bon View Av. & Merrill Av.	Chino, Ontario	No
30	Grove Av. & Edison Av.	Ontario	No
31	Grove Av. & Eucalyptus Av.	Ontario	No
32	Grove Av. & Merrill Av.	Chino, Ontario	No
33	Walker Av. & Edison Av.	Ontario	No
34	Walker Av./Flight Av. & Merrill Av.	Chino, Ontario	No
35	Baker Av./Van Vliet Av. & Merrill Av.	Chino, Ontario	No

ID	Intersection Location	Jurisdiction	SBCTA CMP?
36	Vineyard Av. & Edison Av. – 2040 Analysis Location Only	Ontario	No
37	Vineyard Av./Hellman Av. & Merrill Av.	Chino, Ontario	No
38	Carpenter Av. & Merrill Av.	Chino, Ontario	No
39	Hellman Av. & Edison Av. – 2040 Analysis Location Only	Ontario	No

Traffic signal warrant analyses have not been performed for future intersections with restricted access, such as Driveways 1, 2, 3, 4, and 5 (all proposed for right-in/right-out access only).

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 (2022) 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.

2.4 FREEWAY OFF-RAMP QUEUING ANALYSIS

The study area for this TIA includes the following freeway-to-arterial interchanges:

- SR-71 Freeway & Euclid Avenue (SR-83)
- Euclid Avenue (SR-83) & SR-60 Freeway
- I-15 Freeway & Cantu Galleano Ranch Road

Consistent with Caltrans requirements, the 95th percentile queuing of vehicles has been assessed at the off-ramps to determine potential queuing deficiencies at the freeway ramp intersections at the interchanges identified above. Specifically, the queuing analysis is utilized to identify any potential queuing and "spill back" onto the SR-71, SR-60, or I-15 Freeway mainline from the off-ramps.

The traffic progression analysis tool and HCM intersection analysis program, Synchro, has been used to assess the potential deficiencies/needs of the intersections with traffic added from the proposed Project. Storage (turn-pocket) length recommendations at the ramps have been based upon the 95th percentile queue resulting from the Synchro progression analysis. There are two footnotes which appear on the Synchro outputs. One footnote indicates if the 95th percentile cycle exceeds capacity. Traffic is simulated for two complete cycles of the 95th percentile traffic in Synchro in order to account for the effects of spillover between cycles. In practice, the 95th percentile queue shown will rarely be exceeded and the queues shown with the footnote are acceptable for the design of storage bays. The other footnote indicates whether or not the volume for the 95th percentile queue is metered by an upstream signal. In many cases, the 95th percentile queue will not be experienced and may potentially be less than the 50th percentile

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

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

2.5 FREEWAY MAINLINE SEGMENT ANALYSIS METHODOLOGY

Consistent with recent Caltrans guidance and because deficiencies 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. The freeway system in the study area has been broken into segments defined by the freeway-to-arterial interchange locations. The freeway segments have been evaluated in this TIA based upon peak hour directional volumes. The freeway segment analysis is based on the methodology described in the HCM and performed using HCS7 (Highway Capacity Software, HCM 6th Edition). The performance measure preferred by Caltrans to calculate LOS is density. Density is expressed in terms of passenger cars per mile per lane. Table 2-4 illustrates the freeway segment LOS descriptions for each density range utilized for this analysis.

The number of lanes for existing baseline conditions has been obtained from field observations conducted by Urban Crossroads in March 2019. These existing freeway geometrics have been utilized for Existing, E+P, Opening Year Cumulative Without and With Project, and Horizon Year Without and With Project conditions.

The SR-71 Freeway, SR-60 Freeway, and I-15 Freeway mainline volume data were obtained from the Caltrans Performance Measurement System (PeMS) website for the segments of the SR-71 Freeway north of Central Avenue, SR-60 Freeway west of Euclid Avenue (SR-83), and I-15 Freeway north of Cantu Galleano Ranch Road. The data was obtained from January 2019. 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. (7)

TABLE 2-4: DESCRIPTION OF FREEWAY MAINLINE LOS

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

[1] pc/mi/ln = passenger cars per mile per lane. Source: HCM (6th Edition)

2.6 FREEWAY MERGE/DIVERGE RAMP JUNCTION ANALYSIS

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

The merge/diverge analysis is based on the HCM Ramps and Ramp Junctions analysis method and performed using HCS7 software. The measure of effectiveness (reported in passenger car/mile/lane) are calculated based on the existing number of travel lanes, number of lanes at the on and off ramps both at the analysis junction and at upstream and downstream locations (if applicable) and acceleration/deceleration lengths at each merge/diverge point. Table 2-5 presents the merge/diverge area level of service descriptions for each density range utilized for this analysis.

Similar to the basic freeway segment analysis, the SR-71, SR-60, and I-15 Freeway mainline volume data were obtained from the Caltrans PeMS website for the segments of the SR-71 Freeway north of Central Avenue, SR-60 Freeway west of Euclid Avenue (SR-83), and I-15 Freeway north of Cantu Galleano Ranch Road. The ramp data (per the count data presented in Appendix 3.1) were then utilized to flow conserve the mainline volumes to determine the remaining SR-71, SR-60, and I-15 Freeway mainline segment volumes. Flow conservation checks ensure that traffic flows from east to west and north to south (and vice versa) of the interchange area with no unexplained loss of vehicles. The data was obtained from January 2019. In an effort to conduct

a conservative analysis, the maximum value observed within the three-day period was utilized for the weekday morning (AM) and weekday evening (PM) peak hours. In addition, truck traffic, represented as a percentage of total traffic, has been utilized for the purposes of this analysis in an effort to not overstate traffic volumes and peak hour deficiencies. (7) 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.

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

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

[1] pc/mi/ln = passenger cars per mile per lane. Source: HCM (6th Edition)

2.7 MINIMUM ACCEPTABLE LEVELS OF SERVICE (LOS)

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

2.7.1 CITY OF ONTARIO

The City of Ontario utilizes a minimum acceptable LOS of LOS E, where feasible.

2.7.2 CITY OF CHINO HILLS

The Traffic Impact Study Guidelines for Development Projects in the City of Chino Hills (dated October 15, 2001) indicates LOS D shall be the minimum acceptable LOS to be used for all City of Chino Hills roadways and intersections. Therefore, any intersection operating at LOS E or LOS F will be considered deficient.

2.7.3 CITY OF CHINO

According to the City of Chino, LOS D is the minimum acceptable condition that should be maintained during the peak commute hours, where feasible.

2.7.4 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.

2.7.5 CITY OF JURUPA VALLEY

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

2.7.6 CMP

The CMP definition of deficiency is based on maintaining a level of service standard of LOS E or better, where feasible, except where an existing LOS F condition is identified in the CMP document. However, in an effort to overstate as opposed to understate potential deficiencies, LOS D has been utilized for the CMP intersections for the purposes of this analysis, unless the intersection is located in the City of Ontario (which uses LOS E).

2.7.7 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 and intersections is LOS D. Consistent with the City of Ontario LOS threshold of LOS D and in excess of the City of Ontario stated LOS threshold of LOS E, LOS D will be used as the target LOS for freeway ramps, freeway segments, and freeway merge/diverge ramp junctions.

2.8 DEFICIENCY CRITERIA

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

2.8.1 INTERSECTIONS

To determine whether the addition of project traffic at a study intersection would result in a traffic deficiency, the following will be utilized:

- When the Without 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.

When the Without Project condition is already below LOS D/LOS E (i.e., unacceptable LOS), the Project will be responsible for improving its deficiency to acceptable levels of service. Thus, for intersections operating at unacceptable LOS during either the AM and/or PM peak hour, improvements have been identified to improve the deficiencies of the Project to an intersection LOS that is equal to or better than pre-Project conditions (see Table 2-6).

The Project's contribution to a deficiency can be reduced if the Project is required to implement or fund its fair share of improvements designed to alleviate its contribution to the deficient condition.

TABLE 2-6: DEFICIENCY CRITERIA

Without Project Level of Service	Level of Service with 50 or more Project trips	Deficient?	Improvement Required?
City of Ontario			
A	A-D	No	No
B	B-D	No	No
C	C-D	No	No
D	D-E	No	No
E	E	No	No
A-E	F	Yes	Yes, bring LOS to E or better
F	F	Yes	Yes, bring LOS to E or better
City of Chino, City of Eastvale, City of Chino Hills, City of Jurupa Valley			
A	A-D	No	No
B	B-D	No	No
C	C-D	No	No
D	D	No	No
A-D	E or F	Yes	Yes, bring LOS to D or better
E	E	Yes	Yes, bring LOS to D or better
E	F	Yes	Yes, bring LOS to D or better
F	F	Yes	Yes, bring LOS to D or better

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 improvements 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 improvements, and
- Calculate the Project's fair-share contribution to improve the Project's traffic deficiencies

2.8.2 CALTRANS FREEWAY FACILITIES

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

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

2.8.3 CALTRANS FREEWAY OFF-RAMPS

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

- The traffic study finds that the off-ramp will degrade from acceptable 95th percentile queues to unacceptable 95th percentile queues.
- The traffic study finds that the project will exacerbate an already deficient condition by contributing 50 or more peak hour trips to the off-ramp. An off-ramp that has 95th percentile queues that exceed the available storage is deemed to be deficient.

2.9 PROJECT FAIR SHARE CALCULATION METHODOLOGY

In cases where this TIA identifies that the Project would contribute additional traffic volumes to 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:

Project Fair Share % = Project (2040) AM/PM Traffic / (2040 With Project AM/PM Total Traffic – Existing AM/PM Traffic)

The project fair share percentage has been calculated for both the AM peak hour and PM peak hour and the highest of the two has been selected. The Project fair share contribution calculations are presented in Section 8 *Local and Regional Funding Mechanisms* of this TIA. The cost of implementing the improvements shown on Table 1-3 have been estimated based on the preliminary construction cost estimates found in Appendix G of the San Bernardino County CMP in conjunction with a total cost escalation factor of 1.484 to more closely approximate current (2019) costs. 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 improvements (see Table 10-2). 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 physical improvements.

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3 AREA CONDITIONS

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

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the agreement with City of Ontario staff (Appendix 1.1), the study area includes a total of 52 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 ONTARIO GENERAL PLAN CIRCULATION ELEMENT

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

The study area roadways that are classified as 8-lane Principal Arterials are identified as having four lanes of travel in each direction. The following study area roadways within the City of Ontario are classified as 8-lane Principal Arterials:

- Euclid Avenue (SR-83) from the SR-60 Freeway to Merrill Avenue
- Edison Avenue/Ontario Ranch Road from Euclid Avenue (SR-83) to Hamner Avenue
- Hamner Avenue from the SR-60 Freeway to Bellegrave Avenue

The study area roadways that are classified as 6-lane Principal Arterials are identified as having three lanes of travel in each direction and a 14-foot curbed or painted median. The following study area roadways within the City of Ontario are classified as 6-lane Principal Arterials:

- Vineyard Avenue from the SR-60 Freeway to Merrill Avenue
- Archibald Avenue north of Bellegrave Avenue

The study area roadways that are classified as 4-lane Principal Arterials are identified as having two lanes of travel in each direction. The following study area roadways within the City of Ontario are classified as 4-lane Principal Arterials:

- Grove Avenue north of Merrill Avenue
- Haven Avenue from Riverside Drive to Bellegrave Avenue

EXHIBIT 3-1 (1OF3): EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS

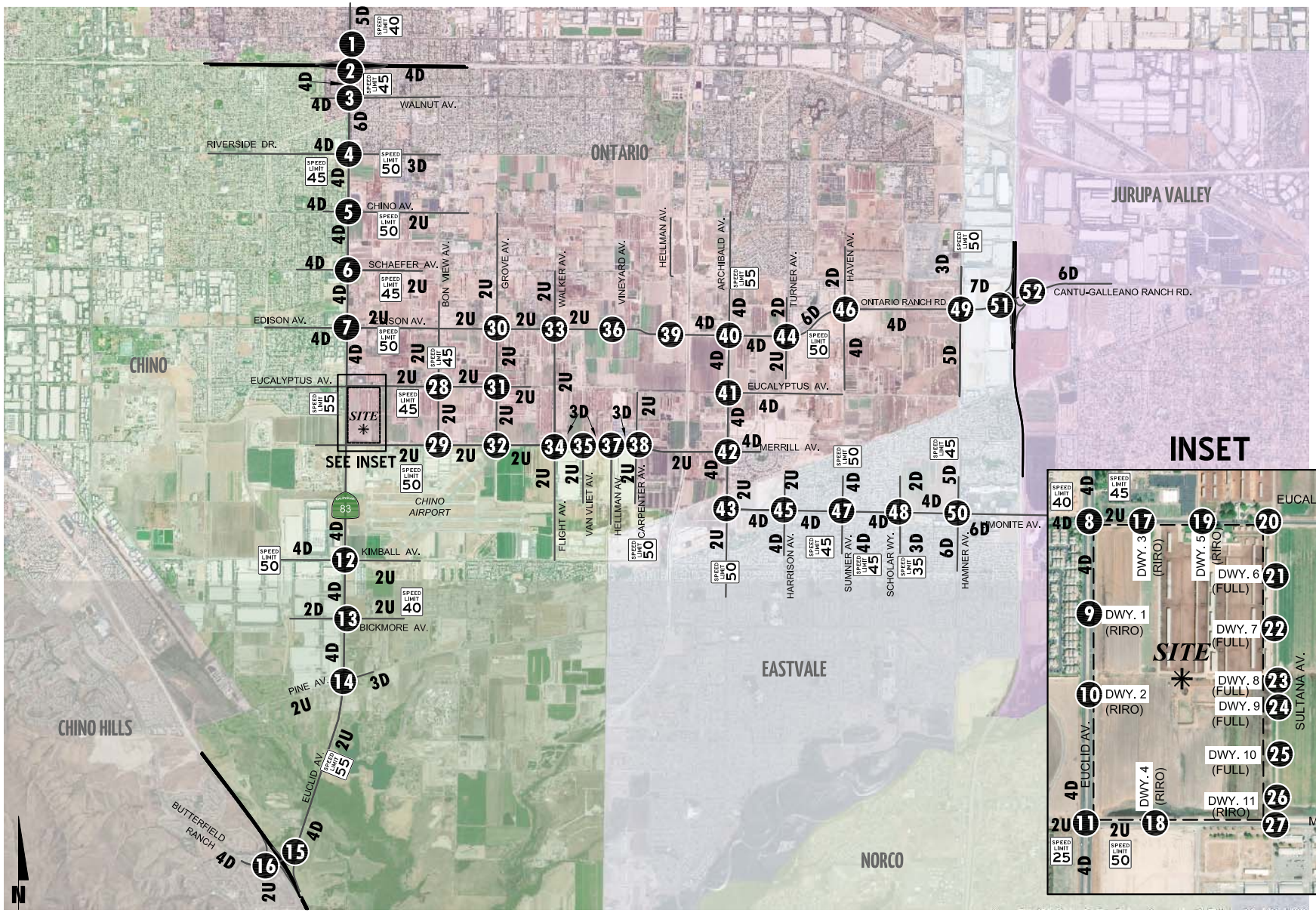
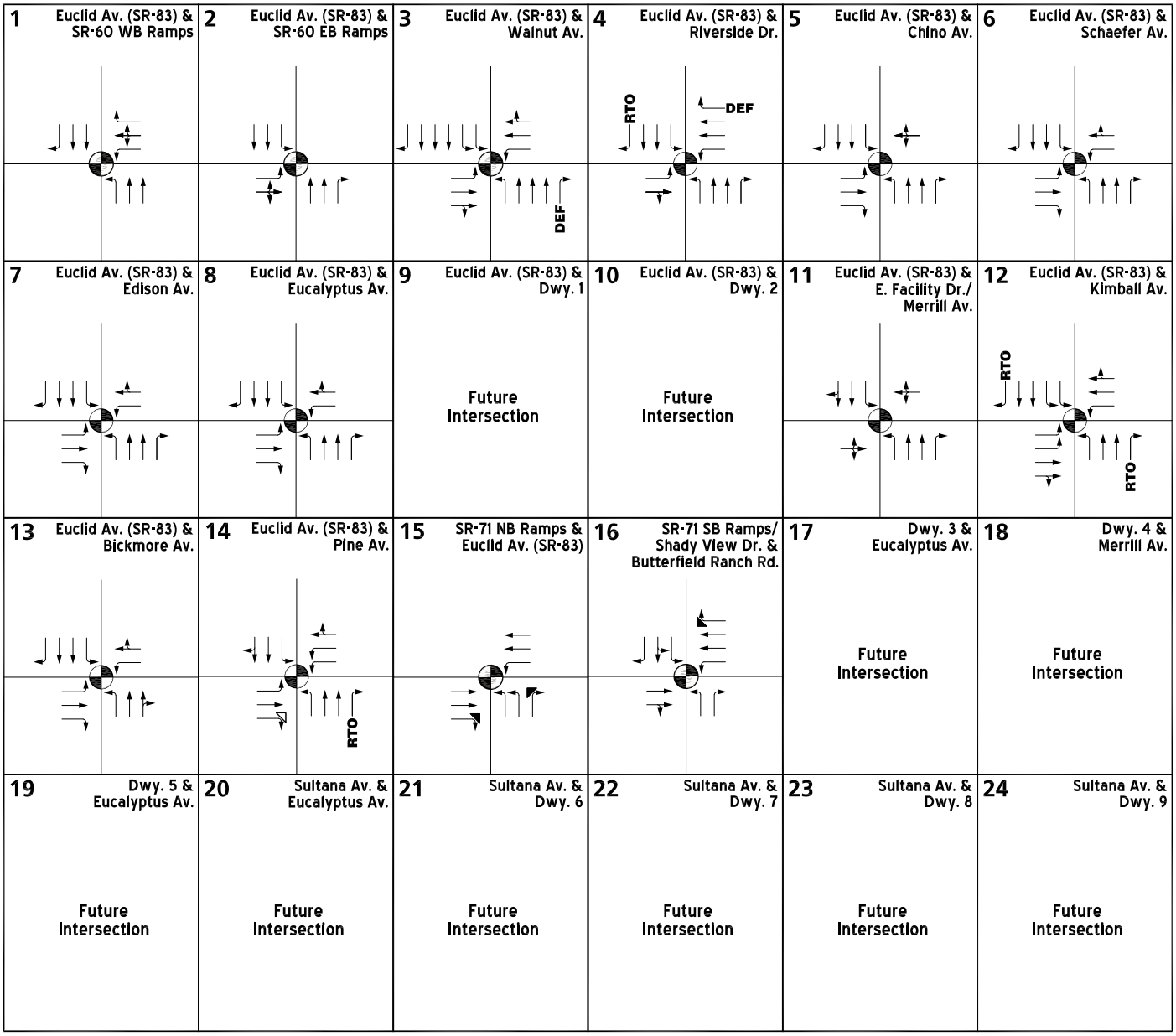


EXHIBIT 3-1 (2OF3): EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS



LEGEND:

- = TRAFFIC SIGNAL
- = FREE RIGHT TURN
- = CHANNELIZED YIELD
- RTO = RIGHT TURN OVERLAP
- DEF = DEFACTO RIGHT TURN

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EXHIBIT 3-1 (3OF3): EXISTING NUMBER OF THROUGH LANES AND INTERSECTION CONTROLS

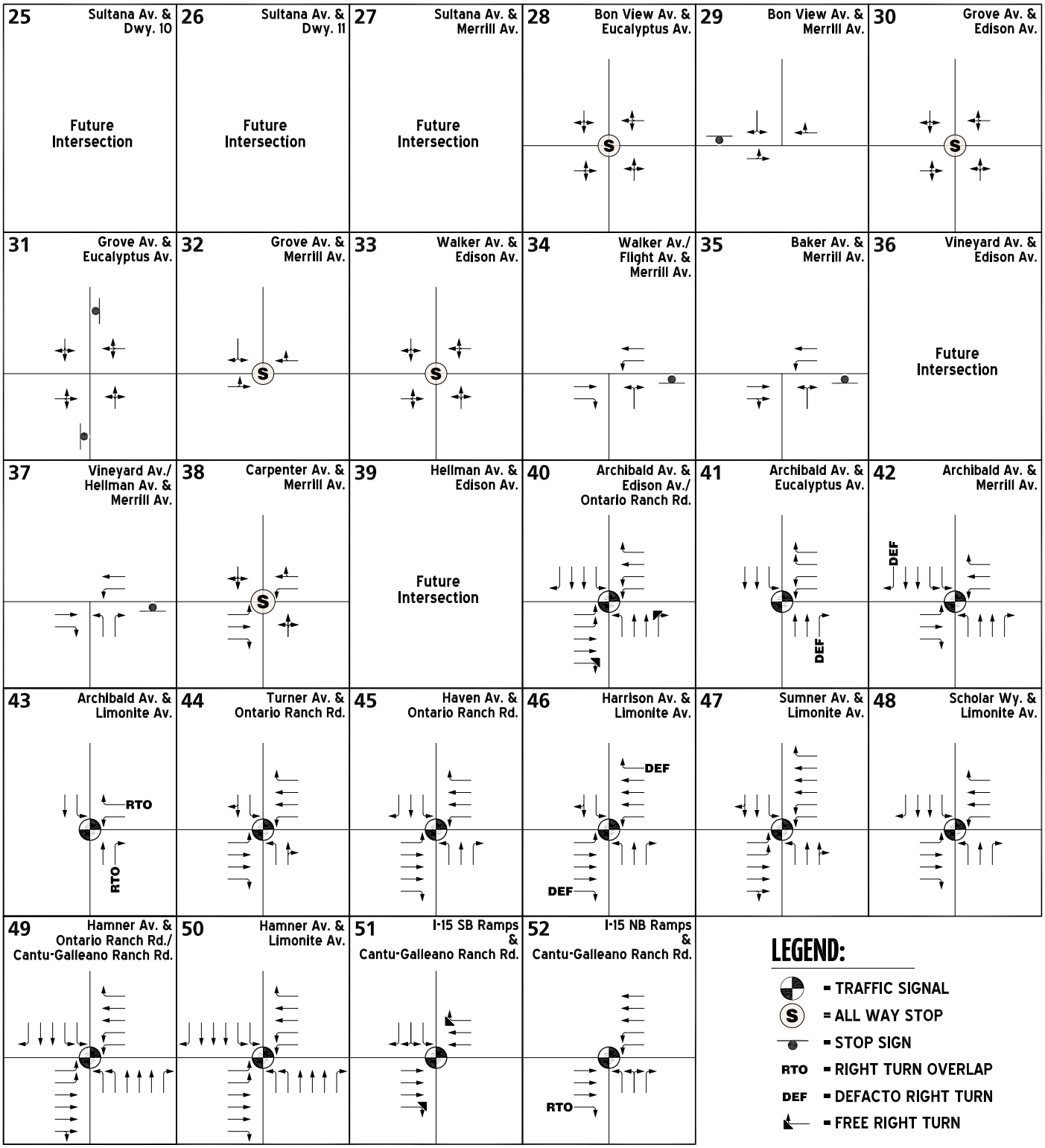
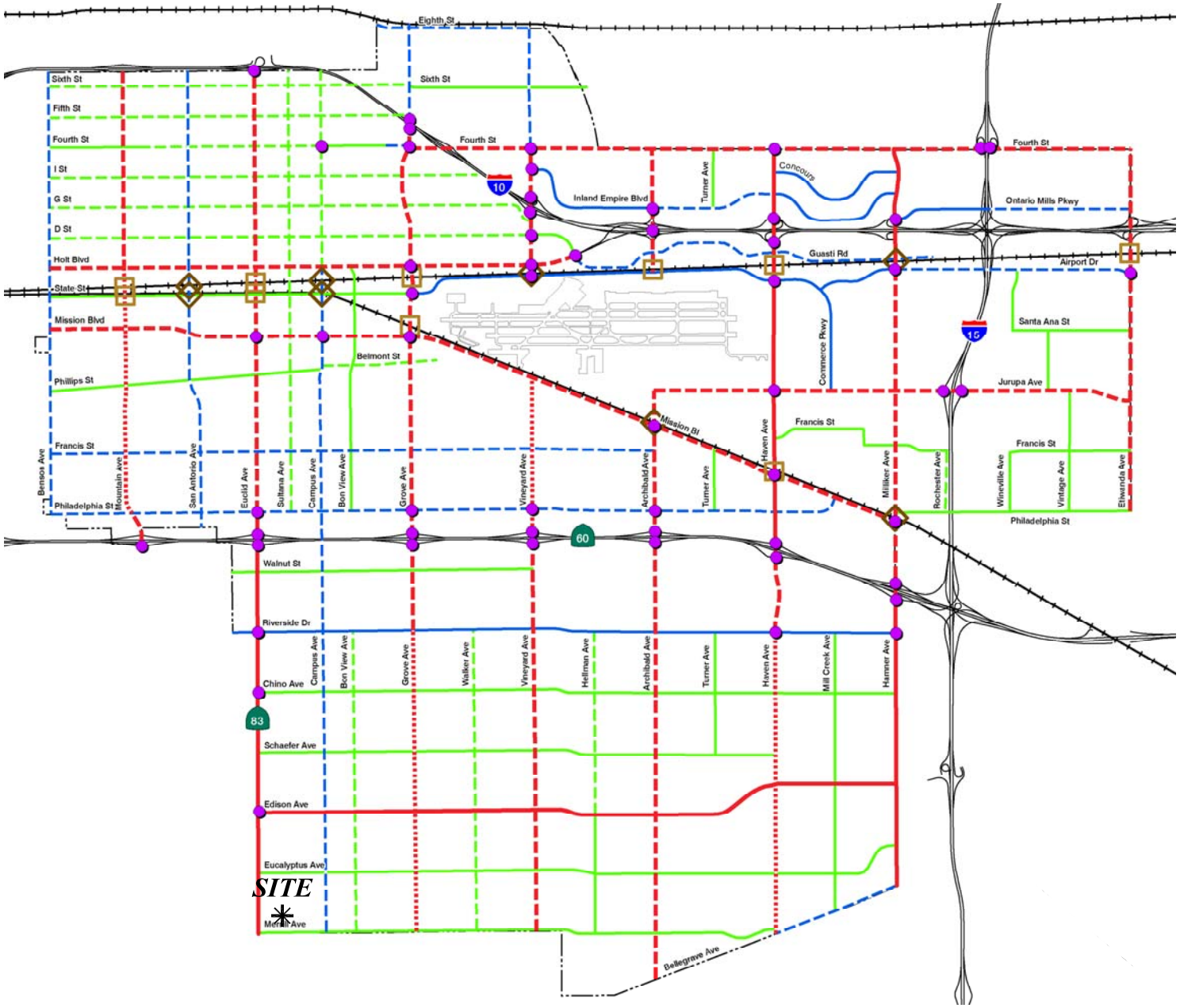


EXHIBIT 3-2: CITY OF ONTARIO GENERAL PLAN CIRCULATION ELEMENT



Other Principal Arterial
- 8 Lanes
- 6 Lanes
- 4 Lanes

Minor Arterial
- 6 Lanes
- 4 Lanes

Collector Street
- 4 Lanes
- 2 Lanes

Freeways
Railroads
Grade-Separated Rail Crossings
Future Grade-Separated Rail Crossings
Enhanced Intersections

N

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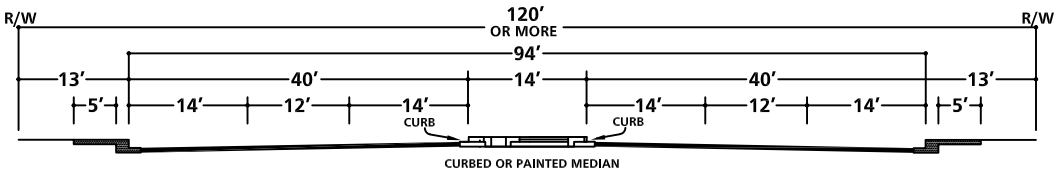
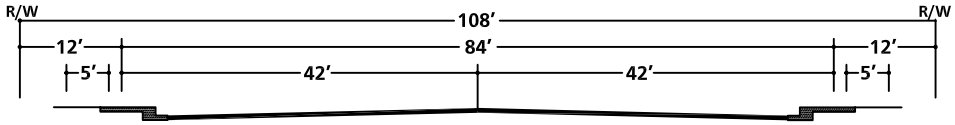
URBAN CROSSROADS

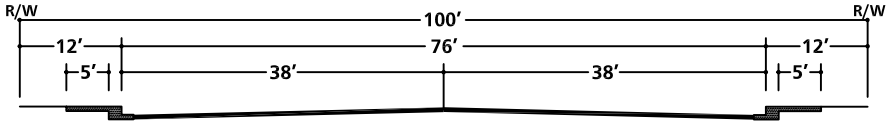
EXHIBIT 3-3: CITY OF ONTARIO GENERAL PLAN ROADWAY CROSS-SECTIONS



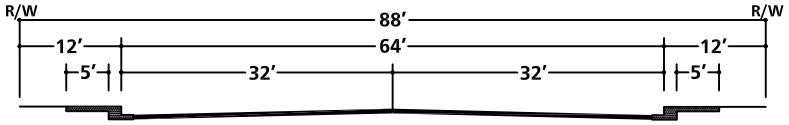
PRINCIPAL ARTERIAL



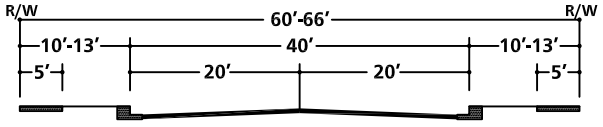
MINOR ARTERIAL



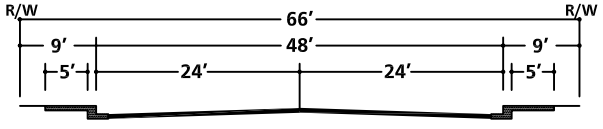
OTHER PRINCIPAL ARTERIAL



COLLECTOR STREET



LOCAL STREET



LOCAL INDUSTRIAL STREET

SOURCE: CITY OF ONTARIO

The study area roadway that is classified as a 6-lane Minor Arterial is identified as having three lanes of travel in each direction. The following study area roadway within the City of Ontario is classified as a 6-lane Minor Arterial:

- Riverside Drive

The study area roadways that are classified as Collector Streets are identified as having two to four lanes of travel in each direction. The following study area roadways within the City of Ontario are classified as Collector Streets:

- Walnut Street
- Chino Avenue
- Schaefer Avenue
- Eucalyptus Avenue
- Merrill Avenue
- Bon View Avenue
- Walker Avenue
- Hellman Avenue
- Turner Avenue

3.3 CITY OF CHINO, CITY OF CHINO HILLS, CITY OF EASTVALE, CITY OF JURUPA VALLEY GENERAL PLAN CIRCULATION ELEMENT

Exhibits 3-4 and 3-5 show the City of Chino General Plan Circulation Element and roadway cross-sections, respectively. Exhibits 3-6 and 3-7 show the City of Chino Hills General Plan Circulation Element and roadway cross-sections, respectively. Exhibits 3-8 and 3-9 show the City of Eastvale General Plan Circulation Element and roadway cross-sections, respectively. Exhibits 3-10 and 3-11 show the currently adopted City of Jurupa Valley General Plan Circulation Element and roadway cross-sections, respectively. Lastly, Exhibits 3-12 and 3-13 show the draft City of Jurupa Valley General Plan Circulation Element and roadway cross-sections, respectively.

3.4 TRUCK ROUTES

The City of Ontario designated truck route map is shown on Exhibit 3-12. Euclid Avenue (SR-83), 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.

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

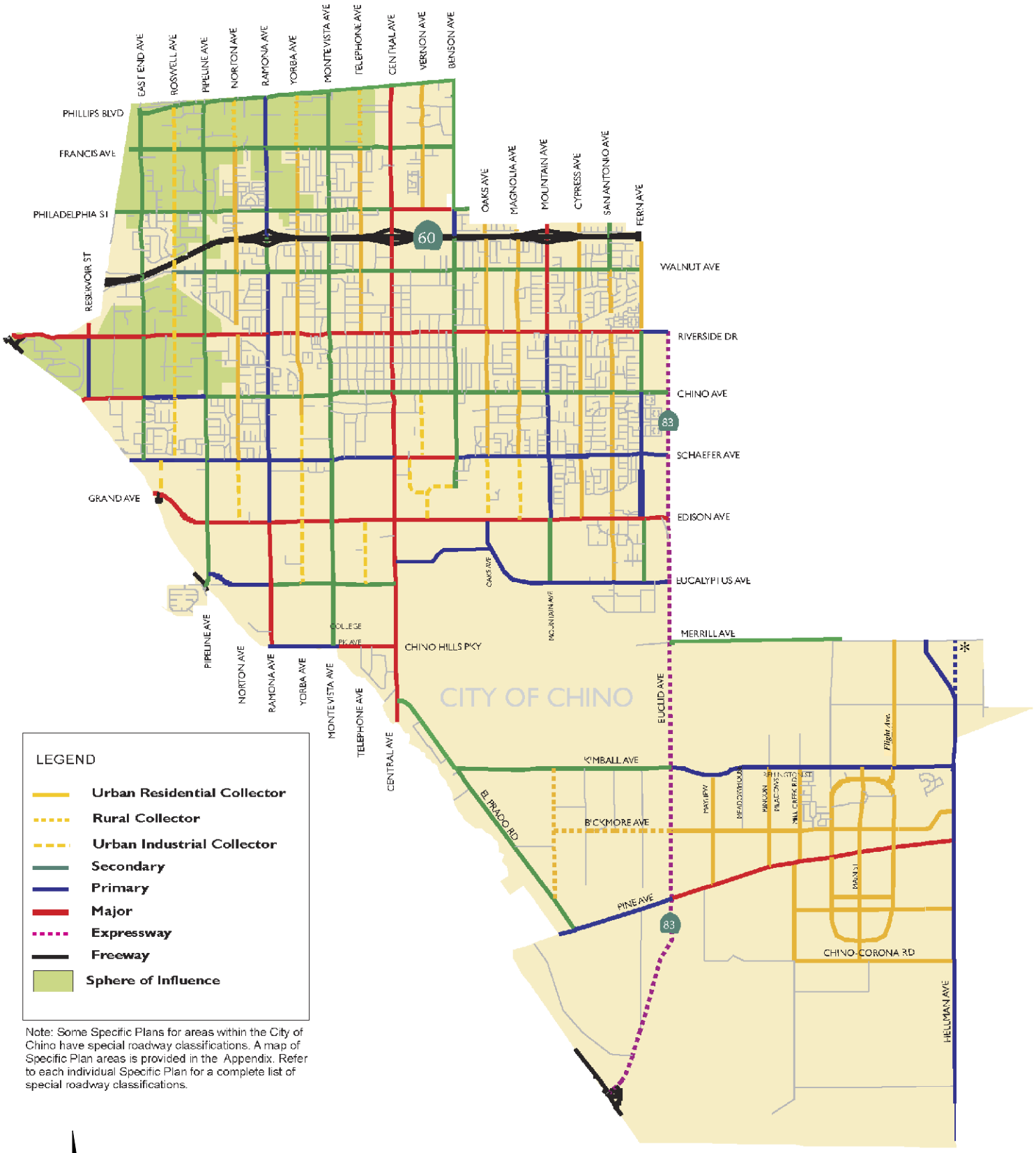
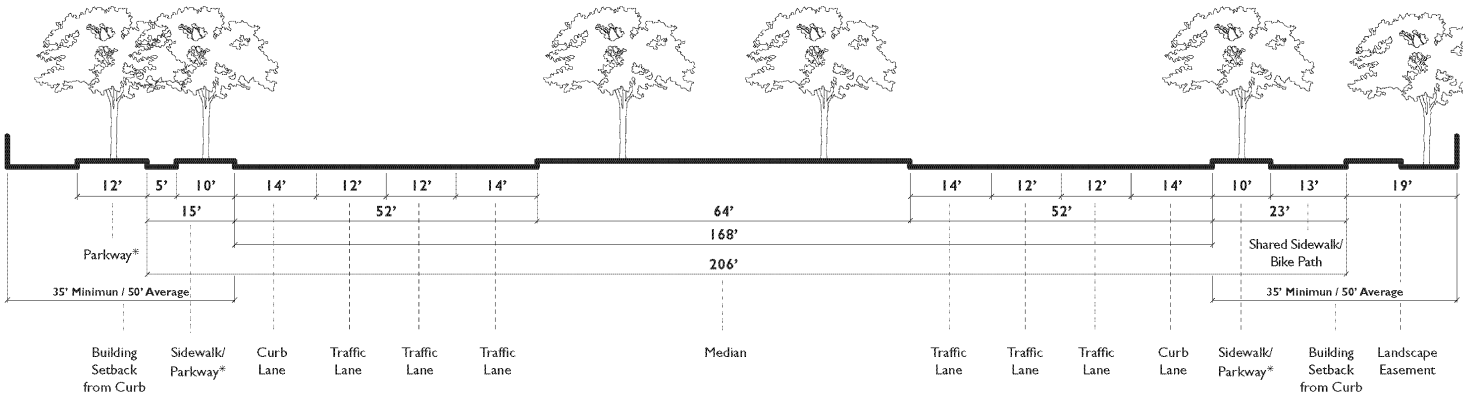
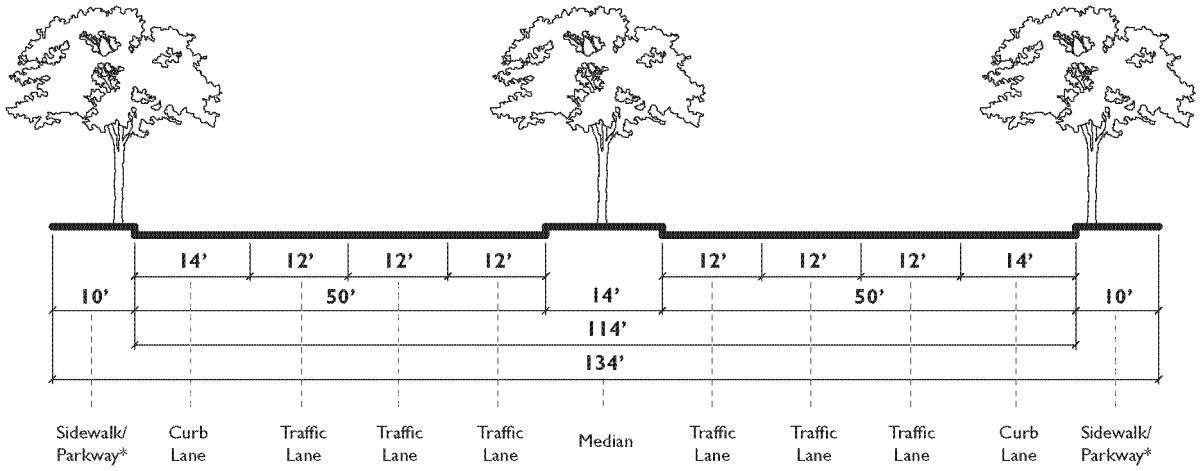


EXHIBIT 3-5 (1 of 2): CITY OF CHINO GENERAL PLAN ROADWAY CROSS-SECTIONS

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

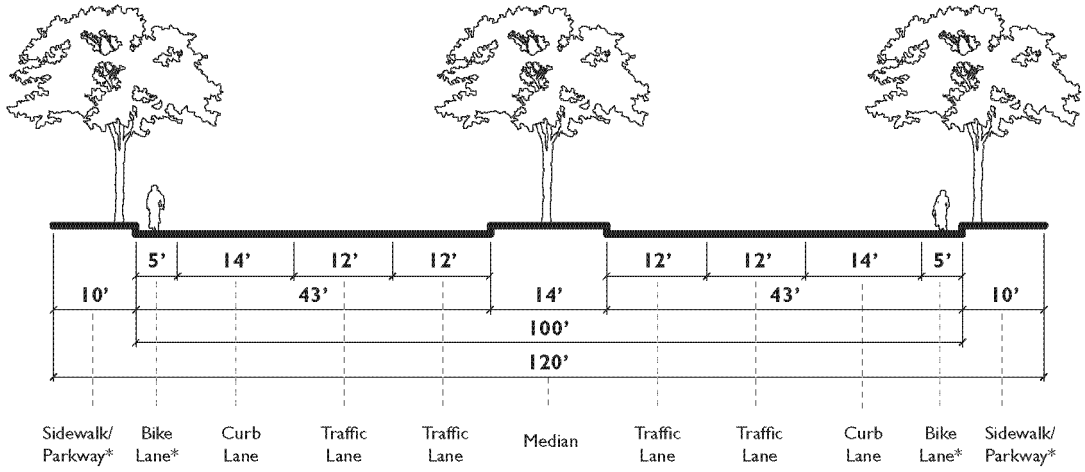
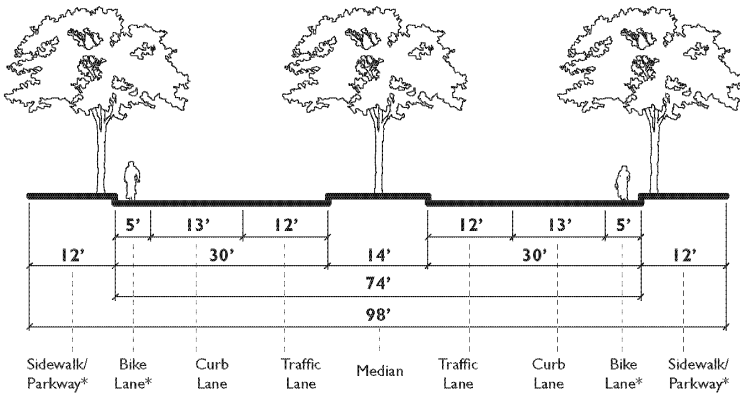
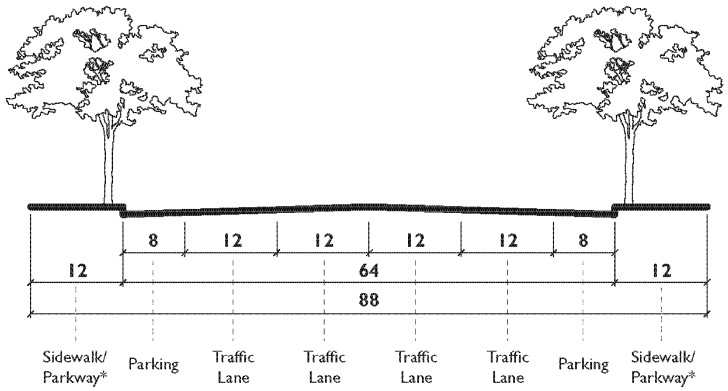


EXHIBIT 3-5 (2 of 2): CITY OF CHINO GENERAL PLAN ROADWAY CROSS-SECTIONS

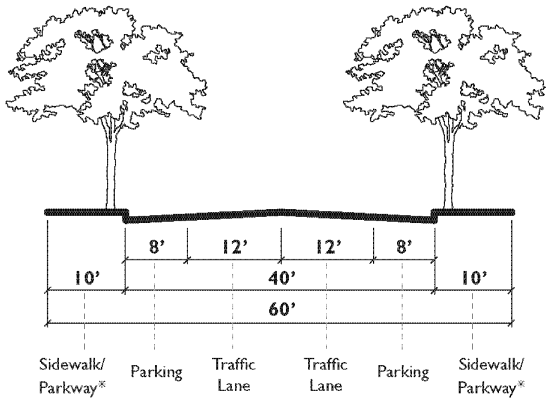
Primary Arterial: Typical 4 Lane
Provides 4 traffic lanes and 2 bicycle lanes separated by a median without parking



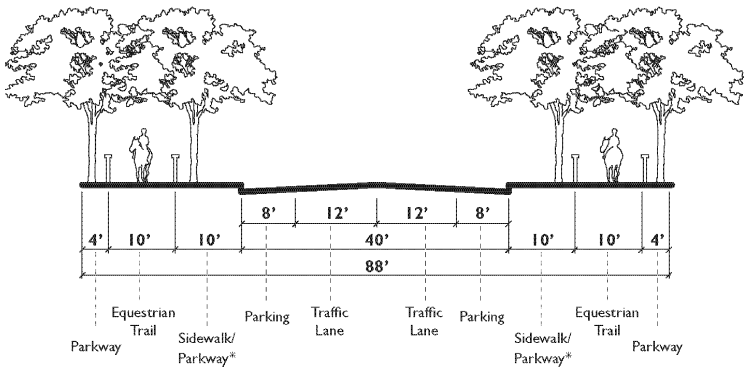
Secondary Arterial
Provides 4 traffic lanes with parking



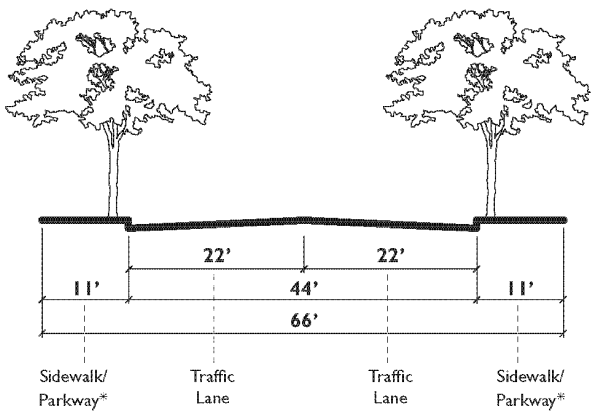
Urban Residential/Rural Collector
Provides 2 traffic lanes with parking and shared bicycle access



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

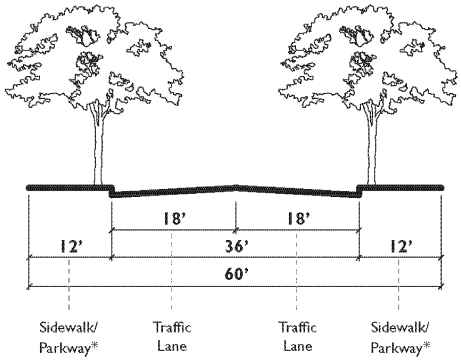


EXHIBIT 3-6: CITY OF CHINO HILLS GENERAL PLAN ROADWAY SEGMENTS

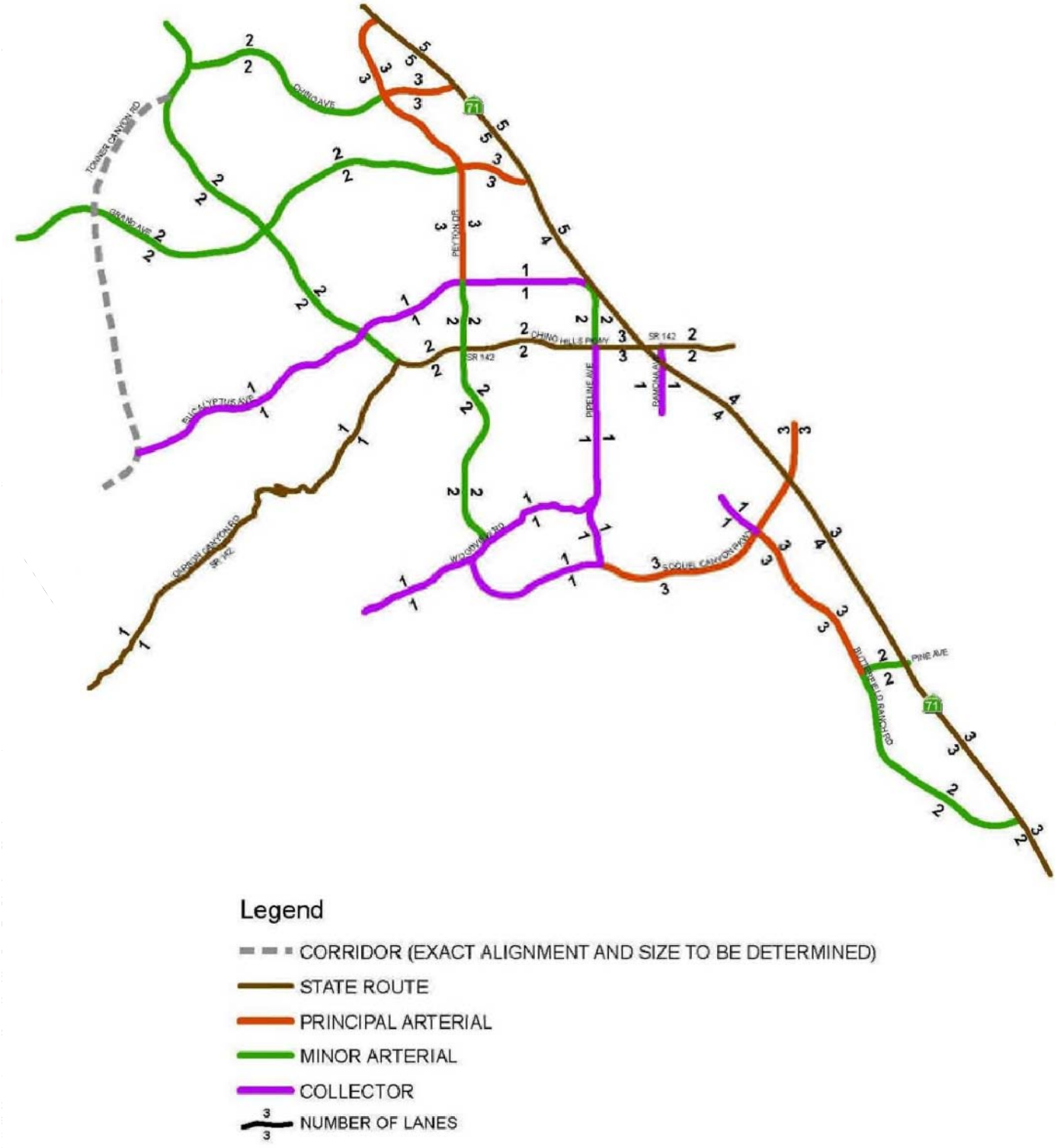
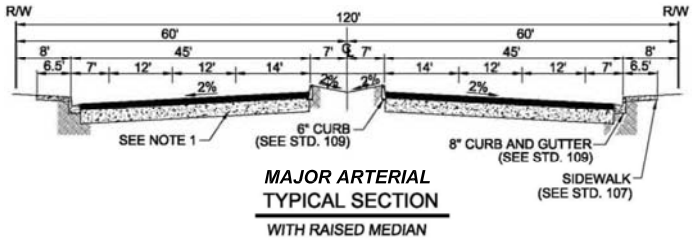
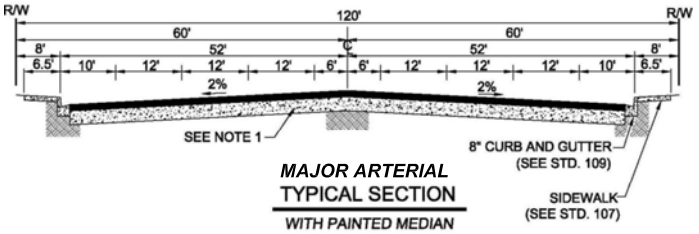
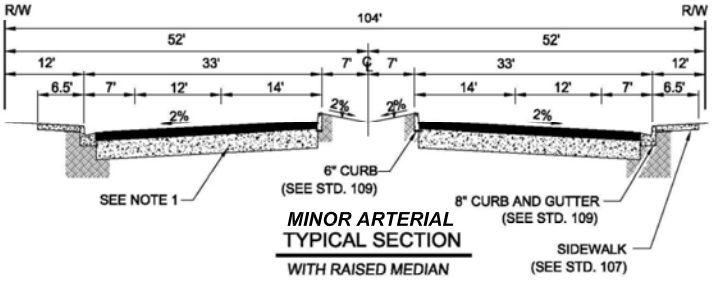
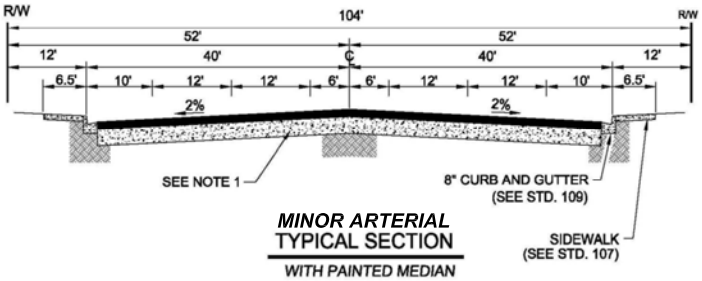


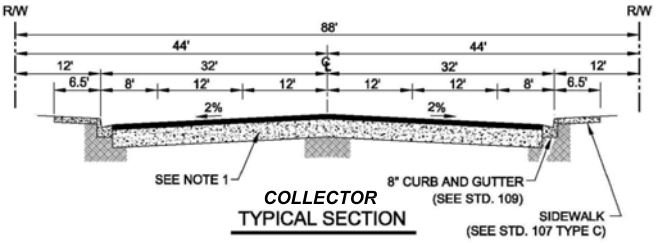
EXHIBIT 3-7: CITY OF CHINO HILLS GENERAL PLAN ROADWAY CROSS-SECTIONS











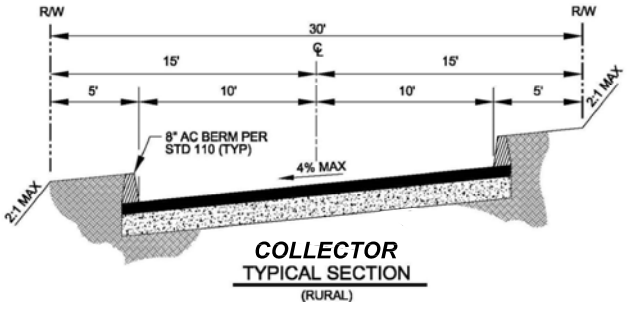
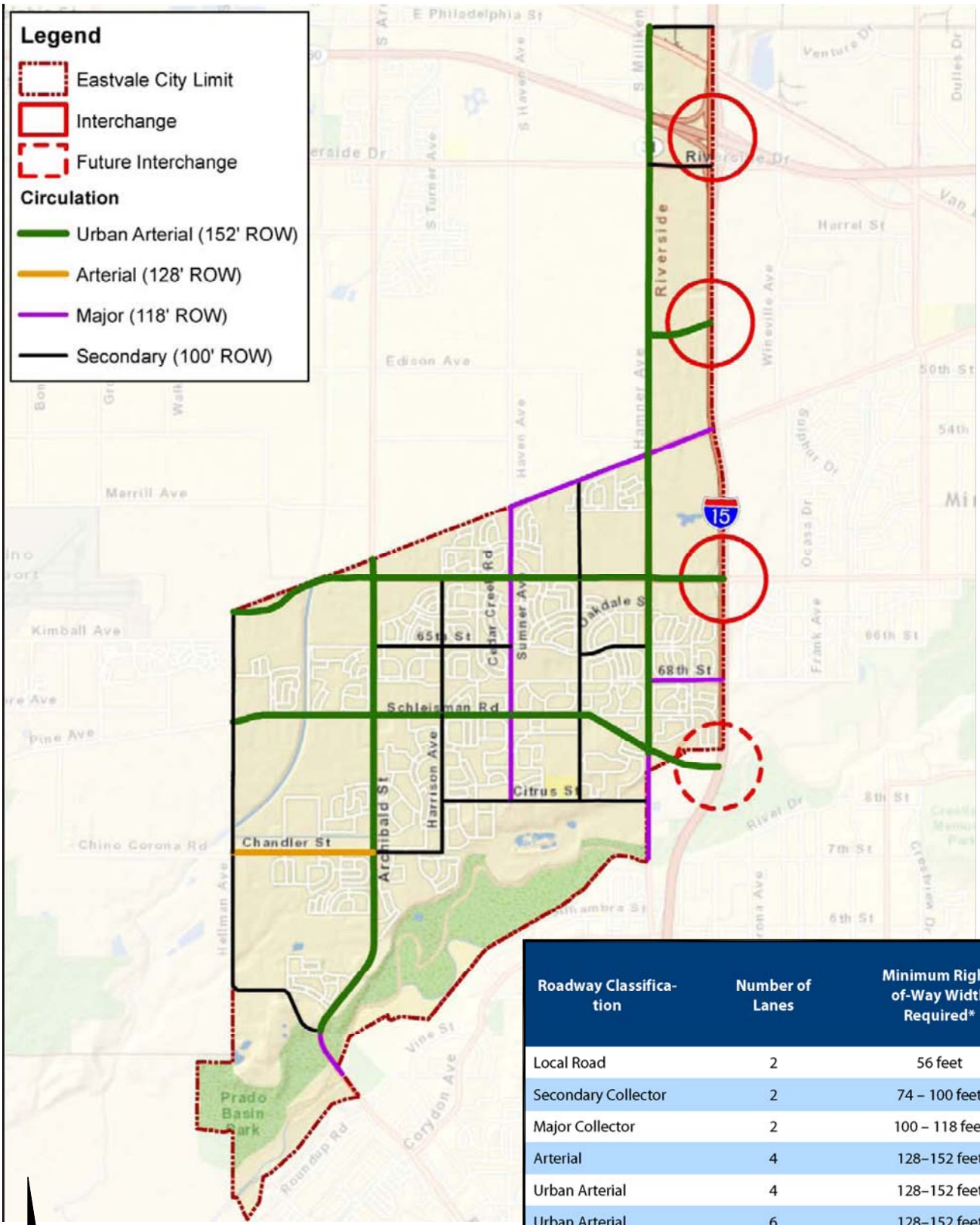


EXHIBIT 3-8: CITY OF EASTVALE GENERAL PLAN CIRCULATION ELEMENT



Roadway Classification	Number of Lanes	Minimum Right-of-Way Width Required*
Local Road	2	56 feet
Secondary Collector	2	74 – 100 feet
Major Collector	2	100 – 118 feet
Arterial	4	128–152 feet
Urban Arterial	4	128–152 feet
Urban Arterial	6	128–152 feet

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

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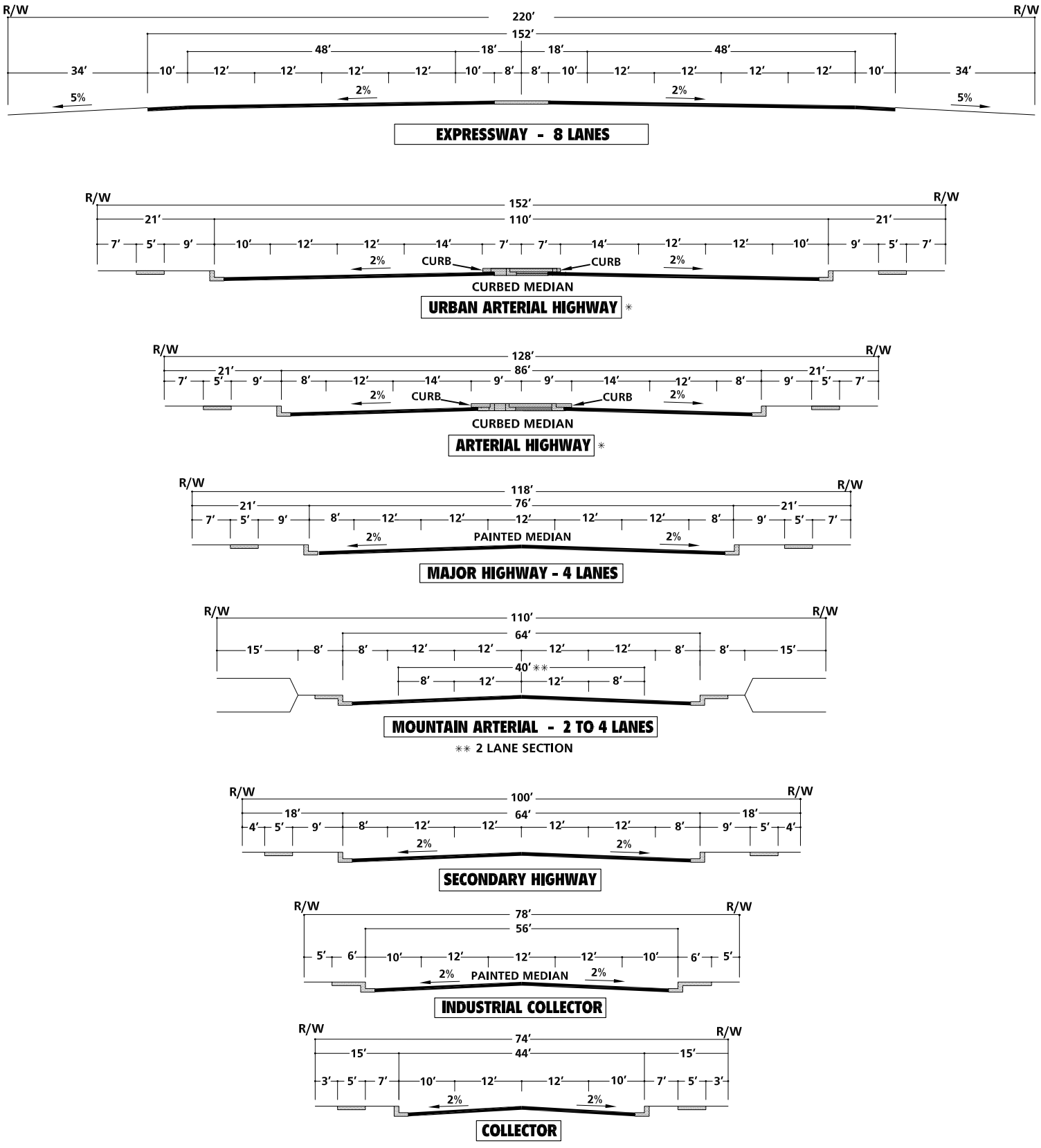
EXHIBIT 3-9: CITY OF EASTVALE GENERAL PLAN ROADWAY CROSS-SECTIONS



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

NOT TO SCALE

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EXHIBIT 3-10: CITY OF JURUPA VALLEY CIRCULATION ELEMENT

EXHIBIT 3-11: CITY OF JURUPA VALLEY GENERAL PLAN ROADWAY CROSS-SECTIONS

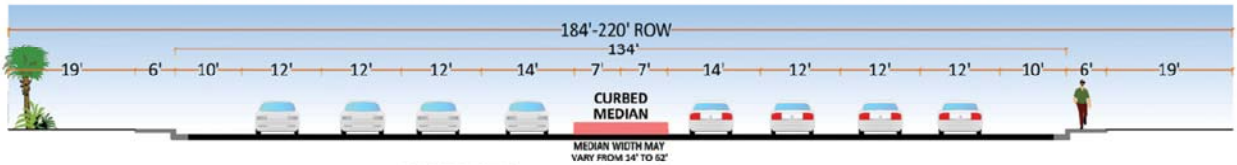


EXHIBIT 1: EXPRESSWAY- 6 TO 8 LANES

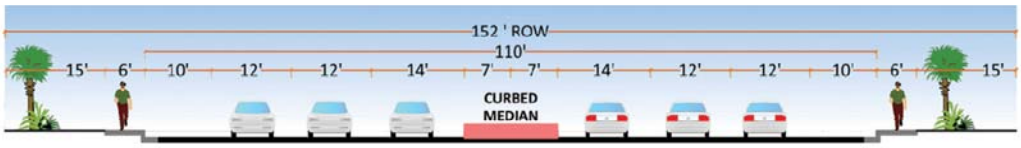


EXHIBIT 2: URBAN ARTERIAL

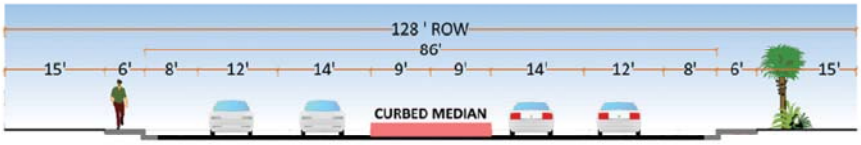


EXHIBIT 3: ARTERIAL

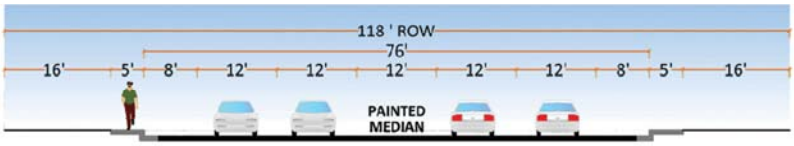


EXHIBIT 4: MAJOR - 4 LANES

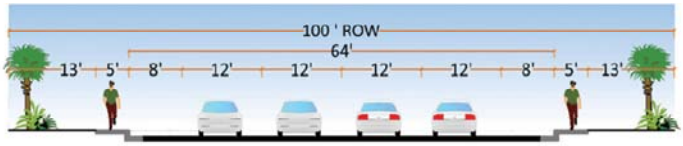


EXHIBIT 5: SECONDARY

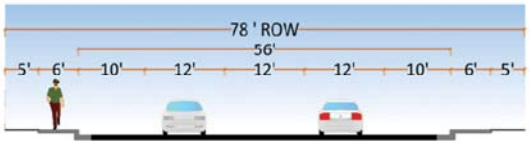


EXHIBIT 6: INDUSTRIAL COLLECTOR

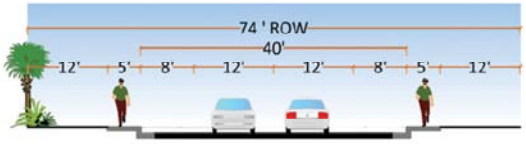
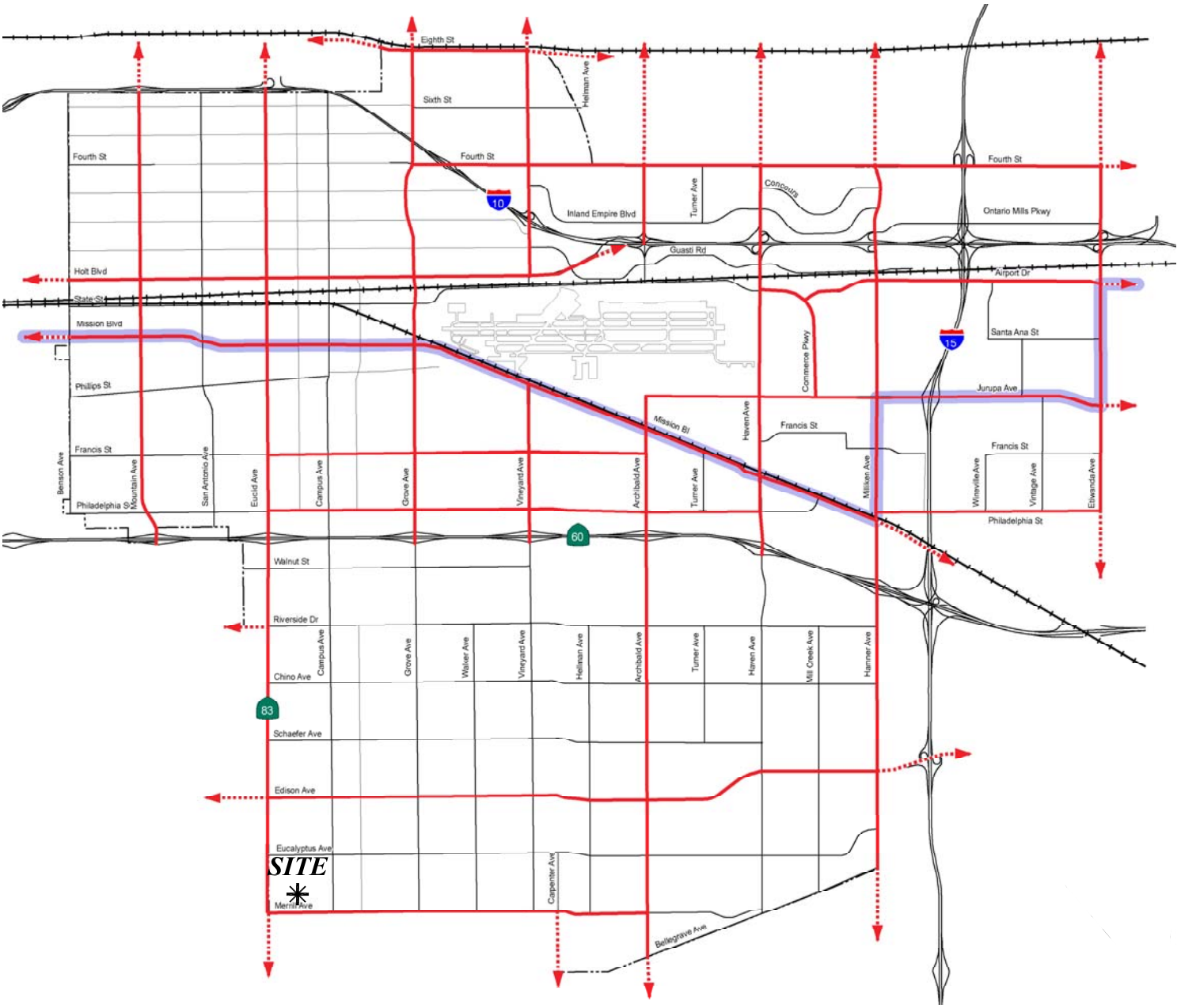


EXHIBIT 7: COLLECTOR

EXHIBIT 3-12: CITY OF ONTARIO TRUCK ROUTES



LEGEND:

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

N

12248 - ontario truck routes.dwg

The City of Chino designated truck route map is shown on Exhibit 3-13. Riverside Drive, Edison Avenue, Merrill Avenue, Kimball Avenue, Pine Avenue, Flight Avenue, and Hellman Avenue are some of the designated City of Chino truck routes within the study area while Euclid Avenue (SR-83) is designated as a State Truck Route. 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 March 2019 indicate nominal pedestrian and bicycle activity within the study area. Exhibit 3-14 illustrates the City of Ontario future planned bicycle facilities, which proposes Class II and Multipurpose Trails along Merrill Avenue and Campus Avenue adjacent to the Project and Euclid Avenue (SR-83) is identified multipurpose trail per The Ontario Plan. Exhibit 3-15 illustrates City of Chino future bicycle facilities, which proposes Class I bicycle facilities along Hellman Avenue and Kimball Avenue near the vicinity of the site. Exhibit 3-16 illustrates the City of Eastvale trails and bikeway systems. Existing pedestrian facilities within the study area are shown on Exhibit 3-17.

3.6 TRANSIT SERVICE

The study area within the 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 83 operates on Euclid Avenue (SR-83) north of the site. Route 83 could potentially serve the Project. The Riverside Transit Authority (RTA) serves the City of Eastvale. Transit service is reviewed and updated by Omnitrans periodically to address ridership, budget and community demand needs. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate. As such, it is recommended that the applicant work in conjunction with Omnitrans and RTA to potentially provide additional bus service to the site. Existing transit routes in the vicinity of the study area are illustrated on Exhibit 3-18.

3.7 EXISTING (2019) TRAFFIC COUNTS

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

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

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

EXHIBIT 3-13: CITY OF CHINO TRUCK ROUTES

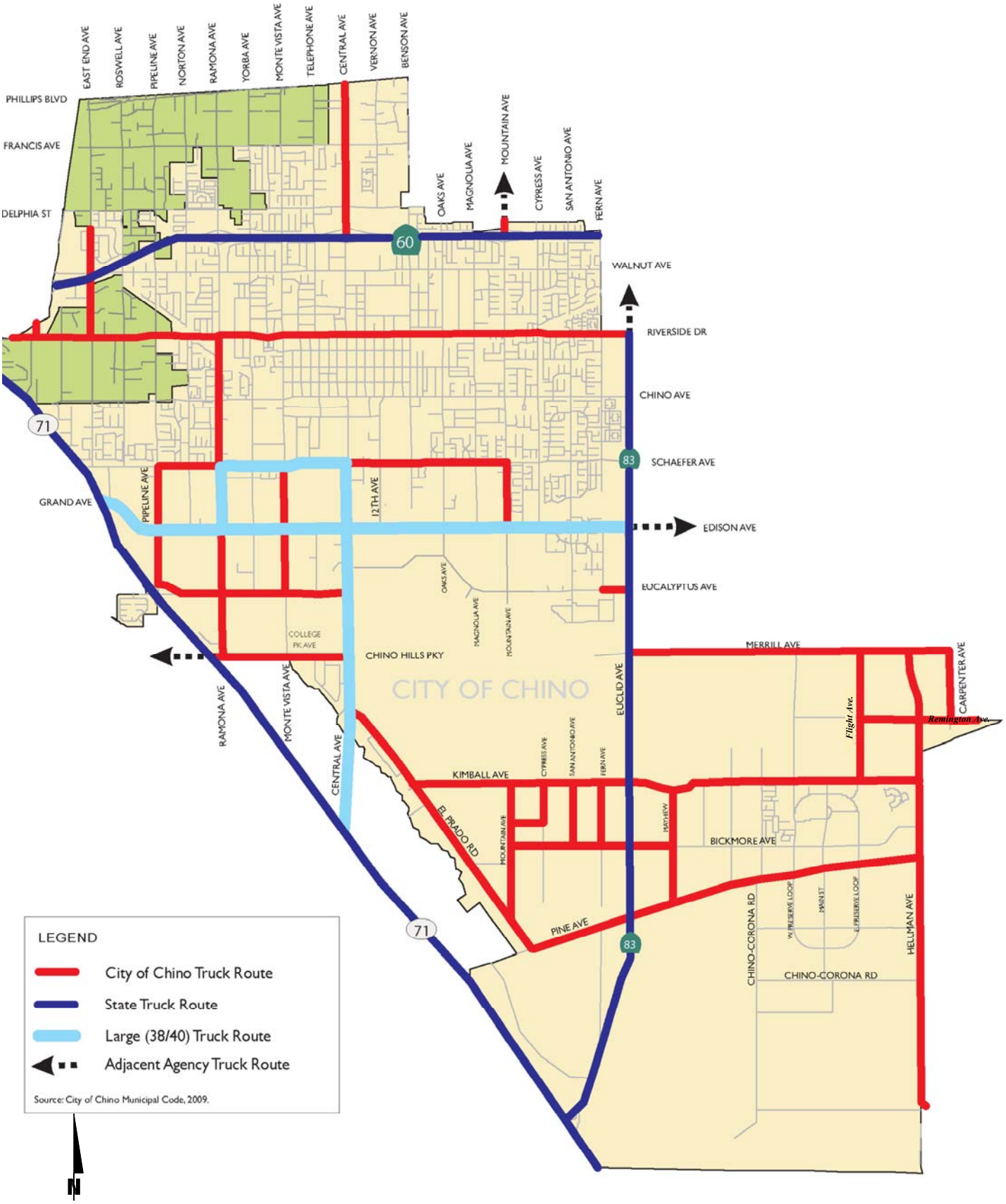


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EXHIBIT 3-14: CITY OF ONTARIO GENERAL PLAN TRAILS AND BIKEWAY SYSTEMS

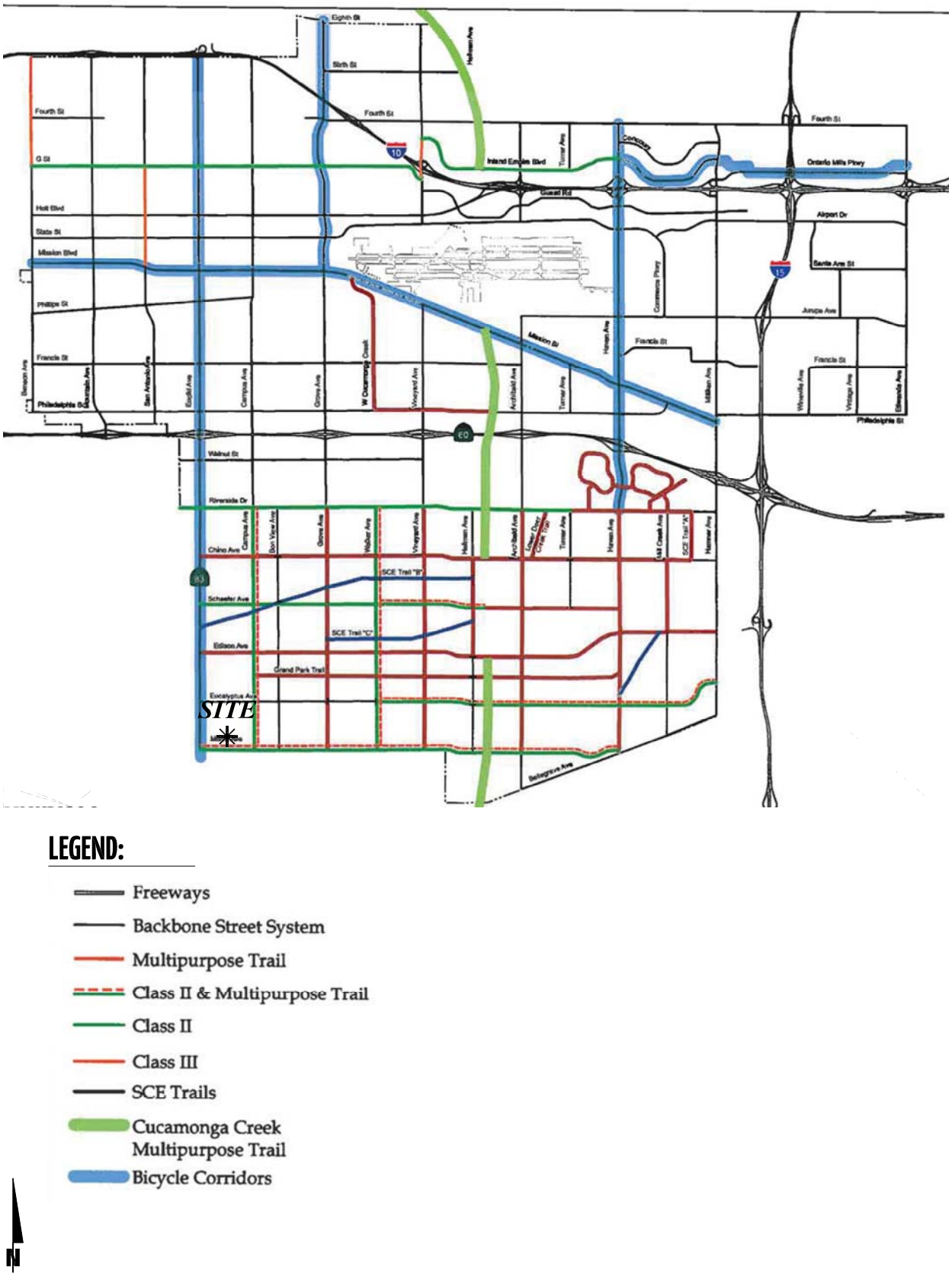
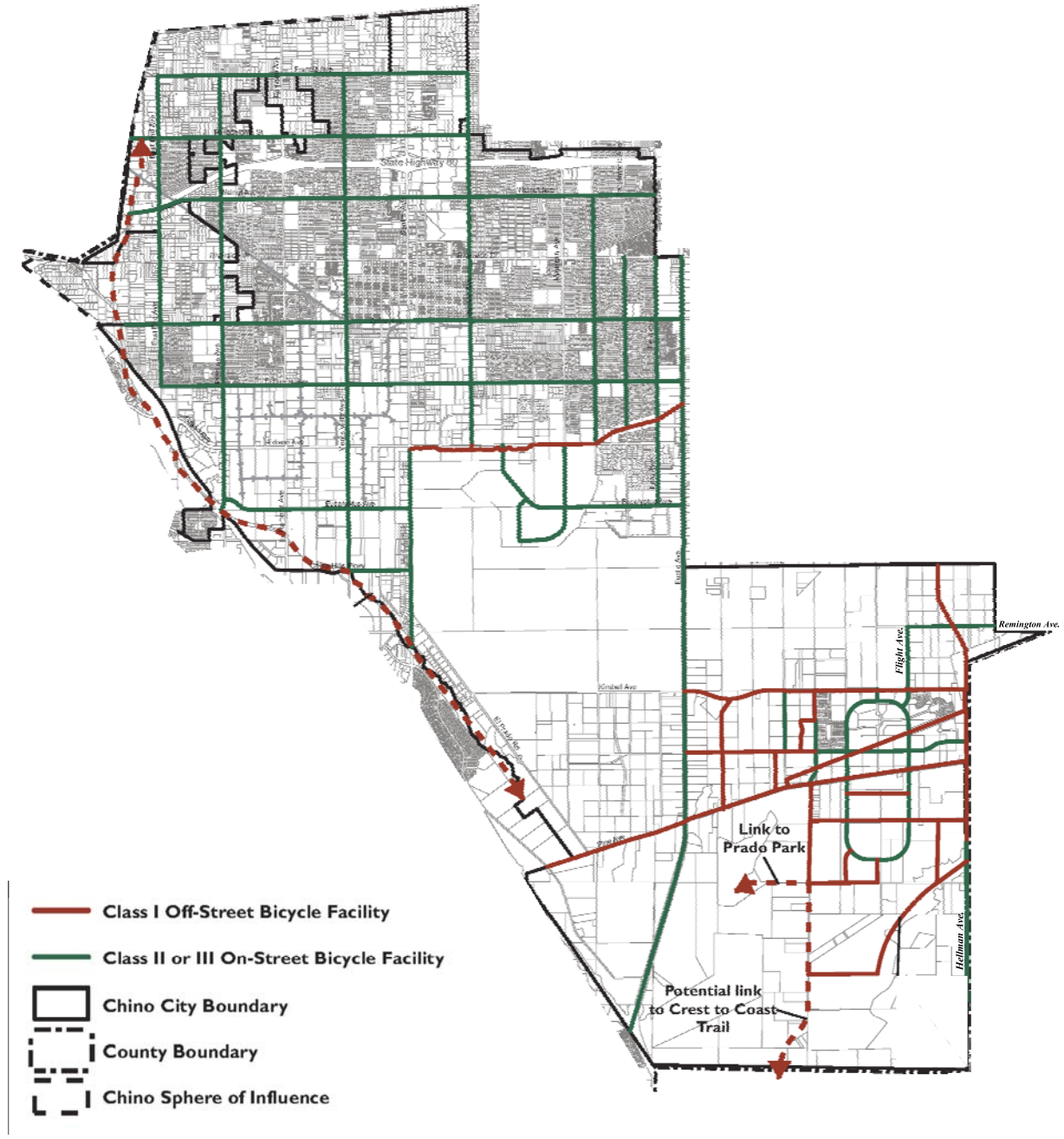


EXHIBIT 3-15: CITY OF CHINO FUTURE BICYCLE FACILITIES



12248 - chino-future-bike.dwg

EXHIBIT 3-16: EASTVALE AREA TRAILS AND BIKEWAYS SYSTEM

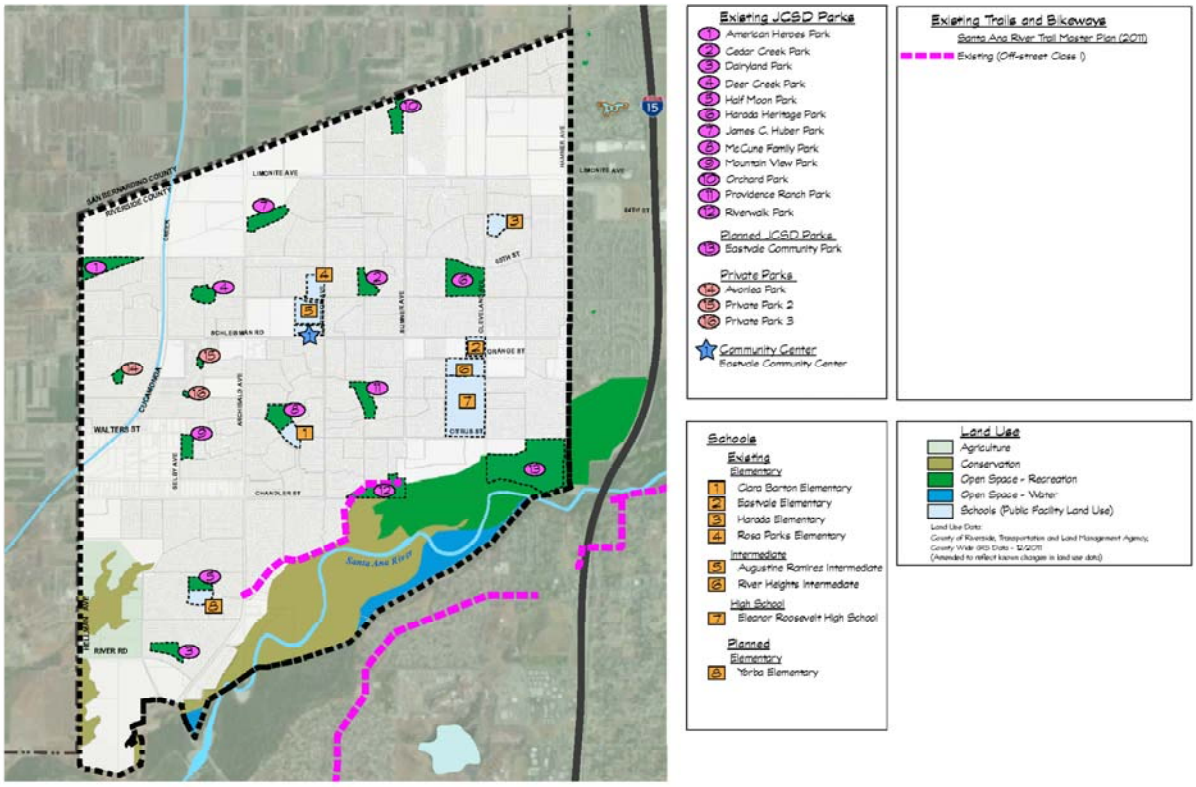


Exhibit 2.8-1 Existing Trails

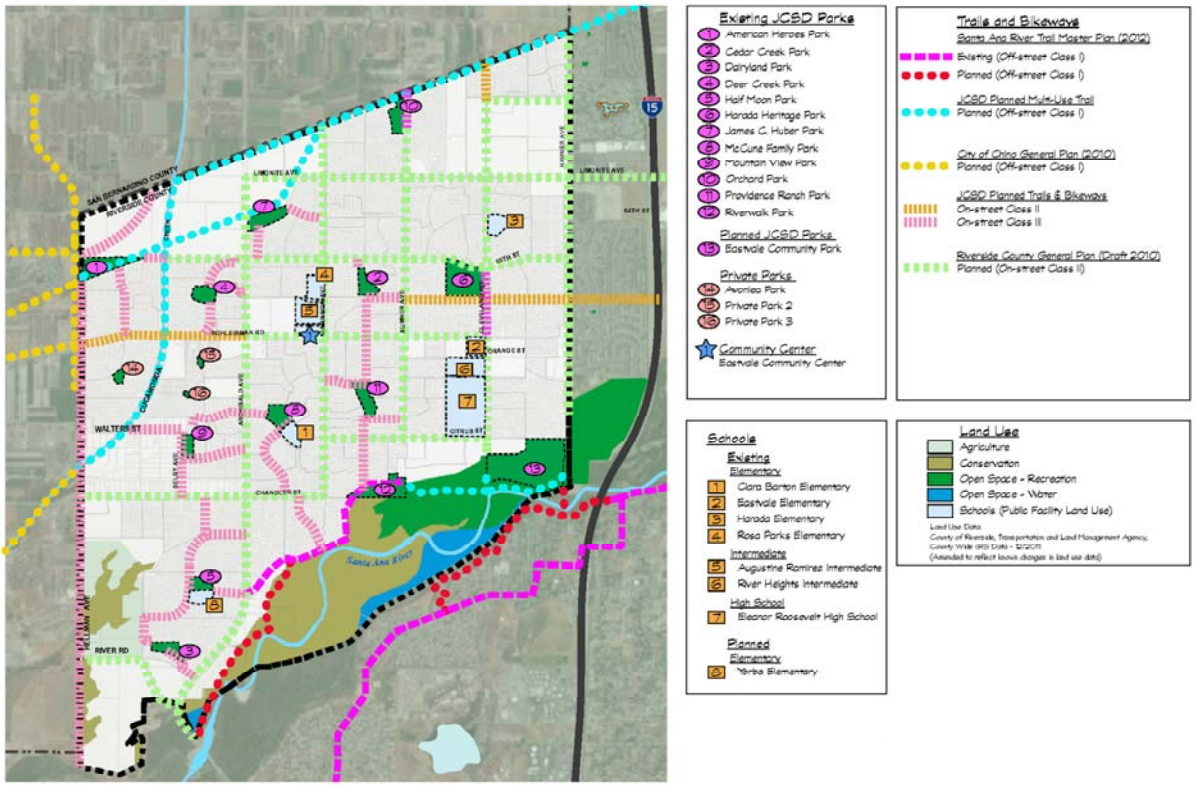
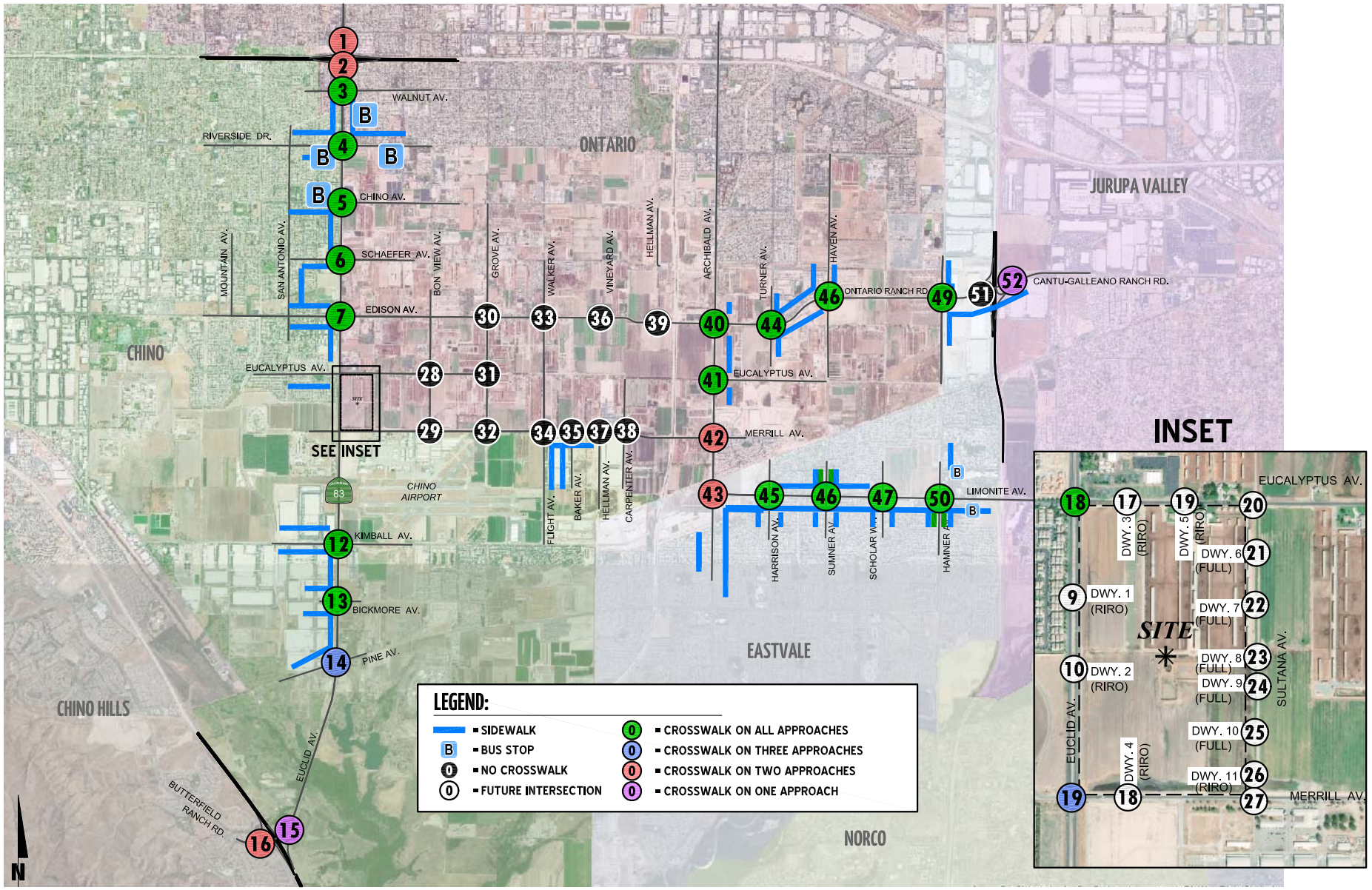


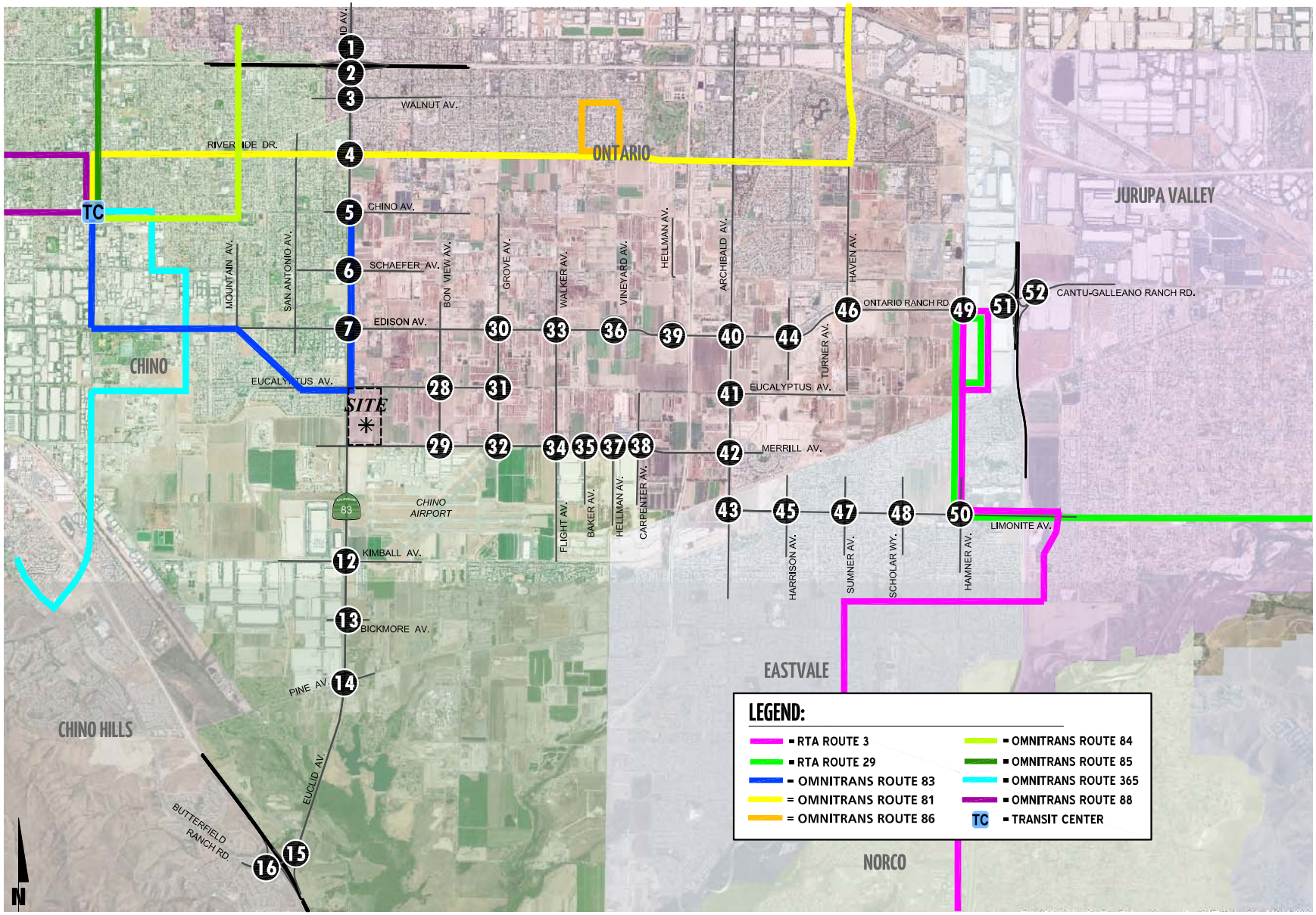
Exhibit 2.8-2 Planned Trails

EXHIBIT 3-17: EXISTING PEDESTRIAN FACILITIES



URBAN CROSSROADS

EXHIBIT 3-18: EXISTING TRANSIT ROUTES



URBAN CROSSROADS

The traffic counts collected in January 2019 include the following vehicle classifications: Passenger Cars, 2-Axle Trucks, 2-Axle Trucks, and 4 or More Axle Trucks. To represent the effect large trucks, buses and recreational vehicles have on traffic flow; all trucks were converted into passenger car equivalent (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. These factors are consistent with the values recommended for use in the CMP.

Existing weekday ADT volumes are shown on Exhibit 3-19. Where actual 24-hour tube count data was not available, Existing ADT volumes were based upon factored intersection peak hour counts collected by Urban Crossroads, Inc. using the following formula for each intersection leg:

Weekday PM Peak Hour (Approach Volume + Exit Volume) x 12.55 = 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 7.97 percent. As such, the above equation utilizing a factor of 12.55 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 7.97 percent (i.e., 1/0.0797 = 12.55) 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 3-20.

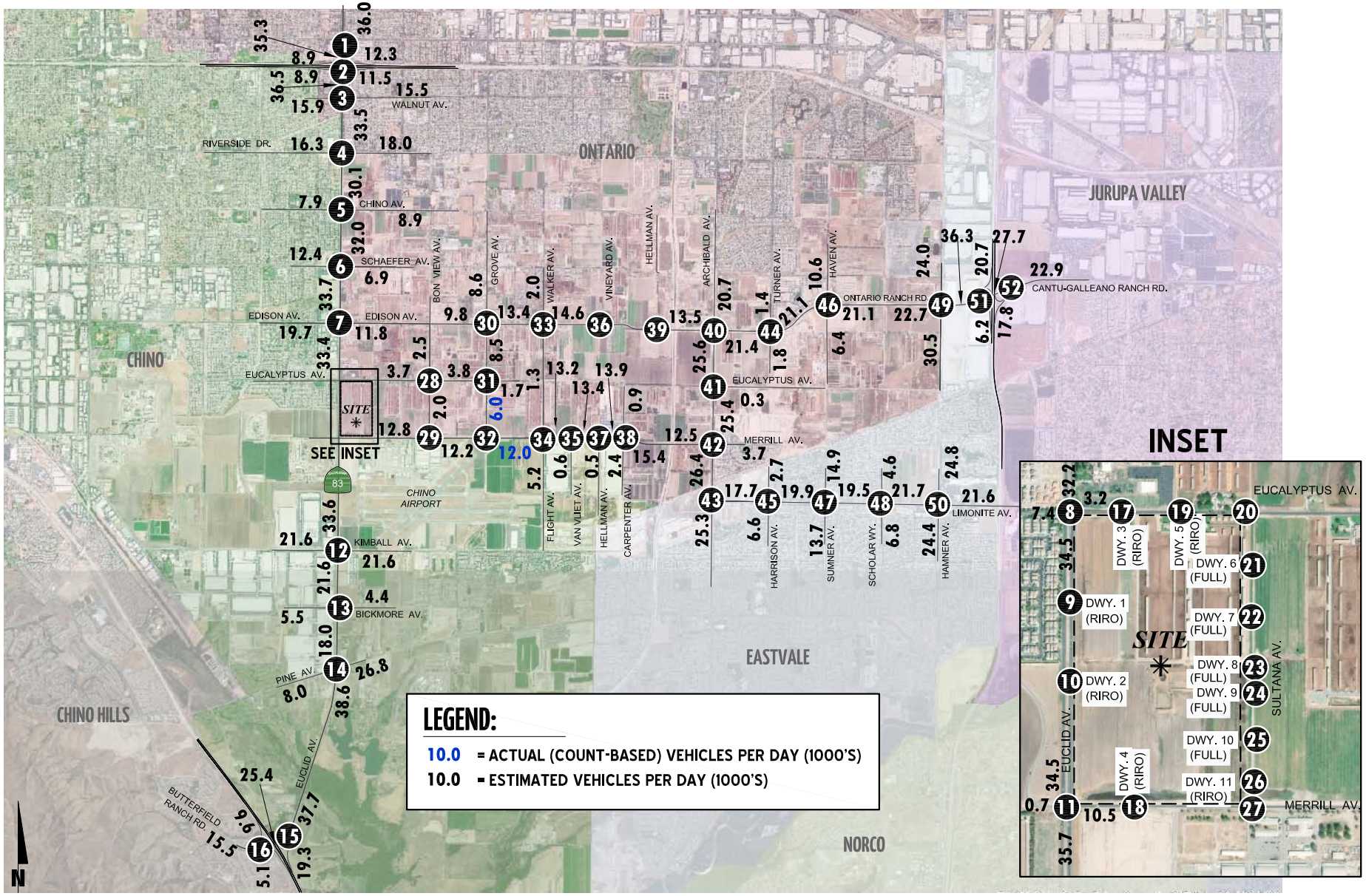
3.8 INTERSECTION OPERATIONS ANALYSIS

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 on Table 3-1, which indicates that the existing study area intersections are currently operating at acceptable LOS during the peak hours with exception to the following:

- Euclid Avenue (SR-83) & Riverside Drive (#4) – LOS E PM peak hour only
- Grove Avenue & Edison Avenue (#30) – LOS F AM and PM peak hours
- Grove Avenue & Eucalyptus Avenue (#31) – LOS F PM peak hour only
- Grove Avenue & Merrill Avenue (#32) – LOS E PM peak hour only
- Walker Avenue & Edison Avenue (#33) – LOS F PM peak hour only
- Carpenter Avenue & Merrill Avenue (#38) – LOS F AM and PM peak hours
- Hamner Avenue & Ontario Ranch Road (#49) – LOS F PM peak hour only

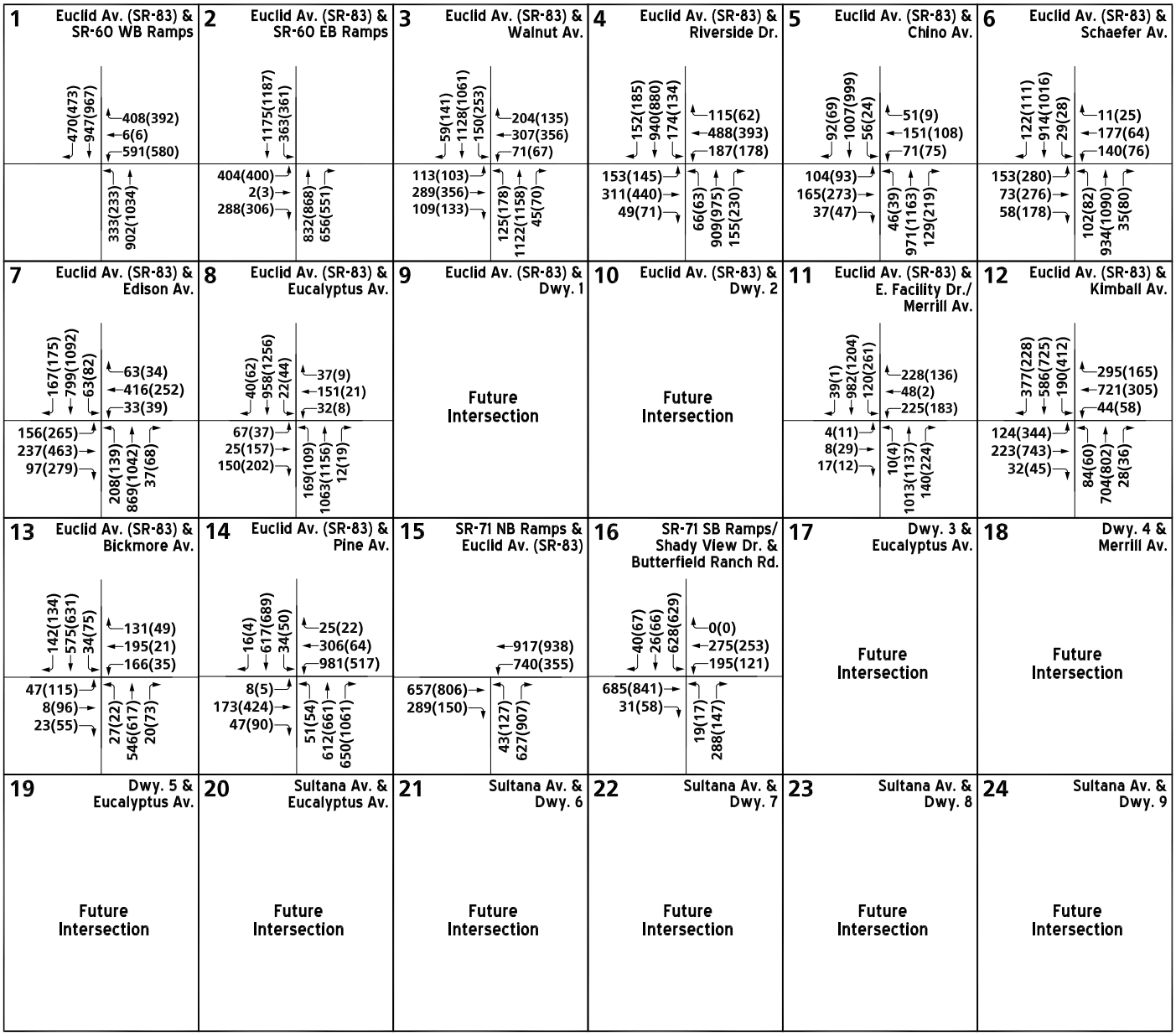
Consistent with Table 3-1, a summary of the peak hour intersection LOS for Existing conditions are shown on Exhibit 3-21. The intersection operations analysis worksheets are included in Appendix 3.2 of this TIA.

EXHIBIT 3-19: EXISTING (2019) AVERAGE DAILY TRAFFIC (ADT) (IN PCE)



URBAN CROSSROADS

EXHIBIT 3-20 (1OF2): EXISTING (2019) TRAFFIC VOLUMES (IN PCE)



LEGEND:

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

EXHIBIT 3-20 (2OF2): EXISTING (2019) TRAFFIC VOLUMES (IN PCE)

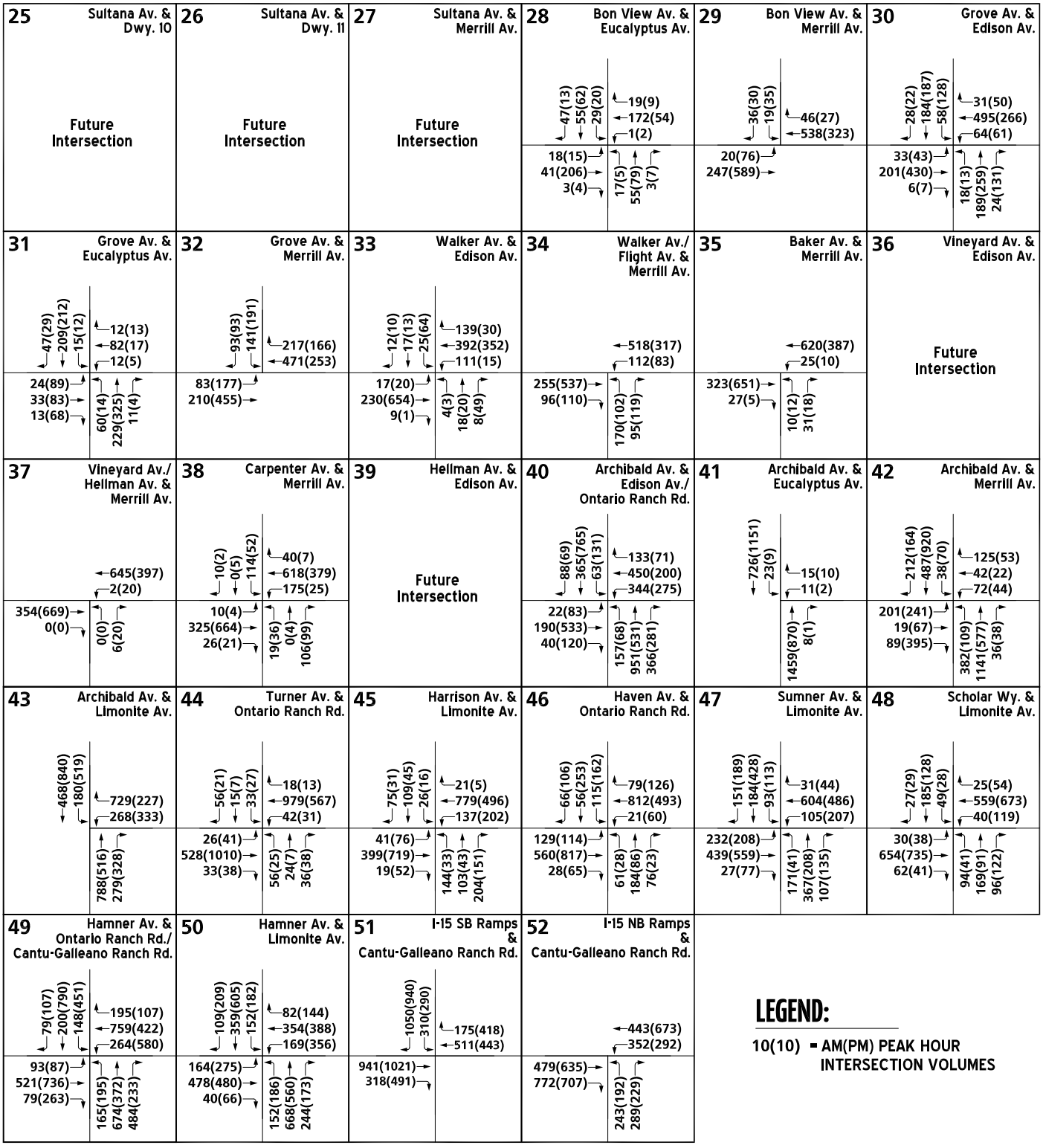


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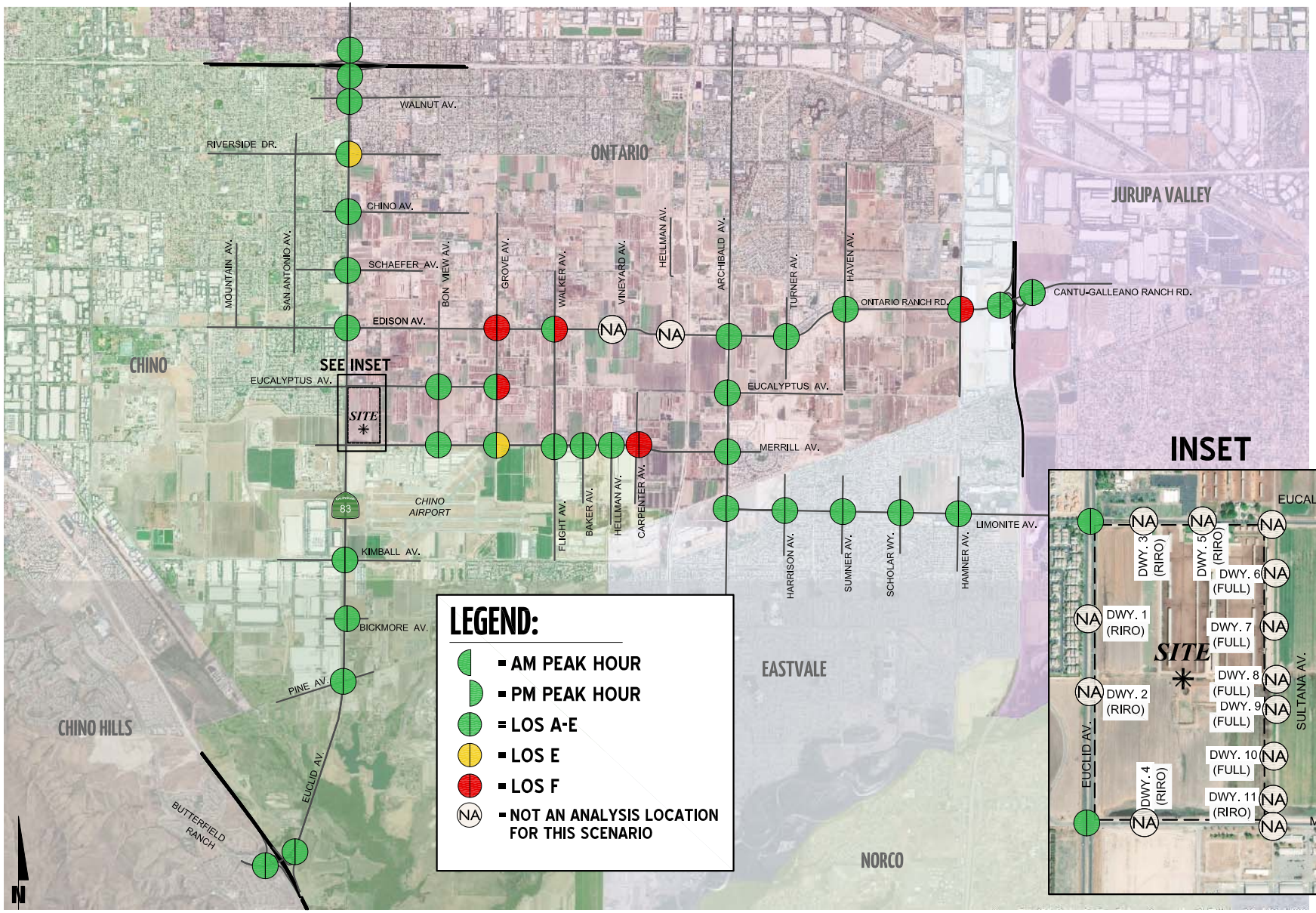
EXHIBIT 3-21: EXISTING (2019) SUMMARY OF LOS



URBAN CROSSROADS

Table 3-1

Intersection Analysis for Existing (2019) Conditions

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service		Acceptable LOS[4]
			Northbound			Southbound			Eastbound			Westbound							
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM	
1	Euclid Av. (SR-83) & SR-60 WB Ramps	TS	1	2	0	0	2	1	0	0	0	1	1	1	22.3	18.6	C	B	D
2	Euclid Av. (SR-83) & SR-60 EB Ramps	TS	0	2	1	1	2	0	1	1	0	0	0	0	25.9	22.3	C	C	D
3	Euclid Av. (SR-83) & Walnut Av.	TS	1	3	d	2	3	1	1	2	0	1	2	0	30.1	32.5	C	C	E
4	Euclid Av. (SR-83) & Riverside Dr.	TS	1	2	1	1	2	1>	1	1	0	1	2	d	47.0	**55.5**	D	**E**	D
5	Euclid Av. (SR-83) & Chino Av.	TS	1	2	1	1	2	1	1	1	1	0	1	0	21.5	23.2	C	C	D
6	Euclid Av. (SR-83) & Schaefer Av.	TS	1	2	1	1	2	1	1	1	1	1	1	0	23.6	26.2	C	C	D
7	Euclid Av. (SR-83) & Edison Av.	TS	1	2	1	1	2	1	1	1	1	1	1	0	38.1	39.7	D	D	D
8	Euclid Av. (SR-83) & Eucalyptus Av.	TS	1	2	1	1	2	1	1	1	1	1	1	0	13.8	13.2	B	B	D
9	Euclid Av. (SR-83) & Driveway 1		Intersection Does Not Exist																D
10	Euclid Av. (SR-83) & Driveway 2		Intersection Does Not Exist																D
11	Euclid Av. (SR-83) & Merrill Av.	TS	1	2	1	1	2	0	0	1	0	0	1	0	26.4	29.9	C	C	D
12	Euclid Av. (SR-83) & Kimball Av.	TS	1	2	1>	2	2	1>	2	2	0	1	2	0	32.4	38.3	C	D	D
13	Euclid Av. (SR-83) & Bickmore Av.	TS	1	2	0	1	2	1	1	1	1	1	1	0	16.3	14.0	B	B	D
14	Euclid Av. (SR-83) & Pine Av.	TS	1	2	1>	1	2	0	1	1	1	2	1	0	31.9	39.5	C	D	D
15	SR-71 NB Ramps & Euclid Av. (SR-83)	TS	2	0	1>>	0	0	0	0	2	1>>	1	2	0	27.2	43.1	C	D	D
16	SR-71 SB Ramps & Butterfield Ranch Rd.	TS	1	0	1	1	1	1	0	2	0	1	2	1>>	40.0	39.8	D	D	D
17	Driveway 3 & Eucalyptus Av.		Intersection Does Not Exist																D
18	Driveway 4 & Merrill Av.		Intersection Does Not Exist																D
19	Driveway 5 & Eucalyptus Av.		Intersection Does Not Exist																D
20	Sultana Av. & Eucalyptus Av.		Intersection Does Not Exist																E
21	Sultana Av. & Driveway 6		Intersection Does Not Exist																D
22	Sultana Av. & Driveway 7		Intersection Does Not Exist																D
23	Sultana Av. & Driveway 8		Intersection Does Not Exist																D
24	Sultana Av. & Driveway 9		Intersection Does Not Exist																D
25	Sultana Av. & Driveway 10		Intersection Does Not Exist																D
26	Sultana Av. & Driveway 11		Intersection Does Not Exist																D
27	Sultana Av. & Merrill Av.		Intersection Does Not Exist																D
28	Bon View Av. & Eucalyptus Av.	AWS	0	1	0	0	1	0	0	1	0	0	1	0	8.6	9.1	A	A	E
29	Bon View Av. & Merrill Av.	CSS	0	0	0	0	1	0	0	1	0	0	1	0	13.2	16.4	B	C	D
30	Grove Av. & Edison Av.	AWS	0	1	0	0	1	0	0	1	0	0	1	0	**71.9**	**>100.0**	**F**	**F**	E
31	Grove Av. & Eucalyptus Av.	CSS	0	1	0	0	1	0	0	1	0	0	1	0	20.0	**>100.0**	C	**F**	E
32	Grove Av. & Merrill Av.	AWS	0	0	0	0	1	0	0	1	0	0	1	0	34.6	**43.7**	D	**E**	D
33	Walker Av. & Edison Av.	CSS	0	1	0	0	1	0	0	1	0	0	1	0	25.2	**60.1**	D	**F**	E
34	Walker Av./Flight Av. & Merrill Av.	CSS	0	1	0	0	0	0	0	1	1	1	1	0	27.2	25.0	D	D	D
35	Baker Av./Van Vliet Av. & Merrill Av.	CSS	0	1	0	0	0	0	0	2	0	1	1	0	11.3	13.6	B	B	D
36	Vineyard Av. & Edison Av.		2040 Analysis Location																E
37	Vineyard Av./Hellman Av. & Merrill Av.	CSS	1	0	1	0	0	0	0	2	0	1	1	0	9.4	10.9	A	B	D
38	Carpenter Av. & Merrill Av.	AWS	0	1	0	0	1	0	1	1	1	1	1	0	**86.2**	**89.5**	**F**	**F**	D
39	Hellman Av. & Edison Av.		2040 Analysis Location																E
40	Archibald Av. & Ontario Ranch Rd.	TS	1	2	1>>	1	2	1	2	2	1>>	2	1	1	31.4	27.0	C	C	E
41	Archibald Av. & Eucalyptus Av.	TS	0	2	d	1	2	0	0	0	0	2	0	2	5.8	3.2	A	A	E
42	Archibald Av. & Merrill Av.	TS	1	2	1	2	2	d	1	1	1	1	1	1	33.6	29.2	C	C	E
43	Archibald Av. & Limonite Av.	TS	0	1	1>	1	1	0	0	0	0	1	0	1>	48.0	29.6	D	C	D
44	Turner Av. & Ontario Ranch Rd.	TS	1	1	0	1	1	0	1	2	1	1	2	1	16.5	14.5	B	B	E
45	Harrison Av. & Limonite Av.	TS	1	1	1	1	1	0	1	3	d	1	3	d	19.1	17.1	B	B	D
46	Haven Av. & Ontario Ranch Rd.	TS	1	1	1	1	1	1	1	3	1	1	2	1	25.0	22.8	C	C	E
47	Sumner Av. & Limonite Av.	TS	1	2	0	1	2	0	2	3	0	2	3	1	18.4	18.4	B	B	D

Table 3-1

Intersection Analysis for Existing (2019) Conditions

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service		Acceptable LOS[4]
			Northbound			Southbound			Eastbound			Westbound							
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM	
48	Scholar Way & Limonite Av.	TS	1	1	1	1	2	1	1	2	1	1	2	1	16.2	14.8	B	B	D
49	Hamner Av. & Ontario Ranch Rd.	TS	2	3	1	2	2	1	2	4	0	2	2	1	42.7	**109.0**	D	**F**	D
50	Hamner Av. & Limonite Av.	TS	2	3	1	2	3	1	2	3	1	2	2	1	24.2	27.1	C	C	D
51	I-15 SB Ramps & Cantu Galleano Ranch Rd.	TS	0	0	0	1	1	1	0	3	1>>	0	2	1>>	14.7	13.1	B	B	D
52	I-15 NB Ramps & Cantu Galleano Ranch Rd.	TS	1	1	1	0	0	0	0	3	1>	2	3	0	18.9	12.5	B	B	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 Highway Capacity Manual (6th Edition), overall average intersection delay and level of service are shown for intersections with a traffic signal or all way stop control. For intersections with cross street stop control, the delay and level of service for the worst individual movement (or movements sharing a single lane) are shown.

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

[4] Minimum acceptable LOS for each applicable jurisdiction.

3.9 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 Avenue & Edison Avenue (#30)
- Grove Avenue & Eucalyptus Avenue (#31)
- Grove Avenue & Merrill Avenue (#32)
- Walker Avenue & Edison Avenue (#33)
- Walker Avenue/Flight Avenue & Merrill Avenue (#34)
- Carpenter Avenue & Merrill Avenue (#38)

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

3.10 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the study area intersections along the SR-71 Freeway, SR-60 Freeway, and I-15 Freeway 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 SR-71, SR-60, and I-15 Freeway mainlines. Queuing analysis findings are presented on Table 3-2. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown on Table 3-2, there are no movements that are currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows. Worksheets for Existing traffic conditions off-ramp queuing analysis are provided in Appendix 3.4.

3.11 FREEWAY FACILITY ANALYSIS

Existing (2019) mainline directional volumes for the AM and PM peak hours are provided on Exhibit 3-24. As shown on Table 3-3, the study area freeway segments and merge/diverge ramp junctions analyzed for this study are currently operating at an acceptable LOS (i.e., LOS D or better) during the peak hours for Existing (2019) traffic conditions, with exception of the following:

- SR-60 Freeway Westbound, Westbound Off-Ramp at Euclid Avenue (SR-83) (#7) – LOS E AM and PM peak hours

Existing (2019) freeway facility analysis worksheets are provided in Appendix 3.5.

Table 3-2

Peak Hour Freeway Off-Ramp Queuing Summary for Existing (2019) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)[3]		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM
Euclid Avenue (SR-83) & SR-60 WB Ramps	WBL	400	306	276	Yes	Yes
	WBL/T/R	1,430	316 [2]	284	Yes	Yes
	WBR	400	202	207	Yes	Yes
Euclid Avenue (SR-83) & SR-60 EB Ramps	EBL	900	363 [2]	352 [2]	Yes	Yes
	EBT/R	1,270	260 [2]	288 [2]	Yes	Yes
SR-71 NB Ramps & Euclid Avenue (SR-83)	NBL	1,745	27	44	Yes	Yes
	NBR	420	203 [2]	732 [2]	Yes	Yes[3]
SR-71 SB Ramps & Euclid Avenue (SR-83)	SBL	1,100	215	230	Yes	Yes
	SBL/T	1,560	215	232	Yes	Yes
	SBR	255	0	1	Yes	Yes
I-15 SB Ramps & Cantu Galleano Ranch Rd.	SBL	1,440	105	90	Yes	Yes
	SBT	560	308 [2]	186	Yes	Yes
	SBR	460	255	167	Yes	Yes
I-15 NB Ramps & Cantu Galleano	NBL	1,680	86	65	Yes	Yes
	NBR	440	51	45	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.

[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 SR-60, SR-71, or I-15 Freeway mainline.

Table 3-3

Freeway Facility Analysis for Existing (2019) Conditions

Freeway	Direction[4]	Ramp or Segment	Lanes on Freeway[1]	AM Peak Hour		PM Peak Hour	
				Density[2]	LOS[3]	Density[2]	LOS[3]
SR-71	SB	Southbound Loop On-Ramp at Euclid Avenue (SR-83)	2	9.7	A	10.4	B
		South of Euclid Avenue (SR-83)	2	12.2	B	12.9	B
	NB	Northbound Off-Ramp at Euclid Avenue (SR-83)	3	13.7	B	21.1	C
		South of Euclid Avenue (SR-83)	3	8.9	A	15.6	B
SR-60	Westbound	West of Euclid Avenue (SR-83)	4	33.9	D	31.5	D
		Westbound On-Ramp at Euclid Avenue (SR-83)	4	28.5	D	27.2	C
		Westbound Off-Ramp at Euclid Avenue (SR-83)	4	**32.0**	**E**	**35.8**	**E**
		East of Euclid Avenue (SR-83)	4	34.6	D	33.3	D
	Eastbound	West of Euclid Avenue (SR-83)	4	31.2	D	25.7	C
		Eastbound Off-Ramp at Euclid Avenue (SR-83)	4	32.3	D	28.6	D
		Eastbound On-Ramp at Euclid Avenue (SR-83)	4	28.1	D	24.0	C
		East of Euclid Avenue (SR-83)	4	32.9	D	26.4	D
I-15	SB	North of Cantu Galleano Ranch Road	4	18.5	C	14.8	B
		Southbound Off-Ramp at Cantu Galleano Ranch Road	4	27.2	C	22.8	C
	NB	North of Cantu Galleano Ranch Road	5	16.2	B	14.1	B
		Northbound On-Ramp at Cantu Galleano Ranch Road	3	34.5	D	30.8	D

* **BOLD** = Unacceptable Level of Service

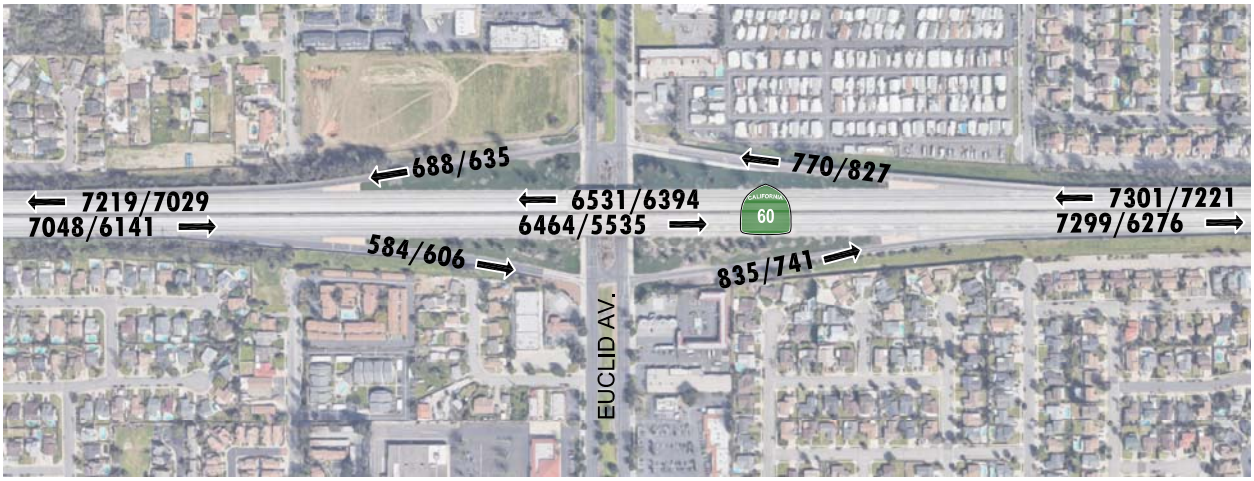
[1] Number of lanes are in the specified direction and is based on existing conditions.

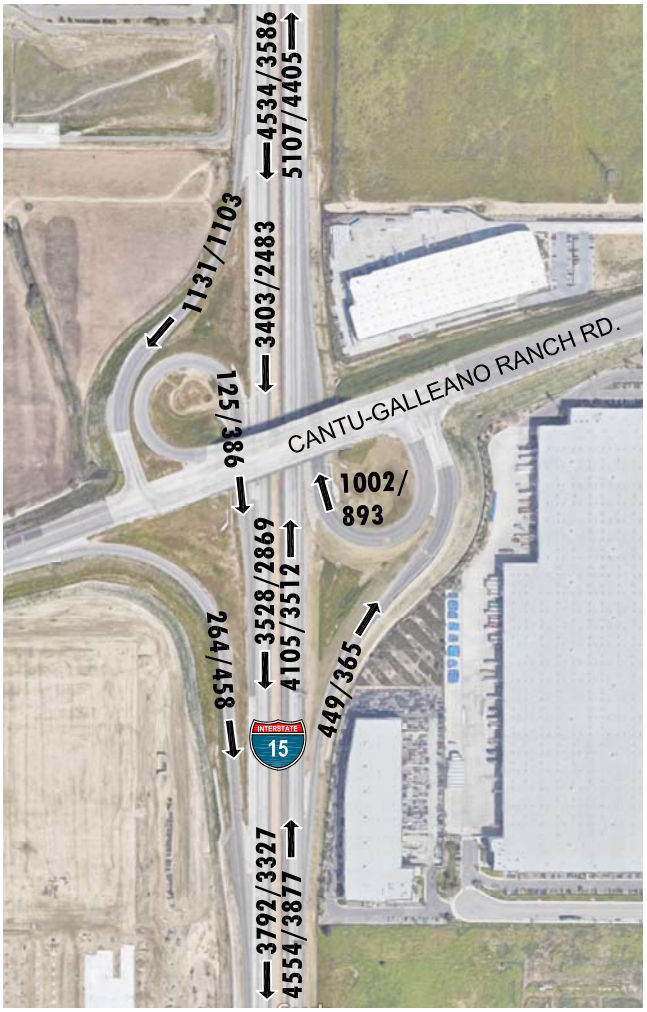
[2] Density is measured by passenger cars per mile per lane (pc/mi/ln).

[3] LOS = Level of Service

[4] SB = Southbound; NB = Northbound

EXHIBIT 3-22: EXISTING (2019) FREEWAY MAINLINE VOLUMES





LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

N

12248 - freeway.dwg

3.12 RECOMMENDED IMPROVEMENTS

Improvement strategies have been recommended at intersections and freeway facilities that have been identified as deficient under Existing (2019) traffic conditions in an effort to achieve an acceptable LOS (i.e., LOS D or better).

3.12.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Table 3-4 indicates the physical improvements needed to address LOS deficiencies at each of the study area intersections under Existing (2019) traffic conditions. The following improvements are recommended to improve the Existing (2019) deficiencies back to acceptable levels.

Euclid Avenue (SR-83) & Riverside Drive (#4) – The following improvement is necessary to improve the existing deficiency to acceptable levels:

- Add an eastbound right turn lane.

Grove Avenue & Edison Avenue (#30) – The following improvement is necessary to improve the existing deficiency to acceptable levels:

- Install a traffic signal.

Grove Avenue & Eucalyptus Avenue (#31) – The following improvement is necessary to improve the existing deficiency to acceptable levels:

- Install a traffic signal.

Grove Avenue & Merrill Avenue (#32) – The following improvement is necessary to improve the existing deficiency to acceptable levels:

- Install a traffic signal.

Walker Avenue & Edison Avenue (#33) – The following improvement is necessary to improve the existing deficiency to acceptable levels:

- Install a traffic signal.

Carpenter Avenue & Merrill Avenue (#38) – The following improvement is necessary to improve the existing deficiency to acceptable levels:

- Install a traffic signal.

Hamner Avenue & Ontario Ranch Road (#49) – The following improvement is necessary to improve the existing deficiency to acceptable levels:

- Restripe the southbound right turn lane as a shared through-right turn lane.

The intersection operations analysis worksheets, with improvements, are included in Appendix 3.7 of this TIA.

Table 3-4

Intersection Analysis for Existing (2019) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
4	Euclid Av. (SR-83) & Riverside Dr.																	
	- Without Improvements	TS	1	2	1	1	2	1>	1	1	0	1	2	d	47.0	**55.5**	D	**E**
	- With Improvements	TS	1	2	1	1	2	1>	1	1	**1**	1	2	d	45.3	49.8	D	D
30	Grove Av. & Edison Av.																	
	- Without Improvements	AWS	0	1	0	0	1	0	0	1	0	0	1	0	**71.9**	**>100.0**	**F**	**F**
	- With Improvements	**TS**	0	1	0	0	1	0	0	1	0	0	1	0	14.2	16.0	B	B
31	Grove Av. & Eucalyptus Av.																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	1	0	0	1	0	20.0	**>100.0**	C	**F**
	- With Improvements	**TS**	0	1	0	0	1	0	0	1	0	0	1	0	8.9	40.6	A	D
32	Grove Av. & Merrill Av.																	
	- Without Improvements	AWS	0	0	0	0	1	0	0	1	0	0	1	0	34.6	**43.7**	D	**E**
	- With Improvements	**TS**	0	0	0	0	1	0	0	1	0	0	1	0	14.7	19.3	B	B
33	Walker Av. & Edison Av.																	
	- Without Improvements	CSS	0	1	0	0	1	0	0	1	0	0	1	0	25.2	**60.1**	D	**F**
	- With Improvements	**TS**	0	1	0	0	1	0	0	1	0	0	1	0	7.5	9.6	A	A
38	Carpenter Av. & Merrill Av.																	
	- Without Improvements	AWS	0	1	0	0	1	0	1	1	1	1	1	0	**86.2**	**89.5**	**F**	**F**
	- With Improvements	**TS**	0	1	0	0	1	0	1	1	1	1	1	0	21.0	14.7	C	B
46	Hamner Av. & Ontario Ranch Rd.																	
	- Without Improvements	TS	2	3	1	2	2	1	2	4	0	2	2	1	42.7	**109.0**	D	**F**
	- With Improvements[4]	TS	2	3	1	2	**3**	**0**	2	4	0	2	2	1	40.1	47.5	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; d= Defacto Right Turn Lane; **1** = Improvement

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

[3] CSS = Cross-Street Stop; AWS = All-Way Stop; TS = Traffic Signal; **TS** = Improvement

[4] Improvement includes modifying the traffic signal to extend the cycle length to 130 seconds.

3.12.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON OFF-RAMP QUEUES

As shown previously on Table 3-2, there are no peak hour queuing issues at the SR-71 Freeway, SR-60 Freeway, and I-15 Freeway study area interchanges. As such, no improvements have been recommended.

3.12.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

SHS facilities are owned and maintained by Caltrans. Improvements to the SHS is regional/state-wide and Caltrans' responsibility. Improvements to freeway facilities LOS deficiencies is addressed through Caltrans regional improvement plans and programs. At this time, Caltrans has no plans or programs in place to address development-specific deficiencies affecting the SHS. There are no feasible measures to address LOS deficiencies that can be autonomously implemented by the Lead Agency or the Project Applicant.

4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project, as well as the Project's trip assignment onto the study area roadway network. The Project is assumed to be developed in a single phase with an anticipated Opening Year of 2022. For purposes of the TIA, the following land uses are assumed:

- High-Cube Fulfillment Center Warehouse: 1,019,317 square feet
- High-Cube Cold Storage Warehouse: 200,000 square feet
- Warehousing: 357,836 square feet
- Business Park: 327,874 square feet of a mix of uses including merchant wholesale, professional services, professional office, warehouse/storage, and research and development uses (as would fall under ITE Land Use Code 130).
- **Total of 1,905,027 square feet**

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 for the Project are shown on Table 4-1 for both actual vehicles and PCE. The trip generation summary illustrating daily, and peak hour trip generation estimates for the proposed Project in actual vehicles and PCE are shown on Table 4-2 and Table 4-3, respectively. 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) and the TUMF High-Cube Warehouse Trip Generation Study (WSP, January 29, 2019). (3) (4)

Table 4-1

Project Trip Generation Rates

Land Use[1]	Units[2]	ITE LU Code	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Daily
Actual Vehicle Trip Generation Rates									
High-Cube Fulfillment Center Warehouse[3]	TSF	--	0.094	0.028	0.122	0.046	0.119	0.165	2.129
Passenger Cars			0.079	0.024	0.103	0.040	0.104	0.144	1.750
2-4 Axle Trucks			0.006	0.002	0.008	0.003	0.008	0.011	0.162
5+-Axle Trucks			0.008	0.003	0.011	0.003	0.007	0.010	0.217
Warehousing[4,5]	TSF	150	0.131	0.039	0.170	0.051	0.139	0.190	1.740
Passenger Cars (80.0%)			0.105	0.031	0.136	0.041	0.111	0.152	1.392
2-Axle Trucks (3.34%)			0.004	0.001	0.006	0.002	0.005	0.006	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	0.024	0.218
High-Cube Cold Storage Warehouse[5]	TSF	157	0.085	0.025	0.110	0.032	0.088	0.120	2.120
Passenger Cars (AM-69.2%; PM-78.3%; Daily-67.8%)			0.059	0.018	0.076	0.025	0.069	0.094	1.437
2-Axle Trucks (AM-10.69%; PM-7.53%; Daily-11.17%)			0.009	0.003	0.012	0.002	0.007	0.009	0.237
3-Axle Trucks (AM-3.39%; PM-2.39%; Daily-3.54%)			0.003	0.001	0.004	0.001	0.002	0.003	0.075
4-Axle+ Trucks (AM-16.76%; PM-11.80%; Daily-17.52%)			0.014	0.004	0.018	0.004	0.010	0.014	0.371
Business Park[4,6]	TSF	130	0.324	0.076	0.400	0.084	0.316	0.400	3.370
Passenger Cars (87.0%)			0.282	0.066	0.348	0.073	0.275	0.348	2.932
2-Axle Trucks (2.17%)			0.007	0.002	0.009	0.002	0.007	0.009	0.073
3-Axle Trucks (2.69%)			0.009	0.002	0.011	0.002	0.009	0.011	0.091
4+-Axle Trucks (8.14%)			0.026	0.006	0.032	0.007	0.026	0.033	0.274
Passenger Car Equivalent (PCE) Trip Generation Rates[5]									
High-Cube Fulfillment Center Warehouse[3]	TSF	--	0.094	0.028	0.122	0.046	0.119	0.165	2.129
Passenger Cars			0.079	0.024	0.103	0.040	0.104	0.144	1.750
2-4 Axle Trucks (PCE = 2.0)			0.012	0.004	0.016	0.006	0.016	0.022	0.324
5+-Axle Trucks (PCE = 3.0)			0.025	0.008	0.033	0.008	0.022	0.030	0.651
Warehousing[4,5]	TSF	150	0.131	0.039	0.170	0.051	0.139	0.190	1.740
Passenger Cars (80.0%)			0.105	0.031	0.136	0.041	0.111	0.152	1.392
2-Axle Trucks (3.34%) (PCE = 1.5)			0.007	0.002	0.009	0.003	0.007	0.010	0.087
3-Axle Trucks (4.14%) (PCE = 2.0)			0.011	0.003	0.014	0.004	0.011	0.016	0.144
4+-Axle Trucks (12.52%) (PCE = 3.0)			0.049	0.015	0.064	0.019	0.052	0.071	0.654
High-Cube Cold Storage Warehouse[5]	TSF	157	0.085	0.025	0.110	0.032	0.088	0.120	2.120
Passenger Cars (AM-69.2%; PM-78.3%; Daily-67.8%)			0.059	0.018	0.076	0.025	0.069	0.094	1.437
2-Axle Trucks (AM-10.69%; PM-7.53%; Daily-11.17%) (PCE = 1.5)			0.014	0.004	0.018	0.004	0.010	0.014	0.355
3-Axle Trucks (AM-3.39%; PM-2.39%; Daily-3.54%) (PCE = 2.0)			0.006	0.002	0.007	0.002	0.004	0.006	0.150
-Axle+ Trucks (AM-16.76%; PM-11.80%; Daily-17.52%) (PCE = 3.0)			0.043	0.013	0.055	0.011	0.031	0.042	1.114
Passenger Car Equivalent (PCE) Trip Generation Rates[5]									
Business Park[4,6]	TSF	130	0.324	0.076	0.400	0.084	0.316	0.400	3.370
Passenger Cars (87.0%)			0.282	0.066	0.348	0.073	0.275	0.348	2.932
2-Axle Trucks (2.17%) (PCE = 1.5)			0.011	0.003	0.014	0.003	0.011	0.014	0.110
3-Axle Trucks (2.69%) (PCE = 2.0)			0.018	0.004	0.022	0.004	0.018	0.022	0.182
4+-Axle Trucks (8.14%) (PCE = 3.0)			0.078	0.018	0.096	0.021	0.078	0.099	0.822

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

[2] TSF = thousand square feet

[3] Vehicle Mix Source: DRAFT TUMF High Cube Warehouse Trip Generation Study, WSP, January 29, 2019.
Inbound and outbound split source: High Cube Warehouse Vehicle Trip Generation Analysis, October 2016, ITE.

[4] Vehicle Mix Source: Institute of Transportation Engineers (ITE), Trip Generation Handbook, Third Edition (September 2017).

[5] Truck Mix Source: South Coast Air Quality Management District (SCAQMD) Warehouse Truck Trip Study Data Results and Usage (2014).
Normalized % - Without Cold Storage: 16.7% 2-Axle trucks, 20.7% 3-Axle trucks, 62.6% 4-Axle trucks
Normalized % - With Cold Storage: 34.7% 2-Axle trucks, 11.0% 3-Axle trucks, 54.3% 4-Axle trucks

[6] The Business Park (ITE Land Use Code 770) land use has trip generation rates for the peak hours is based on limited data (i.e., one surveyed site).
As such, the trip generation rates for ITE Land Use Code 130 has been utilized for the business park portion of the Project.

Table 4-2

Project Trip Generation Summary (Actual)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
High-Cube Fulfillment Warehouse	1,019.317	TSF							
Passenger Cars:			81	24	105	41	106	147	1,784
Truck Trips:									
2-4 axle:			6	2	8	3	8	11	166
5+-axle:			9	3	12	3	7	10	222
- Net Truck Trips			15	5	20	6	15	21	388
FULFILLMENT TOTAL NET TRIPS (Actual Vehicles) [2]			**96**	**29**	**125**	**47**	**121**	**168**	**2,172**
High-Cube Cold Storage Warehouse	200.000	TSF							
Passenger Cars:			12	4	16	5	14	19	288
Truck Trips:									
2-axle:			2	1	3	0	1	1	48
3-axle:			1	0	1	0	0	0	16
4+-axle:			3	1	4	1	2	3	74
- Net Truck Trips			6	2	8	1	3	4	138
COLD STORAGE TOTAL NET TRIPS (Actual Vehicles) [2]			**18**	**6**	**24**	**6**	**17**	**23**	**426**
Warehousing	357.836	TSF							
Passenger Cars:			37	11	48	15	40	55	498
Truck Trips:									
2-axle:			2	0	2	1	2	3	22
3-axle:			2	1	3	1	2	3	26
4+-axle:			6	2	8	2	6	8	78
- Net Truck Trips			10	3	13	4	10	14	126
WAREHOUSING TOTAL NET TRIPS (Actual Vehicles) [2]			**47**	**14**	**61**	**19**	**50**	**69**	**624**
Business Park	327.874	TSF							
Passenger Cars:			92	22	114	24	90	114	962
Truck Trips:									
2-axle:			2	1	3	1	2	3	24
3-axle:			3	1	4	1	3	4	30
4+-axle:			9	2	11	2	9	11	90
- Net Truck Trips			14	4	18	4	14	18	144
BUSINESS PARK TOTAL NET TRIPS (Actual Vehicles) [2]			**106**	**26**	**132**	**28**	**104**	**132**	**1,106**
Total Proposed Project (Actual Vehicles)			**267**	**75**	**342**	**100**	**292**	**392**	**4,328**

[1] TSF = thousand square feet

[2] TOTAL NET TRIPS = Passenger Cars + Net Truck Trips.

Table 4-3

Project Trip Generation Summary (PCE)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
High-Cube Fulfillment Warehouse	1,019.317	TSF							
Passenger Cars:			81	24	105	41	106	147	1,784
Truck Trips:									
2-4 axle:			13	4	17	6	16	22	330
5+-axle:			26	8	34	9	22	31	664
- Net Truck Trips			39	12	51	15	38	53	994
FULFILLMENT TOTAL NET TRIPS (PCE) [2]			**120**	**36**	**156**	**56**	**144**	**200**	**2,778**
High-Cube Cold Storage Warehouse	200.000	TSF							
Passenger Cars:			12	4	16	5	14	19	288
Truck Trips:									
2-axle:			3	1	4	1	2	3	72
3-axle:			1	0	1	0	1	1	30
4+-axle:			9	3	12	2	6	8	224
- Net Truck Trips			13	4	17	3	9	12	326
COLD STORAGE TOTAL NET TRIPS (PCE) [2]			**25**	**8**	**33**	**8**	**23**	**31**	**614**
Warehousing	357.836	TSF							
Passenger Cars:			37	11	48	15	40	55	498
Truck Trips:									
2-axle:			2	1	3	1	2	3	32
3-axle:			4	1	5	2	4	6	52
4+-axle:			18	5	23	7	19	26	234
- Net Truck Trips			24	7	31	10	25	35	318
WAREHOUSING TOTAL NET TRIPS (PCE) [2]			**61**	**18**	**79**	**25**	**65**	**90**	**816**
Business Park	327.874	TSF							
Passenger Cars:			92	22	114	24	90	114	962
Truck Trips:									
2-axle:			3	1	4	1	3	4	36
3-axle:			6	1	7	1	6	7	60
4+-axle:			26	6	32	7	26	33	270
- Net Truck Trips			35	8	43	9	35	44	366
BUSINESS PARK TOTAL NET TRIPS (PCE) [2]			**127**	**30**	**157**	**33**	**125**	**158**	**1,328**
Total Proposed Project (PCE)			**333**	**92**	**425**	**122**	**357**	**479**	**5,536**

[1] TSF = thousand square feet

[2] TOTAL NET TRIPS = Passenger Cars + Net Truck Trips.

For purposes of this analysis, the following ITE land use codes and vehicle mixes have been utilized:

- High-Cube Fulfillment Center Warehouse has been used to derive site specific trip generation estimates for up to 1,006,639 square feet of the proposed Project. The ITE Trip Generation Manual (2017) has trip generation rates for high-cube fulfillment center use (ITE land use code 155), however, these rates are unreliable because they are based on limited data (i.e., one to two surveyed sites) and the ITE Trip Generation Manual recommends the use of local data sources where available. As such, the trip-generation statistics published in the TUMF High-Cube Warehouse Trip Generation Study (WSP, January 29, 2019) which was commissioned by the Western Riverside Council of Governments (WRCOG) in support of the Transportation Uniform Mitigation Fee (TUMF) update, has been utilized for the high-cube fulfillment center use. The WSP trip generation rates were published in January 2019 and are based on data collected at 11 local high-cube fulfillment center sites. However, the WSP study does not include a split for inbound and outbound vehicles, as such, the inbound and outbound splits per the ITE High-Cube Warehouse Vehicle Trip Generation Analysis (October 2016) have been utilized. (8)
- ITE land use code 150 (Warehousing) has been used to derive site specific trip generation estimates for up to 337,600 square feet of the proposed Project. The ITE Trip Generation Handbook (3rd Edition, 2017) identifies a 20% mix of heavy trucks, however, does not provide a breakdown of the 20% further by axle type. As such, the South Coast Air Quality Management District (SCAQMD) Warehouse Truck Trip Study Data Results and Usage (2014) for warehouse trucks has been utilized for the truck mix: 16.7% 2-axle trucks, 20.7% 3-axle trucks, and 62.6% 4+-axle trucks.
- ITE land use code 157 (High-Cube Cold Storage Warehouse) has been used to derive site specific trip generation estimates for up to 200,000 square feet of the proposed Project. The truck percentage was obtained from the ITE's High Cube Warehouse Vehicle Trip Generation Analysis (October 2016). The vehicle mix varies by peak hour and overall daily: 69.2% passenger cars in the AM peak hour, 78.3% passenger cars in the PM peak hour, and 67.8% passenger cars weekday daily. 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 SCAQMD Warehouse Truck Trip Study Data Results and Usage (2014) recommended truck mix. The SCAQMD has recently performed surveys of existing facilities and compiled the data to provide interim guidance on the mix of heavy trucks for these types of high-cube warehousing/distribution facilities. Based on this interim guidance from the SCAQMD, the following truck fleet mix was utilized for the purposes of estimating the truck trip generation for the site (with cold storage): 34.7% of the total trucks as 2-axle trucks, 11.0% of the total trucks as 3-axle trucks, and 54.3% of the total trucks as 4+-axle trucks.
- Because the peak hour trip generation rates collected for the "business park" land use category by the ITE as provided in their Trip Generation Manual, 10th Edition, 2017 (ITE land use code 770) are based on limited data (i.e., a single surveyed site) that does not have the same physical or operational characteristics as the range of uses permitted in the Business Park planning areas of the Specific Plan, the trip generation rates for ITE land use code 130 (Industrial Park) have been used to derive site specific trip generation estimates for up to 290,100 square feet of business park uses proposed for the Project. The ITE Trip Generation Handbook (3rd Edition, 2017) identifies a 13% mix of heavy trucks for ITE land use code 130, however, does not provide a breakdown of the 13% further by axle type. As such, 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 (2014) recommended truck mix. Based on this guidance from the SCAQMD, the following truck fleet mix was utilized for the purposes of estimating the truck trip generation for the business park use (without cold storage): 16.7% of the total trucks as 2-axle trucks, 20.7% of the total trucks as 3-axle trucks, and 62.6% of the total trucks as 4+-axle trucks.

Finally, PCE factors were applied to the trip generation rates for heavy trucks (large 2-axles, 3-axles, 4+-axles) for both the Industrial and Business Park planning areas of the Merrill Commerce Center Specific Plan. 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 Congestion Management Program (CMP), 2016 Update.

As shown on Table 4-2, the proposed Project is anticipated to generate a net total of 4,328 trip-ends per day, 342 AM peak hour trips and 392 PM peak hour trips. The proposed Project is anticipated to generate a net total of 5,536 PCE trip-ends per day, 425 PCE AM peak hour trips and 479 PCE 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 Ontario, City of Chino, City of Chino Hills, City of Eastvale, City of Jurupa Valley, 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 relation 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 Schaefer Avenue at Archibald Avenue, Limonite Avenue/Kimball Avenue extension between Hellman Avenue and Archibald Avenue, and the Merrill Avenue extension to Bellegrave Avenue will also be assumed for Horizon Year conditions only.

Exhibit 4-1 illustrates the truck trip distribution patterns for Opening Year Cumulative and Horizon Year conditions. As shown on Exhibit 4-1, trucks are anticipated to utilize designated truck routes such as Merrill Avenue, Euclid Avenue (SR-83), Archibald Avenue, Edison Avenue/Ontario Ranch Road, and Limonite Avenue to reach regional freeways such as the SR-71, 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.

EXHIBIT 4-1: PROJECT (TRUCK) TRIP DISTRIBUTION

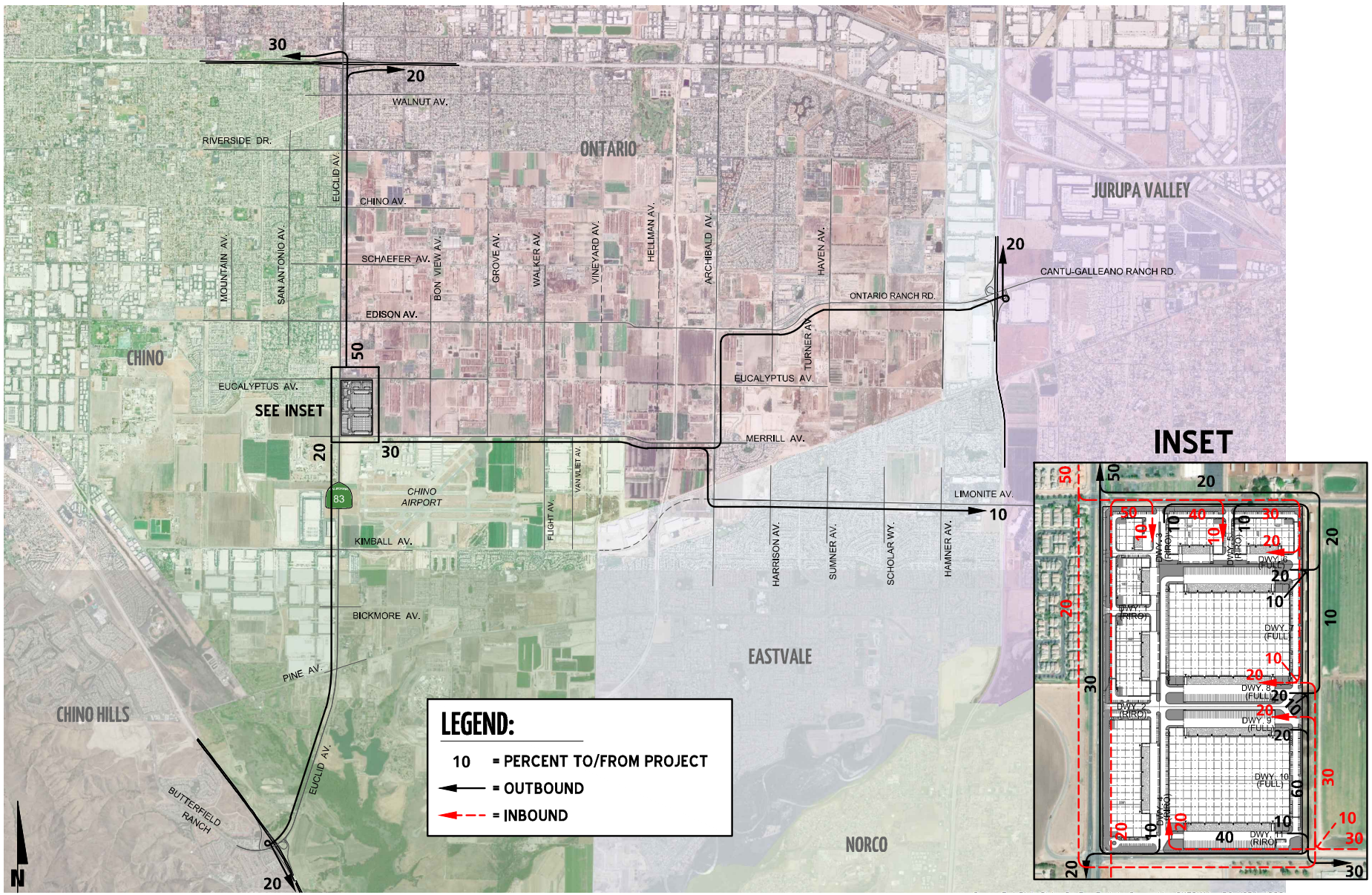


Exhibit 4-2 illustrates the Opening Year Cumulative passenger car trip distribution patterns. The Opening Year Cumulative passenger car trip distribution patterns are based on a SBTAM select zone run for a zone wholly or partially containing the Project, with modifications to utilize existing roadways. Exhibit 4-3 illustrates the passenger car trip distribution patterns 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 the following exhibits:

- Exhibits 4-4 and 4-5 for Project (near-term) traffic conditions
- Exhibits 4-6 and 4-7 for Project (2040) traffic conditions

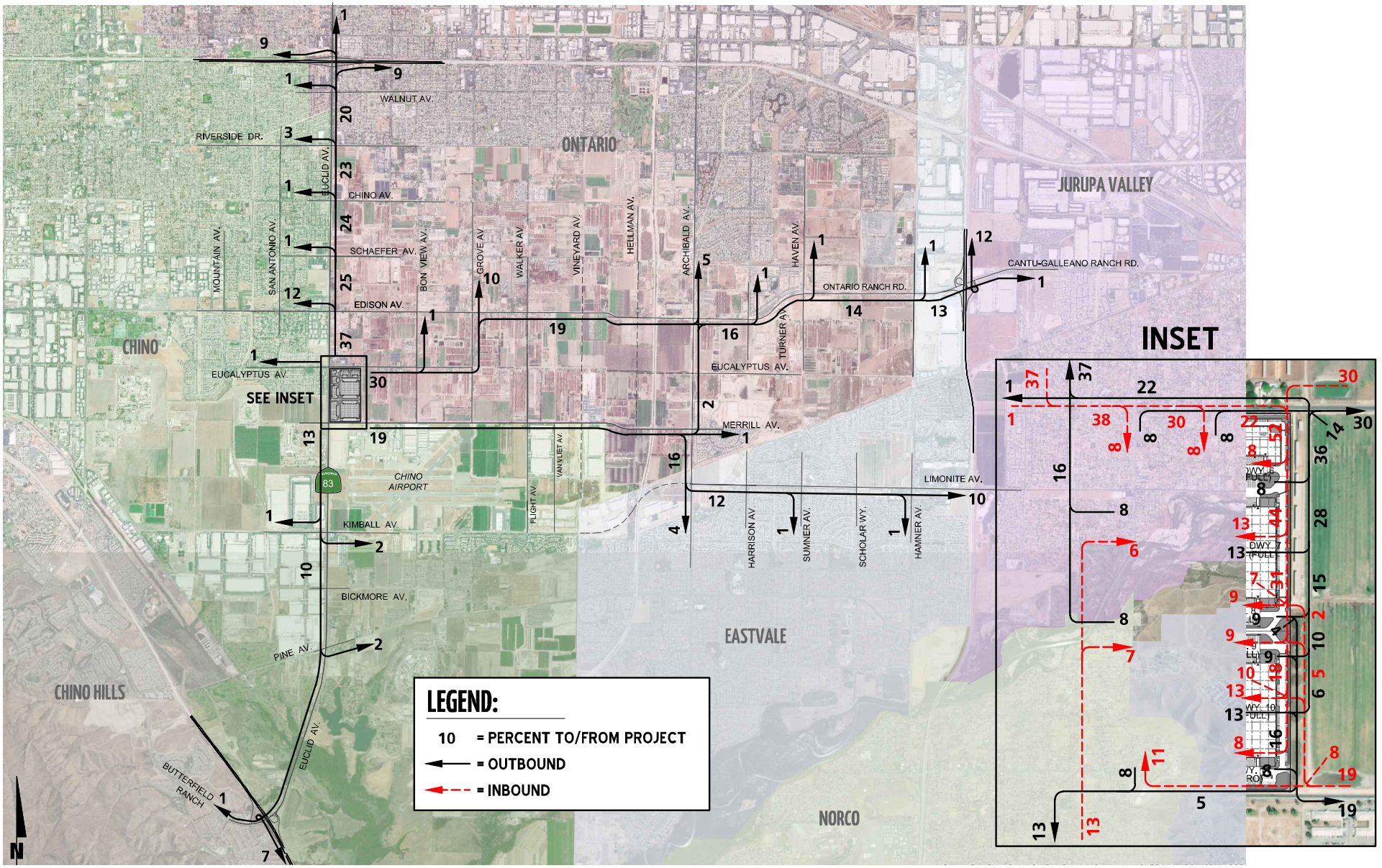
4.5 BACKGROUND TRAFFIC

4.5.1 OPENING YEAR CUMULATIVE CONDITIONS

Future year traffic forecasts have been based upon background (ambient) growth at 2% per year for 2022 traffic conditions. The ambient growth factor is intended to approximate regional traffic growth. This ambient growth rate is added to existing traffic volumes to account for area-wide growth not reflected by cumulative development projects. Ambient growth has been added to daily and peak hour traffic volumes on surrounding roadways, in addition to traffic generated by the development of future projects that have been approved but not yet built and/or for which development applications have been filed and are under consideration by governing agencies.

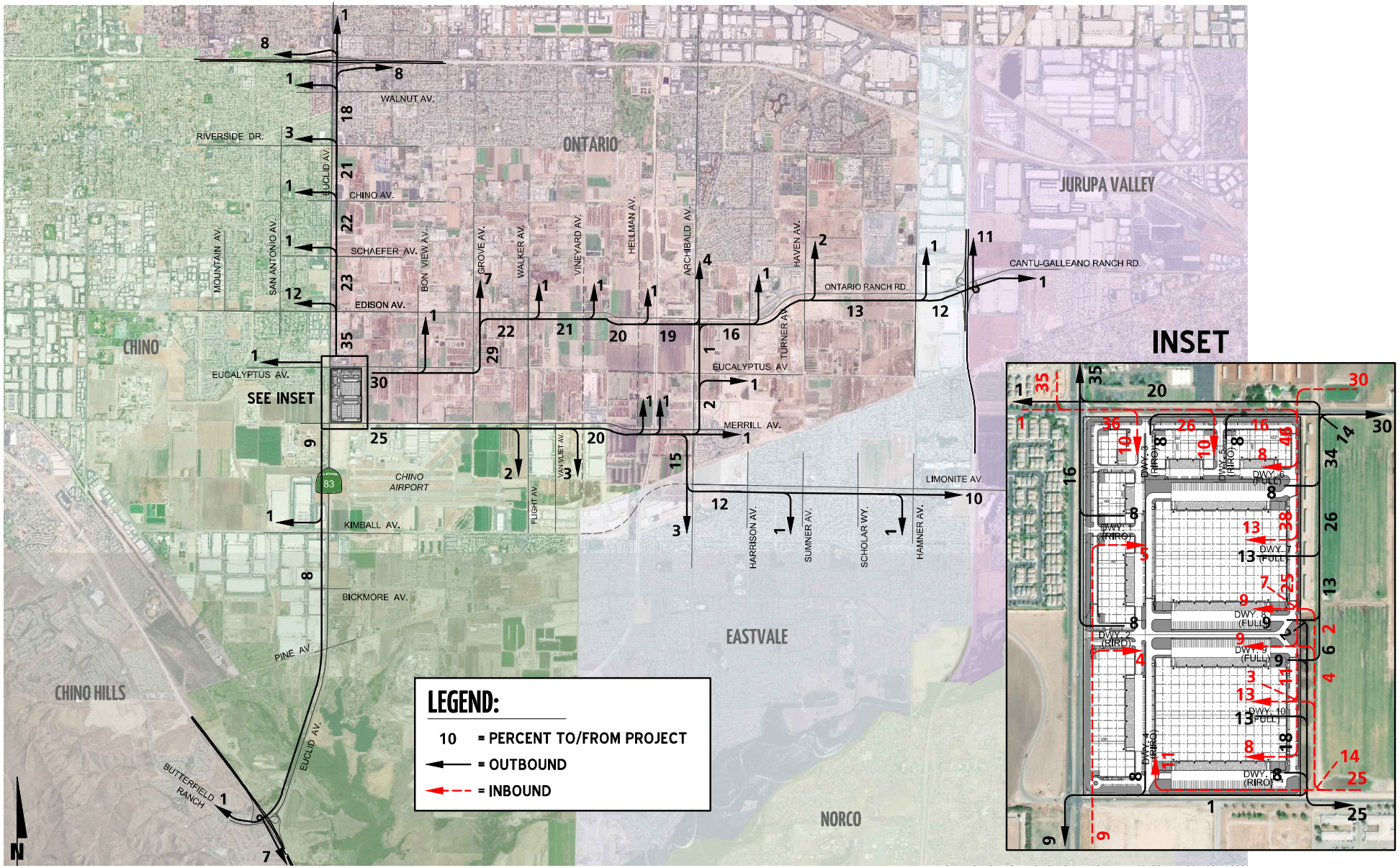
Opening Year Cumulative (2022) traffic volumes are provided in Section 6 of this report. The traffic generated by the proposed Project was then manually added to the base volume to determine Opening Year Cumulative "With Project" forecasts.

EXHIBIT 4-2: PROJECT (OPENING YEAR PASSENGER CAR) TRIP DISTRIBUTION



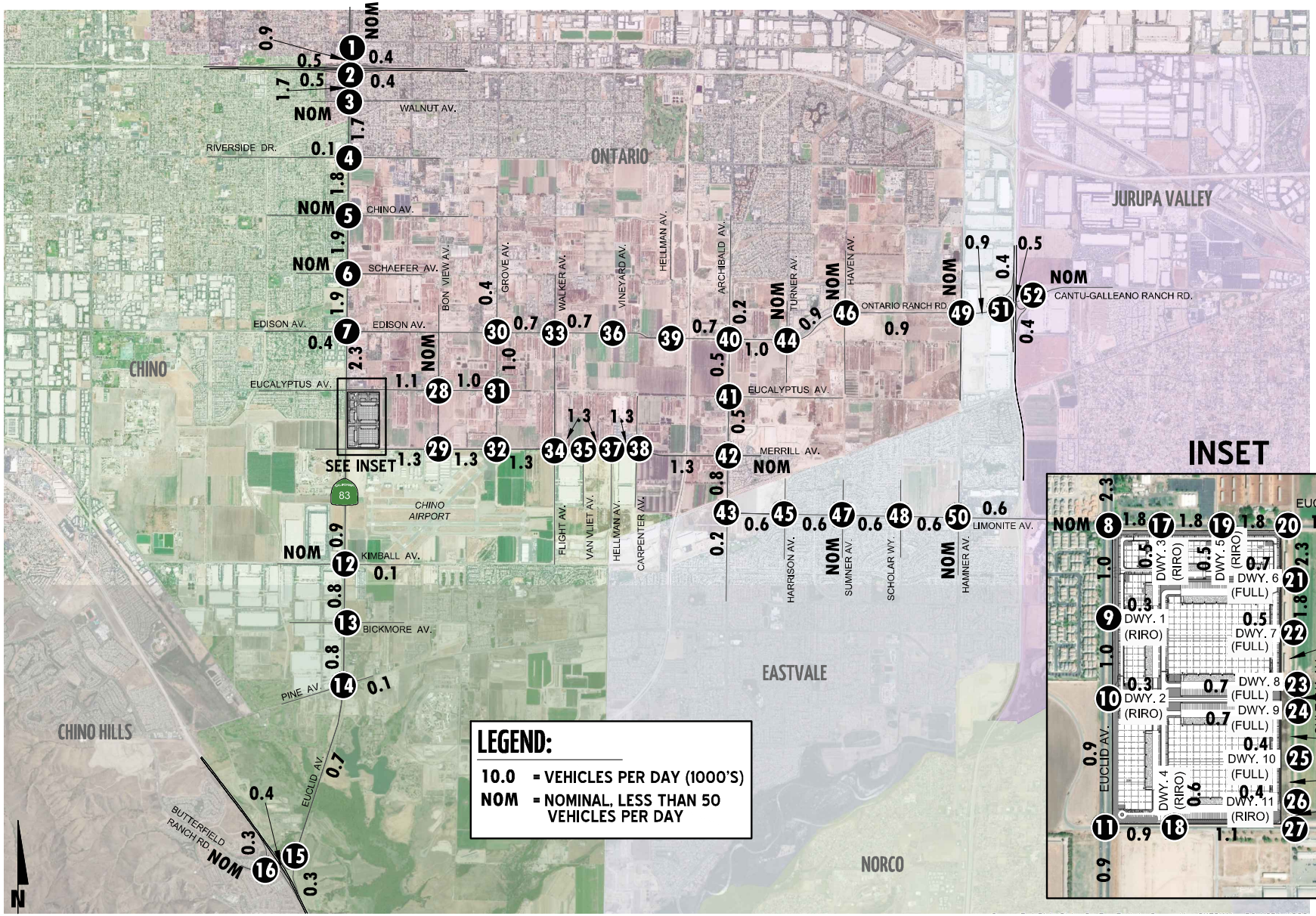
URBAN CROSSROADS

EXHIBIT 4-3: PROJECT (HORIZON YEAR PASSENGER CAR) TRIP DISTRIBUTION



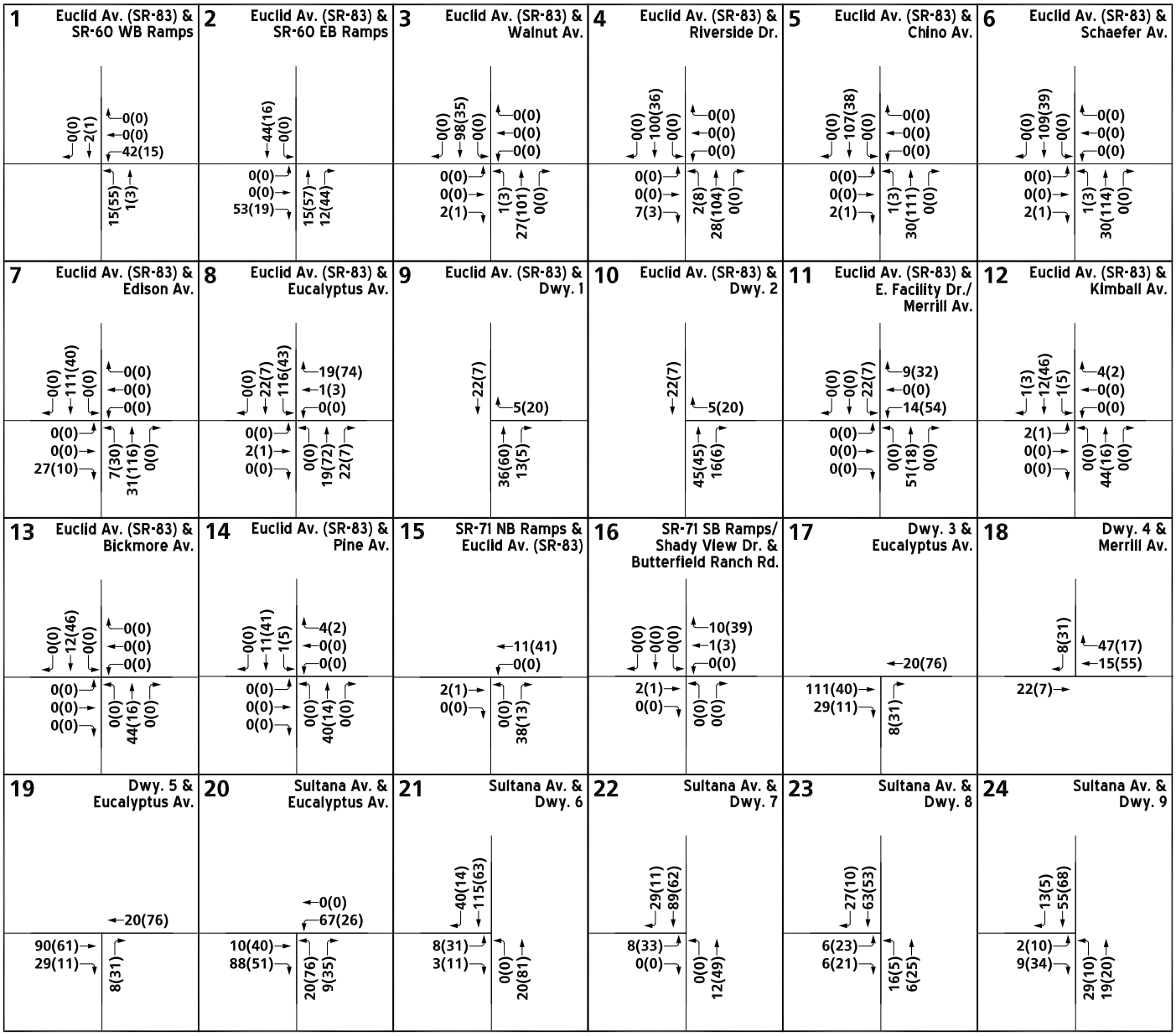
URBAN CROSSROADS

EXHIBIT 4-4: PROJECT (OPENING YEAR) ONLY AVERAGE DAILY TRAFFIC (ADT) (IN PCE)



URBAN CROSSROADS

EXHIBIT 4-5 (1OF2): PROJECT (OPENING YEAR) ONLY TRAFFIC VOLUMES (IN PCE)



LEGEND:

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

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EXHIBIT 4-5 (2OF2): PROJECT (OPENING YEAR) ONLY TRAFFIC VOLUMES (IN PCE)

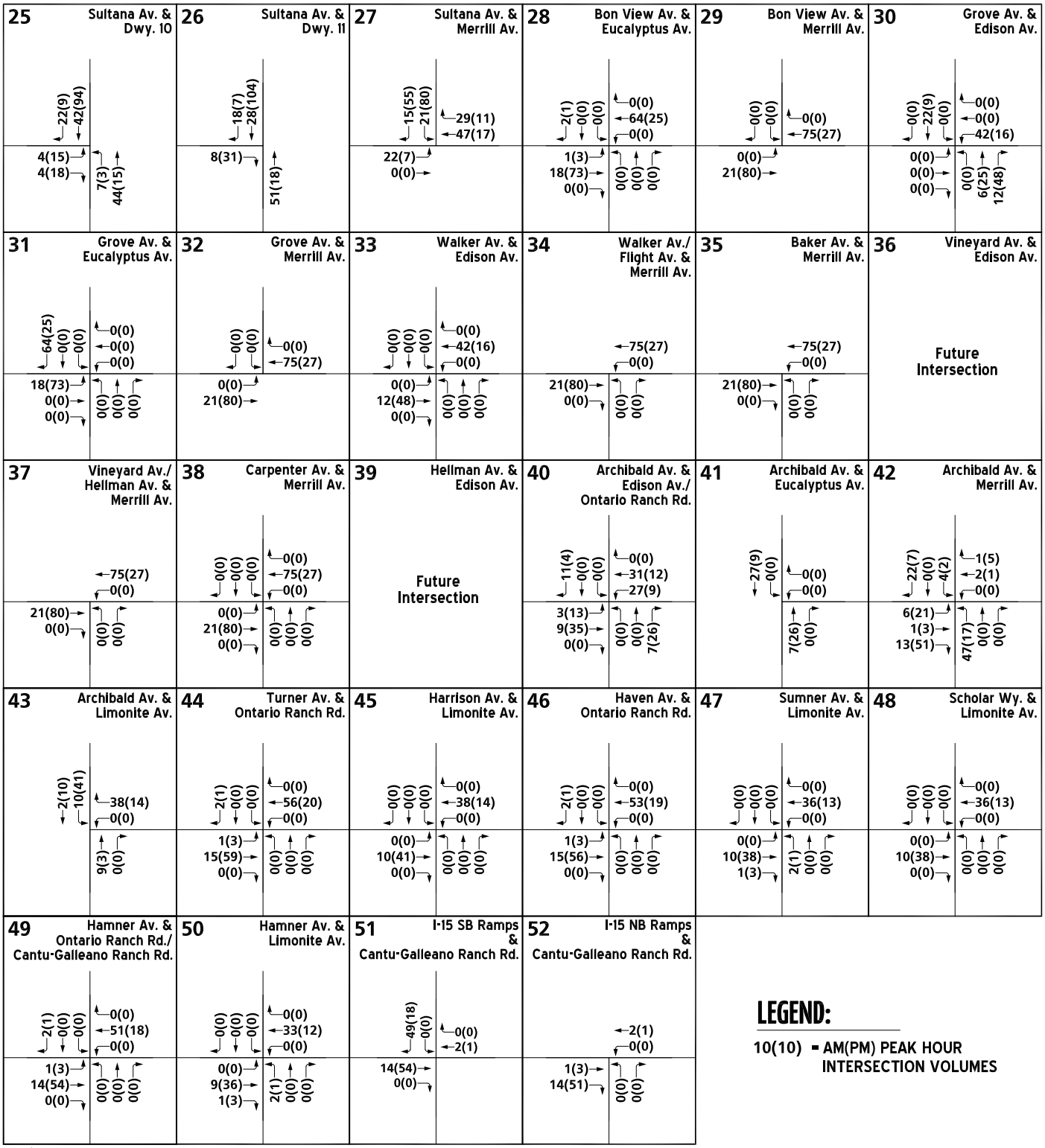
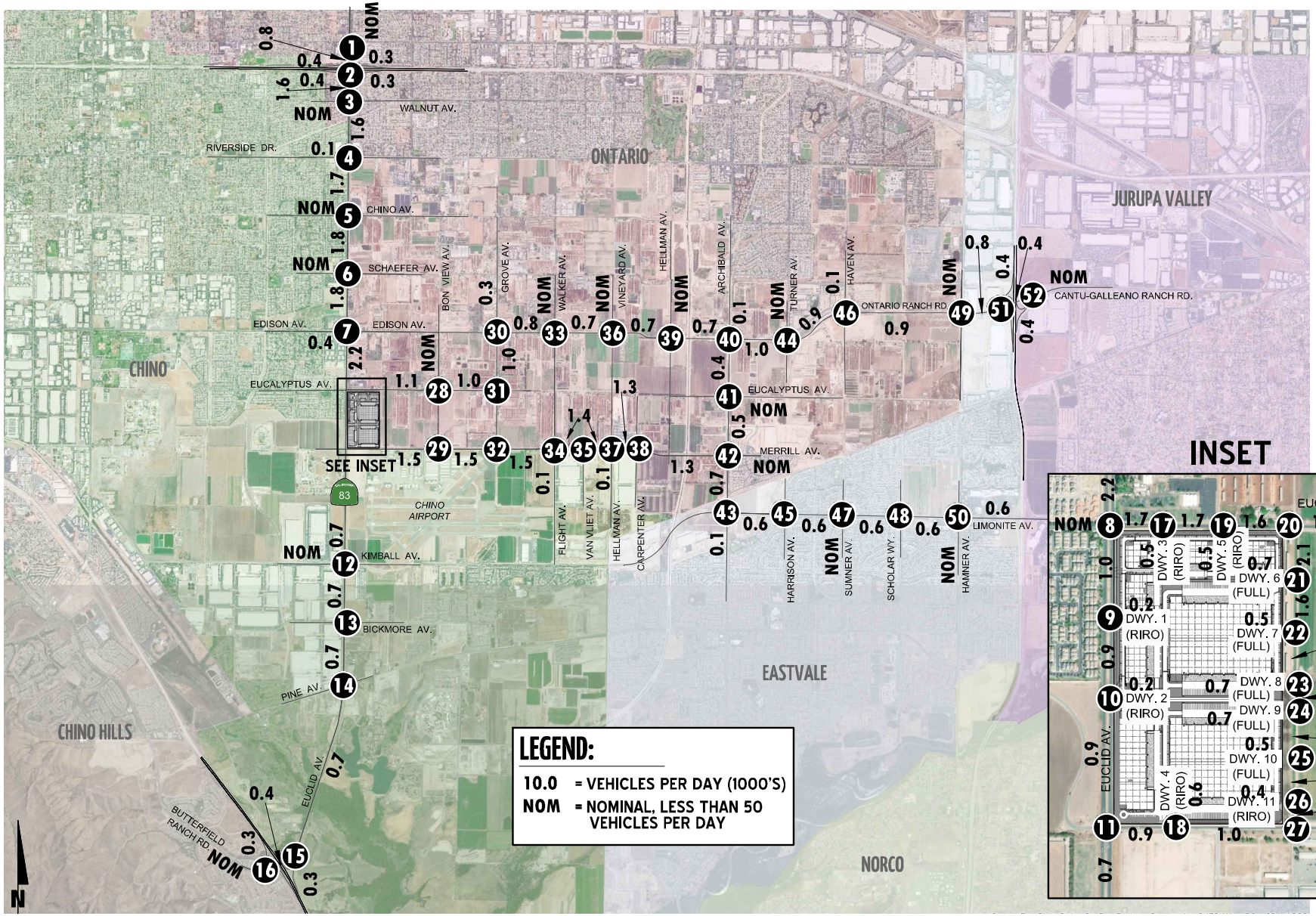
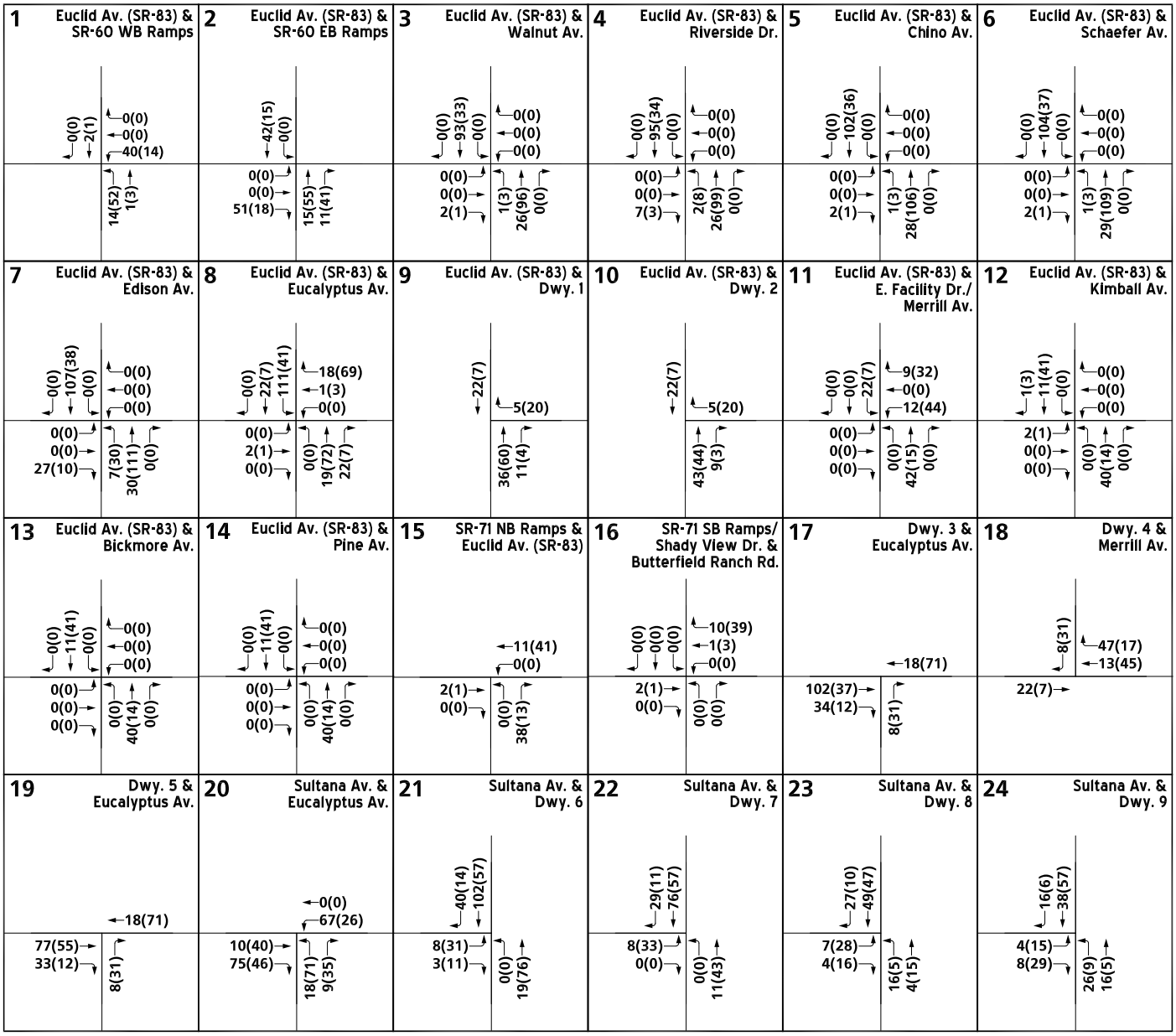


EXHIBIT 4-6: PROJECT (HORIZON YEAR) ONLY AVERAGE DAILY TRAFFIC (ADT) (IN PCE)



URBAN CROSSROADS

EXHIBIT 4-7 (1OF2): PROJECT (HORIZON YEAR) ONLY TRAFFIC VOLUMES (IN PCE)



LEGEND:

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

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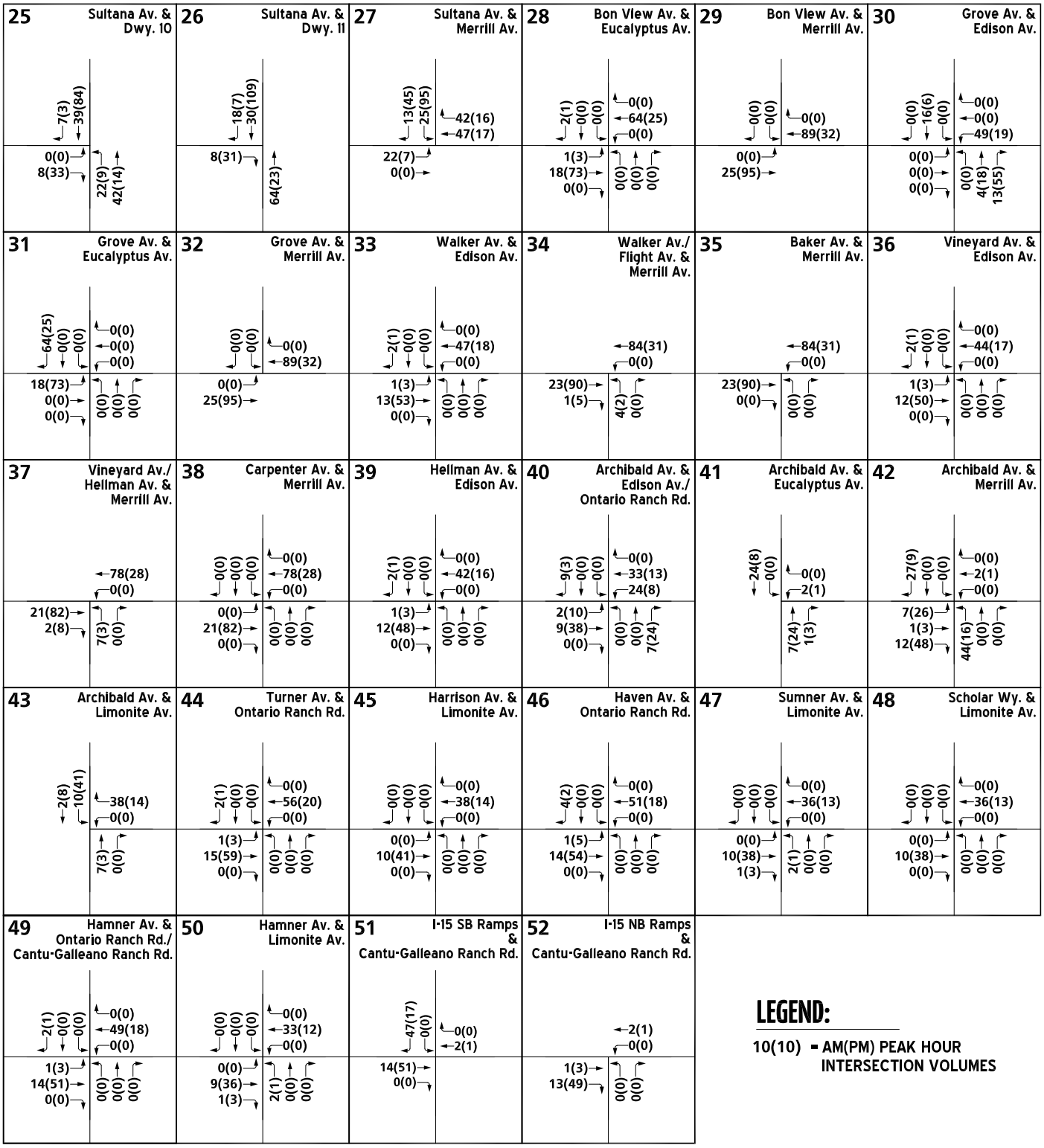
EXHIBIT 4-7 (2OF2): PROJECT (HORIZON YEAR) ONLY TRAFFIC VOLUMES (IN PCE)



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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 Ontario identifies projected growth in population of 166,300 in 2012 to 258,600 in 2040, or a 55.50% increase over the 28-year period. (9) The change in population equates to roughly a 1.59% growth rate, compounded annually. Similarly, growth over the same 28-year period in households is projected to increase by 66.96%, or a 1.85% annual growth rate. Finally, growth in employment over the same 28-year period is projected to increase by 69.80%, or a 1.91% annual growth rate.

Based on a comparison of Existing (2019) traffic volumes to the Horizon Year (2040) forecasts, the average growth rate is estimated at approximately 3.37%, compounded annually between Existing (2019) and 2040 traffic conditions. The annual growth rate at each individual intersection is not lower than 0.49% compounded annually to as high as 8.35% compounded annually over the same time period.

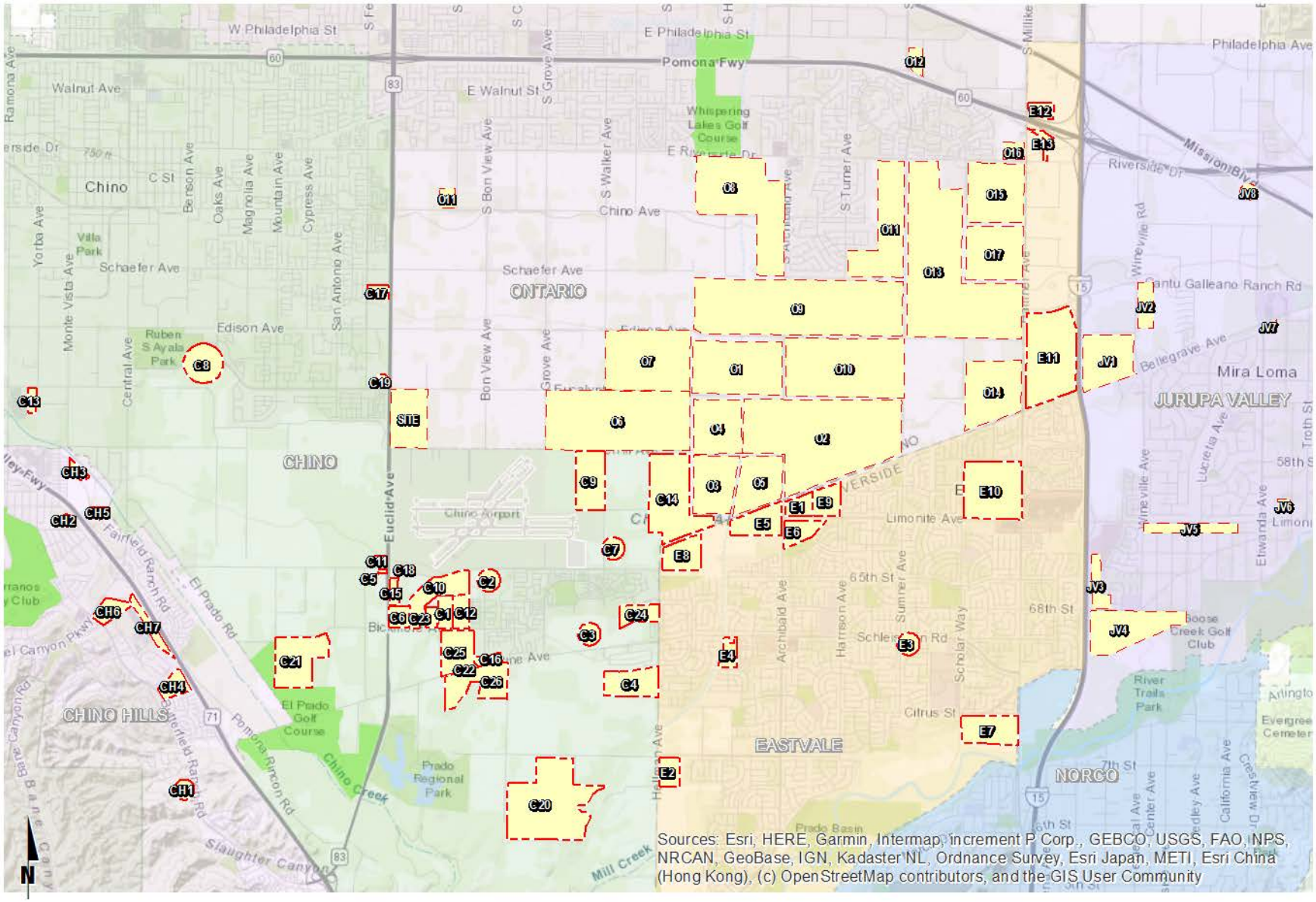
Therefore, the annual growth rate utilized for the purposes of this analysis would appear to conservatively approximate the anticipated regional growth in traffic volumes in the City of Ontario for Opening Year Cumulative and Horizon Year (2040) traffic conditions, especially when considered along with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

4.6 CUMULATIVE DEVELOPMENT TRAFFIC

A cumulative project list was developed for the purposes of this analysis through consultation with planning and engineering staff from the City of Ontario. The cumulative projects listed are those that would generate traffic and would contribute traffic to study area intersections. The neighboring jurisdictions of Chino, Eastvale, and Jurupa Valley have also been contacted to include key projects in their respective cities.

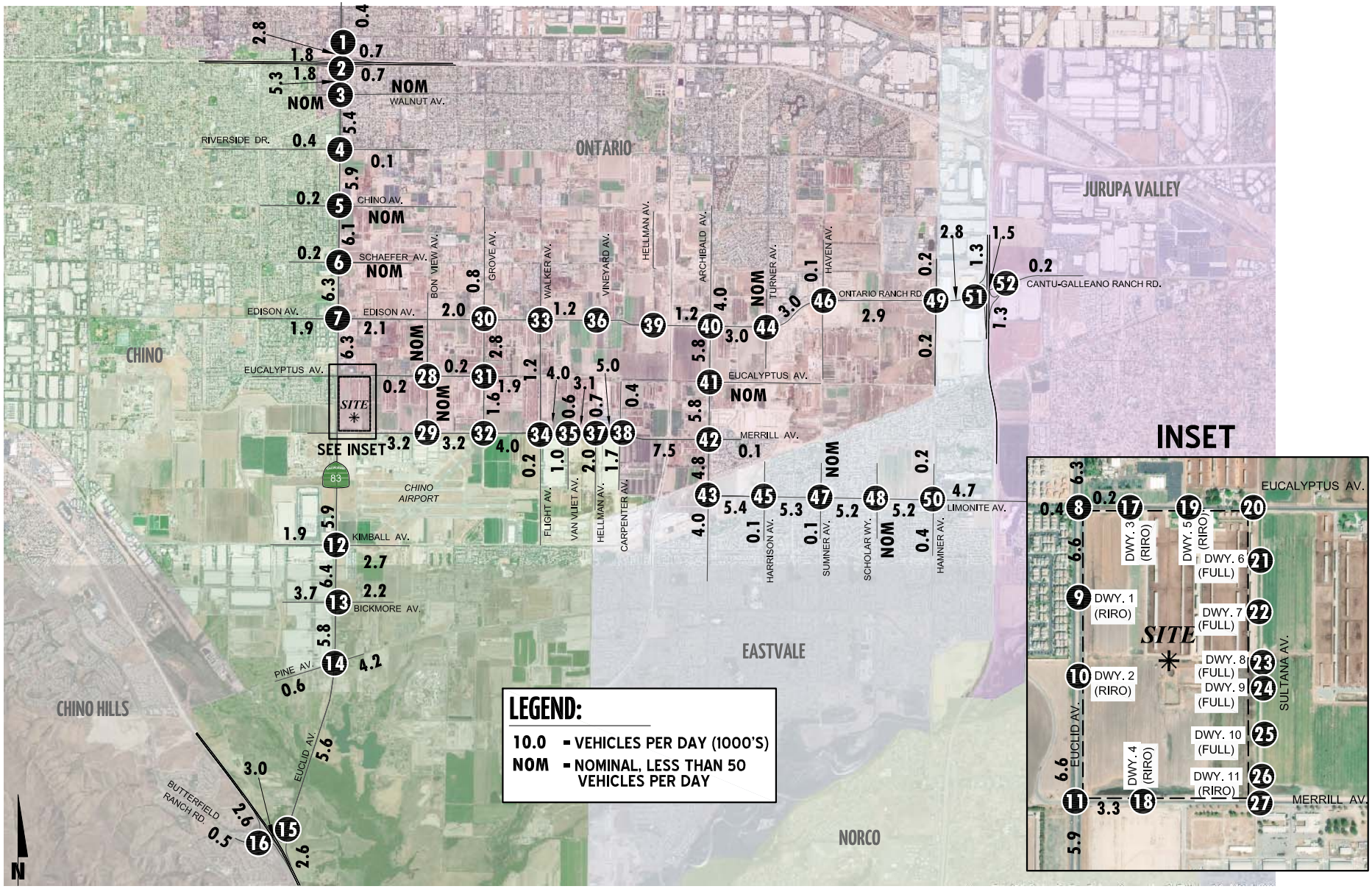
Exhibit 4-8 illustrates the cumulative development location map. A summary of cumulative development projects and their proposed land uses are shown on Table 4-4. If applicable, the traffic generated by individual cumulative projects was manually added to the Opening Year Cumulative forecasts to ensure that traffic generated by the listed cumulative development projects on Table 4-4 are reflected as part of the background traffic. Cumulative ADT and peak hour intersection turning movement volumes are shown on Exhibits 4-9 and 4-10 for near-term traffic conditions.

EXHIBIT 4-8: CUMULATIVE DEVELOPMENT LOCATION MAP



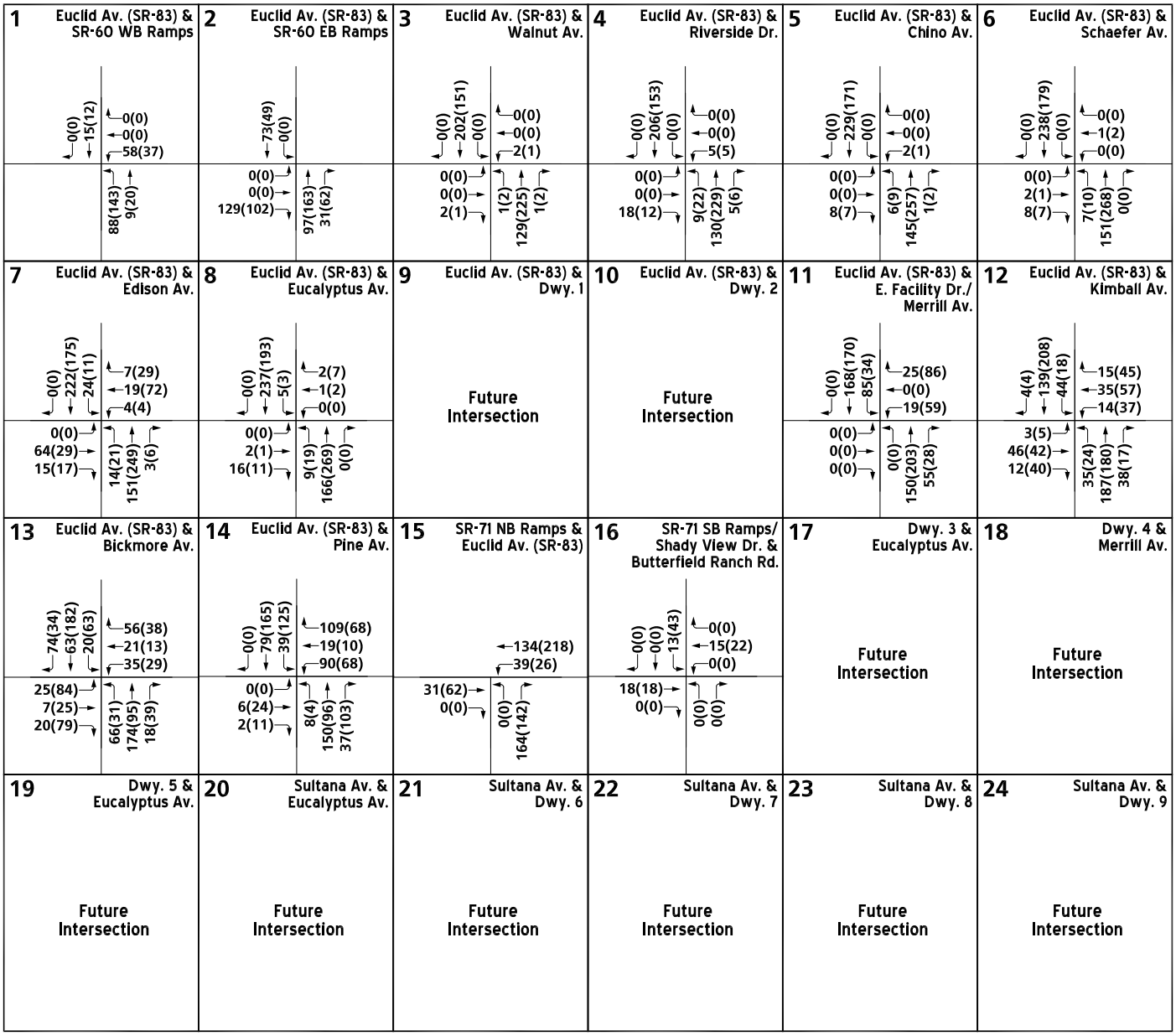
URBAN CROSSROADS

EXHIBIT 4-9: CUMULATIVE ONLY AVERAGE DAILY TRAFFIC (ADT) (IN PCE)



URBAN CROSSROADS

EXHIBIT 4-10 (1OF2): CUMULATIVE ONLY TRAFFIC VOLUMES (IN PCE)



LEGEND:

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

EXHIBIT 4-10 (2OF2): CUMULATIVE ONLY TRAFFIC VOLUMES (IN PCE)

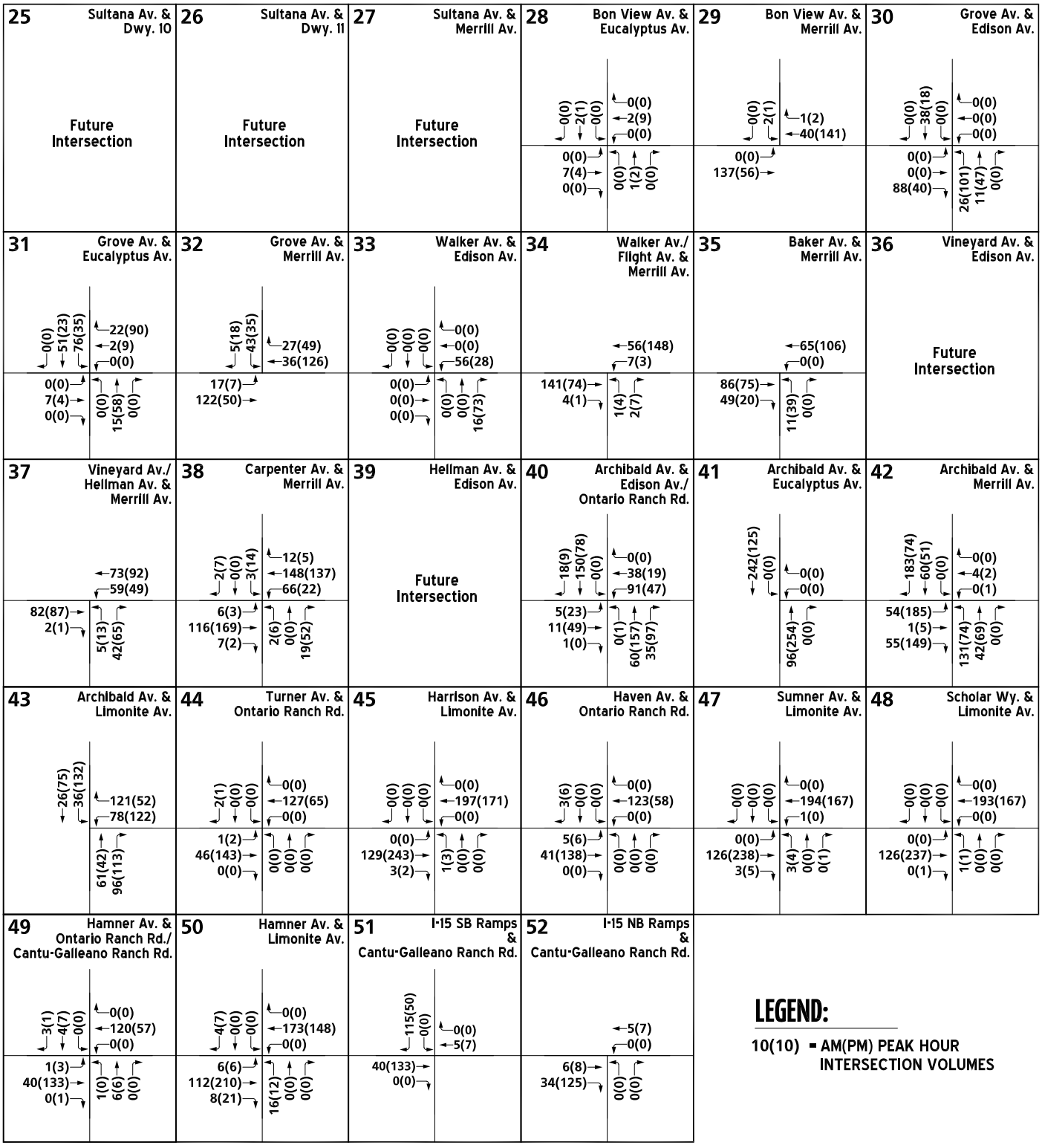


Table 4-4

Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
City of Ontario				
O1	Parkside	SFDR	437	DU
		Multi-Family Attached (Apartments)	1,510	DU
		Shopping Center	115.000	TSF
O2	Subarea 29 & Amendment (40% complete)	SFDR	2,149	DU
		Shopping Center	87.000	TSF
O3	Colony Commerce West	High-Cube Warehouse	2213.360	TSF
		Manufacturing	737.786	TSF
O4	West Ontario Commerce Center SP	High-Cube Warehouse	1976.535	TSF
		Manufacturing	658.845	TSF
		Business Park	548.856	TSF
O5	Colony Commerce East	High-Cube Warehouse	998.680	TSF
		Manufacturing	233.129	TSF
		Warehousing	699.387	TSF
O6	Merrill Commerce Center	High-Cube Fulfillment Warehouse	7014.000	TSF
		Business Park	1441.000	TSF
O7	Parente Home Ranch SP	SFDR	270	DU
		Condo/Townhouse	1,872	DU
		General Office	462.281	TSF
		Shopping Center	194.278	TSF
O8	Countryside	SFDR	819	DU
	Armstrong Ranch	SFDR	994	DU
O9	The Avenue	SFDR	2,020	DU
		Multi-Family Attached (Apartments)	586	DU
		Shopping Center	250.000	TSF
O10	Grand Park	SFDR	484	DU
		Multi-Family Attached (Apartments)	843	DU
O11	West Haven	SFDR	753	DU
		Shopping Center	87.000	TSF
O12	Haven Gateway	General Light Industrial	42.160	TSF
		High-Cube Warehouse	168.640	TSF
O13	Rich Haven	SFDR	2,732	DU
		Multi-Family Attached (Condo)	1,524	DU
		Shopping Center	317.400	TSF
O14	Esperanza	SFDR	914	DU
		Multi-Family Attached (Apartments)	496	DU
O15	Edenglen	SFDR	310	DU
		Multi-Family Attached (Condo)	274	DU
		Shopping Center	217.520	TSF
		Business Park	550.000	TSF
O16	PDEV10-008 - Dry Food Storage	Mini-Warehouse	17.000	TSF
O17	Tuscana Village	SFDR	176	DU
		Shopping Center	26.000	TSF
City of Chino				
C1	Bickmore Street Residential (TM 18858) (30% complete)	SFDR	185	DU
C2	TM17574 (80% complete)	Condo/Townhouse	108	DU
		SFDR	210	DU

Table 4-4

Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
C3	Falloncrest at the Preserve	Condo/Townhouse	786	DU
		Apartments	412	DU
		Shopping Center	77.597	TSF
		General Office	77.597	TSF
C4	Tract 19980 (Homecoming Phase 4)	Apartments	454	DU
	TTM No. 20166 & 20167	SFDR	148	DU
	Brio & TTM No. 21065 & 20168 (Orchards)	SFDR	239	DU
C5	Farmer Boys	Fast-food w/ Drive-Thru	3.218	TSF
		Shopping Center	2.300	TSF
C6	Euclid & Bickmore Warehouse	Warehousing	205.820	TSF
		General Light Industrial	51.030	TSF
		Business Park	110.620	TSF
C7	Kimball Business Park	Business Park	146.550	TSF
C8	Chaffey College Expansion	Junior/Community College	93.50	AC
	College Park Commercial	Shopping Center	7.50	AC
C9	Chino Parcel Delivery	Parcel Delivery Facility	765.274	TSF
C10	Altitude Business Centre	Warehousing	715.000	TSF
		Light Industrial	255.000	TSF
		Business Park	233.000	TSF
		Self-Storage	110.000	TSF
C11	Majestic Gateway	Specialty Retail	25.000	TSF
		Pharmacy/Drugstore with Drive-Thru	13.000	TSF
		Fast-Food with Drive-Thru	8.600	TSF
C12	Bouma Residential	SFDR	106	DU
		Condo/Townhouse	94	DU
C13	Fairfield Inn & Suites (PL 17-0060 & PL 17-0061)	Hotel	111	RM
C14	Watson Industrial Park (40% complete)	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 (Stonebrook - TM 18923)	SFDR	127	DU
C18	Archibald's (PL 17-0037)	Fast-Food with Drive-Thru	3.147	TSF
C19	TM 18972 (80% complete)	SFDR	147	DU
C20	Rancho Miramonte	SFDR	691	DU
		Condo/Townhouse	132	DU
		Neighborhood Retail	21.780	TSF
		Church	400	SEAT
C21	Majestic Chino Heritage	High-Cube Fulfillment Warehouse	1982.700	TSF
		High-Cube Cold Storage Warehouse	100.000	TSF
C22	Church	Church	47.979	TSF
		Daycare	190	STU
C23	Appesetche Residential	SFDR	60	DU
		Condo/Townhouse	160	DU

Table 4-4

Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
C24	Tract 19951, 19952, 19953, 19935 & 18479	SFDR	151	DU
		Condo/Townhouse	150	DU
C25	Ag. Buffer, Bungalow, Lic. Product, Liberty Deluxe, Lyon 2 & 3	SFDR	474	DU
C26	Pines Community	SFDR	552	DU
		Public Park	3.0	AC
		Self Storage & RV Storage	120.000	TSF
		Sports Park	41.8	AC
City of Eastvale				
E1	The Merge	Warehousing	336.501	TSF
		Shopping Center	4.750	TSF
		Supermarket	30.000	TSF
		Gas Station w/ convenience store	16	VFP
		Pharmacy/Drugstore with Drive-Thru	14.600	TSF
		Fast-Food with Drive-Thru	6.000	TSF
		Automated Car Wash	4.000	TSF
		Fast-Food Without Drive-Thru	7.750	TSF
		Coffee/Donut Shop With Drive-Thru	2.500	TSF
E2	TR29997	SFDR	122	DU
E3	13-0632 - Sumner Residential (Stratham Homes)	SFDR	129	DU
E4	TR35751	Condo/Townhouse	243	DU
E5	PP23219 (PM35865) (50% complete)	General Light Industrial	738.430	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
		Gas Station w/ convenience store and car wash	16	VFP
E7	Van Leeuwen	SFDR	224	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	Leal Master Plan	Lifestyle Center (Commercial)	1,300.000	TSF
		General Commercial	225.000	TSF
		Office	920.000	TSF
		Hotel	450	RM
		High Density Residential	500-660	DU
E11	Eastvale Commerce Center	Shopping Center	650.000	TSF
E12	S. Milliken Warehouse	High-Cube Warehouse	280.000	TSF
E13	15-1508 - Industrial Warehouse	Warehousing	155.000	TSF
City of Chino Hills				
CH1	Vila Borba Specific Plan (TR 16414)	SFDR	172	DU
CH2	Country Club Villas	Condo/Townhouse	46	DU
CH3	Crossings at Chino Hills	Apartments	346	DU
CH4	The Goddard School	Daycare	10.587	TSF
CH5	Indus Light Industrial	General Light Industrial	100.330	TSF

Table 4-4

Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
CH6	The Santa Barbara	Condo/Townhouse - Low Rise	138	DU
		Condo/Townhouse - Mid Rise	186	DU
		Shopping Center	15.700	TSF
CH7	Heritage Professional Center	Hospital	55.000	TSF
		Medical Office Building	86.952	TSF
		Hotel	120	RM
		Shopping Center	38.848	TSF
		Restaurant	7.200	TSF
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 (70% complete)	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
JV8	Flying J Travel Center	Diesel Pumps	12	VFP
		Passenger Car Pumps	8	VFP

[1] SFDR = Single Family Detached Residential

[2] TSF = Thousand Square Feet; DU = Dwelling Unit; VFP = Vehicle Fueling Position ; AC = Acres; RM = Rooms

[3] Source: Altfillisch Residential Project TIA Memorandum, LSA Associates, Inc., July 25, 2011.

4.7 HORIZON YEAR (2040) VOLUME DEVELOPMENT

Traffic projections for Horizon Year (2040) without Project conditions were derived from the San Bernardino Transportation Analysis Model (SBTAM) using accepted procedures for model forecast refinement and smoothing for study area intersections located within the County of San Bernardino. The current version of the SBTAM (Version 2.20, March 2019) 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 (2019) 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 January 2019. 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. Similarly, the Riverside Transportation Analysis Model (RivTAM) has a base (validation) year of 2012 and a horizon (future forecast) year of 2040.

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 0.27. 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). 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 (2022) 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 (2022) 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 (2019) and Opening Year Cumulative (2022) conditions. Adjustments have not

been made to study area intersections that may be affected by new future roadway connections (such as the extension of Pine Avenue or the extension of Kimball Avenue/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 in order 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 SBTAM and RivTAM 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 (2022) traffic forecasts, which are presented and evaluated in PCE (see Section 3.7 *Existing (2019) 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. Post-processing worksheets for Horizon Year (2040) without Project traffic conditions are provided in Appendix 4.1.

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5 E+P TRAFFIC CONDITIONS

This section discusses the traffic forecasts for Existing plus Project (E+P) conditions and the resulting intersection operations, freeway facility 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 and weekday AM and PM peak hour intersection turning movement volumes which can be expected for E+P traffic conditions are shown on Exhibit 5-1 and Exhibit 5-2, respectively.

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 on Table 5-1 for E+P traffic conditions, which indicate that there are no additional study area intersections anticipated to operate at an unacceptable LOS, in addition to those previously identified for Existing traffic conditions.

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

5.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no additional study area intersections anticipated to meet peak hour volume-based or planning level (ADT) volume-based traffic signal warrants for E+P traffic conditions (see Appendix 5.2), in addition to those previously warranted under Existing traffic conditions.

5.5 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for E+P are presented on Table 5-2. As shown on Table 5-2, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows with the addition of Project traffic. Worksheets for E+P traffic conditions off-ramp queuing analysis are provided in Appendix 5.3.

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

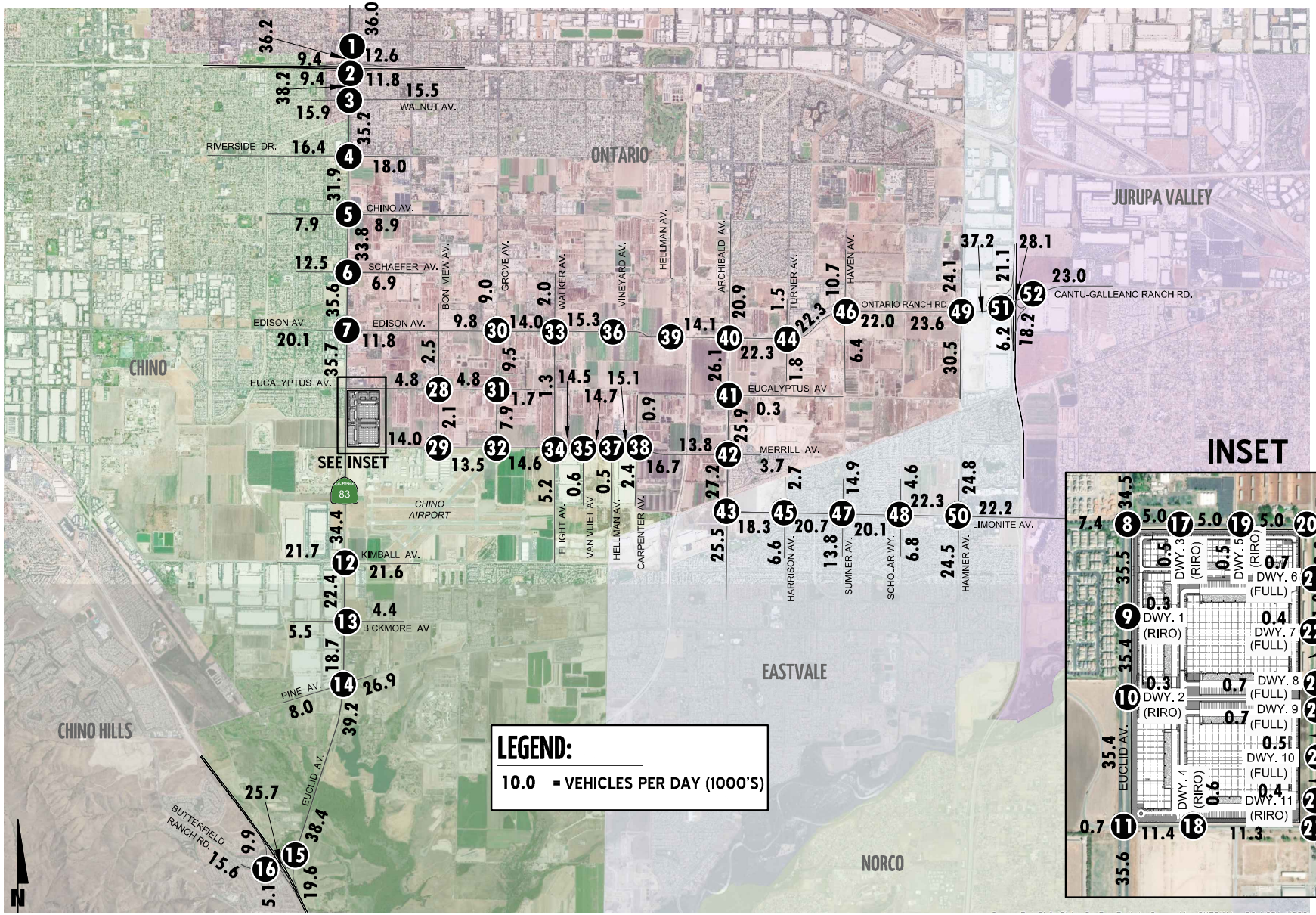
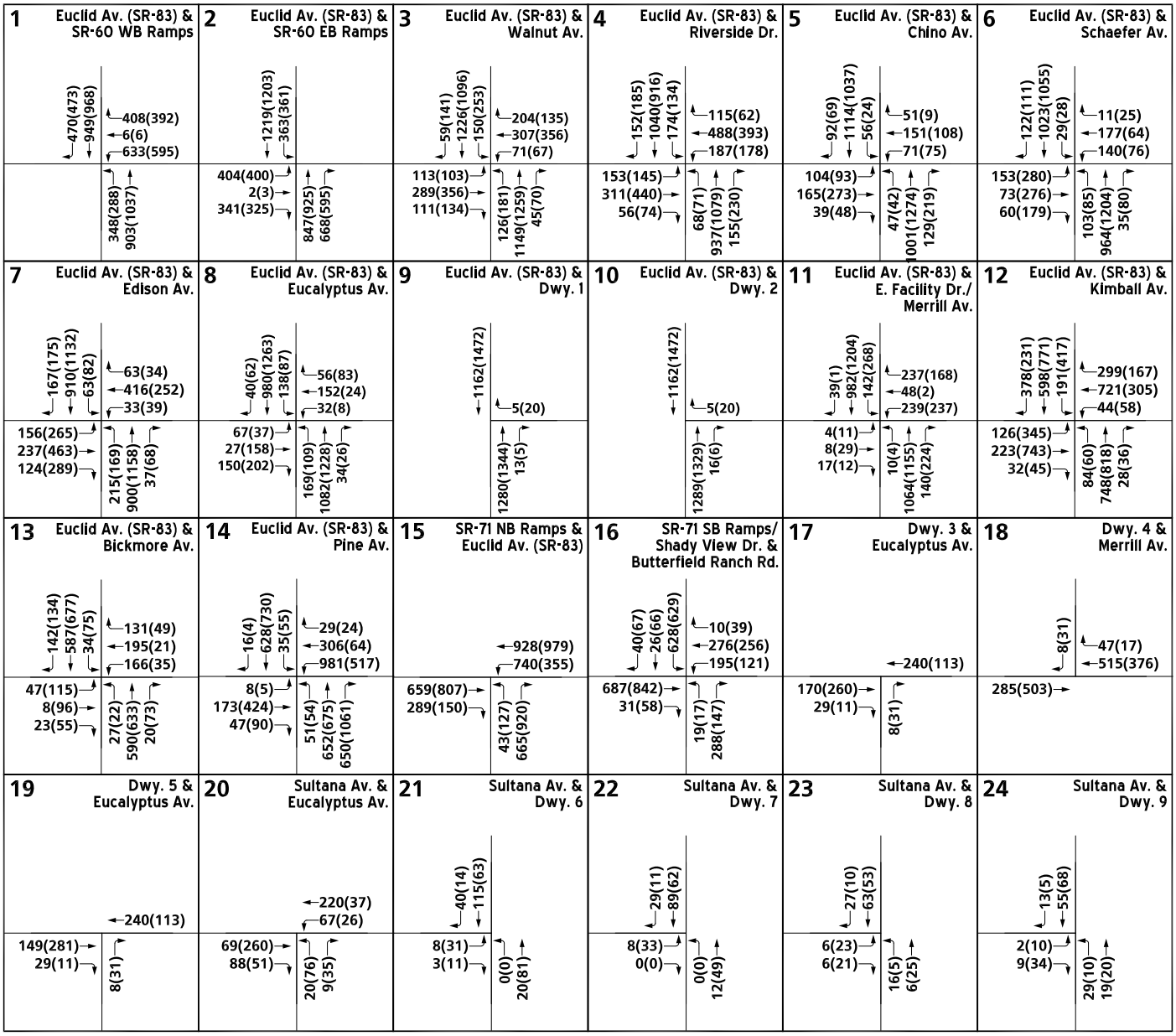


EXHIBIT 5-2 (1OF2): E+P TRAFFIC VOLUMES (IN PCE)



LEGEND:

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

EXHIBIT 5-2 (2OF2): E+P TRAFFIC VOLUMES (IN PCE)

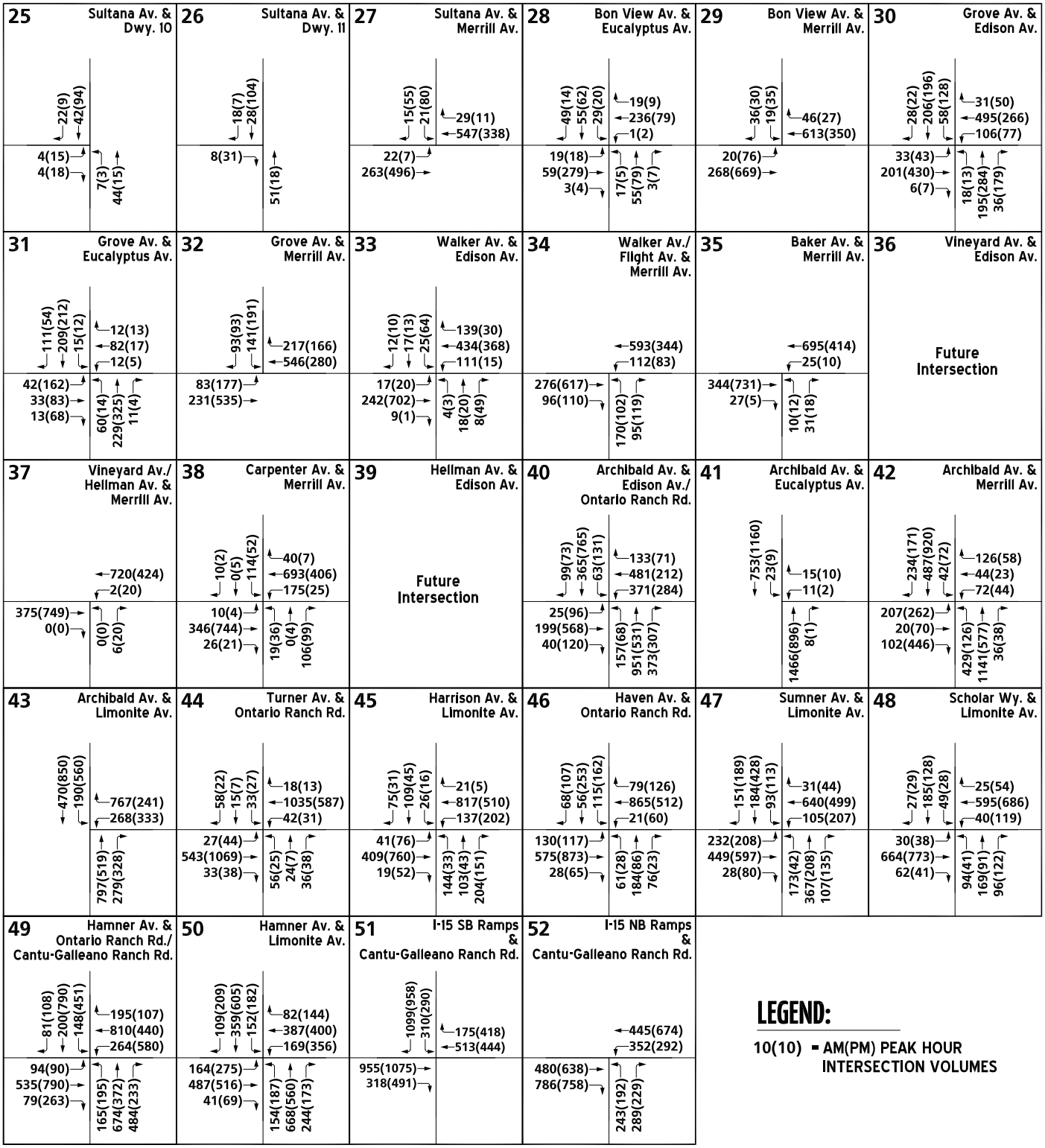


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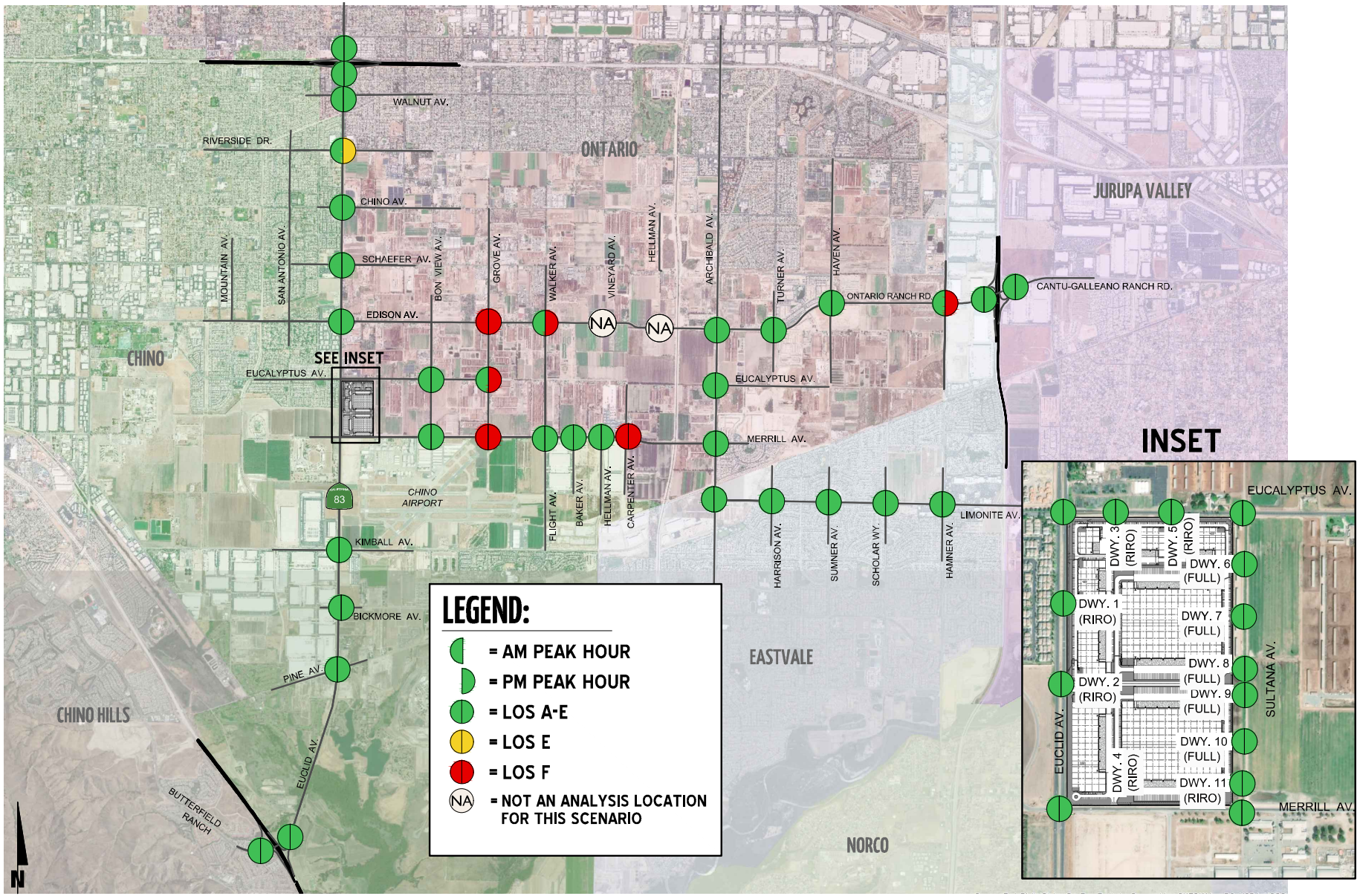
EXHIBIT 5-3: E+P SUMMARY OF LOS



URBAN CROSSROADS

Table 5-1

Intersection Analysis for E+P Conditions

#	Intersection	Traffic Control[2]	Existing (2019) Delay[1] (secs.) AM	Existing (2019) Delay[1] (secs.) PM	Existing (2019) Level of Service AM	Existing (2019) Level of Service PM	E+P Delay[1] (secs.) AM	E+P Delay[1] (secs.) PM	E+P Level of Service AM	E+P Level of Service PM	Acceptable LOS[3]
1	Euclid Av. (SR-83) & SR-60 WB Ramps	TS	22.3	18.6	C	B	23.4	20.3	C	C	D
2	Euclid Av. (SR-83) & SR-60 EB Ramps	TS	25.9	22.3	C	C	27.0	22.5	C	C	D
3	Euclid Av. (SR-83) & Walnut Av.	TS	30.1	32.5	C	C	30.3	32.8	C	C	E
4	Euclid Av. (SR-83) & Riverside Dr.	TS	47.0	**55.5**	D	**E**	48.7	**65.0**	D	**E**	D
5	Euclid Av. (SR-83) & Chino Av.	TS	21.5	23.2	C	C	21.8	23.9	C	C	D
6	Euclid Av. (SR-83) & Schaefer Av.	TS	23.6	26.2	C	C	25.4	27.9	C	C	D
7	Euclid Av. (SR-83) & Edison Av.	TS	38.1	39.7	D	D	41.9	44.3	D	D	D
8	Euclid Av. (SR-83) & Eucalyptus Av.	TS	13.8	13.2	B	B	17.7	15.4	B	B	D
9	Euclid Av. (SR-83) & Driveway 1	**CSS**	Future Intersection				14.4	15.4	B	C	D
10	Euclid Av. (SR-83) & Driveway 2	**CSS**	Future Intersection				14.5	15.2	B	C	D
11	Euclid Av. (SR-83) & Merrill Av.	TS	26.4	29.9	C	C	30.9	46.1	C	D	D
12	Euclid Av. (SR-83) & Kimball Av.	TS	32.4	38.3	C	D	33.8	39.0	C	D	D
13	Euclid Av. (SR-83) & Bickmore Av.	TS	16.3	14.0	B	B	16.4	14.1	B	B	D
14	Euclid Av. (SR-83) & Pine Av.	TS	31.9	39.5	C	D	33.0	41.1	C	D	D
15	SR-71 NB Ramps & Euclid Av. (SR-83)	TS	27.2	43.1	C	D	27.1	42.7	C	D	D
16	SR-71 SB Ramps & Butterfield Ranch Rd.	TS	40.0	39.8	D	D	40.0	39.8	D	D	D
17	Driveway 3 & Eucalyptus Av.	**CSS**	Future Intersection				9.2	10.0	A	B	D
18	Driveway 4 & Merrill Av.	**CSS**	Future Intersection				11.9	10.9	B	B	D
19	Driveway 5 & Eucalyptus Av.	**CSS**	Future Intersection				9.1	10.1	A	B	D
20	Sultana Av. & Eucalyptus Av.	**CSS**	Future Intersection				10.4	11.0	B	B	E
21	Sultana Av. & Driveway 6	**CSS**	Future Intersection				9.3	9.3	A	A	D
22	Sultana Av. & Driveway 7	**CSS**	Future Intersection				9.2	9.2	A	A	D
23	Sultana Av. & Driveway 8	**CSS**	Future Intersection				8.9	9.0	A	A	D
24	Sultana Av. & Driveway 9	**CSS**	Future Intersection				8.8	8.9	A	A	D
25	Sultana Av. & Driveway 10	**CSS**	Future Intersection				8.8	9.1	A	A	D
26	Sultana Av. & Driveway 11	**CSS**	Future Intersection				8.5	9.0	A	A	D
27	Sultana Av. & Merrill Av.	**CSS**	Future Intersection				13.0	13.8	B	B	D
28	Bon View Av. & Eucalyptus Av.	AWS	8.6	9.1	A	A	9.2	10.1	A	A	E
29	Bon View Av. & Merrill Av.	CSS	13.2	16.4	B	C	14.2	18.0	B	C	D
30	Grove Av. & Edison Av.	AWS	**71.9**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	E
31	Grove Av. & Eucalyptus Av.	CSS	20.0	**>100.0**	C	**F**	23.1	**>100.0**	C	**F**	E
32	Grove Av. & Merrill Av.	AWS	34.6	**43.7**	D	**E**	**57.2**	**70.5**	**F**	**F**	D
33	Walker Av. & Edison Av.	CSS	25.2	**60.1**	D	**F**	27.6	**77.3**	D	**F**	E
34	Walker Av./Flight Av. & Merrill Av.	CSS	27.2	25.0	D	D	32.0	30.3	D	D	D
35	Baker Av./Van Vliet Av. & Merrill Av.	CSS	11.3	13.6	B	B	11.7	14.5	B	B	D
36	Vineyard Av. & Edison Av.		2040 Analysis Location				2040 Analysis Location				E
37	Vineyard Av./Hellman Av. & Merrill Av.	CSS	9.4	10.9	A	B	9.5	11.4	A	B	D
38	Carpenter Av. & Merrill Av.	AWS	**86.2**	**89.5**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	D
39	Hellman Av. & Edison Av.		2040 Analysis Location				2040 Analysis Location				E
40	Archibald Av. & Ontario Ranch Rd.	TS	31.4	27.0	C	C	34.6	27.9	C	C	E
41	Archibald Av. & Eucalyptus Av.	TS	5.8	3.2	A	A	5.8	3.3	A	A	E
42	Archibald Av. & Merrill Av.	TS	33.6	29.2	C	C	38.0	32.3	D	C	E
43	Archibald Av. & Limonite Av.	TS	48.0	29.6	D	C	54.9	33.7	D	C	D
44	Turner Av. & Ontario Ranch Rd.	TS	16.5	14.5	B	B	16.7	14.9	B	B	E

Table 5-1

Intersection Analysis for E+P Conditions

#	Intersection	Traffic Control[2]	Existing (2019)				E+P				Acceptable LOS[3]
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
			AM	PM	AM	PM	AM	PM	AM	PM	
45	Harrison Av. & Limonite Av.	TS	19.1	17.1	B	B	19.2	17.1	B	B	D
46	Haven Av. & Ontario Ranch Rd.	TS	25.0	22.8	C	C	25.2	22.9	C	C	E
47	Sumner Av. & Limonite Av.	TS	18.4	18.4	B	B	18.6	18.4	B	B	D
48	Scholar Way & Limonite Av.	TS	16.2	14.8	B	B	16.2	14.8	B	B	D
49	Hamner Av. & Ontario Ranch Rd.	TS	42.7	**109.0**	D	**F**	45.0	**111.5**	D	**F**	D
50	Hamner Av. & Limonite Av.	TS	24.2	27.1	C	C	24.3	27.1	C	C	D
51	I-15 SB Ramps & Cantu Galleano Ranch Rd.	TS	14.7	13.1	B	B	15.1	13.2	B	B	D
52	I-15 NB Ramps & Cantu Galleano Ranch Rd.	TS	18.9	12.5	B	B	18.8	12.5	B	B	D

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

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

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

[3] Minimum acceptable LOS for each applicable jurisdiction.

Table 5-2

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

Intersection	Movement	Available Stacking Distance (Feet)	Existing (2019)				E+P			
			95th Percentile Queue (Feet)[3]		Acceptable?[1]		95th Percentile Queue (Feet)[3]		Acceptable?[1]	
			AM Peak	PM Peak	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
Euclid Avenue (SR-83) & SR-60 WB Ramps	WBL	400	306	276	Yes	Yes	342 [2]	285	Yes	Yes
	WBL/T/R	1,430	316 [2]	284	Yes	Yes	360 [2]	285	Yes	Yes
	WBR	400	202	207	Yes	Yes	213	209	Yes	Yes
Euclid Avenue (SR-83) & SR-60 EB Ramps	EBL	900	363 [2]	352 [2]	Yes	Yes	363 [2]	352 [2]	Yes	Yes
	EBT/R	1,270	260 [2]	288 [2]	Yes	Yes	365 [2]	321 [2]	Yes	Yes
SR-71 NB Ramps & Euclid Avenue (SR-83)	NBL	1,745	27	44	Yes	Yes	27	44	Yes	Yes
	NBR	420	203 [2]	732 [2]	Yes	Yes[3]	249 [2]	749 [2]	Yes	Yes[3]
SR-71 SB Ramps & Euclid Avenue (SR-83)	SBL	1,100	215	230	Yes	Yes	215	230	Yes	Yes
	SBL/T	1,560	215	232	Yes	Yes	215	232	Yes	Yes
	SBR	255	0	1	Yes	Yes	0	1	Yes	Yes
I-15 SB Ramps & Cantu Galleano Ranch Rd.	SBL	1,440	105	90	Yes	Yes	105	90	Yes	Yes
	SBT	560	308 [2]	186	Yes	Yes	373 [2]	193	Yes	Yes
	SBR	460	255	167	Yes	Yes	288 [2]	173	Yes	Yes
I-15 NB Ramps & Cantu Galleano	NBL	1,680	86	65	Yes	Yes	86	65	Yes	Yes
	NBR	440	51	45	Yes	Yes	51	45	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.

[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 SR-60, SR-71, or I-15 Freeway mainline.

5.6 FREEWAY FACILITY ANALYSIS

E+P mainline directional volumes for the AM and PM peak hours are provided on Exhibit 5-4. As shown on Table 5-3, there are no additional freeway segments or merge/diverge ramp junctions that are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for E+P traffic conditions, in addition to the location previously identified under Existing traffic conditions. E+P freeway facility analysis worksheets are provided in Appendix 5.4.

5.7 PROJECT DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

This section provides a summary of Project deficiencies and recommended improvements. Based on the City of Ontario deficiency criteria discussed in Section 2.8 *Deficiency Criteria*, the following intersections were found to be deficient. Improvements necessary to reduce project-related traffic deficiencies are also discussed below.

5.7.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

The effectiveness of the proposed recommended improvements is presented on Table 5-4 for E+P traffic conditions. The intersection operations analysis worksheets for E+P traffic conditions, with improvements, are included in Appendix 5.5 of this TIA.

Euclid Avenue (SR-83) & Riverside Drive (#4) – This intersection was found to operate at an unacceptable LOS (LOS E or worse) during the peak hours under Existing traffic conditions and is anticipated to continue to operate at an unacceptable LOS during the one or more peak hours with the addition of Project traffic resulting in a cumulative deficiency.

The following improvement is necessary to reduce the Project's proportionate increase in delay to pre-project levels or better, thus reducing the Project's contribution to the deficiency:

- Project to contribute fair share towards the addition of an eastbound right turn lane to improve the existing deficiency.

Table 5-3

Freeway Facility Analysis for E+P Conditions

Freeway	Direction[4]	Ramp or Segment	Lanes on Freeway[1]	Existing (2019)				E+P			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]
SR-71	SB	Southbound Loop On-Ramp at Euclid Avenue (SR-83)	2	9.7	A	10.4	B	9.7	A	10.6	B
		South of Euclid Avenue (SR-83)	2	12.2	B	12.9	B	12.3	B	13.1	B
	NB	Northbound Off-Ramp at Euclid Avenue (SR-83)	3	13.7	B	21.1	C	14.0	B	21.2	C
		South of Euclid Avenue (SR-83)	3	8.9	A	15.6	B	9.1	A	15.7	B
SR-60	Westbound	West of Euclid Avenue (SR-83)	4	33.9	D	31.5	D	34.0	D	32.2	D
		Westbound On-Ramp at Euclid Avenue (SR-83)	4	28.5	D	27.2	C	28.7	D	27.6	C
		Westbound Off-Ramp at Euclid Avenue (SR-83)	4	**32.0**	**E**	**35.8**	**E**	**36.8**	**E**	**35.9**	**E**
		East of Euclid Avenue (SR-83)	4	34.6	D	33.3	D	34.8	D	33.4	D
	Eastbound	West of Euclid Avenue (SR-83)	4	31.2	D	25.7	C	31.4	D	25.8	C
		Eastbound Off-Ramp at Euclid Avenue (SR-83)	4	32.3	D	28.6	D	32.6	D	28.8	D
		Eastbound On-Ramp at Euclid Avenue (SR-83)	4	28.1	D	24.0	C	28.3	D	24.2	C
		East of Euclid Avenue (SR-83)	4	32.9	D	26.4	D	33.0	D	26.6	D
I-15	SB	North of Cantu Galleano Ranch Road	4	18.5	C	14.8	B	18.7	C	14.8	B
		Southbound Off-Ramp at Cantu Galleano Ranch Road	4	27.2	C	22.8	C	27.6	C	22.9	C
	NB	North of Cantu Galleano Ranch Road	5	16.2	B	14.1	B	16.2	B	14.2	B
		Northbound On-Ramp at Cantu Galleano Ranch Road	3	34.5	D	30.8	D	34.5	D	31.1	D

* **BOLD** = Unacceptable Level of Service

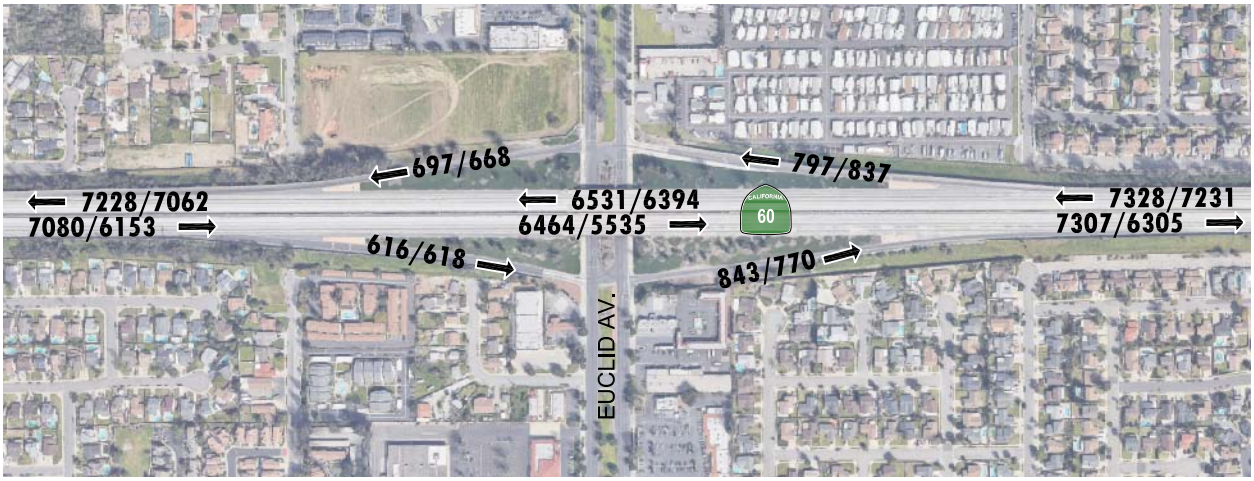
[1] Number of lanes are in the specified direction and is based on existing conditions.

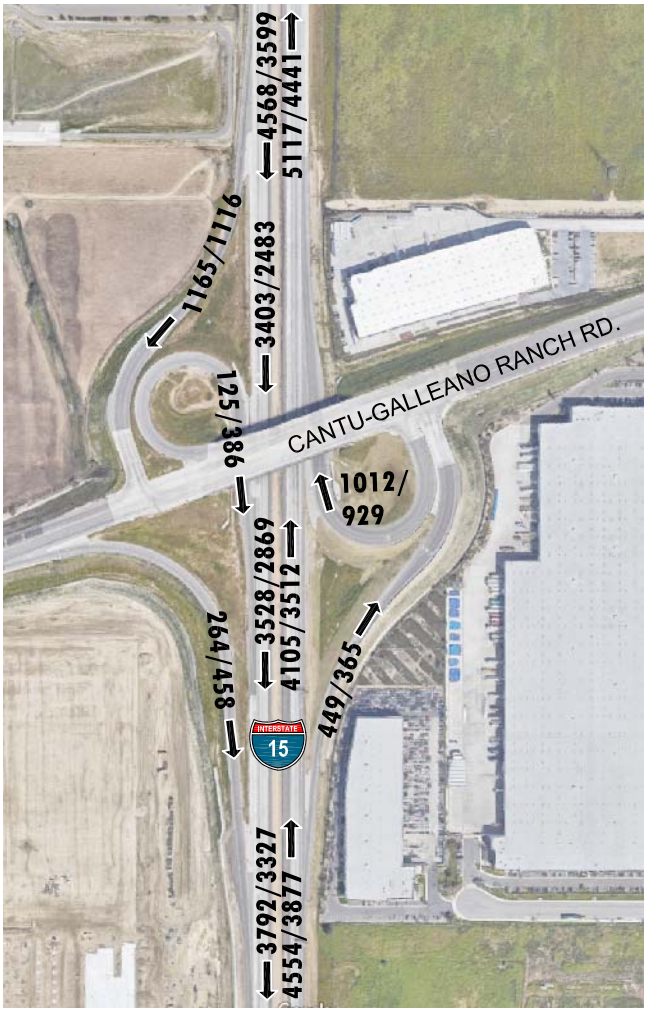
[2] Density is measured by passenger cars per mile per lane (pc/mi/ln).

[3] LOS = Level of Service

[4] SB = Southbound; NB = Northbound

EXHIBIT 5-4: E+P FREEWAY MAINLINE VOLUMES





LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

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Grove Avenue & Edison Avenue (#30) – This intersection was found to operate at an unacceptable LOS (LOS E or worse) during the peak hours under Existing traffic conditions and is anticipated to continue to operate at an unacceptable LOS during the one or more peak hours with the addition of Project traffic resulting in a cumulative deficiency.

The following improvement is necessary to reduce the Project's proportionate increase in delay to pre-project levels or better, thus reducing the Project's contribution to the deficiency:

- Project to contribute fair share towards the installation of a traffic signal to improve the existing deficiency.

Grove Avenue & Eucalyptus Avenue (#31) – This intersection was found to operate at an unacceptable LOS (LOS E or worse) during the peak hours under Existing traffic conditions and is anticipated to continue to operate at an unacceptable LOS during the one or more peak hours with the addition of Project traffic resulting in a cumulative deficiency.

The following improvement is necessary to reduce the Project's proportionate increase in delay to pre-project levels or better, thus reducing the Project's contribution to the deficiency:

- Project to contribute fair share towards the installation of a traffic signal to improve the existing deficiency.

Grove Avenue & Merrill Avenue (#32) – This intersection was found to operate at an unacceptable LOS (LOS E or worse) during the peak hours under Existing traffic conditions and is anticipated to continue to operate at an unacceptable LOS during the one or more peak hours with the addition of Project traffic resulting in a cumulative deficiency.

The following improvement is necessary to reduce the Project's proportionate increase in delay to pre-project levels or better, thus reducing the Project's contribution to the deficiency:

- Project to contribute fair share towards the installation of a traffic signal to improve the existing deficiency.

Walker Avenue & Edison Avenue (#33) – This intersection was found to operate at an unacceptable LOS (LOS E or worse) during the peak hours under Existing traffic conditions and is anticipated to continue to operate at an unacceptable LOS during the one or more peak hours with the addition of Project traffic resulting in a cumulative deficiency.

The following improvement is necessary to reduce the Project's proportionate increase in delay to pre-project levels or better, thus reducing the Project's contribution to the deficiency:

- Project to contribute fair share towards the installation of a traffic signal to improve the existing deficiency.

Carpenter Avenue & Merrill Avenue (#38) – This intersection was found to operate at an unacceptable LOS (LOS E or worse) during the peak hours under Existing traffic conditions and is anticipated to continue to operate at an unacceptable LOS during the one or more peak hours with the addition of Project traffic resulting in a cumulative deficiency.

The following improvement is necessary to reduce the Project's proportionate increase in delay to pre-project levels or better, thus reducing the Project's contribution to the deficiency:

- Project to contribute fair share towards the installation of a traffic signal to improve the existing deficiency.

Hamner Avenue & Ontario Ranch Road (#49) – This intersection was found to operate at an unacceptable LOS (LOS E or worse) during the peak hours under Existing traffic conditions and is anticipated to continue to operate at an unacceptable LOS during the one or more peak hours with the addition of Project traffic resulting in a cumulative deficiency.

The following improvements are necessary to reduce the Project's proportionate increase in delay to pre-project levels or better, thus reducing the Project's contribution to the deficiency:

- Project to contribute fair share towards modifying the cycle length to 130-seconds.
- Project to contribute fair share towards restriping the southbound approach to accommodate two left turn lanes, two through lanes, and one shared through-right turn lane.

5.7.2 Recommended Improvements To Address Deficiencies On Off-Ramp Queues

As shown previously on Table 5-2, there are no peak hour queuing issues at the study area interchanges. As such, no improvements have been recommended.

5.7.3 Recommended Improvements To Address Deficiencies On Freeway Facilities

SHS facilities are owned and maintained by Caltrans. Improvements to the SHS is regional/state-wide and Caltrans' responsibility. Improvements to freeway facilities LOS deficiencies is addressed through Caltrans regional improvement plans and programs. At this time, Caltrans has no plans or programs in place to address development-specific deficiencies affecting the SHS. There are no feasible measures to address LOS deficiencies that can be autonomously implemented by the Lead Agency or the Project Applicant.

Table 5-4

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						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
4	Euclid Av. (SR-83) & Riverside Dr.																	
	Existing Conditions:																	
	-Without Improvements	TS	1	2	1	1	2	1>	1	1	0	1	2	d	47.0	**55.5**	D	**E**
	-With Improvements	TS	1	2	1	1	2	1>	1	1	**1**	1	2	d	45.3	49.8	D	D
	E+P:																	
	-Without Improvements	TS	1	2	1	1	2	1>	1	1	0	1	2	d	48.7	**65.0**	D	**E**
	-With Improvements	TS	1	2	1	1	2	1>	1	1	**1**	1	2	d	46.0	54.3	D	D
30	Grove Av. & Edison Av.																	
	Existing Conditions:																	
	-Without Improvements	AWS	0	1	0	0	1	0	0	1	0	0	1	0	**71.9**	**>100.0**	**F**	**F**
	-With Improvements	**TS**	0	1	0	0	1	0	0	1	0	0	1	0	14.2	16.0	B	B
	E+P:																	
	-Without Improvements	AWS	0	1	0	0	1	0	0	1	0	0	1	0	**>100.0**	**>100.0**	**F**	**F**
	-With Improvements	**TS**	0	1	0	0	1	0	0	1	0	0	1	0	15.5	18.1	B	B
31	Grove Av. & Eucalyptus Av.																	
	Existing Conditions:																	
	-Without Improvements	CSS	0	1	0	0	1	0	0	1	0	0	1	0	20.0	**>100.0**	C	**F**
	-With Improvements	**TS**	0	1	0	0	1	0	0	1	0	0	1	0	8.9	40.6	A	D
	E+P:																	
	-Without Improvements	CSS	0	1	0	0	1	0	0	1	0	0	1	0	23.1	**>100.0**	C	**F**
	-With Improvements	**TS**	0	1	0	0	1	0	0	1	0	0	1	0	9.2	50.6	A	D
32	Grove Av. & Merrill Av.																	
	Existing Conditions:																	
	-Without Improvements	AWS	0	0	0	0	1	0	0	1	0	0	1	0	34.6	**43.7**	D	**E**
	-With Improvements	**TS**	0	0	0	0	1	0	0	1	0	0	1	0	14.7	19.3	B	B
	E+P:																	
	-Without Improvements	AWS	0	0	0	0	1	0	0	1	0	0	1	0	**57.2**	**70.5**	**F**	**F**
	-With Improvements	**TS**	0	0	0	0	1	0	0	1	0	0	1	0	16.4	25.7	B	C
33	Walker Av. & Edison Av.																	
	Existing Conditions:																	
	-Without Improvements	CSS	0	1	0	0	1	0	0	1	0	0	1	0	25.2	**60.1**	D	**F**
	-With Improvements	**TS**	0	1	0	0	1	0	0	1	0	0	1	0	7.5	9.6	A	A
	E+P:																	
	-Without Improvements	CSS	0	1	0	0	1	0	0	1	0	0	1	0	27.6	**77.3**	D	**F**
	-With Improvements	**TS**	0	1	0	0	1	0	0	1	0	0	1	0	7.9	10.1	A	B
38	Carpenter Av. & Merrill Av.																	
	Existing Conditions:																	
	-Without Improvements	AWS	0	1	0	0	1	0	1	1	1	1	1	0	**86.2**	**89.5**	**F**	**F**
	-With Improvements	**TS**	0	1	0	0	1	0	1	1	1	1	1	0	21.0	14.7	C	B
	E+P:																	
	-Without Improvements	AWS	0	1	0	0	1	0	1	1	1	1	1	0	**>100.0**	**>100.0**	**F**	**F**
	-With Improvements	**TS**	0	1	0	0	1	0	1	1	1	1	1	0	21.6	15.0	C	B

Table 5-4

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						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
49	Hamner Av. & Ontario Ranch Rd.																	
	Existing Conditions:																	
	-Without Improvements	TS	2	3	1	2	2	1	2	4	0	2	2	1	42.7	**109.0**	D	**F**
	-With Improvements[4]	TS	2	3	1	2	**3**	**0**	2	4	0	2	2	1	40.1	47.5	D	D
	E+P:																	
	-Without Improvements	TS	2	3	1	2	2	1	2	4	0	2	2	1	45.0	**111.5**	D	**F**
	-With Improvements[4]	TS	2	3	1	2	**3**	**0**	2	4	0	2	2	1	42.0	49.2	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; d= Defacto Right Turn Lane; **1** = Improvement

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

[3] AWS = All-Way Stop; CSS = Cross-Street Stop; TS = Traffic Signal; **TS** = Improvement

[4] Improvement includes modifying the traffic signal to extend the cycle length to 130 seconds.

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6 OPENING YEAR CUMULATIVE (2022) TRAFFIC CONDITIONS

This section discusses the methods used to develop Opening Year Cumulative (2022) Without and With Project traffic forecasts, and the resulting intersection operations, freeway facility 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 (2022) 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.

6.2 OPENING YEAR CUMULATIVE (2022) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth of 6.12% 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 (2022) Without Project traffic conditions are shown on Exhibits 6-1 and 6-2, respectively.

6.3 OPENING YEAR CUMULATIVE (2022) WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Opening Year Cumulative (2022) 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 (2022) With Project traffic conditions are shown on Exhibits 6-3 and 6-4, respectively.

EXHIBIT 6-1: OPENING YEAR CUMULATIVE (2022) WITHOUT PROJECT AVERAGE DAILY TRAFFIC (ADT) (IN PCE)

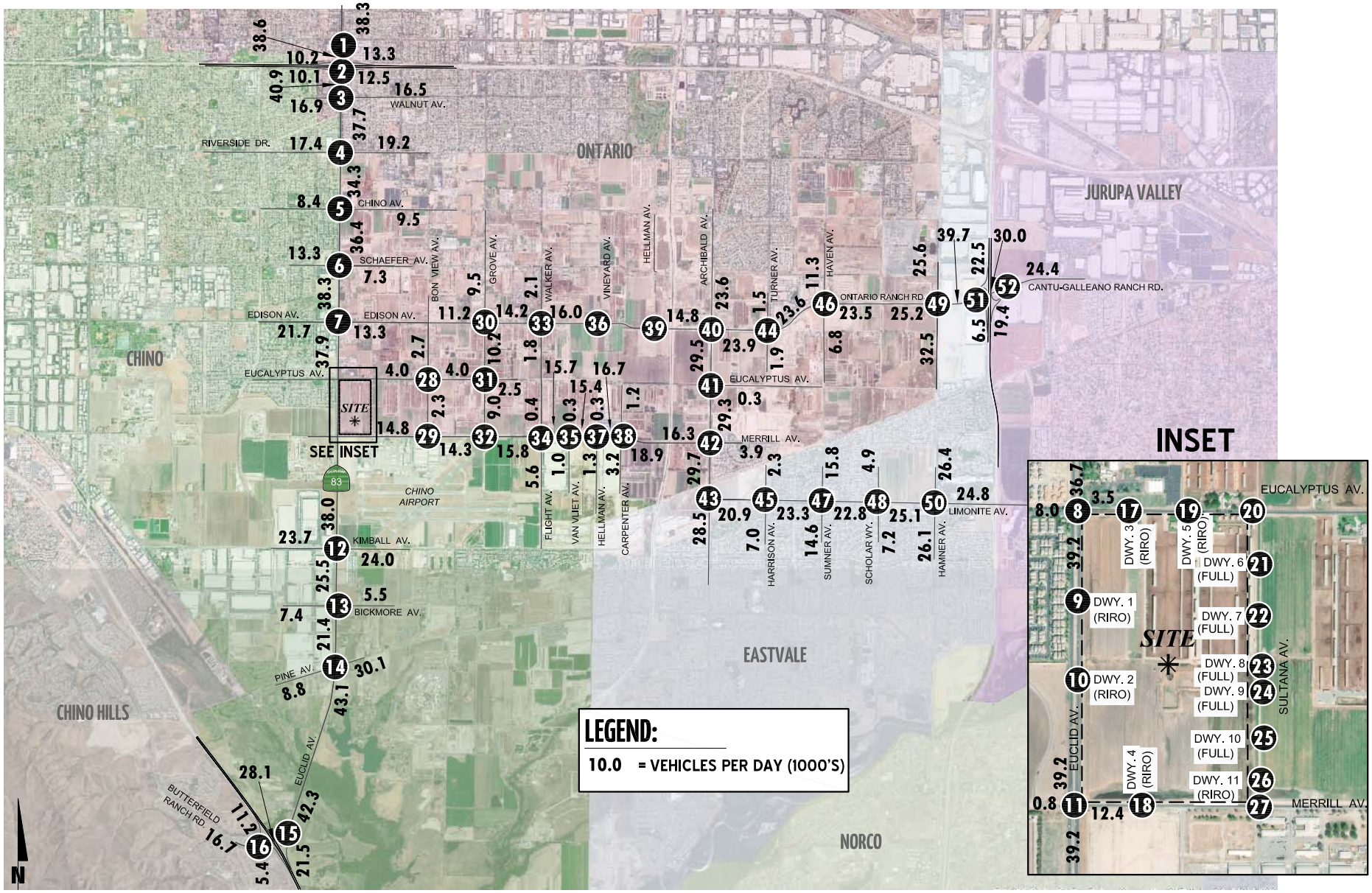

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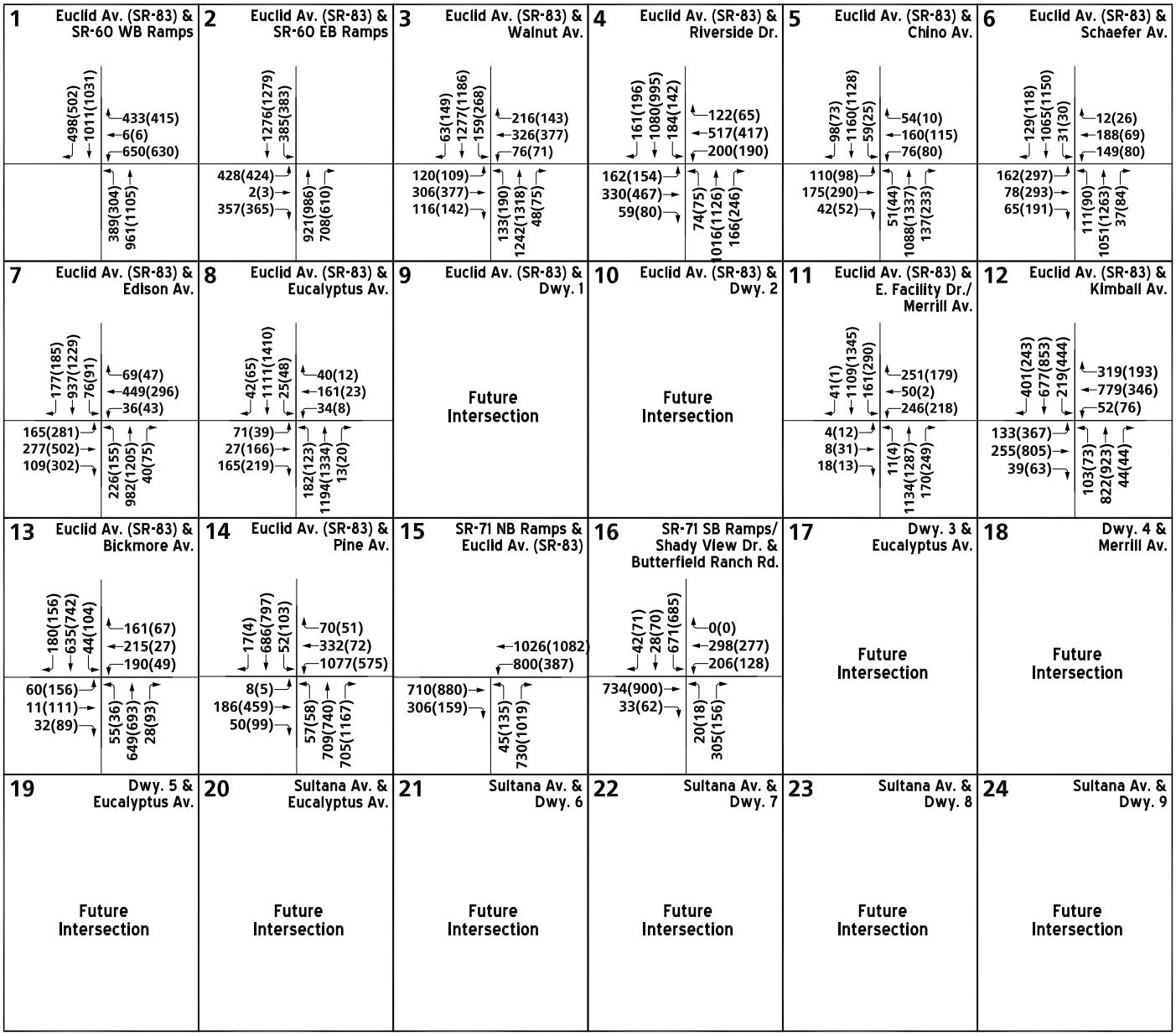
EXHIBIT 6-2 (1OF2): OPENING YEAR CUMULATIVE (2022) WITHOUT PROJECT TRAFFIC VOLUMES (IN PCE)



LEGEND:

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

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EXHIBIT 6-2 (2OF2): OPENING YEAR CUMULATIVE (2022) WITHOUT PROJECT TRAFFIC VOLUMES (IN PCE)

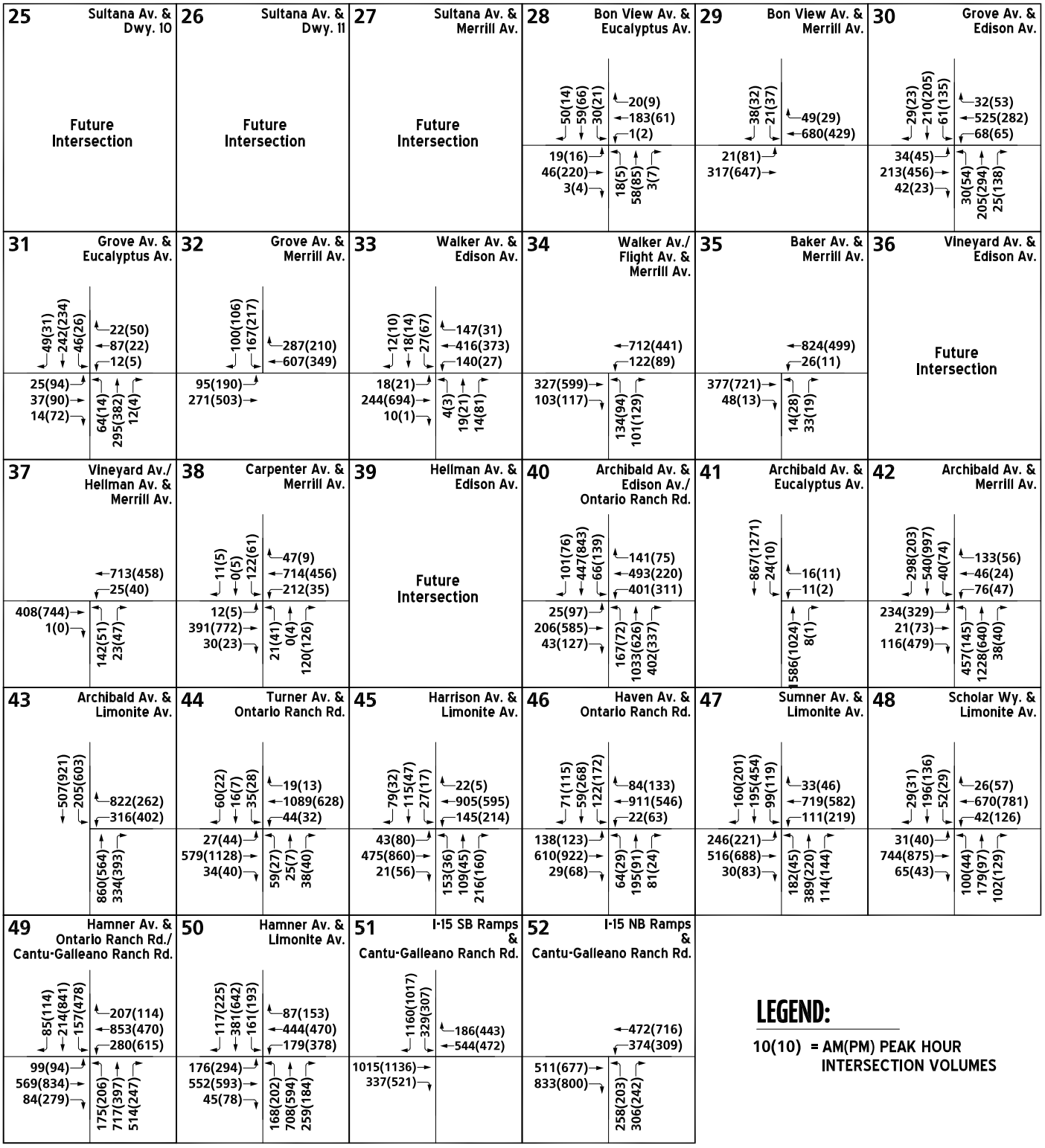

EXHIBIT 6-3: OPENING YEAR CUMULATIVE (2022) WITH PROJECT AVERAGE DAILY TRAFFIC (ADT) (IN PCE)

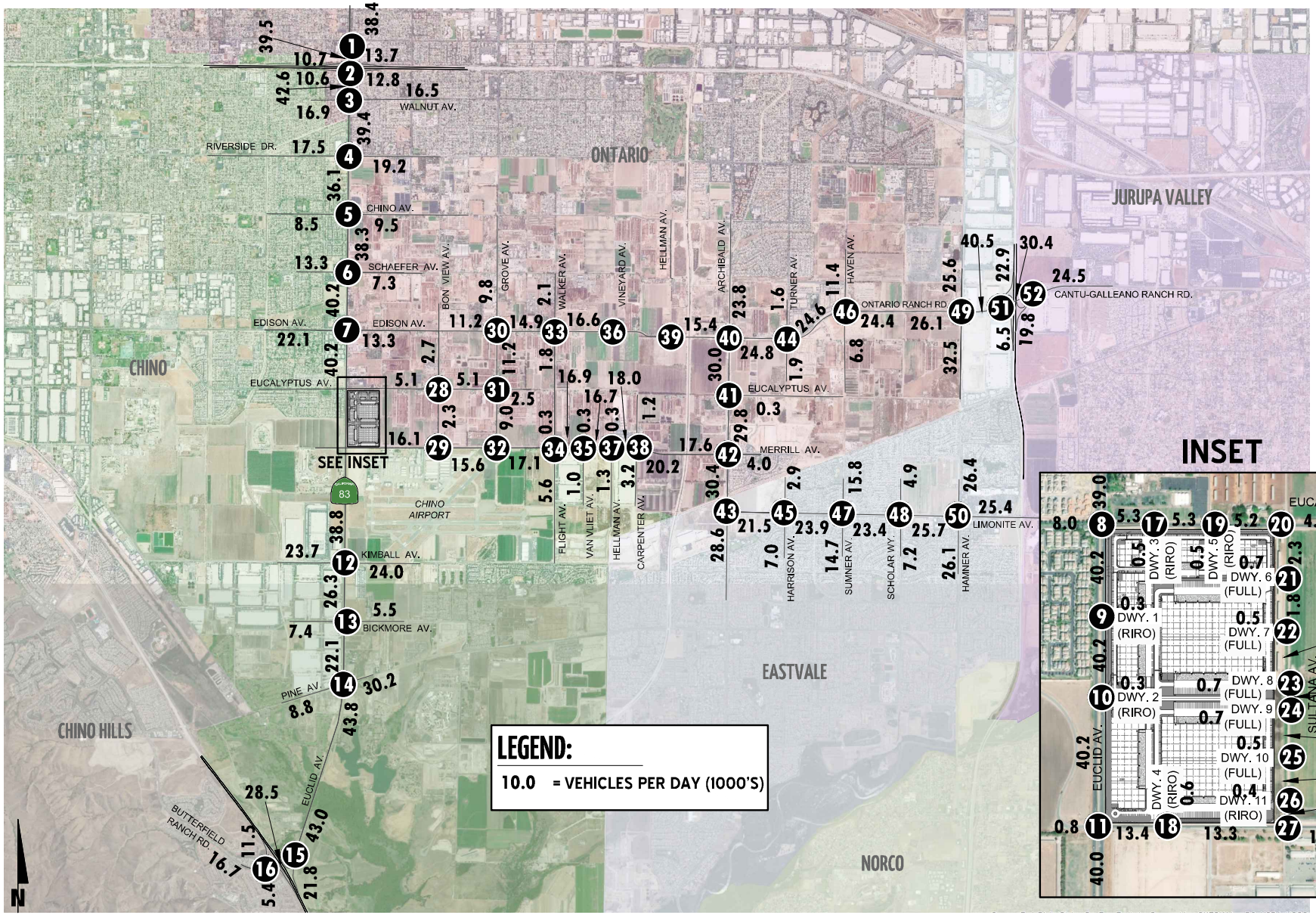

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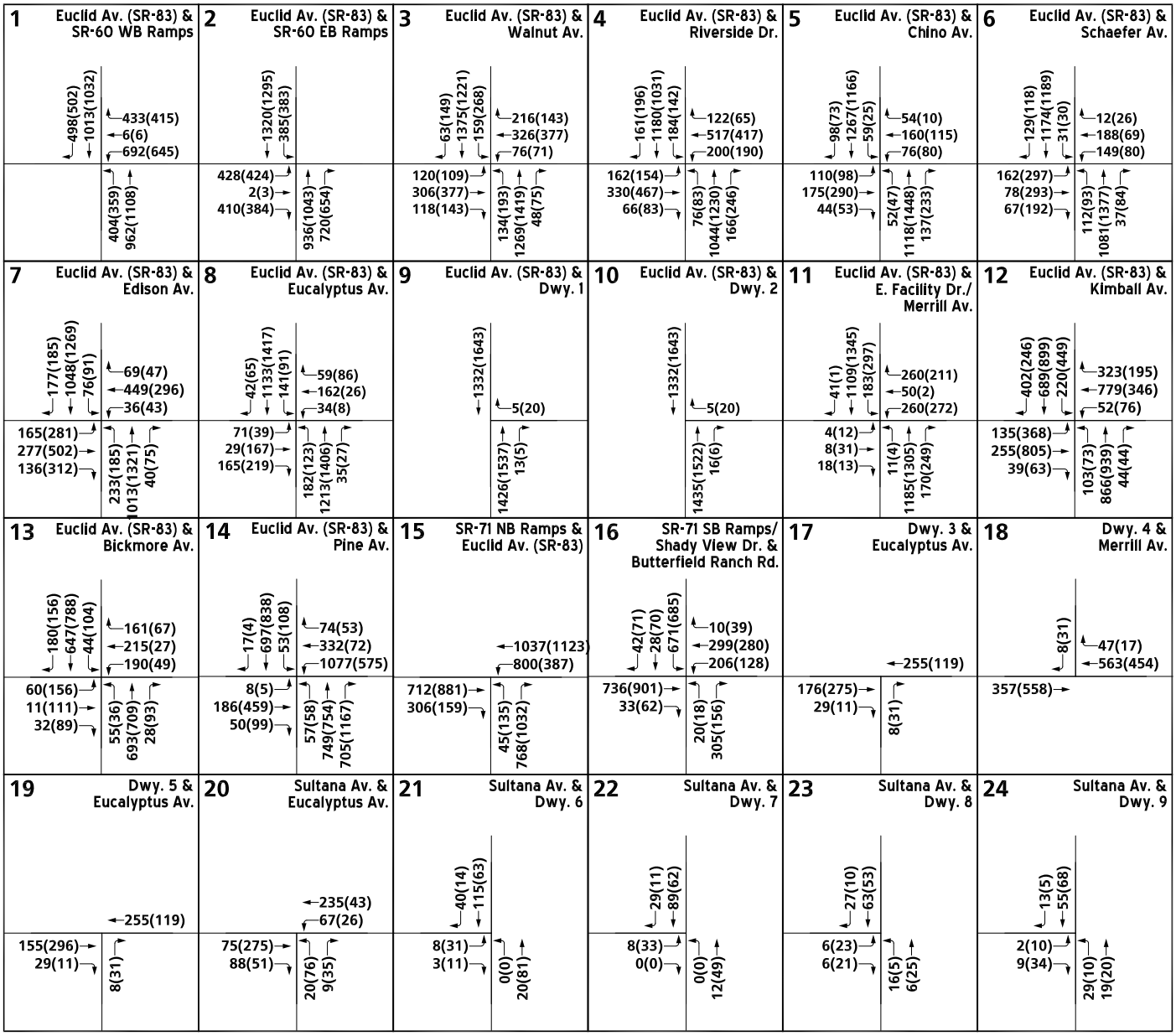
EXHIBIT 6-4 (1OF2): OPENING YEAR CUMULATIVE (2022) WITH PROJECT TRAFFIC VOLUMES (IN PCE)



LEGEND:

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

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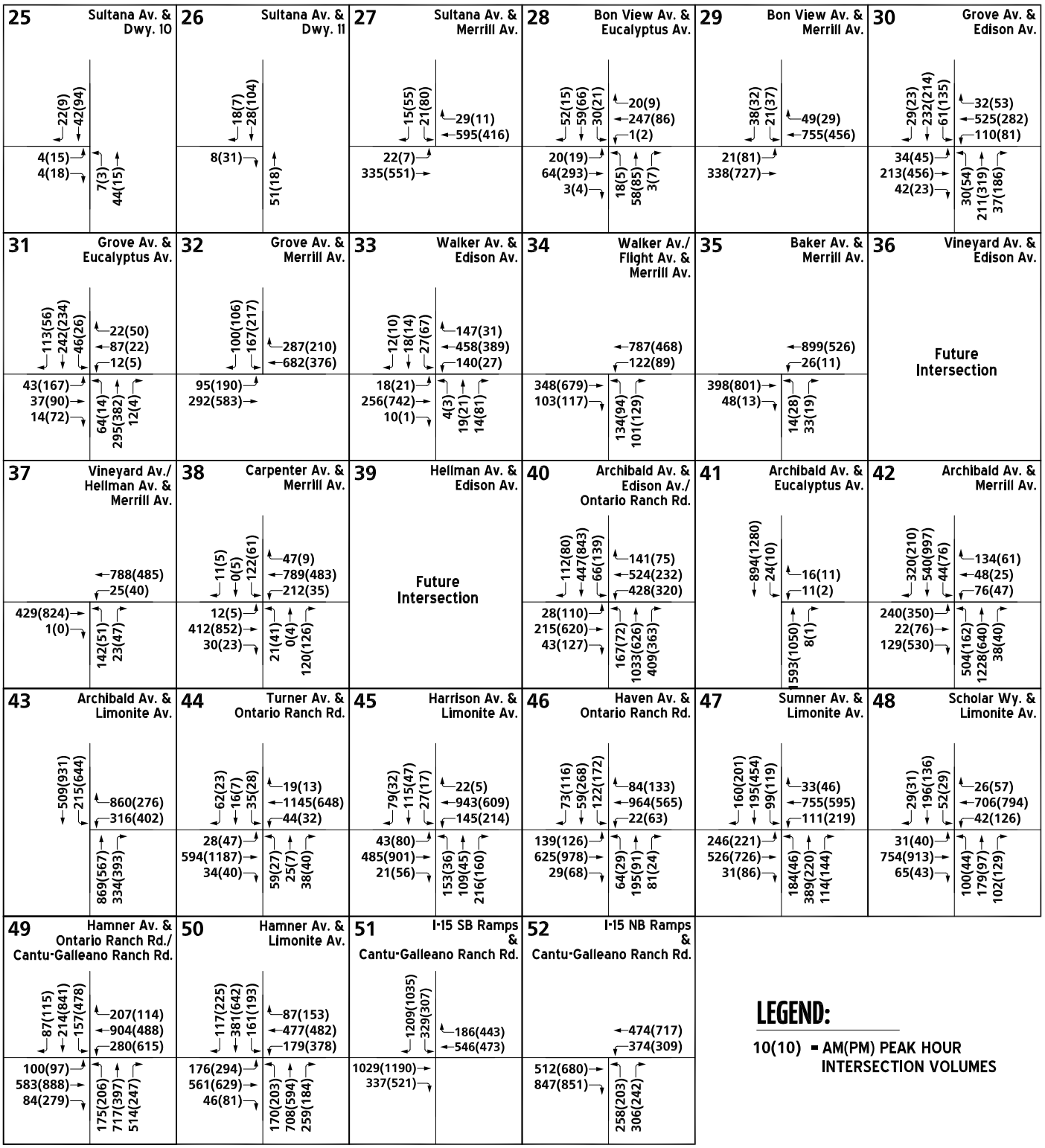
EXHIBIT 6-4 (2OF2): OPENING YEAR CUMULATIVE (2022) WITH PROJECT TRAFFIC VOLUMES (IN PCE)



6.4 INTERSECTION OPERATIONS ANALYSIS

6.4.1 OPENING YEAR CUMULATIVE (2022) WITHOUT PROJECT TRAFFIC CONDITIONS

LOS calculations were conducted for the study intersections to evaluate their operations under Opening Year Cumulative (2022) Without Project conditions with roadway and intersection geometrics consistent with Section 6.1 *Roadway Improvements*. As shown on Table 6-1, the following additional study area intersections are anticipated to operate at an unacceptable LOS under Opening Year Cumulative (2022) Without Project traffic conditions:

- Euclid Avenue (SR-83) & Riverside Drive (#4) – LOS E AM and PM peak hours
- Euclid Avenue (SR-83) & Merrill Avenue (#11) – LOS E PM peak hour only
- Euclid Avenue (SR-83) & Pine Avenue (#14) – LOS E PM peak hour only
- Grove Avenue & Edison Avenue (#30) – LOS F AM and PM peak hours
- Grove Avenue & Eucalyptus Avenue (#31) – LOS F PM peak hour only
- Grove Avenue & Merrill Avenue (#32) – LOS F AM and PM peak hours
- Walker Avenue & Edison Avenue (#33) – LOS F PM peak hour only
- Walker Avenue/Flight Avenue & Merrill Avenue (#34) – LOS E AM and PM peak hours
- Vineyard Avenue/Hellman Avenue & Merrill Avenue (#37) – LOS E AM peak hour only
- Carpenter Avenue & Merrill Avenue (#38) – LOS F AM and PM peak hours
- Archibald Avenue & Limonite Avenue (#43) – LOS E AM peak hour only
- Hamner Avenue & Ontario Ranch Road (#49) – LOS F PM peak hour only

A summary of the peak hour intersection LOS for Opening Year Cumulative (2022) Without Project conditions is shown on Exhibit 6-5. The intersection operations analysis worksheets for Opening Year Cumulative (2022) Without Project traffic conditions are included in Appendix 6.1 of this TIA.

6.4.2 OPENING YEAR CUMULATIVE (2022) WITH PROJECT TRAFFIC CONDITIONS

As shown on Table 6-1 and illustrated on Exhibit 6-6, the following study area intersection is anticipated to operate at a deficient LOS during one or both peak hours for Opening Year Cumulative (2022) With Project traffic conditions with the addition of Project traffic, in addition to the locations identified above for Opening Year Cumulative (2022) Without Project traffic conditions.

- Euclid Avenue (SR-83) & Edison Avenue (#7) – LOS E PM peak hour only

The intersection operations analysis worksheets for Opening Year Cumulative (2022) With Project traffic conditions are included in Appendix 6.2 of this TIA.

Table 6-1

Intersection Analysis for Opening Year Cumulative (2022) Conditions

#	Intersection	Traffic Control[2]	2022 Without Project				2022 With Project				Acceptable LOS[3]
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
			AM	PM	AM	PM	AM	PM	AM	PM	
1	Euclid Av. (SR-83) & SR-60 WB Ramps	TS	25.6	21.3	C	C	27.6	23.2	C	C	D
2	Euclid Av. (SR-83) & SR-60 EB Ramps	TS	32.8	24.5	C	C	36.7	25.5	D	C	D
3	Euclid Av. (SR-83) & Walnut Av.	TS	32.2	35.2	C	D	32.5	35.7	C	D	E
4	Euclid Av. (SR-83) & Riverside Dr.	TS	**56.9**	**75.0**	**E**	**E**	**61.0**	**90.1**	**E**	**F**	D
5	Euclid Av. (SR-83) & Chino Av.	TS	23.6	26.4	C	C	24.3	27.9	C	C	D
6	Euclid Av. (SR-83) & Schaefer Av.	TS	28.8	31.5	C	C	31.7	34.7	C	C	D
7	Euclid Av. (SR-83) & Edison Av.	TS	47.0	53.5	D	D	53.7	**57.2**	D	**E**	D
8	Euclid Av. (SR-83) & Eucalyptus Av.	TS	15.8	16.2	B	B	21.0	18.8	C	B	D
9	Euclid Av. (SR-83) & Driveway 1	**CSS**	Future Intersection				15.6	17.3	C	C	D
10	Euclid Av. (SR-83) & Driveway 2	**CSS**	Future Intersection				15.7	17.1	C	C	D
11	Euclid Av. (SR-83) & Merrill Av.	TS	39.8	**60.2**	D	**E**	50.6	**78.2**	D	**E**	D
12	Euclid Av. (SR-83) & Kimball Av.	TS	41.0	51.5	D	D	42.8	52.9	D	D	D
13	Euclid Av. (SR-83) & Bickmore Av.	TS	19.2	16.2	B	B	19.4	16.3	B	B	D
14	Euclid Av. (SR-83) & Pine Av.	TS	44.8	**68.5**	D	**E**	46.8	**73.1**	D	**E**	D
15	SR-71 NB Ramps & Euclid Av. (SR-83)	TS	33.7	49.7	C	D	35.1	54.1	D	D	D
16	SR-71 SB Ramps & Butterfield Ranch Rd.	TS	43.6	48.7	D	D	46.8	54.2	D	D	D
17	Driveway 3 & Eucalyptus Av.	**CSS**	Future Intersection				9.2	10.1	A	B	D
18	Driveway 4 & Merrill Av.	**CSS**	Future Intersection				12.4	11.6	B	B	D
19	Driveway 5 & Eucalyptus Av.	**CSS**	Future Intersection				9.1	10.2	A	B	D
20	Sultana Av. & Eucalyptus Av.	**CSS**	Future Intersection				10.5	11.1	B	B	E
21	Sultana Av. & Driveway 6	**CSS**	Future Intersection				9.3	9.3	A	A	D
22	Sultana Av. & Driveway 7	**CSS**	Future Intersection				9.2	9.2	A	A	D
23	Sultana Av. & Driveway 8	**CSS**	Future Intersection				8.9	9.0	A	A	D
24	Sultana Av. & Driveway 9	**CSS**	Future Intersection				8.8	8.9	A	A	D
25	Sultana Av. & Driveway 10	**CSS**	Future Intersection				8.8	9.1	A	A	D
26	Sultana Av. & Driveway 11	**CSS**	Future Intersection				8.5	9.0	A	A	D
27	Sultana Av. & Merrill Av.	**CSS**	Future Intersection				13.7	15.1	B	C	D
28	Bon View Av. & Eucalyptus Av.	AWS	8.8	9.3	A	A	9.5	10.4	A	B	E
29	Bon View Av. & Merrill Av.	CSS	15.7	19.9	C	C	17.0	22.4	C	C	D
30	Grove Av. & Edison Av.	AWS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	E
31	Grove Av. & Eucalyptus Av.	CSS	29.4	**>100.0**	D	**F**	41.8	**>100.0**	E	**F**	E
32	Grove Av. & Merrill Av.	AWS	**>100.0**	**87.2**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	D
33	Walker Av. & Edison Av.	CSS	32.3	**>100.0**	D	**F**	36.3	**>100.0**	E	**F**	E
34	Walker Av./Flight Av. & Merrill Av.	CSS	**54.7**	**41.7**	**E**	**E**	**71.2**	**55.5**	**F**	**F**	D
35	Baker Av./Van Vliet Av. & Merrill Av.	CSS	17.8	19.6	C	C	19.3	21.7	C	C	D
36	Vineyard Av. & Edison Av.		2040 Analysis Location				2040 Analysis Location				E
37	Vineyard Av./Hellman Av. & Merrill Av.	CSS	**37.9**	27.1	**E**	D	**46.1**	30.7	**E**	D	D
38	Carpenter Av. & Merrill Av.	AWS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	D
39	Hellman Av. & Edison Av.		2040 Analysis Location				2040 Analysis Location				E
40	Archibald Av. & Ontario Ranch Rd.	TS	44.7	30.9	D	C	54.5	32.2	D	C	E
41	Archibald Av. & Eucalyptus Av.	TS	6.5	3.6	A	A	6.5	3.6	A	A	E
42	Archibald Av. & Merrill Av.	TS	46.9	44.6	D	D	53.6	52.9	D	D	E
43	Archibald Av. & Limonite Av.	TS	**69.6**	53.4	**E**	D	**77.8**	**61.6**	**E**	**E**	D
44	Turner Av. & Ontario Ranch Rd.	TS	17.3	15.4	B	B	17.6	15.8	B	B	E

Table 6-1

Intersection Analysis for Opening Year Cumulative (2022) Conditions

#	Intersection	Traffic Control[2]	2022 Without Project				2022 With Project				Acceptable LOS[3]
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
			AM	PM	AM	PM	AM	PM	AM	PM	
45	Harrison Av. & Limonite Av.	TS	20.0	17.5	B	B	20.1	17.5	C	B	D
46	Haven Av. & Ontario Ranch Rd.	TS	27.1	23.9	C	C	27.6	24.0	C	C	E
47	Sumner Av. & Limonite Av.	TS	19.6	19.8	B	B	19.8	20.0	B	B	D
48	Scholar Way & Limonite Av.	TS	16.9	15.3	B	B	17.0	15.4	B	B	D
49	Hamner Av. & Ontario Ranch Rd.	TS	51.9	**134.5**	D	**F**	54.5	**137.1**	D	**F**	D
50	Hamner Av. & Limonite Av.	TS	25.6	29.2	C	C	26.0	29.6	C	C	D
51	I-15 SB Ramps & Cantu Galleano Ranch Rd.	TS	15.8	13.5	B	B	16.3	13.7	B	B	D
52	I-15 NB Ramps & Cantu Galleano Ranch Rd.	TS	21.2	13.1	C	B	21.2	13.3	C	B	D

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

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

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

[3] Minimum acceptable LOS for each applicable jurisdiction.

EXHIBIT 6-5: OPENING YEAR CUMULATIVE (2022) WITHOUT PROJECT SUMMARY OF LOS

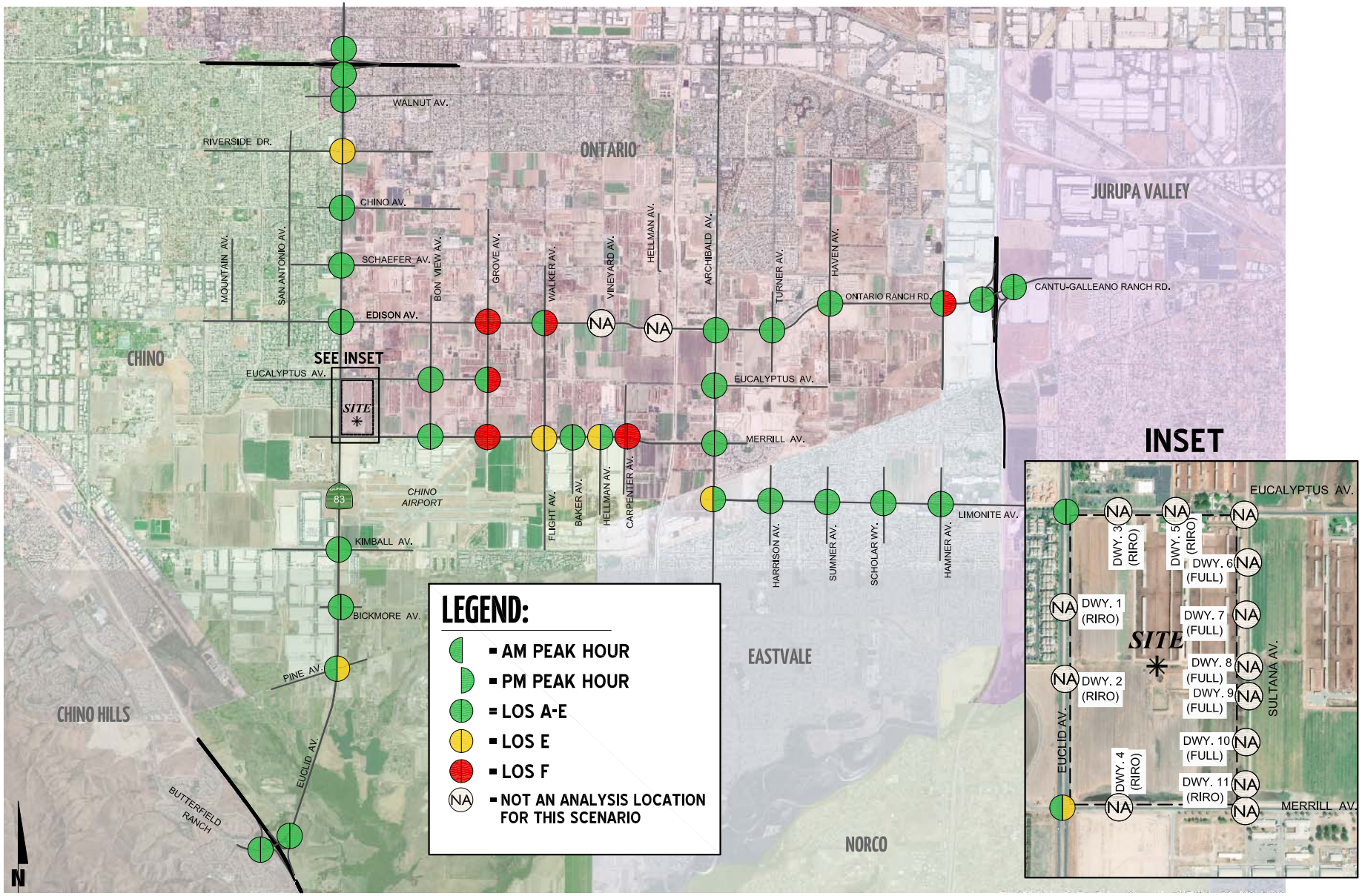


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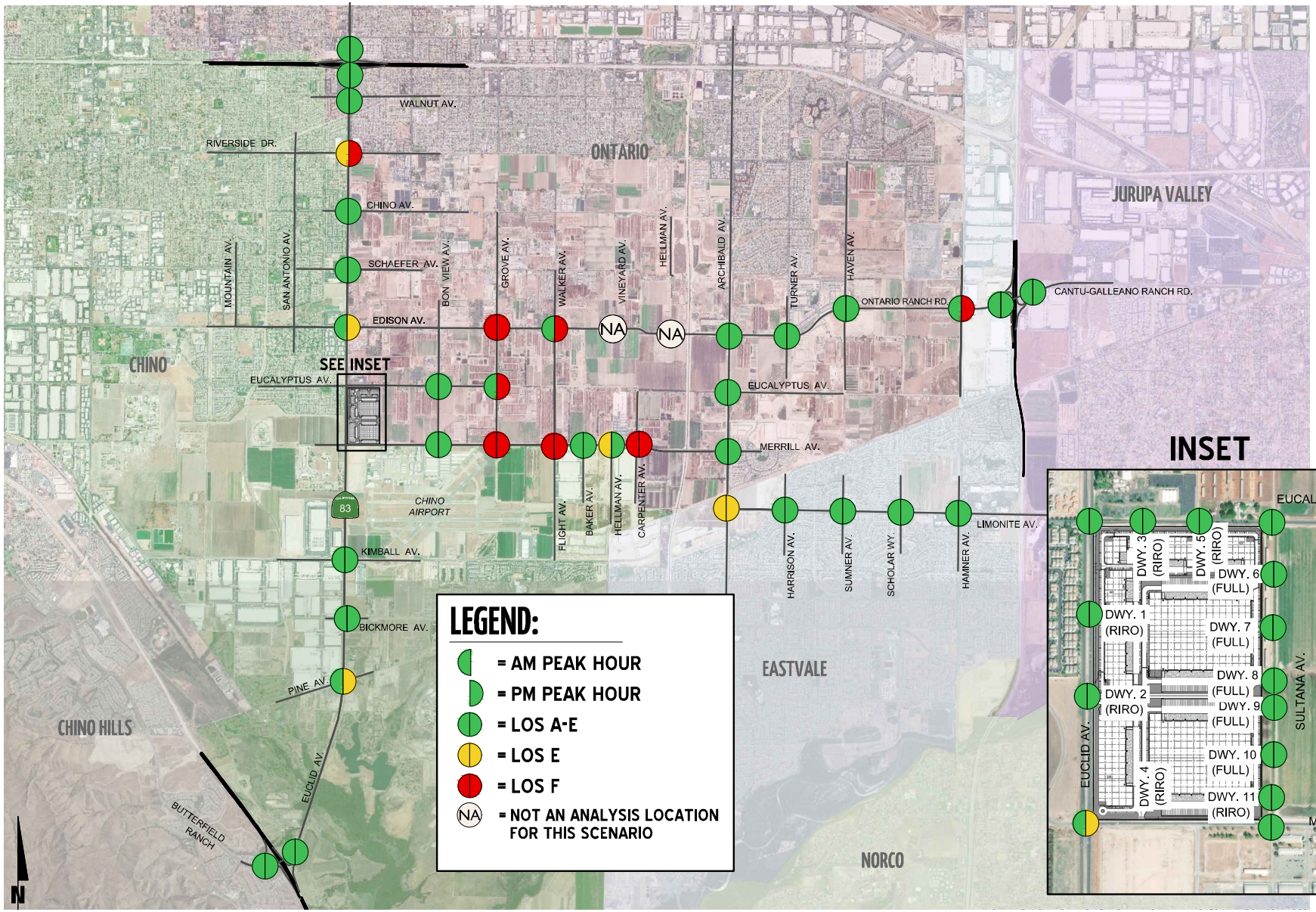
EXHIBIT 6-6: OPENING YEAR CUMULATIVE (2022) WITH PROJECT SUMMARY OF LOS



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6.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

Vineyard Avenue/Hellman Avenue & Merrill Avenue is anticipated to warrant a peak hour volume-based traffic signal under Opening Year Cumulative (2022) Without Project traffic conditions in addition to those previously warranted under Existing and E+P traffic conditions (see Appendix 6.3). There are no additional traffic signals warranted for Opening Year Cumulative (2022) With Project traffic conditions in addition to those previously warranted under Opening Year Cumulative (2022) Without traffic conditions (see Appendix 6.4).

6.6 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for Opening Year Cumulative (2022) Without and With Project traffic conditions are shown on Table 6-2. As shown on Table 6-2, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows with the addition of Project traffic. Worksheets for Opening Year Cumulative (2022) Without and With Project traffic conditions off-ramp queuing analysis are provided in Appendices 6.5 and 6.6, respectively.

6.7 FREEWAY FACILITY ANALYSIS

Opening Year Cumulative (2022) Without and With Project mainline directional volumes for the AM and PM peak hours are provided on Exhibits 6-7 and 6-8, respectively. As shown on Table 6-3, the following additional freeway segments and merge/diverge ramp junctions are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for Opening Year Cumulative (2022) Without Project conditions, in addition to those previously identified under Existing and E+P traffic conditions:

- SR-60 Freeway Westbound, West of Euclid Avenue (SR-83) (#5) – LOS E AM and PM peak hours
- SR-60 Freeway Westbound, East of Euclid Avenue (SR-83) (#8) – LOS E AM and PM peak hours
- SR-60 Freeway Eastbound, East of Euclid Avenue (#12) – LOS E AM peak hour only
- I-15 Freeway Northbound, On-Ramp at Cantu Galleano Ranch Road (#16) – LOS E AM peak hour only

The following additional freeway diverge ramp junction is anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hour with the addition of Project traffic:

- SR-60 Freeway Eastbound, Off-Ramp at Euclid Avenue (SR-83) (#10) – LOS E AM peak hour only

Opening Year Cumulative (2022) Without and With Project freeway facility analysis worksheets are provided in Appendix 6.7 and 6.8, respectively.

Table 6-2

Peak Hour Freeway Off-Ramp Queuing Summary for Opening Year Cumulative (2022) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	2022 Without Project				2022 With Project			
			95th Percentile Queue (Feet)[3]		Acceptable?[1]		95th Percentile Queue (Feet)[3]		Acceptable?[1]	
			AM Peak	PM Peak	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
Euclid Avenue (SR-83) & SR-60 WB Ramps	WBL	400	366 [2]	304	Yes	Yes	382 [2]	306	Yes	Yes
	WBL/T/R	1,430	374 [2]	307	Yes	Yes	408 [2]	317	Yes	Yes
	WBR	400	241	227	Yes	Yes	254	231	Yes	Yes
Euclid Avenue (SR-83) & SR-60 EB Ramps	EBL	900	396 [2]	386 [2]	Yes	Yes	396 [2]	386 [2]	Yes	Yes
	EBT/R	1,270	400 [2]	394 [2]	Yes	Yes	487 [2]	426 [2]	Yes	Yes
SR-71 NB Ramps & Euclid Avenue (SR-83)	NBL	1,745	28	46	Yes	Yes	28	46	Yes	Yes
	NBR	420	339 [2]	878 [2]	Yes	Yes[3]	385 [2]	911 [2]	Yes	Yes[3]
SR-71 SB Ramps & Euclid Avenue (SR-83)	SBL	1,100	232	255	Yes	Yes	234	255	Yes	Yes
	SBL/T	1,560	233	255	Yes	Yes	235	255	Yes	Yes
	SBR	255	0	3	Yes	Yes	0	3	Yes	Yes
I-15 SB Ramps & Cantu Galleano Ranch Rd.	SBL	1,440	112	95	Yes	Yes	112	95	Yes	Yes
	SBT	560	410 [2]	224	Yes	Yes	436 [2]	230	Yes	Yes
	SBR	460	369 [2]	197	Yes	Yes	394 [2]	205	Yes	Yes
I-15 NB Ramps & Cantu Galleano	NBL	1,680	93 [2]	68	Yes	Yes	93 [2]	68	Yes	Yes
	NBR	440	53	46	Yes	Yes	53	46	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.

[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 SR-60, SR-71, or I-15 Freeway mainline.

Table 6-3

Freeway Facility Analysis for Opening Year Cumulative (2022) Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	2022 Without Project				2022 With Project			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]
SR-71	SB	Southbound Loop On-Ramp at Euclid Avenue (SR-83)	2	10.6	B	11.6	B	10.7	B	11.8	B
		South of Euclid Avenue (SR-83)	2	13.4	B	14.3	B	13.4	B	14.5	B
	NB	Northbound Off-Ramp at Euclid Avenue (SR-83)	3	15.1	B	22.8	C	15.2	B	22.9	C
		South of Euclid Avenue (SR-83)	3	9.8	A	17.0	B	10.0	A	17.0	B
SR-60	Westbound	West of Euclid Avenue (SR-83)	4	**37.9**	**E**	**35.7**	**E**	**38.0**	**E**	**36.0**	**E**
		Westbound On-Ramp at Euclid Avenue (SR-83)	4	30.6	D	29.4	D	30.7	D	29.8	D
		Westbound Off-Ramp at Euclid Avenue (SR-83)	4	**38.8**	**E**	**38.2**	**E**	**39.1**	**E**	**38.3**	**E**
		East of Euclid Avenue (SR-83)	4	**38.6**	**E**	**37.2**	**E**	**38.9**	**E**	**37.2**	**E**
	Eastbound	West of Euclid Avenue (SR-83)	4	34.7	D	28.1	D	34.8	D	28.1	D
		Eastbound Off-Ramp at Euclid Avenue (SR-83)	4	34.7	D	30.8	D	**35.1**	**E**	30.9	D
		Eastbound On-Ramp at Euclid Avenue (SR-83)	4	30.1	D	25.7	C	30.2	D	26.0	C
		East of Euclid Avenue (SR-83)	4	**36.6**	**E**	28.8	D	**37.3**	**E**	29.0	D
I-15	SB	North of Cantu Galleano Ranch Road	4	19.9	C	15.8	B	20.3	C	15.9	B
		Southbound Off-Ramp at Cantu Galleano Ranch Road	4	29.2	D	24.4	C	29.8	D	24.5	C
	NB	North of Cantu Galleano Ranch Road	5	17.2	B	15.1	B	17.3	B	15.2	B
		Northbound On-Ramp at Cantu Galleano Ranch Road	3	**36.4**	**E**	32.7	D	**36.5**	**E**	33.2	D

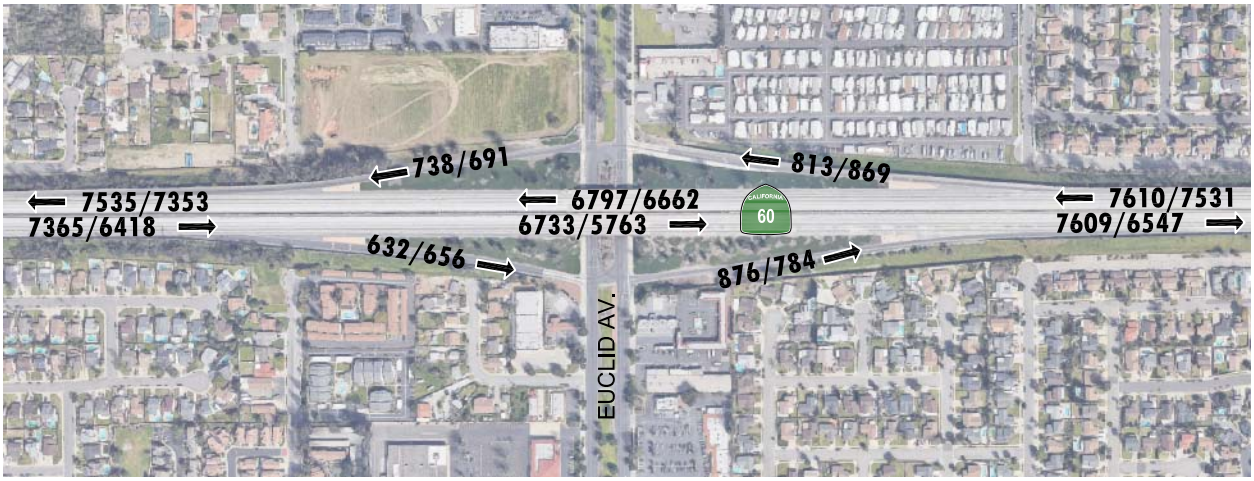
* **BOLD** = Unacceptable Level of Service

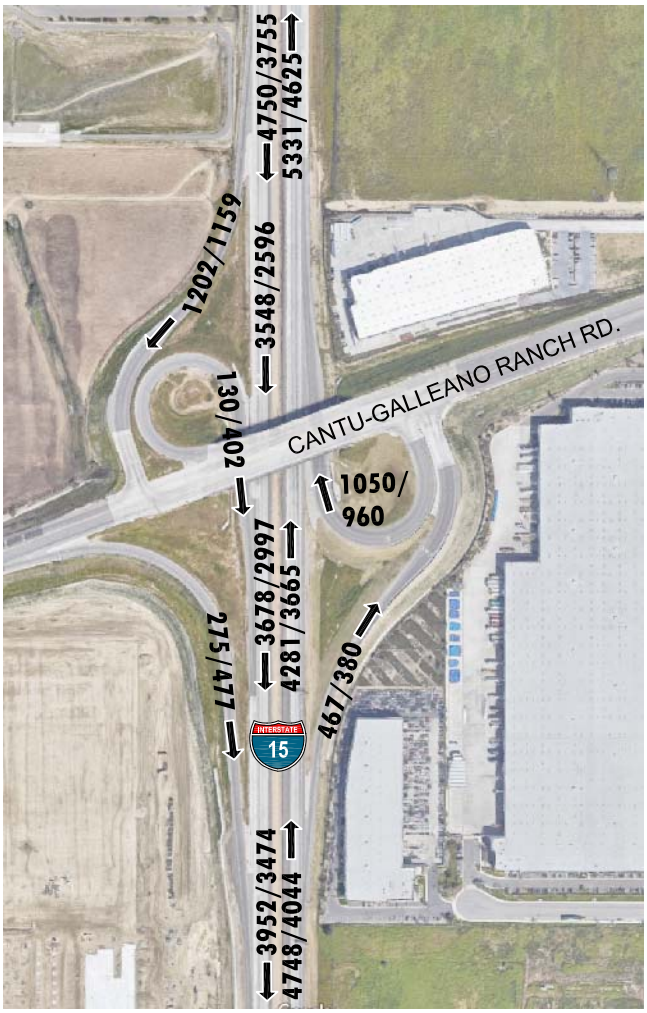
[1] Number of lanes are in the specified direction and is based on existing conditions.

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

[3] LOS = Level of Service

EXHIBIT 6-7: OPENING YEAR CUMULATIVE (2021) WITHOUT PROJECT FREEWAY MAINLINE VOLUMES





LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

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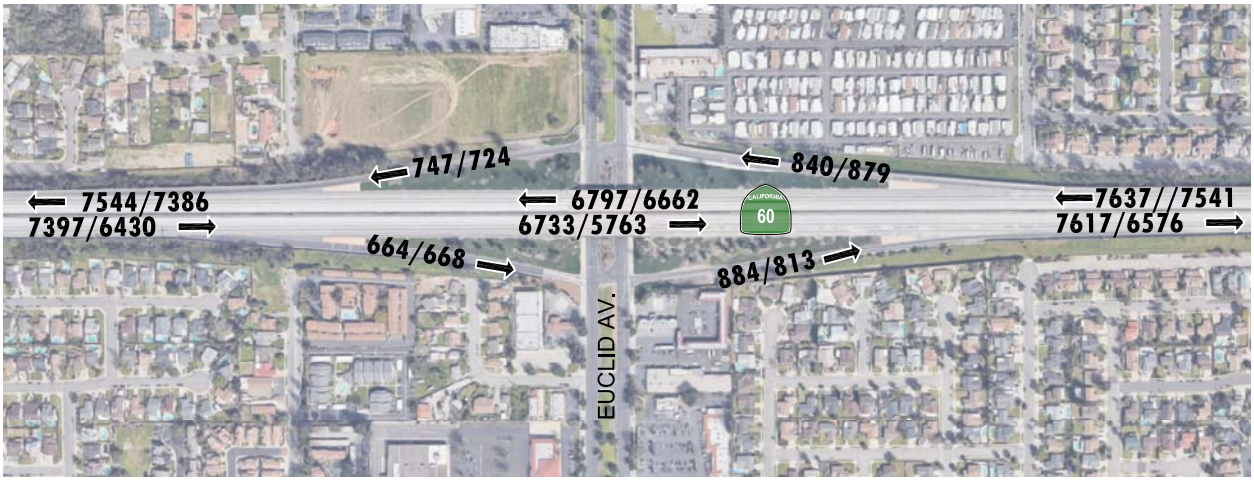
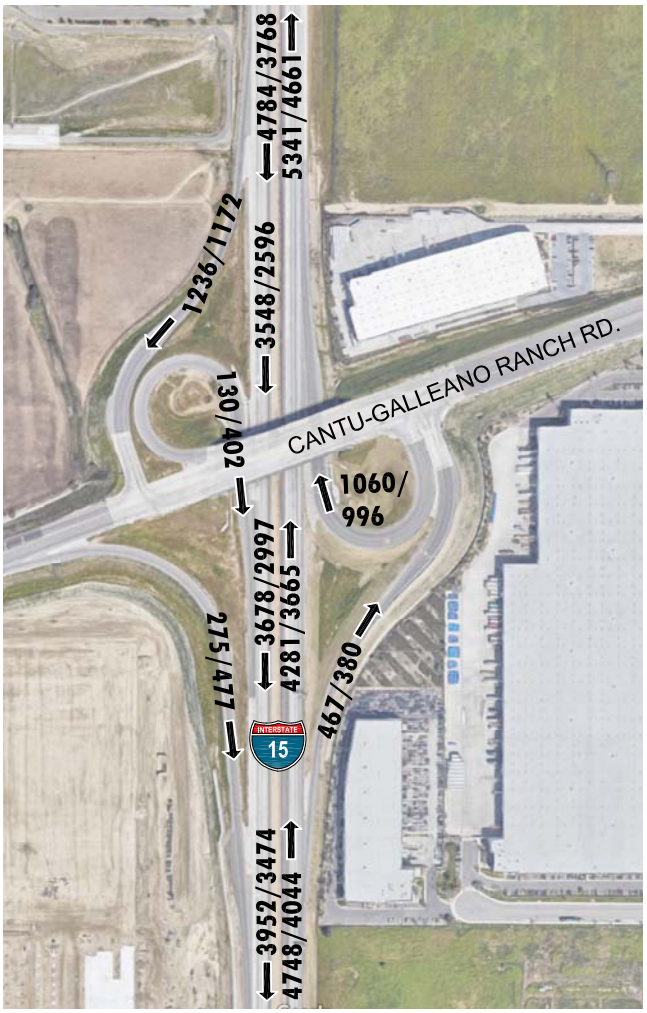
EXHIBIT 6-8: OPENING YEAR CUMULATIVE (2021) WITH PROJECT FREEWAY MAINLINE VOLUMES





LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

N

6.8 RECOMMENDED IMPROVEMENTS

6.8.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as deficient, in an effort to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS D or better). Intersections have been identified at deficient intersections if the Project causes a new deficiency or contributes 50 or more peak hour trips to an intersection that operates at a deficient LOS under pre-project traffic conditions.

The effectiveness of the recommended improvement strategies to address Opening Year Cumulative (2022) traffic deficiencies are presented on Table 6-4. Worksheets for Opening Year Cumulative (2022) Without and With Project conditions, with improvements, HCM calculation worksheets are provided in Appendix 6.9 and Appendix 6.10.

6.8.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON OFF-RAMP QUEUES

As shown previously on Table 6-2, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Opening Year Cumulative (2022) traffic conditions. As such, no improvements have been recommended.

6.8.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

SHS facilities are owned and maintained by Caltrans. Improvements to the SHS is regional/state-wide and Caltrans' responsibility. Improvements to freeway facilities LOS deficiencies is addressed through Caltrans regional improvement plans and programs. At this time, Caltrans has no plans or programs in place to address development-specific deficiencies affecting the SHS. There are no feasible measures to address LOS deficiencies that can be autonomously implemented by the Lead Agency or the Project Applicant.

Table 6-4

Intersection Analysis for Opening Year Cumulative (2022) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
4	Euclid Av. (SR-83) & Riverside Dr.																	
	- Without Project[4]	TS	1	**3**	0	1	**3**	1>	1	1	**1**	1	2	d	44.5	52.0	D	D
	- With Project[4]	TS	1	**3**	0	1	**3**	1>	1	1	**1**	1	2	d	44.8	54.3	D	D
7	Euclid Av. (SR-83) & Edison Av.																	
	- Without Project		Not Applicable															
	- With Project	TS	1	2	1	1	2	1	1	1	1	1	1	**1**	46.0	54.8	D	D
11	Euclid Av. (SR-83) & Merrill Av.																	
	- Without Project	TS	1	2	1	1	2	0	0	1	0	**1**	1	**1>**	17.8	30.1	B	C
	- With Project	TS	1	2	1	1	2	0	0	1	0	**1**	1	**1>**	19.7	40.6	B	D
14	Euclid Av. (SR-83) & Pine Av.																	
	- Without Project	TS	1	**3**	**1>>**	1	**3**	0	1	1	1	2	1	0	35.3	39.0	D	D
	- With Project	TS	1	**3**	**1>>**	1	**3**	0	1	1	1	2	1	0	36.4	40.2	D	D
30	Grove Av. & Edison Av.																	
	- Without Project	**TS**	0	1	0	0	1	0	0	1	0	0	1	0	20.5	18.5	C	B
	- With Project	**TS**	0	1	0	0	1	0	0	1	0	0	1	0	22.6	22.2	C	C
31	Grove Av. & Eucalyptus Av.																	
	- Without Project	**TS**	0	**2**	0	0	1	0	0	1	0	0	1	0	8.8	17.5	A	B
	- With Project	**TS**	0	**2**	0	0	1	0	0	1	0	0	1	0	9.2	24.0	A	C
32	Grove Av. & Merrill Av.																	
	- Without Project	**TS**	0	0	0	0	1	0	**1**	1	0	0	**2**	0	20.7	26.2	C	C
	- With Project	**TS**	0	0	0	0	1	0	**1**	1	0	0	**2**	0	20.8	27.1	C	C
33	Walker Av. & Edison Av.																	
	- Without Project	**TS**	0	1	0	0	1	0	0	1	0	0	1	0	8.6	10.6	A	B
	- With Project	**TS**	0	1	0	0	1	0	0	1	0	0	1	0	9.1	11.3	A	B
34	Walker Av./Flight Av. & Merrill Av.																	
	- Without Project	**TS**	**1**	**1**	**0**	**1**	**1**	0	**1**	**2**	**0**	1	**2**	0	15.6	15.3	B	B
	- With Project	**TS**	**1**	**1**	**0**	**1**	**1**	0	**1**	**2**	**0**	1	**2**	0	15.7	15.5	B	B
37	Vineyard Av./Hellman Av. & Merrill Av.																	
	- Without Project	CSS	1	**1**	1	**1**	**1**	0	**1**	2	0	1	**2**	0	21.8	23.3	C	C
	- With Project	CSS	1	**1**	1	**1**	**1**	0	**1**	2	0	1	**2**	0	23.7	26.3	C	D
38	Carpenter Av. & Merrill Av.																	
	- Without Project	**TS**	0	1	0	0	1	0	1	1	1	1	1	0	23.6	17.6	C	B
	- With Project	**TS**	0	1	0	0	1	0	1	1	1	1	1	0	24.0	18.7	C	B
43	Archibald Av. & Limonite Av.																	
	- Without Project	TS	0	1	1>	**2**	1	0	0	0	0	1	0	**2>**	31.3	23.2	C	C
	- With Project	TS	0	1	1>	**2**	1	0	0	0	0	1	0	**2>**	32.9	24.7	C	C
49	Hamner Av. & Ontario Ranch Rd.																	
	- Without Project[5]	TS	2	3	1	2	**3**	**0**	2	4	0	2	2	1	42.4	51.0	D	D
	- With Project[5]	TS	2	3	1	2	**3**	**0**	2	4	0	2	2	1	44.5	52.8	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; >> = Free Right Turn; d = Defacto Right Turn Lane; **1** = Improvement

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

[3] CSS = Cross-Street Stop; TS = Traffic Signal; **TS** = Improvement

[4] Improvement includes restriping the northbound approach to provide one left turn lane, two through lanes, and one shared through-right turn lane.

[5] Improvement includes modifying the traffic signal to extend the cycle length to 130 seconds.

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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, freeway facility 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 Meadow Valley Avenue on Kimball Avenue and the northern extension of Hellman Avenue north of Kimball Avenue).
- The Pine Avenue extension between its El Prado Road and the SR-71 Freeway.
- The Kimball Avenue/Limonite Avenue extension between Hellman Avenue and Archibald 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, etc.).

7.2 HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-process volumes obtained from the SBTAM/RivTAM (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, respectively.

7.3 HORIZON YEAR (2040) WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-process volumes obtained from the SBTAM/RivTAM, plus the traffic generated by the proposed 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, respectively.

EXHIBIT 7-1: HORIZON YEAR (2040) WITHOUT PROJECT AVERAGE DAILY TRAFFIC (ADT) (IN PCE)

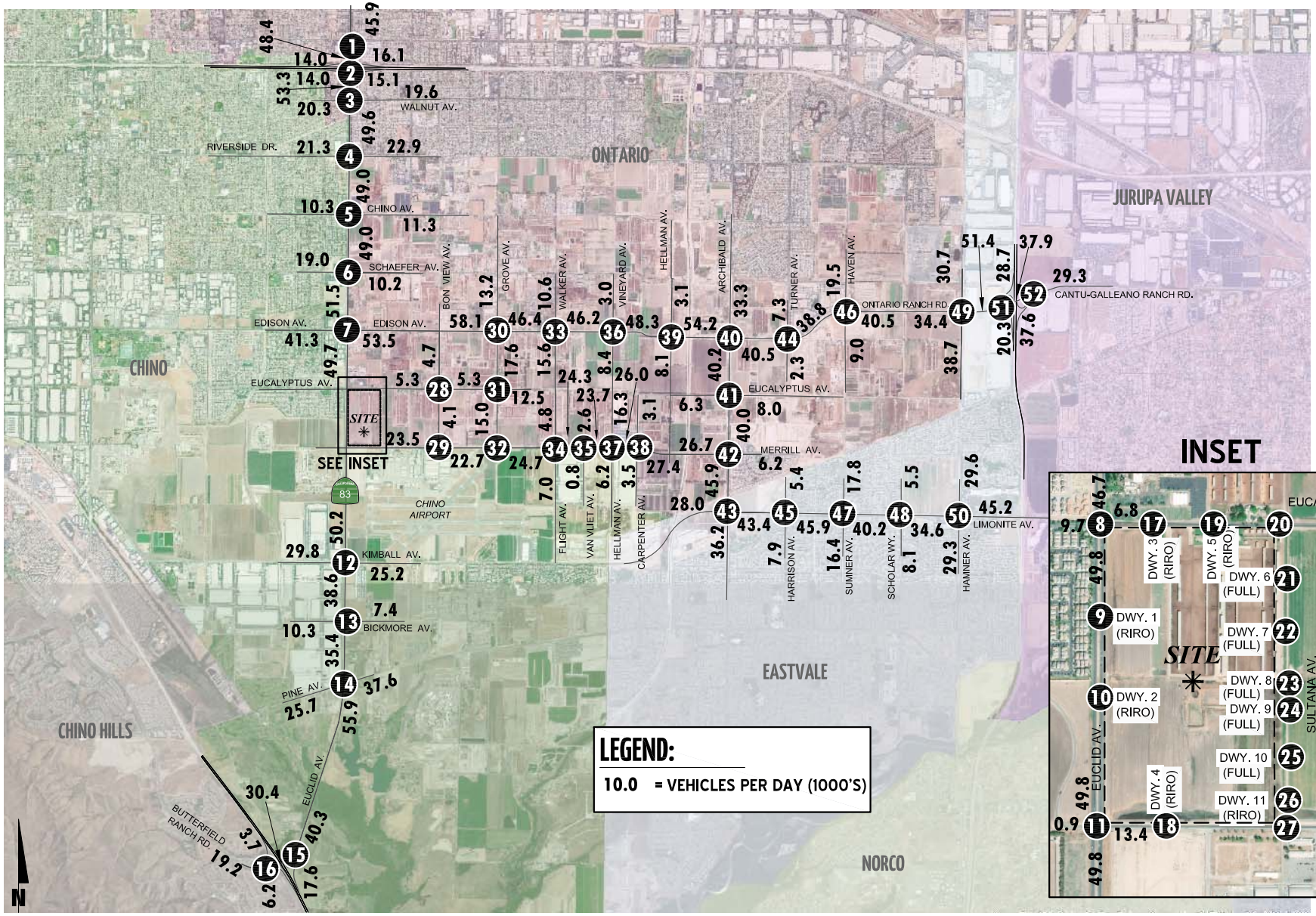

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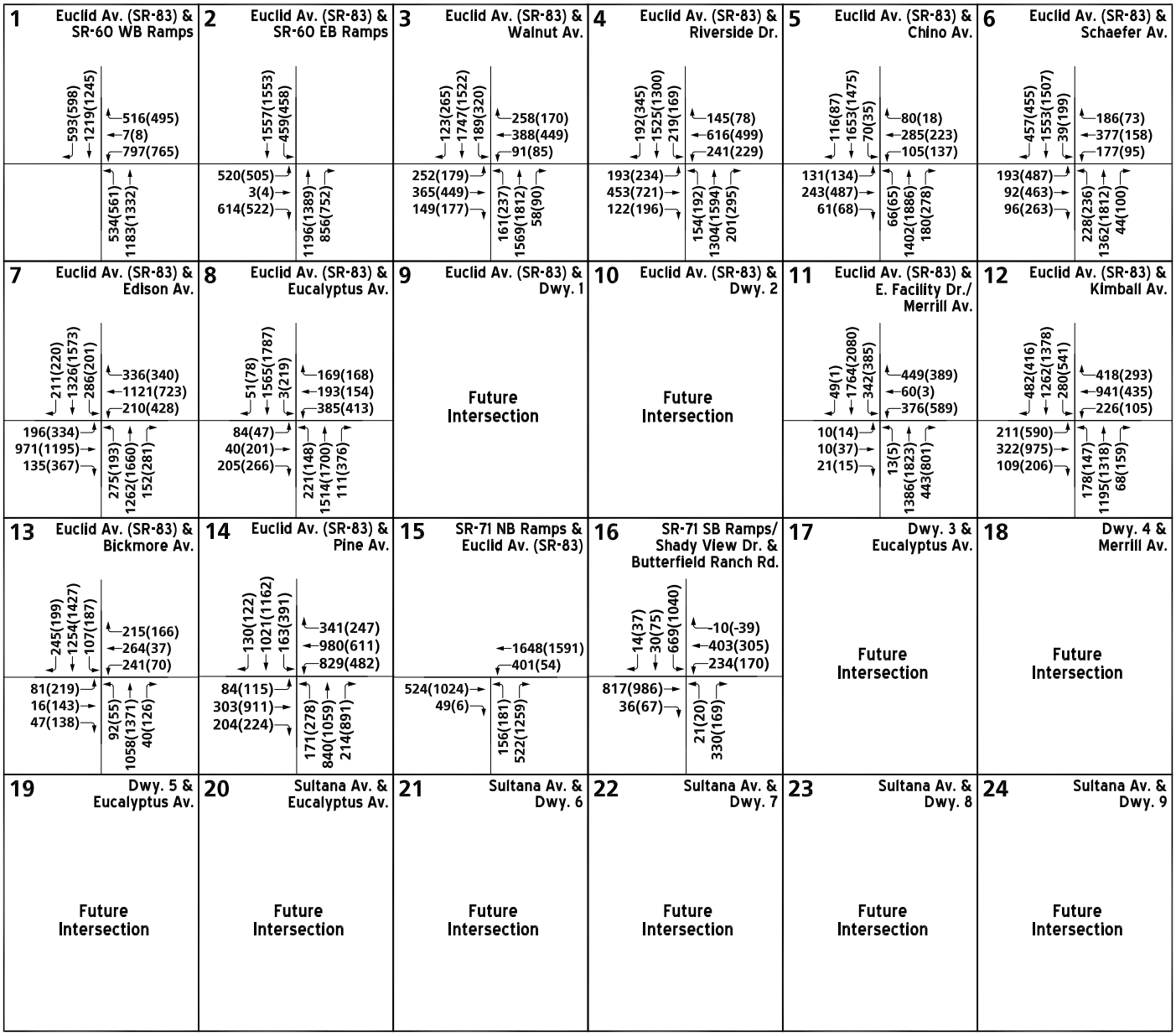
EXHIBIT 7-2 (1OF2): HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC VOLUMES (IN PCE)



LEGEND:

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

EXHIBIT 7-2 (2OF2): HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC VOLUMES (IN PCE)

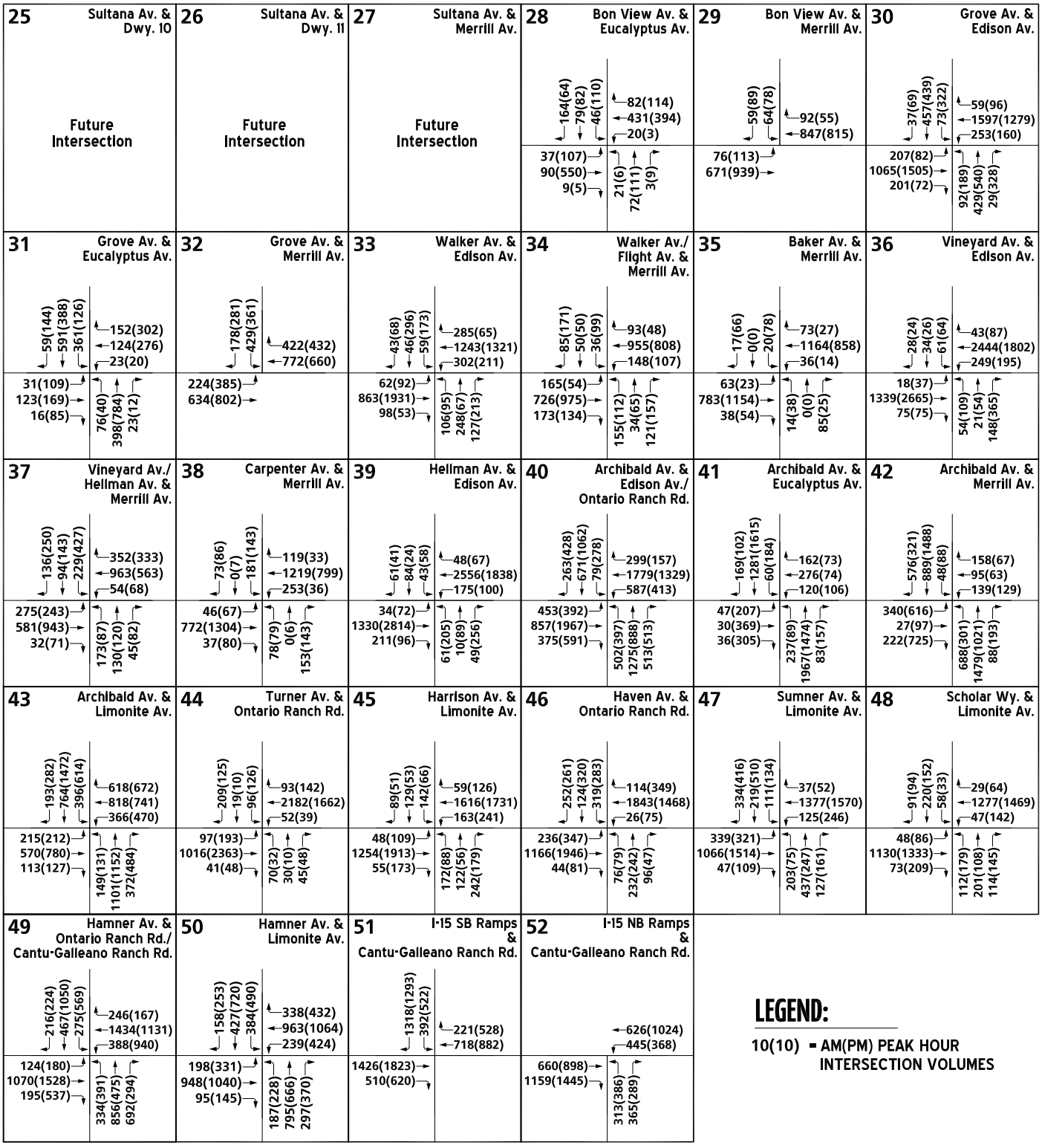


EXHIBIT 7-3: HORIZON YEAR (2040) WITH PROJECT AVERAGE DAILY TRAFFIC (ADT) (IN PCE)

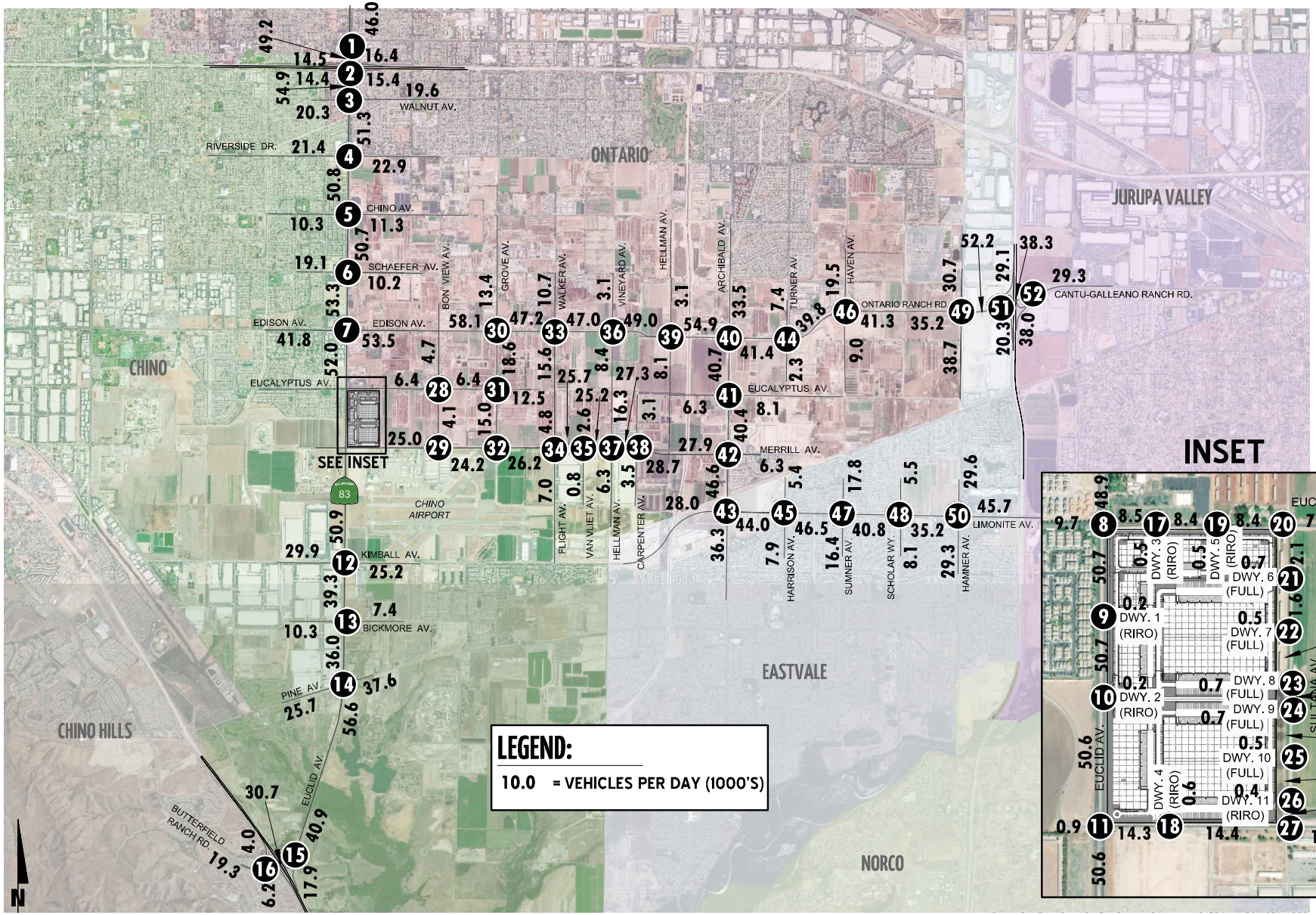
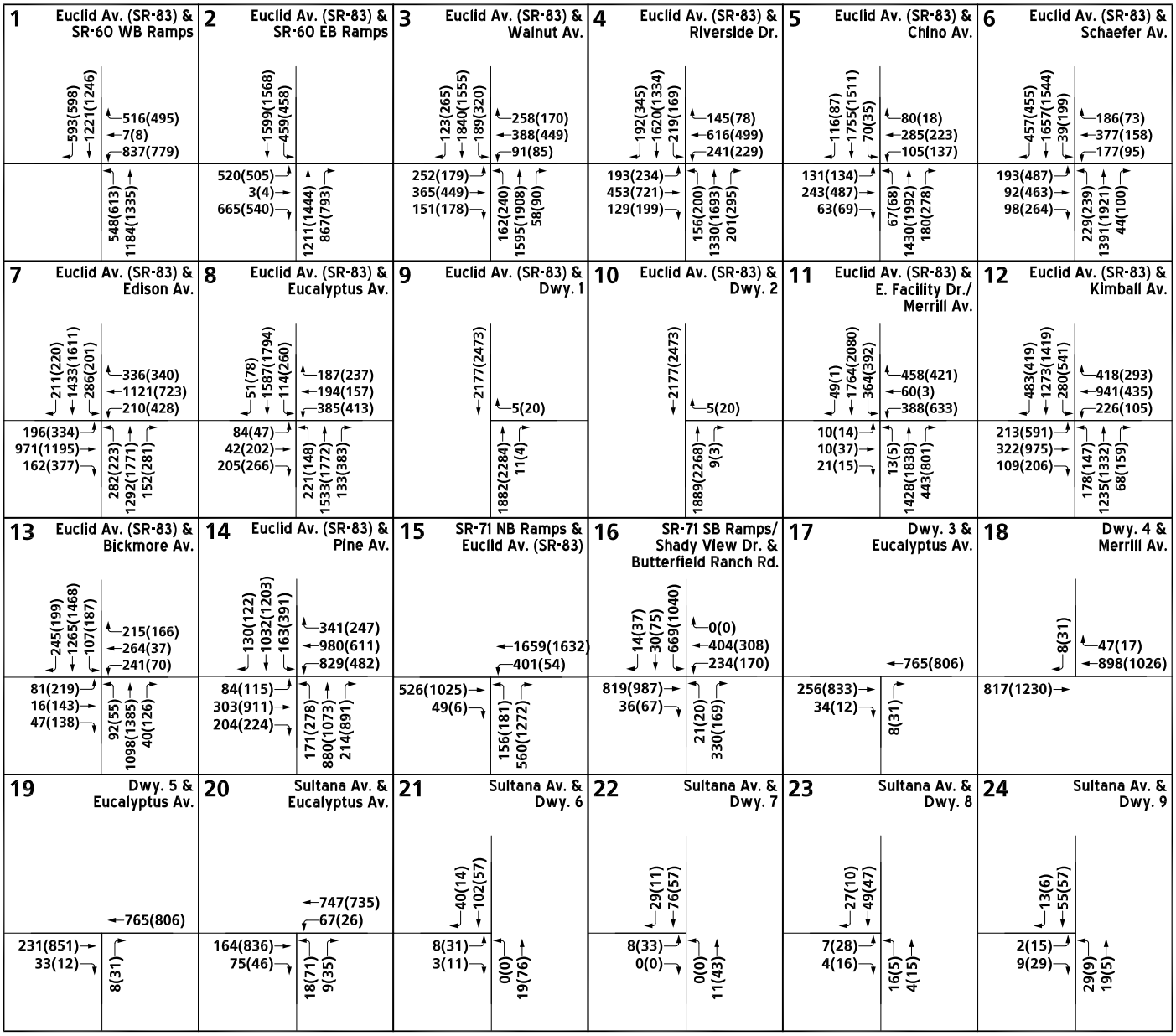


EXHIBIT 7-4 (1OF2): HORIZON YEAR (2040) WITH PROJECT TRAFFIC VOLUMES (IN PCE)



LEGEND:

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

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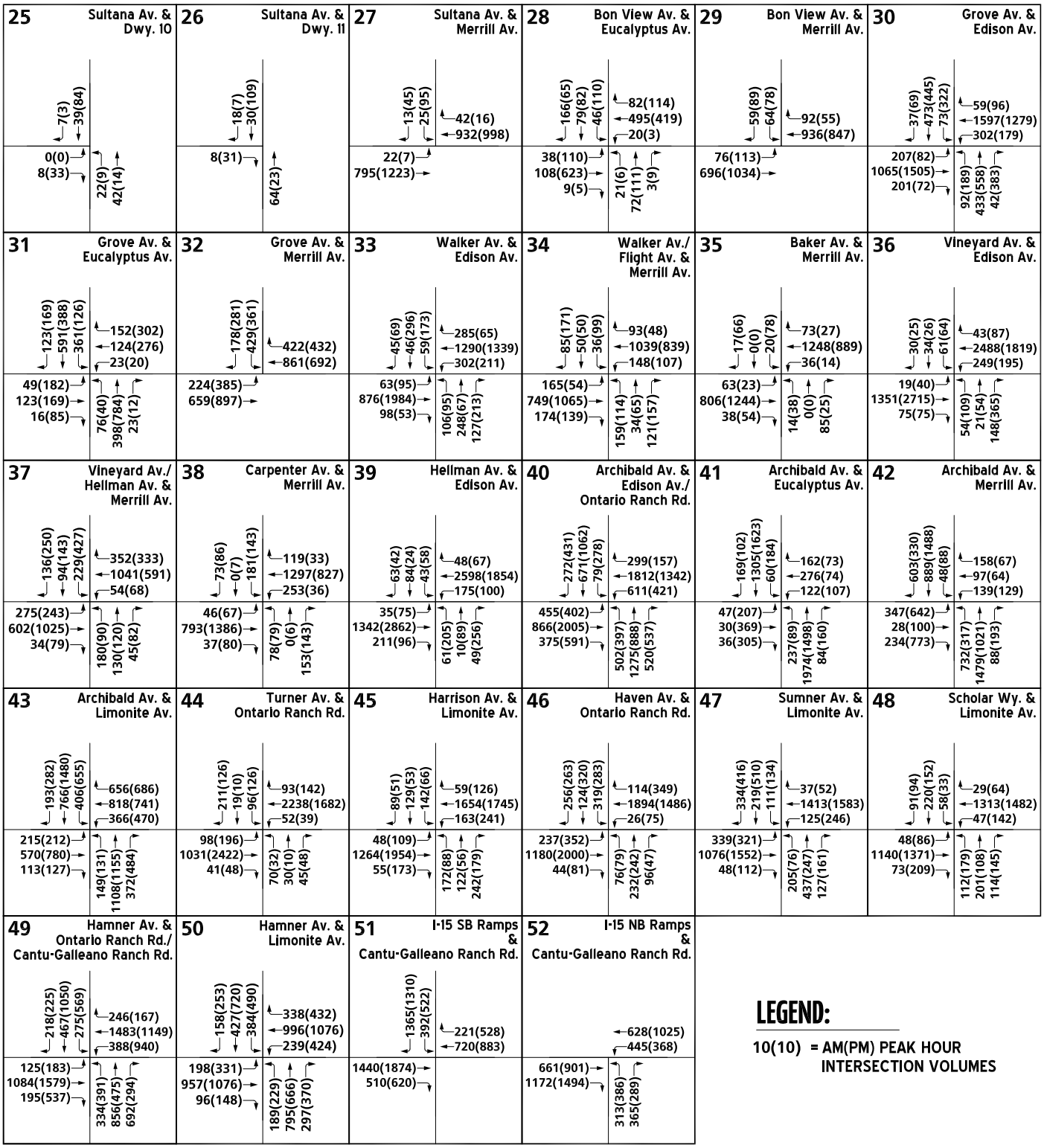
EXHIBIT 7-4 (2OF2): HORIZON YEAR (2040) WITH PROJECT TRAFFIC VOLUMES (IN PCE)



7.4 INTERSECTION OPERATIONS ANALYSIS

7.4.1 HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC CONDITIONS

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

- Euclid Avenue (SR-83) & SR-60 Westbound Ramps (#1) – LOS E AM and PM peak hours
- Euclid Avenue (SR-83) & SR-60 Eastbound Ramps (#2) – LOS F AM peak hour; LOS E PM peak hour
- Euclid Avenue (SR-83) & Riverside Drive (#4) – LOS F AM and PM peak hours
- Euclid Avenue (SR-83) & Chino Avenue (#5) – LOS F PM peak hour only
- Euclid Avenue (SR-83) & Schaefer Avenue (#6) – LOS F AM and PM peak hours
- Euclid Avenue (SR-83) & Edison Avenue (#7) – LOS F AM and PM peak hours
- Euclid Avenue (SR-83) & Eucalyptus Avenue (#8) – LOS F PM peak hour only
- Euclid Avenue (SR-83) & Merrill Avenue (#11) – LOS F AM and PM peak hours
- Euclid Avenue (SR-83) & Kimball Avenue (#12) – LOS F AM and PM peak hours
- Euclid Avenue (SR-83) & Pine Avenue (#14) – LOS F AM and PM peak hours
- SR-71 Southbound Ramps & Butterfield Ranch Road (#16) – LOS E AM and PM peak hours
- Bon View Avenue & Eucalyptus Avenue (#28) – LOS F PM peak hour only
- Bon View Avenue & Merrill Avenue (#29) – LOS F AM and PM peak hours
- Grove Avenue & Edison Avenue (#30) – LOS F AM and PM peak hours
- Grove Avenue & Eucalyptus Avenue (#31) – LOS F AM and PM peak hours
- Grove Avenue & Merrill Avenue (#32) – LOS F AM and PM peak hours
- Walker Avenue & Edison Avenue (#33) – LOS F AM and PM peak hours
- Walker Avenue/Flight Avenue & Merrill Avenue (#34) – LOS F AM and PM peak hours
- Baker Avenue/Van Vliet Avenue & Merrill Avenue (#35) – LOS E AM peak hour; LOS F PM peak hour
- Vineyard Avenue & Edison Avenue (#36) – LOS F AM and PM peak hours
- Vineyard Avenue/Hellman Avenue & Merrill Avenue (#37) – LOS F AM and PM peak hours
- Carpenter Avenue & Merrill Avenue (#38) – LOS F AM and PM peak hours
- Hellman Avenue & Edison Avenue (#39) – LOS F AM and PM peak hours
- Archibald Avenue & Ontario Ranch Road (#40) – LOS F AM and PM peak hours
- Archibald Avenue & Eucalyptus Avenue (#41) – LOS F AM and PM peak hours
- Archibald Avenue & Merrill Avenue (#42) – LOS F AM and PM peak hours
- Archibald Avenue & Limonite Avenue (#43) – LOS F AM and PM peak hours
- Turner Avenue & Ontario Ranch Road (#44) – LOS F AM and PM peak hours

- Haven Avenue & Ontario Ranch Road (#46) – LOS F AM and PM peak hours
- Hamner Avenue & Ontario Ranch Road (#49) – LOS F AM and PM peak hours

A summary of the peak hour intersection LOS for Horizon Year (2040) Without Project conditions is shown on Exhibit 7-5. The intersection operations analysis worksheets for Horizon Year (2040) Without Project traffic conditions are included in Appendix 7.1 of this TIA.

7.4.2 HORIZON YEAR (2040) WITH PROJECT TRAFFIC CONDITIONS

As shown on Table 7-1 and illustrated on Exhibit 7-6, the following study area intersection is anticipated to operate at a deficient LOS during one or both peak hours for Horizon Year (2040) With Project traffic conditions with the addition of Project traffic, in addition to the locations identified above for Horizon Year (2040) Without Project traffic conditions.

- Sultana Avenue & Merrill Avenue (#27) – LOS F PM peak hour only

The intersection operations analysis worksheets for Horizon Year (2040) With Project traffic conditions are included in Appendix 7.2 of this TIA.

7.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

The following study area intersections are anticipated to meet peak hour or planning level (ADT) volume-based traffic signal warrants for Horizon Year (2040) Without Project traffic conditions (see Appendix 7.3), in addition to those previously warranted under Existing, E+P, and Opening Year Cumulative traffic conditions:

- Bon View Avenue & Eucalyptus Avenue (#28)
- Bon View Avenue & Merrill Avenue (#29)
- Baker Avenue/Van Vliet Avenue & Merrill Avenue (#35)
- Vineyard Avenue & Edison Avenue (#36)
- Hellman Avenue & Edison Avenue (#39)

The following study area intersections are anticipated to meet peak hour volume-based traffic signal warrant for Horizon Year (2040) With Project traffic conditions (see Appendix 7.4), in addition to those previously warranted under Horizon Year (2040) Without Project traffic conditions:

- Sultana Avenue & Eucalyptus Avenue (#20)
- Sultana Avenue & Merrill Avenue (#27)

EXHIBIT 7-5: HORIZON YEAR (2040) WITHOUT PROJECT SUMMARY OF LOS

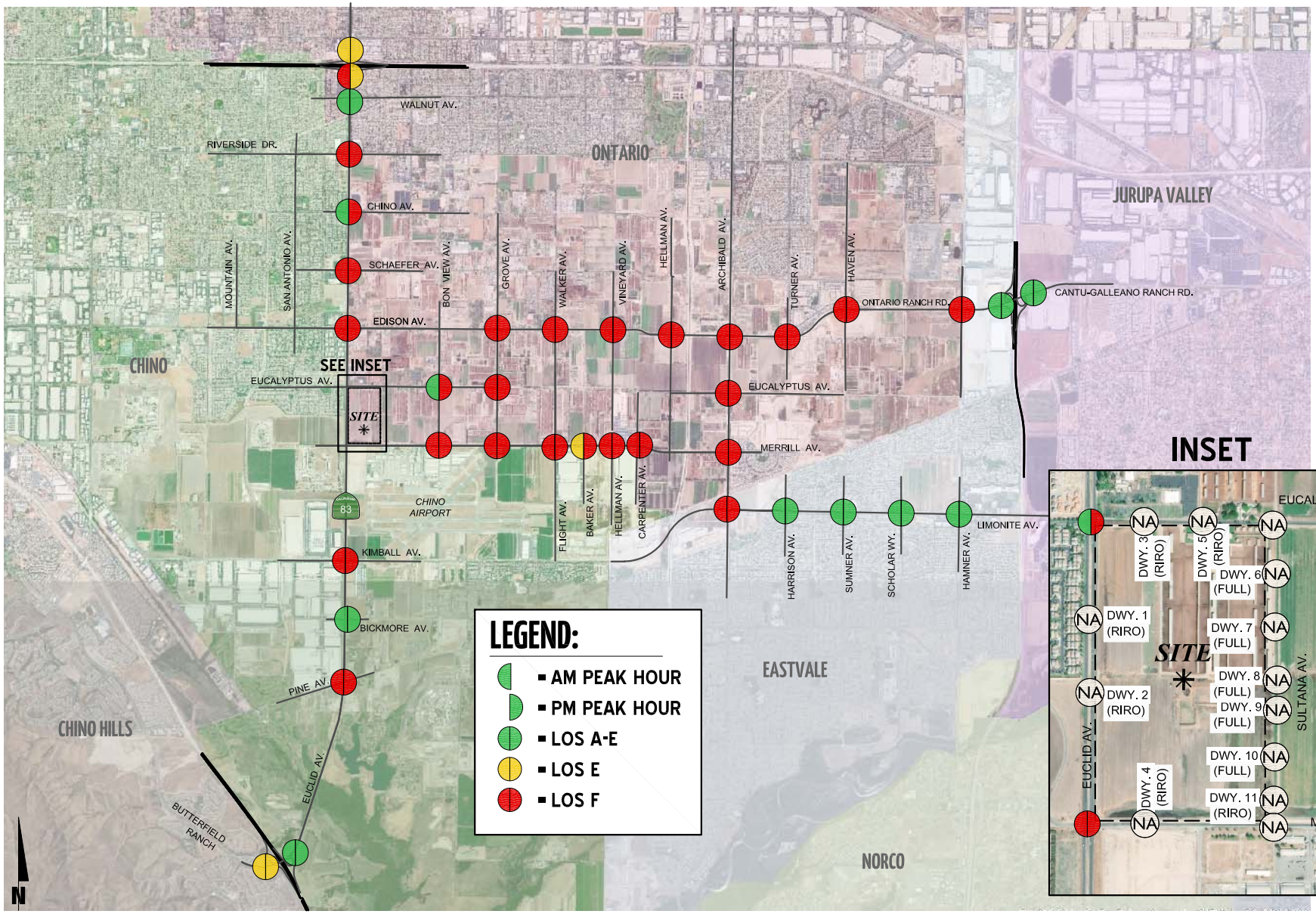


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EXHIBIT 7-6: HORIZON YEAR (2040) WITH PROJECT SUMMARY OF LOS

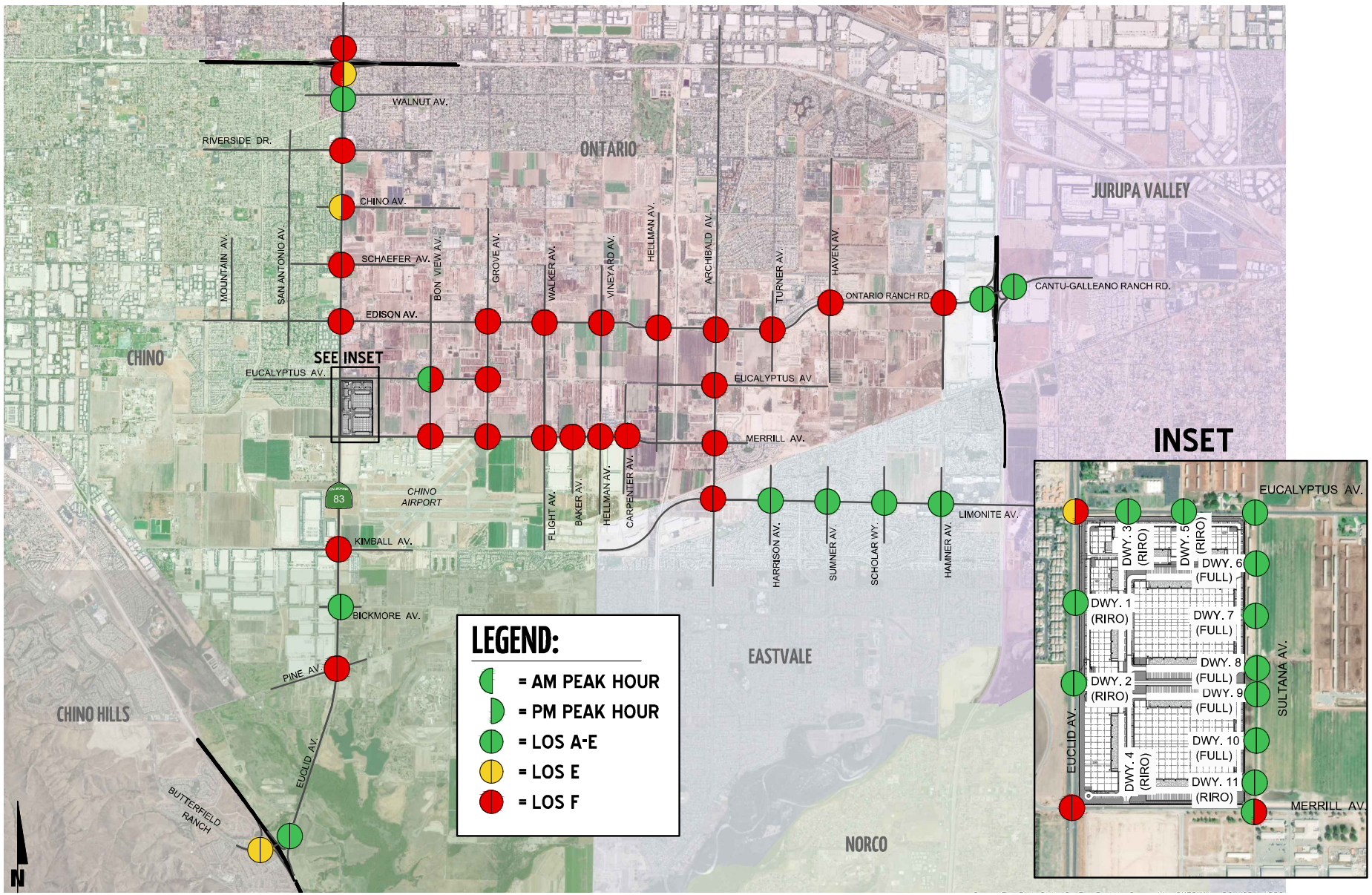

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Table 7-1

Intersection Analysis for Horizon Year (2040) Conditions

#	Intersection	Traffic Control[2]	2040 Without Project				2040 With Project				Acceptable LOS[3]
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
			AM	PM	AM	PM	AM	PM	AM	PM	
1	Euclid Av. (SR-83) & SR-60 WB Ramps	TS	**79.7**	**72.6**	**E**	**E**	**87.7**	**81.0**	**F**	**F**	D
2	Euclid Av. (SR-83) & SR-60 EB Ramps	TS	**81.4**	**58.9**	**F**	**E**	**90.9**	**67.8**	**F**	**E**	D
3	Euclid Av. (SR-83) & Walnut Av.	TS	54.8	54.1	D	D	55.9	55.5	E	E	E
4	Euclid Av. (SR-83) & Riverside Dr.	TS	**108.5**	**182.8**	**F**	**F**	**121.4**	**197.8**	**F**	**F**	D
5	Euclid Av. (SR-83) & Chino Av.	TS	51.4	**107.4**	D	**F**	**61.8**	**122.4**	**E**	**F**	D
6	Euclid Av. (SR-83) & Schaefer Av.	TS	**136.1**	**173.8**	**F**	**F**	**152.4**	**188.0**	**F**	**F**	D
7	Euclid Av. (SR-83) & Edison Av.	TS	**>200.0**	**>200.0**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**	D
8	Euclid Av. (SR-83) & Eucalyptus Av.	TS	52.2	**122.5**	D	**F**	**62.9**	**140.2**	**E**	**F**	D
9	Euclid Av. (SR-83) & Driveway 1	**CSS**	Future Intersection				20.5	29.4	C	D	D
10	Euclid Av. (SR-83) & Driveway 2	**CSS**	Future Intersection				20.7	29.1	C	D	D
11	Euclid Av. (SR-83) & Merrill Av.	TS	**126.7**	**>200.0**	**F**	**F**	**137.4**	**>200.0**	**F**	**F**	D
12	Euclid Av. (SR-83) & Kimball Av.	TS	**94.9**	**182.5**	**F**	**F**	**98.7**	**187.6**	**F**	**F**	D
13	Euclid Av. (SR-83) & Bickmore Av.	TS	50.9	53.3	D	D	52.0	54.3	D	D	D
14	Euclid Av. (SR-83) & Pine Av.	TS	**>200.0**	**>200.0**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**	D
15	SR-71 NB Ramps & Euclid Av. (SR-83)	TS	42.6	12.5	D	B	42.4	12.5	D	B	D
16	SR-71 SB Ramps & Butterfield Ranch Rd.	TS	**57.9**	**78.0**	**E**	**E**	**58.2**	**78.1**	**E**	**E**	D
17	Driveway 3 & Eucalyptus Av.	**CSS**	Future Intersection				9.8	16.8	A	C	D
18	Driveway 4 & Merrill Av.	**CSS**	Future Intersection				17.1	21.3	C	C	D
19	Driveway 5 & Eucalyptus Av.	**CSS**	Future Intersection				9.6	17.2	A	C	D
20	Sultana Av. & Eucalyptus Av.	**CSS**	Future Intersection				14.3	24.6	B	C	E
21	Sultana Av. & Driveway 6	**CSS**	Future Intersection				7.6	9.4	A	A	D
22	Sultana Av. & Driveway 7	**CSS**	Future Intersection				9.3	9.4	A	A	D
23	Sultana Av. & Driveway 8	**CSS**	Future Intersection				9.1	9.1	A	A	D
24	Sultana Av. & Driveway 9	**CSS**	Future Intersection				8.8	9.0	A	A	D
25	Sultana Av. & Driveway 10	**CSS**	Future Intersection				8.5	8.9	A	A	D
26	Sultana Av. & Driveway 11	**CSS**	Future Intersection				8.5	9.0	A	A	D
27	Sultana Av. & Merrill Av.	**CSS**	Future Intersection				21.1	**59.9**	C	**F**	D
28	Bon View Av. & Eucalyptus Av.	AWS	22.3	**>100.0**	C	**F**	37.0	**>100.0**	E	**F**	E
29	Bon View Av. & Merrill Av.	CSS	**70.5**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	D
30	Grove Av. & Edison Av.	AWS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	E
31	Grove Av. & Eucalyptus Av.	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	E
32	Grove Av. & Merrill Av.	AWS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	D
33	Walker Av. & Edison Av.	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	E
34	Walker Av./Flight Av. & Merrill Av.	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	D
35	Baker Av./Van Vliet Av. & Merrill Av.	CSS	**48.4**	**68.9**	**E**	**F**	**59.1**	**88.3**	**F**	**F**	D
36	Vineyard Av. & Edison Av.	**CSS**	**>200.0**	**>200.0**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**	E
37	Vineyard Av./Hellman Av. & Merrill Av.	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	D
38	Carpenter Av. & Merrill Av.	AWS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	D
39	Hellman Av. & Edison Av.	**CSS**	**>200.0**	**>200.0**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**	E
40	Archibald Av. & Ontario Ranch Rd.	TS	**>200.0**	**>200.0**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**	E
41	Archibald Av. & Eucalyptus Av.	TS	**111.2**	**181.5**	**F**	**F**	**112.0**	**183.9**	**F**	**F**	E
42	Archibald Av. & Merrill Av.	TS	**>200.0**	**>200.0**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**	E
43	Archibald Av. & Limonite Av.	TS	**>200.0**	**>200.0**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**	D
44	Turner Av. & Ontario Ranch Rd.	TS	**155.4**	**122.7**	**F**	**F**	**166.8**	**132.6**	**F**	**F**	E

Table 7-1

Intersection Analysis for Horizon Year (2040) Conditions

#	Intersection	Traffic Control[2]	2040 Without Project				2040 With Project				Acceptable LOS[3]
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
			AM	PM	AM	PM	AM	PM	AM	PM	
45	Harrison Av. & Limonite Av.	TS	29.9	26.3	C	C	30.3	27.8	C	C	D
46	Haven Av. & Ontario Ranch Rd.	TS	**185.8**	**83.7**	**F**	**F**	**195.3**	**86.0**	**F**	**F**	E
47	Sumner Av. & Limonite Av.	TS	30.5	39.5	C	D	31.1	40.7	C	D	D
48	Scholar Way & Limonite Av.	TS	22.2	30.3	C	C	22.6	30.8	C	C	D
49	Hamner Av. & Ontario Ranch Rd.	TS	**152.5**	**>200.0**	**F**	**F**	**156.8**	**>200.0**	**F**	**F**	D
50	Hamner Av. & Limonite Av.	TS	42.6	53.3	D	D	43.2	53.8	D	D	D
51	I-15 SB Ramps & Cantu Galleano Ranch Rd.	TS	18.7	15.6	B	B	19.7	15.9	B	B	D
52	I-15 NB Ramps & Cantu Galleano Ranch Rd.	TS	36.0	43.4	D	D	37.4	50.7	D	D	D

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

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

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

[3] Minimum acceptable LOS for each applicable jurisdiction.

7.6 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for Horizon Year (2040) Without and With Project traffic conditions are shown on Table 9-2. As shown on Table 7-2, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows with the addition of Project traffic. Worksheets for Horizon Year (2040) Without and With Project traffic conditions off-ramp queuing analysis are provided in Appendices 7.5 and 7.6, respectively.

7.7 FREEWAY FACILITY ANALYSIS

Horizon Year (2040) mainline directional volumes for the AM and PM peak hours are provided on Exhibits 7-7 and 7-8. As shown on Table 7-3, the following freeway segments and merge/diverge ramp junctions 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 and With Project traffic conditions:

- SR-60 Freeway Westbound, West of Euclid Avenue (SR-83) (#5) – LOS E AM and PM peak hours
- SR-60 Freeway Westbound, Off-Ramp at Euclid Avenue (SR-83) (#7) – LOS E AM peak hour; LOS F PM peak hour
- SR-60 Freeway Westbound, East of Euclid Avenue (SR-83) (#8) – LOS E AM peak hour; LOS F PM peak hour
- SR-60 Freeway Eastbound, West of Euclid Avenue (SR-83) (#9) – LOS F PM peak hour only
- SR-60 Freeway Eastbound, Off-Ramp at Euclid Avenue (SR-83) (#10) – LOS E AM peak hour; LOS F PM peak hour
- SR-60 Freeway Eastbound, On-Ramp at Euclid Avenue (SR-83) (#11) – LOS F PM peak hour only
- SR-60 Freeway Eastbound, East of Euclid Avenue (#12) – LOS F PM peak hour only
- I-15 Freeway Southbound, Off-Ramp at Cantu Galleano Ranch Road (#14) – LOS E AM peak hour; LOS F PM peak hour
- I-15 Freeway Northbound, On-Ramp at Cantu Galleano Ranch Road (#16) – LOS E AM and PM peak hours

Horizon Year (2040) Without and With Project freeway facility analysis worksheets are provided in Appendix 7.7 and 7.8, respectively.

Table 7-2

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)[3]		Acceptable?[1]		95th Percentile Queue (Feet)[3]		Acceptable?[1]	
			AM Peak	PM Peak	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
Euclid Avenue (SR-83) & SR-60 WB Ramps	WBL	400	483 [2]	441 [2]	Yes[3]	Yes[3]	503 [2]	452 [2]	Yes[3]	Yes[3]
	WBL/T/R	1,430	509 [2]	470 [2]	Yes	Yes	537 [2]	471 [2]	Yes	Yes
	WBR	400	380 [2]	346 [2]	Yes	Yes	395 [2]	353 [2]	Yes	Yes
Euclid Avenue (SR-83) & SR-60 EB Ramps	EBL	900	543 [2]	502	Yes	Yes	543 [2]	502 [2]	Yes	Yes
	EBT/R	1,270	843 [2]	677	Yes	Yes	921 [2]	704 [2]	Yes	Yes
SR-71 NB Ramps & Euclid Avenue (SR-83)	NBL	1,745	60	65	Yes	Yes	62	65	Yes	Yes
	NBR	420	170 [2]	1,191 [2]	Yes	Yes[3]	248 [2]	1,208 [2]	Yes	Yes[3]
SR-71 SB Ramps & Euclid Avenue (SR-83)	SBL	1,100	226	468 [2]	Yes	Yes	226	468 [2]	Yes	Yes
	SBL/T	1,560	228	482 [2]	Yes	Yes	228	482 [2]	Yes	Yes
	SBR	255	0	0	Yes	Yes	0	0	Yes	Yes
I-15 SB Ramps & Cantu Galleano Ranch Rd.	SBL	1,440	138	210	Yes	Yes	138	210	Yes	Yes
	SBT	560	501 [2]	472 [2]	Yes	Yes	526 [2]	481 [2]	Yes	Yes
	SBR	460	454 [2]	416 [2]	Yes[3]	Yes	478 [2]	425 [2]	Yes[3]	Yes
I-15 NB Ramps & Cantu Galleano	NBL	1,680	144 [2]	131 [2]	Yes	Yes	144 [2]	131 [2]	Yes	Yes
	NBR	440	58	47	Yes	Yes	58	47	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.

[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 SR-60, SR-71, or I-15 Freeway mainline.

Table 7-3

Freeway Facility Analysis for Horizon Year (2040) Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	2040 Without Project				2040 With Project			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]	Density[2]	LOS[3]
SR-71	SB	Southbound Loop On-Ramp at Euclid Avenue (SR-83)	2	21.2	C	17.0	B	21.2	C	17.2	B
		South of Euclid Avenue (SR-83)	2	30.9	D	24.0	C	31.0	D	24.3	C
	NB	Northbound Off-Ramp at Euclid Avenue (SR-83)	3	17.5	B	30.2	D	17.9	B	30.3	D
		South of Euclid Avenue (SR-83)	3	13.1	B	24.7	C	13.3	B	24.8	C
SR-60	Westbound	West of Euclid Avenue (SR-83)	4	**35.5**	**E**	**42.5**	**E**	**35.5**	**E**	**42.9**	**E**
		Westbound On-Ramp at Euclid Avenue (SR-83)	4	31.6	D	34.1	D	31.7	D	34.5	D
		Westbound Off-Ramp at Euclid Avenue (SR-83)	4	**41.3**	**E**	**43.5**	**F**	**41.6**	**E**	**43.6**	**F**
		East of Euclid Avenue (SR-83)	4	**37.9**	**E**	**45.0**	**F**	**38.2**	**E**	**45.0**	**F**
	Eastbound	West of Euclid Avenue (SR-83)	4	32.7	D	**45.0**	**F**	33.0	D	**45.0**	**F**
		Eastbound Off-Ramp at Euclid Avenue (SR-83)	4	**36.1**	**E**	**43.3**	**F**	**36.5**	**E**	**43.4**	**F**
		Eastbound On-Ramp at Euclid Avenue (SR-83)	4	31.2	D	**37.1**	**F**	31.3	D	**37.3**	**F**
		East of Euclid Avenue (SR-83)	4	34.7	D	**38.4**	**F**	34.8	D	**38.4**	**F**
I-15	SB	North of Cantu Galleano Ranch Road	4	31.6	D	20.1	C	31.9	D	20.2	C
		Southbound Off-Ramp at Cantu Galleano Ranch Road	4	**40.9**	**E**	**32.2**	**F**	**41.2**	**F**	**32.3**	**F**
	NB	North of Cantu Galleano Ranch Road	5	19.3	C	17.5	B	19.3	C	17.7	B
		Northbound On-Ramp at Cantu Galleano Ranch Road	3	**41.1**	**E**	**37.5**	**E**	**41.2**	**E**	**37.8**	**E**

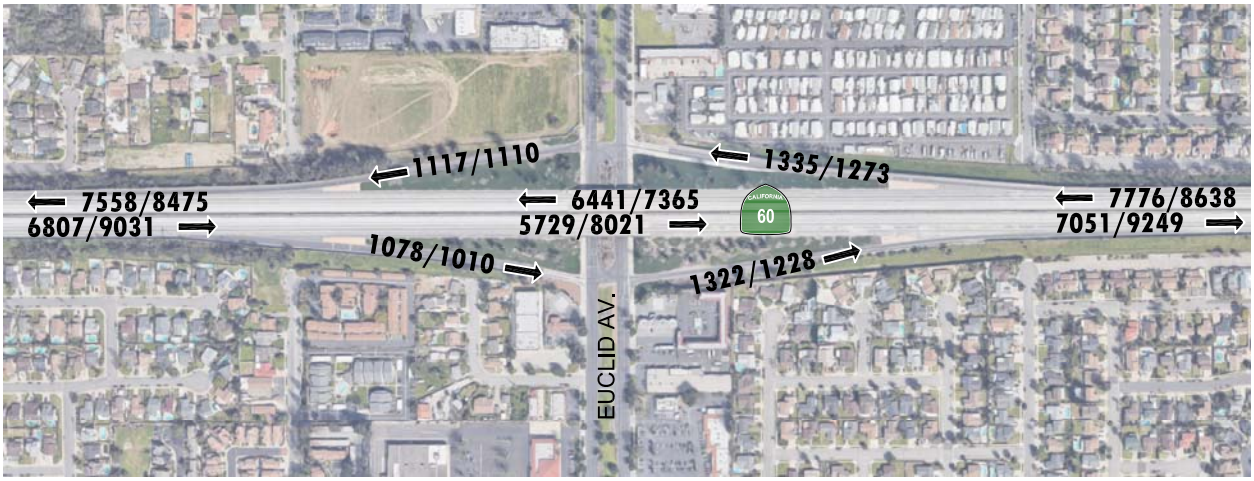
* **BOLD** = Unacceptable Level of Service

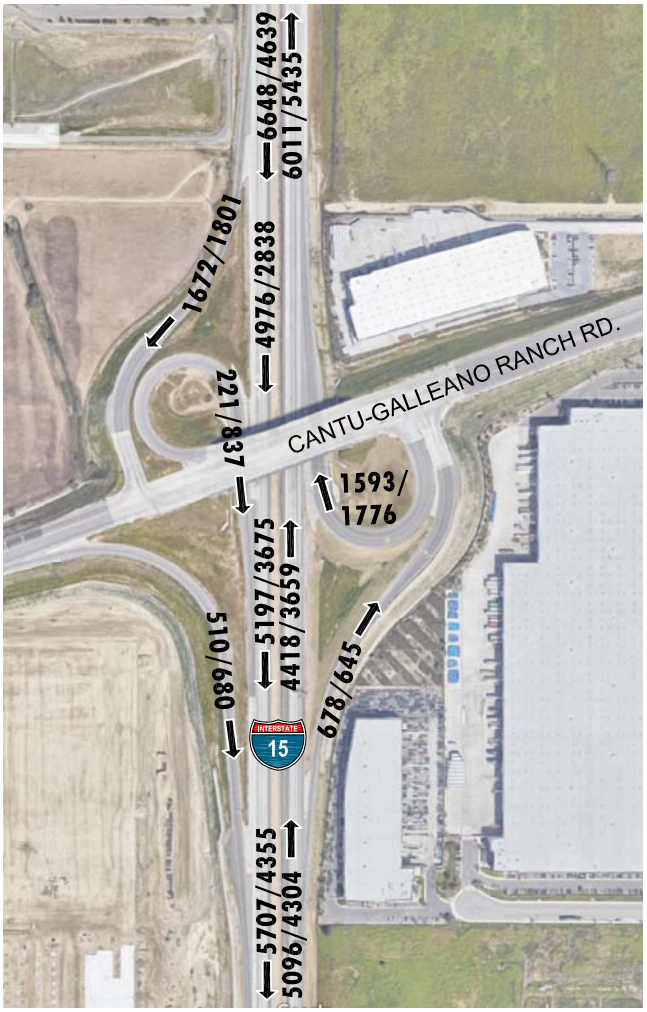
[1] Number of lanes are in the specified direction and is based on existing conditions.

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

[3] LOS = Level of Service

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





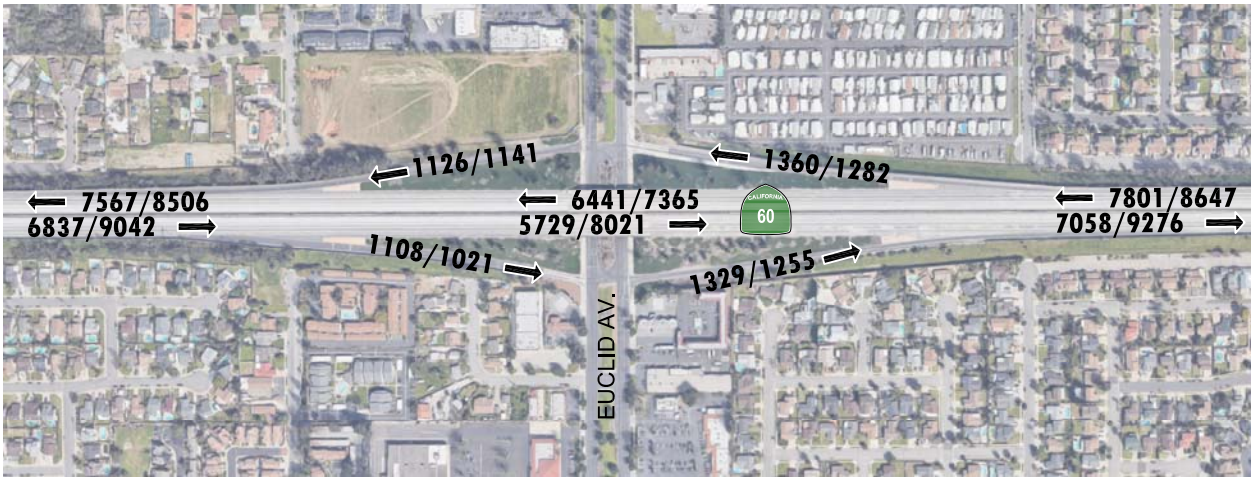
LEGEND:

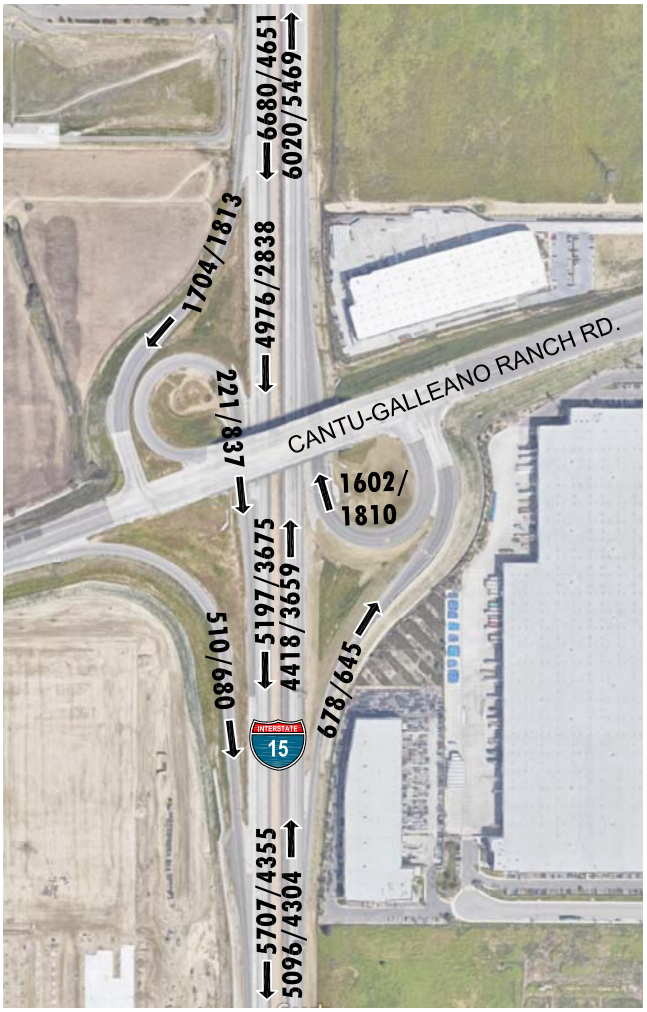
⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

N

EXHIBIT 7-8: HORIZON YEAR (2040) WITH PROJECT FREEWAY MAINLINE VOLUMES





LEGEND:

⟵ 100/200 = AM/PM PEAK HOUR VOLUMES

NOTE: VOLUMES IN ACTUAL VEHICLES (NOT PCE)

N

7.8 HORIZON YEAR (2040) DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

7.8.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as deficient, in an effort to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS D/E or better). Intersections have been identified at deficient intersections if the Project causes a new deficiency or contributes 50 or more peak hour trips to an intersection that operates at a deficient LOS under pre-project traffic conditions. The effectiveness of the recommended improvement strategies to address Horizon Year (2040) traffic deficiencies are presented on Table 7-4.

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 Ontario DIF (if the improvements are included in the DIF program) or on a fair share basis (if the improvements are not included in the DIF program. These fees shall be collected by the City of Ontario, 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 on Table 9-4 have been identified as being included as part of City DIF fee program or fair share contribution in Section 8 *Local and Regional Funding Mechanisms* of this TIA.

Worksheets for Horizon Year (2040) Without and With Project conditions, with improvements, HCM calculation worksheets are provided in Appendix 7.9 and Appendix 7.10, respectively.

7.8.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON OFF-RAMP QUEUES

As shown previously on Table 7-2, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows for Horizon Year (2040) traffic conditions. As such, no improvements have been recommended.

7.8.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

SHS facilities are owned and maintained by Caltrans. Improvements to the SHS is regional/state-wide and Caltrans' responsibility. Improvements to freeway facilities LOS deficiencies is addressed through Caltrans regional improvement plans and programs. At this time, Caltrans has no plans or programs in place to address development-specific deficiencies affecting the SHS. There are no feasible measures to address LOS deficiencies that can be autonomously implemented by the Lead Agency or the Project Applicant.

Table 7-4

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						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
1	Euclid Av. (SR-83) & SR-60 WB Ramps																	
	Without Project	TS	**2**	2	0	0	2	1	0	0	0	1	1	1	32.4	28.9	C	C
	With Project	TS	**2**	2	0	0	2	1	0	0	0	1	1	1	36.2	32.9	D	C
2	Euclid Av. (SR-83) & SR-60 EB Ramps																	
	Without Project	TS	0	2	1	**2**	2	0	1	1	**1**	0	0	0	28.1	21.9	C	C
	With Project	TS	0	2	1	**2**	2	0	1	1	**1**	0	0	0	30.7	22.1	C	C
4	Euclid Av. (SR-83) & Riverside Dr.																	
	Without Project	TS	**2**	**3**	**1**	**2**	**3**	1>	1	**2**	**1**	1	2	d	36.8	45.4	D	D
	With Project	TS	**2**	**3**	**1**	**2**	**3**	1>	1	**2**	**1**	1	2	d	37.2	46.4	D	D
5	Euclid Av. (SR-83) & Chino Av.																	
	Without Project	TS	1	**3**	1	1	**3**	1	1	1	1	**1**	1	0	25.6	35.3	C	D
	With Project	TS	1	**3**	1	1	**3**	1	1	1	1	**1**	1	0	26.1	37.7	C	D
6	Euclid Av. (SR-83) & Schaefer Av.																	
	Without Project	TS	**2**	**3**	1	**2**	**3**	1	**2**	1	1	1	1	0	50.1	40.4	D	D
	With Project	TS	**2**	**3**	1	**2**	**3**	1	**2**	1	1	1	1	0	54.9	42.9	D	D
7	Euclid Av. (SR-83) & Edison Av.																	
	Without Project	TS	**2**	**3**	1	**2**	**3**	**1>**	**2**	**3**	1	**2**	**2**	**1>**	41.0	42.3	D	D
	With Project	TS	**2**	**3**	1	**2**	**3**	**1>**	**2**	**3**	1	**2**	**2**	**1>**	42.7	44.1	D	D
8	Euclid Av. (SR-83) & Eucalyptus Av.																	
	Without Project	TS	1	**3**	1	1	**3**	1	1	1	1	**2**	1	**1**	24.2	41.9	C	D
	With Project	TS	1	**3**	1	1	**3**	1	1	1	1	**2**	1	**1**	26.6	47.3	C	D
11	Euclid Av. (SR-83) & Merrill Av.																	
	Without Project	TS	1	**3**	**1>**	1	**3**	0	**1**	1	0	**2**	1	**1>**	25.3	50.4	C	D
	With Project	TS	1	**3**	**1>**	1	**3**	0	**1**	1	0	**2**	1	**1>**	27.0	54.6	C	D
12	Euclid Av. (SR-83) & Kimball Av.																	
	Without Project	TS	1	**3**	1>	2	**3**	1>	2	2	**1**	**2**	2	**1>**	35.7	54.3	D	D
	With Project	TS	1	**3**	1>	2	**3**	1>	2	2	**1**	**2**	2	**1>**	35.9	54.9	D	D
14	Euclid Av. (SR-83) & Pine Av.																	
	Without Project	TS	**2**	**3**	**1>>**	**2**	**3**	**1**	1	**2**	1	2	**2**	**1**	38.3	39.9	D	D
	With Project	TS	**2**	**3**	**1>>**	**2**	**3**	**1**	1	**2**	1	2	**2**	**1**	38.6	40.5	D	D
27	Sultana Av. & Merrill Av.																	
	Without Project		Not Applicable															
	With Project	CSS	0	0	0	0	1	0	1	**2**	0	0	**2**	1	17.5	29.3	C	D
28	Bon View Av. & Eucalyptus Av.																	
	Without Project	**TS**	0	1	0	0	1	0	**1**	1	0	**1**	1	0	10.8	10.7	B	B
	With Project	**TS**	0	1	0	0	1	0	**1**	1	0	**1**	1	0	11.3	11.3	B	B
29	Bon View Av. & Merrill Av.																	
	Without Project	**TS**	0	0	0	0	1	0	**1**	**2**	0	0	**2**	0	12.3	13.4	B	B
	With Project	**TS**	0	0	0	0	1	0	**1**	**2**	0	0	**2**	0	13.2	13.5	B	B

Table 7-4

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						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
30	Grove Av. & Edison Av.																	
	Without Project	**TS**	**1**	**2**	**1**	**1**	**2**	0	**1**	**3**	0	**1**	**3**	0	41.9	67.1	D	E
	With Project	**TS**	**1**	**2**	**1**	**1**	**2**	0	**1**	**3**	0	**1**	**3**	0	44.4	75.4	D	E
31	Grove Av. & Eucalyptus Av.																	
	Without Project	**TS**	**1**	**2**	0	**1**	**2**	0	**1**	1	0	**1**	1	0	28.9	37.8	C	D
	With Project	**TS**	**1**	**2**	0	**1**	**2**	0	**1**	1	0	**1**	1	0	29.3	43.5	C	D
32	Grove Av. & Merrill Av.																	
	Without Project	**TS**	0	0	0	**1**	**0**	**1**	**1**	**2**	0	0	**2**	0	37.0	40.2	D	D
	With Project	**TS**	0	0	0	**1**	**0**	**1**	**1**	**2**	0	0	**2**	0	39.1	40.2	D	D
33	Walker Av. & Edison Av.																	
	Without Project	**TS**	**1**	1	0	**1**	1	0	**1**	**3**	0	**1**	**3**	0	27.3	40.8	C	D
	With Project	**TS**	**1**	1	0	**1**	1	0	**1**	**3**	0	**1**	**3**	0	27.4	42.5	C	D
34	Walker Av./Flight Av. & Merrill Av.																	
	Without Project	**TS**	**1**	**1**	**0**	**1**	**1**	0	**1**	**2**	**0**	1	**2**	0	26.3	26.8	C	C
	With Project	**TS**	**1**	**1**	**0**	**1**	**1**	0	**1**	**2**	**0**	1	**2**	0	26.9	27.6	C	C
35	Baker Av./Van Vliet Av. & Merrill Av.																	
	Without Project	**TS**	0	1	0	0	**1**	0	**1**	2	0	1	**2**	0	12.6	11.4	B	B
	With Project	**TS**	0	1	0	0	**1**	0	**1**	2	0	1	**2**	0	12.8	11.5	B	B
36	Vineyard Av. & Edison Av.																	
	Without Project	**TS**	**1**	**1**	**1**	**1**	**1**	0	**1**	**3**	0	**1**	**3**	0	18.4	55.8	B	E
	With Project	**TS**	**1**	**1**	**1**	**1**	**1**	0	**1**	**3**	0	**1**	**3**	0	18.7	59.2	B	E
37	Vineyard Av./Hellman Av. & Merrill Av.																	
	Without Project	**TS**	1	**1**	1	**1**	**1**	**1**	**1**	2	0	1	**2**	**1**	42.1	48.6	D	D
	With Project	**TS**	1	**1**	1	**1**	**1**	**1**	**1**	2	0	1	**2**	**1**	43.3	50.8	D	D
38	Carpenter Av. & Merrill Av.																	
	Without Project	**TS**	0	1	0	0	1	0	1	**2**	1	1	**2**	0	17.9	13.7	B	B
	With Project	**TS**	0	1	0	0	1	0	1	**2**	1	1	**2**	0	18.0	13.8	B	B
39	Hellman Av. & Edison Av.																	
	Without Project	**TS**	**1**	**1**	0	**1**	**1**	0	**1**	**3**	0	**1**	**3**	0	19.7	48.5	B	D
	With Project	**TS**	**1**	**1**	0	**1**	**1**	0	**1**	**3**	0	**1**	**3**	0	20.1	51.5	C	D
40	Archibald Av. & Ontario Ranch Rd.																	
	Without Project	TS	**2**	**3**	1>>	**2**	**3**	**1>**	2	**4**	1>>	2	**4**	1	64.1	74.6	E	E
	With Project	TS	**2**	**3**	1>>	**2**	**3**	**1>**	2	**4**	1>>	2	**4**	1	64.8	77.3	E	E
42	Archibald Av. & Merrill Av.																	
	Without Project	TS	1	**3**	1	2	**3**	**1>**	**2**	1	**1>>**	1	1	1	58.9	55.9	E	E
	With Project	TS	1	**3**	1	2	**3**	**1>**	**2**	1	**1>>**	1	1	1	68.6	62.1	E	E
43	Archibald Av. & Limonite Av.																	
	Without Project	TS	**1**	**3**	1>	**2**	**3**	0	**2**	**2**	0	**2**	**2**	1>	40.5	51.9	D	D
	With Project	TS	**1**	**3**	1>	**2**	**3**	0	**2**	**2**	0	**2**	**2**	1>	41.0	54.0	D	D

Table 7-4

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						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
44	Turner Av. & Ontario Ranch Rd.																	
	Without Project	TS	1	1	0	1	1	0	1	**3**	1	1	**3**	1	31.8	28.1	C	C
	With Project	TS	1	1	0	1	1	0	1	**3**	1	1	**3**	1	34.5	29.5	C	C
46	Haven Av. & Ontario Ranch Rd.																	
	Without Project	TS	1	**2**	1	1	**2**	1	1	3	1	1	**3**	1	59.5	43.5	E	D
	With Project	TS	1	**2**	1	1	**2**	1	1	3	1	1	**3**	1	61.6	44.3	E	D
49	Hamner Av. & Ontario Ranch Rd.																	
	Without Project[4]	TS	2	3	**1>**	2	**3**	**0**	2	4	**1>**	2	**3**	1	38.8	54.4	D	D
	With Project[4]	TS	2	3	**1>**	2	**3**	**0**	2	4	**1>**	2	**3**	1	38.9	54.9	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; >> = Free Right Turn Lane; d = Defacto Right Turn Lane; **1** = Improvement

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

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

[4] Improvement consists of modifying the traffic signal to extend the cycle length to 130 seconds.

8 LOCAL AND REGIONAL FUNDING MECHANISMS

Transportation improvements within the City of Ontario are funded through a combination of improvements constructed by the Project, development impact fee programs or fair share contributions, such as the City of Ontario Development Impact Fee (DIF) program. Identification and timing of needed improvements is generally determined through local jurisdictions based upon a variety of factors.

8.1 CITY OF ONTARIO DEVELOPMENT IMPACT FEE PROGRAM

The City of Ontario 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 October 2017 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 8-1: ESTIMATED FEE OBLIGATION

Fee Reference	Industrial ($ PER SQ. FT.)	Business Park ($ PER SQ. FT.)
Ontario Ranch DIF: Regional Streets Component	$1.169/SF	$2.269/SF
Ontario Ranch DIF: Local Streets Component	$1.754/SF	$3.403/SF

* Ontario Ranch DIF rates effective as of October 16, 2017.

Fee Calculation

Program	Category	Unit Cost	Units/Sq.Ft.	Local Circulation
Local/Regional Impacts	Industrial	$2.92	1,577,153	$4,610,018
	Business Park	$5.67	327,874	$1,859,701

Total Transportation Impact Fees	**$6,469,720**

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 improvement requirements at potentially affected DIF-funded facilities.

8.2 MEASURE "I" FUNDS

In 2004, the voters of San Bernardino County approved the 30-year extension of Measure "I," a one-half of one percent sales tax on retail transactions, through the year 2040, for transportation projects including, but not limited to, infrastructure improvements, commuter rail, public transit, and other identified improvements. The Measure "I" extension requires that a regional traffic impact fee be created to ensure development is paying its fair share. A regional Nexus study was prepared by SBCTA and concluded that each jurisdiction should include a regional fee component in their local programs in order to meet the Measure "I" requirement. The regional component assigns specific facilities and cost sharing formulas to each jurisdiction and was most recently updated in November 2011. Revenues collected through these programs are used in tandem with Measure "I" funds to deliver projects identified in the Nexus Study. While Measure "I" is a self-executing sales tax administered by SBCTA, it bears discussion here because the funds raised through Measure "I" have funded in the past and will continue to fund new transportation facilities in San Bernardino County.

8.3 FAIR SHARE CONTRIBUTION

Project improvements 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, has been provided on Table 10-2 for the applicable deficient study area intersections.

Table 8-2

Project Fair Share Calculations for Intersections

#	Intersection		Existing	Total Project	2040 With Project Volume	Total New Traffic	Project % of New Traffic
4	Euclid Av. (SR-83) & Riverside Dr.						
		AM:	3,696	130	5,496	1,800	**7.222%**
		PM:	3,753	144	5,996	2,243	6.420%
5	Euclid Av. (SR-83) & Chino Av.						
		AM:	2,877	133	4,525	1,648	**8.070%**
		PM:	3,116	146	5,039	1,923	7.592%
6	Euclid Av. (SR-83) & Schaefer Av.						
		AM:	2,746	136	4,940	2,194	**6.199%**
		PM:	3,302	150	5,999	2,697	5.562%
7	Euclid Av. (SR-83) & Edison Av.						
		AM:	3,143	171	6,653	3,510	4.872%
		PM:	3,926	189	7,704	3,778	**5.003%**
8	Euclid Av. (SR-83) & Eucalyptus Av.						
		AM:	2,724	195	4,735	2,011	**9.697%**
		PM:	3,077	200	5,756	2,679	7.465%
11	Euclid Av. (SR-83) & Merrill Av.						
		AM:	2,829	85	5,008	2,179	**3.901%**
		PM:	3,203	98	6,240	3,037	3.227%
12	Euclid Av. (SR-83) & Kimball Av.						
		AM:	3,406	54	5,746	2,340	**2.308%**
		PM:	3,919	59	6,622	2,703	2.183%
14	Euclid Av. (SR-83) & Pine Av.						
		AM:	3,519	51	5,331	1,812	**2.815%**
		PM:	3,639	55	6,548	2,909	1.891%
28	Bon View Av. & Eucalyptus Av.						
		AM:	457	85	1,138	681	**12.482%**
		PM:	475	102	1,657	1,182	8.629%
29	Bon View Av. & Merrill Av.						
		AM:	905	114	1,924	1,019	**11.187%**
		PM:	1,079	127	2,216	1,137	11.170%
30	Grove Av. & Edison Av.						
		AM:	1,328	82	4,580	3,252	2.522%
		PM:	1,594	98	5,180	3,586	**2.733%**
31	Grove Av. & Eucalyptus Av.						
		AM:	744	82	2,059	1,315	**6.236%**
		PM:	868	98	2,554	1,686	5.813%
32	Grove Av. & Merrill Av.						
		AM:	1,213	114	2,773	1,560	7.308%
		PM:	1,334	127	3,048	1,714	**7.410%**
33	Walker Av. & Edison Av.						
		AM:	979	63	3,545	2,566	**2.455%**
		PM:	1,228	75	4,660	3,432	2.185%

Table 8-2

Project Fair Share Calculations for Intersections

#	Intersection		Existing	Total Project	2040 With Project Volume	Total New Traffic	Project % of New Traffic
34	Walker Av./Flight Av. & Merrill Av.						
		AM:	1,244	112	2,853	1,609	6.961%
		PM:	1,266	128	2,908	1,642	**7.795%**
35	Baker Av./Van Vliet Av. & Merrill Av.						
		AM:	1,035	107	2,400	1,365	7.839%
		PM:	1,082	121	2,459	1,377	**8.787%**
36	Vineyard Av. & Edison Av.						
		AM:	903	59	4,573	3,670	1.608%
		PM:	1,162	71	5,574	4,412	**1.609%**
37	Vineyard Av./Hellman Av. & Merrill Av.						
		AM:	1,006	108	3,171	2,165	4.988%
		PM:	1,105	121	3,451	2,346	**5.158%**
39	Hellman Av. & Edison Av.						
		AM:	903	57	4,719	3,816	**1.494%**
		PM:	1,162	68	5,728	4,566	1.489%
40	Archibald Av. & Ontario Ranch Rd.						
		AM:	3,168	84	7,736	4,568	**1.839%**
		PM:	3,125	96	8,511	5,386	1.782%
42	Archibald Av. & Merrill Av.						
		AM:	2,842	93	4,841	1,999	**4.652%**
		PM:	2,698	103	5,213	2,515	4.095%
43	Archibald Av. & Limonite Av.						
		AM:	2,711	57	5,732	3,021	**1.887%**
		PM:	2,762	66	7,203	4,441	1.486%
49	Hamner Av. & Ontario Ranch Rd.						
		AM:	3,660	66	6,364	2,704	**2.441%**
		PM:	4,340	73	7,559	3,219	2.268%

BOLD = Denotes highest fair share percentage.

9 REFERENCES

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