Kimball Business Center (Renamed: Altitude Business Centre)

TRAFFIC IMPACT ANALYSIS

CITY OF CHINO

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LIST OF EXHIBITS

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LIST OF ABBREVIATED TERMS

(1)	Reference
AASHTO	American Association of State Highway Transportation Officials
ADT	Average Daily Traffic
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
CMP	Congestion Management Program
CTM	Chino Traffic Model
DIF	Development Impact Fee
E+P	Existing Plus Project
FHWA	Federal Highway Administration
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
MUTCD	Manual on Uniform Traffic Control Devices
NCHRP	National Cooperative Highway Research Program
NP	No Project (or Without Project)
PCE	Passenger Car Equivalents
PHF	Peak Hour Factor
Project	Kimball Business Center
RTA	Riverside Transport Authority
RTP	Regional Transportation Plan
SBCTA	San Bernardino County Transportation Authority
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
sf	Square Feet
TIA	Traffic Impact Analysis
WP	With Project

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1 INTRODUCTION

This report presents the results of the traffic impact analysis (TIA) for the proposed Kimball Business Center ("Project") between Kimball Avenue and Bickmore Avenue on either side of the future Mayhew Avenue in the City of Chino, as shown on Exhibit 1-1.

The purpose of this TIA is to evaluate the potential circulation system deficiencies that may result from the development of the proposed Project, and to recommend improvements to achieve acceptable circulation system operational conditions. As directed by City of Chino staff, 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 scoping process. (1) (2) The approved Project Traffic Study Scoping agreement is provided in Appendix 1.1 of this TIA.

1.1 PROJECT OVERVIEW

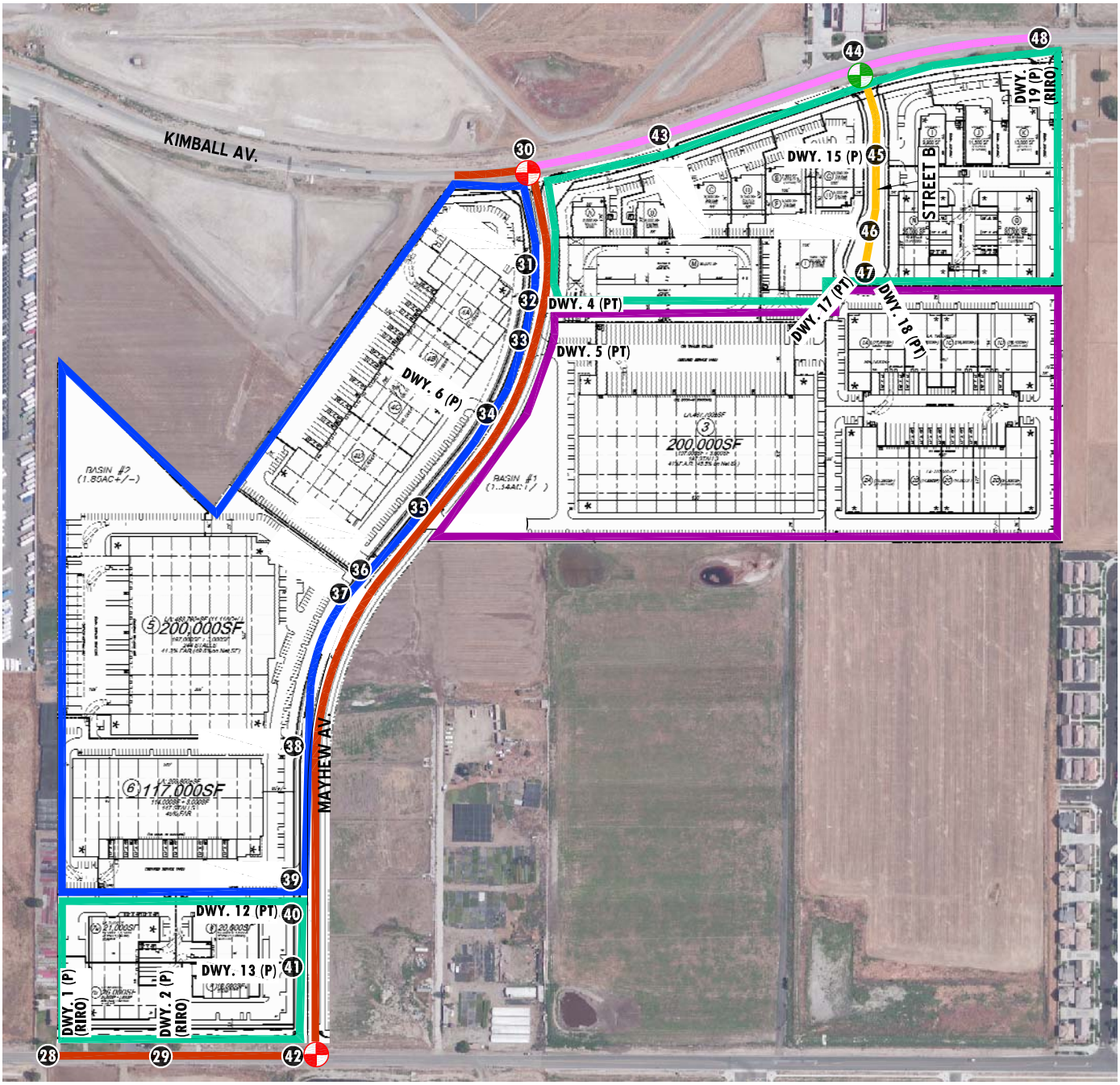
Exhibit 1-1 illustrates the preliminary Project site plan. As indicated on Exhibit 1-1, the total development is proposed to consist of up to 1,313,000 square feet (sf) of building space, specifically with the following uses:

- 715,000 sf of warehousing use within 4 buildings (Buildings 3, 4, 5, and 6). Warehouse use has been utilized for a portion of the buildings that are proposed to include dock doors.
- 255,000 sf of general light industrial use within 3 buildings (Buildings 1, 2, N, and O). General Light Industrial use has been utilized for remaining buildings that are proposed to include dock doors.
- 233,000 sf of business park use within 14 buildings (Buildings 7A, 7B, 8, 9, and A through L). The business park land use has been utilized for all the remaining smaller buildings without dock doors.
- 110,000 sf of self-storage use within 1 building (Building 2).

The Project is planned to be completed in 3 phases, as illustrated in Exhibit 1-1:

- Phase 1 (2018): Buildings 4, 5, and 6 – 515,000 sf Warehouse use
- Phase 2 (2019): Buildings 1, 2, and 3 – 194,000 sf of General Light Industrial use and 200,000 sf Warehouse use
- Phase 3 (2020): Buildings M, N, O, 7A, 7B, 8, 9, and A through L – 61,000 sf General Light Industrial use, 233,000 sf Business Park use, and 110,000 sf of Self-Storage use

EXHIBIT 1-1: SITE PLAN



LEGEND:

RIRO	= RIGHT-IN/RIGHT-OUT ONLY ACCESS
P	= PASSENGER CARS ONLY
T	= TRUCKS ONLY
PT	= PASSENGER CARS AND TRUCKS

= PHASE 1 (2018)
= PHASE 2 (2019)
= PHASE 3 (2020)

= PHASE 1 (2018) FULL-SECTION ROADWAY IMPROVEMENT
= PHASE 2 (2019) FULL-SECTION ROADWAY IMPROVEMENT
= PHASE 3 (2020) FULL-SECTION ROADWAY IMPROVEMENT
= PHASE 1 TRAFFIC SIGNAL
= PHASE 2 TRAFFIC SIGNAL

NOTE: UNLESS NOTED, ALL DRIVEWAYS ARE ASSUMED TO BE FULL ACCESS.

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URBAN CROSSROADS

Regional access to the Project is provided by the State Route 71 (SR-71) and State Route 60 (SR-60) freeways. Vehicular and truck traffic access will be provided via the following driveways (see Exhibit 1-1):

- Driveway 1 / Bickmore Avenue – Right-in/right-out driveway providing access to passenger cars only for Buildings 7A/7B
- Driveway 2 / Bickmore Avenue – Right-in/right-out driveway providing access to both passenger cars only for Buildings 7A/7B and 8/9
- Mayhew Avenue / Driveway 3 – Right-in/right-out driveway providing access to passenger cars only for Building 4
- Mayhew Avenue / Driveway 4 – Full access driveway providing access to both passenger cars and trucks for Buildings A, B, M, and 4
- Mayhew Avenue / Driveway 5 – Full access driveway providing access to both passenger cars and trucks for Building 3
- Mayhew Avenue / Driveway 6 – Full access driveway providing access to passenger cars only for Building 4
- Mayhew Avenue / Driveway 7 – Full access driveway providing access to passenger cars only for Building 3
- Mayhew Avenue / Driveway 8 – Full access driveway providing access to both passenger cars and trucks for Building 6
- Mayhew Avenue / Driveway 9 – Full access driveway providing access to both passenger cars and trucks for Building 5
- Mayhew Avenue / Driveway 10 – Full access driveway providing access to both passenger cars and trucks for Buildings 5 & 6
- Mayhew Avenue / Driveway 11 – Full access driveway providing access to both passenger cars and trucks for Building 6
- Mayhew Avenue / Driveway 12 – Full access driveway providing access to both passenger cars and trucks for Buildings 8 and 9
- Mayhew Avenue / Driveway 13 – Full access driveway providing access to passenger cars only for Buildings 8 and 9
- Driveway 14 / Kimball Avenue – Right-in/right-out driveway providing access to passenger cars only for Buildings A, B, C, and D
- Street B / Driveway 15 – Full access driveway providing access to both passenger cars and trucks for Buildings E through K

- Street B / Driveway 16 – Full access driveway providing access to passenger cars only for Buildings L and M
- Street B/Driveway 17 / Driveway 18 – Full access driveway providing access to both passenger cars and trucks for Buildings 1, 2, and 3
- Driveway 19 / Kimball Avenue - Right-in/right-out driveway providing access to passenger cars only for Buildings I through K

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*, 9th Edition, 2012. (3) The proposed Project (Project buildout) is anticipated to generate a net total of 9,144 passenger car equivalent (PCE) trip-ends per day, 960 PCE AM peak hour trips and 975 PCE PM peak hour trips. In comparison, the proposed Project (Project Buildout) is anticipated to generate a net total of 7,496 actual vehicle trip-ends per day with 791 AM peak hour trips and 798 PM peak hour trips. The assumptions and methods used to estimate the Project's trip generation characteristics are discussed in greater detail in Section 4.1 *Project Trip Generation* of this report.

1.2 ANALYSIS SCENARIOS

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

- Existing (2016)
- Existing plus Project (E+P)
    - Existing plus Project (Phase 1)
    - Existing plus Project (Phase 1+2)
    - Existing plus Project (Project Buildout)
- Opening Year Cumulative Without Project
    - Opening Year Cumulative (2018) Without Project
    - Opening Year Cumulative (2019) Without Project
    - Opening Year Cumulative (2020) Without Project
- Opening Year Cumulative With Project
    - Opening Year Cumulative (2018) With Project (Phase 1)
    - Opening Year Cumulative (2019) With Project (Phases 1+2)
    - Opening Year Cumulative (2020) With Project (Project Buildout)
- Horizon Year (2040) Without Project
- Horizon Year (2040) With Project (Project Buildout)

1.2.1 EXISTING (2016) CONDITIONS

Information for Existing (2016) conditions is disclosed to represent the baseline traffic conditions as they existed at the time this report was prepared.

1.2.2 EXISTING PLUS PROJECT CONDITIONS

The Existing Plus Project (E+P) analysis determines circulation system deficiencies that would occur on the existing roadway system in the scenario of the Project being placed upon Existing conditions. The E+P analysis is intended to identify the project-specific traffic impacts associated solely with the development of the proposed Project based on a comparison of the E+P traffic conditions to Existing (2016) conditions. For the purposes of this analysis, E+P traffic conditions has been evaluated for each phase of development.

1.2.3 OPENING YEAR CUMULATIVE CONDITIONS

The Opening Year Cumulative conditions analysis determines the potential near-term cumulative circulation system deficiencies. The Opening Year Cumulative traffic conditions analyses determine the potential near-term cumulative circulation system deficiencies. To account for background traffic growth, traffic associated with other known cumulative development projects in conjunction with an ambient growth factor from Existing conditions of 4.04% (for 2018 conditions), 6.12% (for 2019 conditions), and 8.24% (for 2020 conditions) are included for Opening Year Cumulative traffic conditions. This comprehensive list was compiled from information provided by the City of Chino 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 Chino. 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 Chino (lead agency). It should be noted that the City of Chino 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 cumulative mitigation. 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 Chino's traffic study requirements, Urban Crossroads, Inc. prepared a project traffic study scoping package for review by City staff prior to the preparation of this report. The Agreement provides an outline of the Project study area, trip generation, trip distribution, and analysis methodology. The Agreement approved by the City is included in Appendix 1.1.

1.3.1 INTERSECTIONS

The following 61 study area intersections shown on Exhibit 1-2 and listed in Table 1-1 were selected for this TIA based on consultation with City of Chino staff.

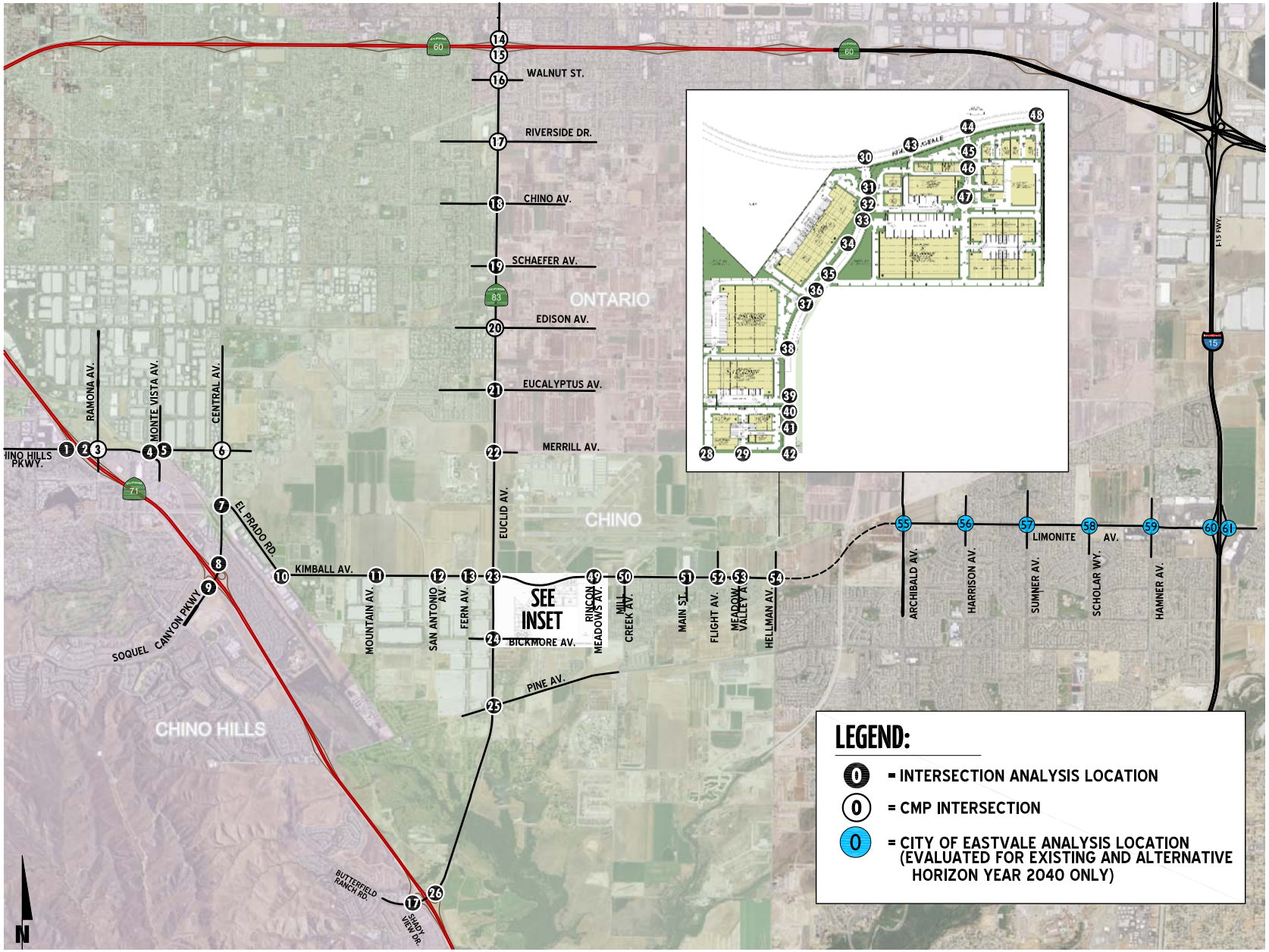
TABLE 1-1: INTERSECTION ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction	CMP?
1	SR-71 SB Ramps / Chino Hills Pkwy.	Caltrans	No
2	SR-71 NB Ramps / Chino Hills Pkwy.	Caltrans	No
3	Ramona Av. / Chino Hills Pkwy.	Chino	Yes
4	Monte Vista Av. West / Chino Hills Pkwy.	Chino	No
5	Monte Vista Av. East / Chino Hills Pkwy.	Chino	No
6	Central Av. / Chino Hills Pkwy.	Chino	Yes
7	Central Av. / El Prado Rd.	Chino	No
8	Central Av. / SR-71 NB Ramps	Caltrans	No
9	Central Av. / SR-71 SB Ramps	Caltrans	No
10	El Prado Rd. / Kimball Av.	Chino	No
11	Mountain Av. / Kimball Av.	Chino	No
12	San Antonio Av. / Kimball Av.	Chino	No
13	Fern Av. / Kimball Av.	Chino	No
14	Euclid Av. (SR-83) / SR-60 WB Ramps	Caltrans	Yes
15	Euclid Av. (SR-83) / SR-60 EB Ramps	Caltrans	Yes
16	Euclid Av. (SR-83) / Walnut St.	Ontario	Yes
17	Euclid Av. (SR-83) / Riverside Dr.	Chino/Ontario	Yes
18	Euclid Av. (SR-83) / Chino Av.	Chino/Ontario	No
19	Euclid Av. (SR-83) / Schaefer Av.	Chino/Ontario	No
20	Euclid Av. (SR-83) / Edison Av.	Chino/Ontario	Yes
21	Euclid Av. (SR-83) / Eucalyptus Av.	Chino/Ontario	No
22	Euclid Av. (SR-83) / Merrill Av.	Chino/Ontario	No
23	Euclid Av. (SR-83) / Kimball Av.	Chino	No
24	Euclid Av. (SR-83) / Bickmore Av.	Chino	No
25	Euclid Av. (SR-83) / Pine Av.	Chino	No
26	SR-71 NB Ramps / Euclid Av. (SR-83)	Caltrans	No
27	SR-71 SB Ramps / Euclid Av. (SR-83)	Caltrans	No
28	Dwy. 1 / Bickmore Av.	Chino	No
29	Dwy. 2 / Bickmore Av.	Chino	No
30	Mayhew Av. / Kimball Av.	Chino	No
31	Mayhew Av. / Dwy. 3	Chino	No
32	Mayhew Av. / Dwy. 4	Chino	No
33	Mayhew Av. / Dwy. 5	Chino	No

ID	Intersection Location	Jurisdiction	CMP?
34	Mayhew Av. / Dwy. 6	Chino	No
35	Mayhew Av. / Dwy. 7	Chino	No
36	Mayhew Av. / Dwy. 8	Chino	No
37	Mayhew Av. / Dwy. 9	Chino	No
38	Mayhew Av. / Dwy. 10	Chino	No
39	Mayhew Av. / Dwy. 11	Chino	No
40	Mayhew Av. / Dwy. 12	Chino	No
41	Mayhew Av. / Dwy. 13	Chino	No
42	Mayhew Av. / Bickmore Av.	Chino	No
43	Dwy. 14 / Kimball Av.	Chino	No
44	Street B / Kimball Av.	Chino	No
45	Street B / Dwy. 15	Chino	No
46	Street B / Dwy. 16	Chino	No
47	Street B/Dwy.17 / Dwy. 18	Chino	No
48	Dwy. 19 / Kimball Av.	Chino	No
49	Rincon Meadows Av. / Kimball Av.	Chino	No
50	Mill Creek Av. / Kimball Av.	Chino	No
51	Main St. / Kimball Av.	Chino	No
52	Flight Av. / Kimball Av.	Chino	No
53	Meadow Valley Av. / Kimball Av.	Chino	No
54	Hellman Av. / Kimball Av.	Chino/Eastvale	No
55	Archibald Av. / Limonite Av.	Eastvale	No
56	Harrison Av. / Limonite Av.	Eastvale	No
57	Sumner Av. / Limonite Av.	Eastvale	No
58	Scholar Wy. / Limonite Av.	Eastvale	No
59	Hamner Av. / Limonite Av.	Eastvale	No
60	I-15 SB Ramps / Limonite Av.	Caltrans	No
61	I-15 NB Ramps / Limonite Av.	Caltrans	No

The “50 peak hour trip” criterion utilized by the City of Chino 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 substantively impacted by a given development proposal. Although each intersection may have unique operating characteristics, this traffic engineering rule of thumb is a widely utilized tool for estimating a potential area of impact (i.e., study area). The “50 peak hour trip” criterion is also utilized by the County of 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. Specifically, the Project is not anticipated to contribute any trips to the SR-71 Freeway and Pine Avenue interchange in Chino Hills. As such, this interchange has not been evaluated as part of this TIA.

EXHIBIT 1-2: LOCATION MAP



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1.3.2 ROADWAY SEGMENTS

Pursuant to the request of City staff and consistent with the roadway segment analysis prepared for other projects in the area, a focused capacity assessment of Kimball Avenue, between Euclid Avenue (SR-83) and Flight Avenue has been performed for Existing (2016), E+P (Phase 1, Phase 2, and Project Buildout), and Opening Year Cumulative (2018-2020) traffic conditions. Roadway segment volume-to-capacity ratios have been calculated based on existing travel lanes, and the associated forecasted peak hour directional traffic flows. The roadway segments evaluated for the purposes of this analysis are currently operating at acceptable LOS, and the addition of Project traffic is not anticipated result in any deficiencies. The results of this assessment are provided in Appendix 1.2 of this TIA.

1.3.3 FREEWAY MAINLINE SEGMENTS

Study area freeway mainline analysis locations were selected based on Caltrans traffic study guidelines, which may require the analysis of State highway facilities. (2) Consistent with recent Caltrans guidance, and because impacts to freeway segments tend to dissipate with distance from the point of State Highway System (SHS) entry, quantitative study of freeway segments beyond those immediately adjacent to the point of entry typically is not required. As such, this study evaluates the following freeway segments adjacent to the point of entry to the SHS, where the Project is anticipated to contribute 25or more one-way peak hour trips (see Table 1-2):

TABLE 1-2: FREEWAY MAINLINE SEGMENT ANALYSIS LOCATIONS

ID	Freeway Mainline Segments
1	SR-71 Freeway – Southbound, North of Chino Hills Pkwy.
2	SR-71 Freeway – Southbound, South of Chino Hills Pkwy.
3	SR-71 Freeway – Southbound, North of Central Av.
4	SR-71 Freeway – Southbound, South of Euclid Av. (SR-83)
5	SR-71 Freeway – Northbound, North of Chino Hills Pkwy.
6	SR-71 Freeway – Northbound, South of Chino Hills Pkwy.
7	SR-71 Freeway – Northbound, North of Central Av.
8	SR-71 Freeway – Northbound, South of Euclid Av. (SR-83)
9	SR-60 Freeway – Westbound, West of Euclid Av. (SR-83)
10	SR-60 Freeway – Westbound, East of Euclid Av. (SR-83)
11	SR-60 Freeway – Eastbound, West of Euclid Av. (SR-83)
12	SR-60 Freeway – Eastbound, East of Euclid Av. (SR-83)
13	I-15 Freeway – Southbound, North of Limonite Av.
14	I-15 Freeway – Southbound, South of Limonite Av.
15	I-15 Freeway – Northbound, North of Limonite Av.
16	I-15 Freeway – Northbound, South of Limonite Av.

1.3.4 FREEWAY MERGE/DIVERGE RAMP JUNCTIONS

The study area freeway merge/diverge ramp junction analysis locations include the following freeway ramp junctions for each direction of flow as shown on Table 1-3, where the Project is anticipated to contribute 25 or more one-way peak hour trips:

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

ID	Freeway Merge/Diverge Ramp Junctions
1	SR-71 Freeway – Southbound, Off-Ramp at Chino Hills Pkwy. (Diverge)
2	SR-71 Freeway – Southbound, Off-Ramp at Central Av. (Diverge)
3	SR-71 Freeway – Southbound, Loop On-Ramp at Euclid Av. (SR-83) (Upstream) (Merge)
4	SR-71 Freeway – Southbound, Loop On-Ramp at Euclid Av. (SR-83) (Downstream) (Merge)
5	SR-71 Freeway – Northbound, On-Ramp at Chino Hills Pkwy. (Merge)
6	SR-71 Freeway – Northbound, On-Ramp at Central Av. (Merge)
7	SR-71 Freeway – Northbound, Off-Ramp at Euclid Av. (SR-83) (Diverge)
8	SR-60 Freeway – Westbound, On-Ramp at Euclid Av. (SR-83) (Merge)
9	SR-60 Freeway – Westbound, Off-Ramp at Euclid Av. (SR-83) (Diverge)
10	SR-60 Freeway – Eastbound, Off-Ramp at Euclid Av. (SR-83) (Diverge)
11	SR-60 Freeway – Eastbound, On-Ramp at Euclid Av. (SR-83) (Merge)
12	I-15 Freeway – Southbound, Off-Ramp at Limonite Av. (Diverge)
13	I-15 Freeway – Southbound, On-Ramp at Limonite Av. (Merge)
14	I-15 Freeway – Northbound, On-Ramp at Limonite Av. (Merge)
15	I-15 Freeway – Northbound, Off-Ramp at Limonite Av. (Diverge)

1.4 PROJECT IMPACTS AND MITIGATION MEASURES

This section provides a summary of recommended mitigation measures necessary to address Project impacts for E+P traffic conditions, by development phase. Section 2.0 *Methodologies* provides information on the methodologies used in the analysis and Section 5.0 *Existing Plus Project Traffic Analysis* includes the detailed analysis. The recommended mitigation measures necessary to reduce Project impacts to less-than-significant are discussed in Section 1.4.2. The construction of facilities by the Project applicant would be eligible for DIF credit and reimbursement if the construction exceeds the Project's fair share. The City shall review the proposed mitigation measures to determine if the Project shall construct certain improvements, including traffic signals or contribute fair share.

1.4.1 PROJECT IMPACTS

Phase 1

Central Avenue / El Prado Road (#7) – Although this intersection was found to operate at an unacceptable LOS (LOS F) during the PM peak hour under Existing traffic conditions, the intersection is anticipated to continue to operate at unacceptable levels during the PM peak hour only with the addition of Project (Phase 1) traffic. However, the Project (Phase 1) is anticipated to contribute less than 50 peak hour trips to this intersection. As such, the impact is considered less than significant.

Hellman Avenue / Kimball Avenue (#54) – Although this intersection was found to operate at an unacceptable LOS (LOS F) during the AM and PM peak hours under Existing traffic conditions, the intersection is anticipated to continue to operate at unacceptable levels during both peak hours with the addition of Project (Phase 1) traffic. However, the Project (Phase 1) is anticipated to contribute less than 50 peak hour trips to this intersection. As such, the impact is considered less than significant.

Phase 2 and Phase 3

Impact 1.1 – Central Avenue / El Prado Road (#7) – Although this intersection was found to operate at an unacceptable LOS (LOS F) during the PM peak hour under Existing traffic conditions, the intersection is anticipated to continue to operate at unacceptable levels during the PM peak hour only with the addition of Project (Phase 2 and Project Buildout) traffic (as measured by 50 or more peak hour trips). As such, the impact is considered cumulatively significant (Impact 1.1).

Impact 2.1 – Euclid Avenue (SR-83) / Kimball Avenue (#23) – This intersection was found to operate at an acceptable LOS (LOS D or better) during the peak hours under Existing traffic conditions, however, the intersection is anticipated to operate at an unacceptable LOS during the AM and PM peak hours with the addition of Project (Phase 2 and Project Buildout) traffic (as measured by 50 or more peak hour trips). As such, the impact is considered significant (Impact 2.1).

Hellman Avenue / Kimball Avenue (#54) – Although this intersection was found to operate at an unacceptable LOS (LOS F) during the AM and PM peak hours under Existing traffic conditions, the intersection is anticipated to continue to operate at unacceptable levels during both peak hours with the addition of Project (Phase 2 and Project Buildout) traffic. However, the Project (Phase 2 and Project Buildout) is anticipated to contribute less than 50 peak hour trips to this intersection. As such, the impact is considered less than significant.

1.4.2 MITIGATION MEASURES

Phase 1

No mitigation measures have been identified as the impacts to the deficient intersections are less than significant for Phase 1.

Phase 2

Mitigation Measure 1.1 – Central Avenue / El Prado Road (#7) – The following improvement is necessary to reduce the Project's Phase 2 proportionate increase in delay to pre-project levels or better, thus reducing the Project's cumulative impact to less-than-significant:

- Modify the traffic signal to implement overlap phasing on the northbound right turn lane to improve the existing deficiency (currently under construction). This improvement may be eligible for DIF fee credit.

Mitigation Measure 2.1 – Euclid Avenue (SR-83) / Kimball Avenue (#23) – The Project will be required to construct or pay their fair share towards the following improvements necessary to reduce the Project's Phase 2 impact to less-than-significant:

- Add a southbound right turn lane with overlap phasing (currently under construction).
- Add a 2nd eastbound left turn lane (currently under construction).

Project Buildout

Mitigation Measure 1.1 – Central Avenue / El Prado Road (#7) – The following improvement is necessary to reduce the Project's (Project Buildout) proportionate increase in delay to pre-project levels or better, thus reducing the Project's cumulative impact to less-than-significant:

- Same as Phase 2 mitigation.

Mitigation Measure 2.1 – Euclid Avenue (SR-83) / Kimball Avenue (#23) – The Project will be required to construct or pay their fair share towards the following improvements necessary to reduce the Project's (Project Buildout) impact to less-than-significant:

- Same as Phase 2 mitigation plus a 2nd southbound left turn lane and westbound right turn lane.

1.5 LOCAL AND REGIONAL FUNDING MECHANISMS

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

Tables 1-4 and 1-5 list the incremental improvements that are required for each analysis scenario from Existing and Horizon Year (2040) traffic conditions to alleviate circulation system deficiencies. The regional and local transportation impact fee programs have each been reviewed and compared to the recommended improvements for each impacted facility. Recommended improvements already identified and included in the City of Chino DIF are clearly denoted. If an impacted facility was found to require improvements beyond those already identified within the fee program, the Project would be required to contribute the associated intersection or roadway fair-share percentage toward the costs of the recommended improvements. A summary of improvements and rough order of magnitude costs needed for Horizon Year (2040) has been prepared for both Without the Limonite Avenue Extension (Table 1-4) and With the Limonite Avenue Extension (Table 1-5). The fair-share calculations, presented

on Table 1-4 and Table 1-5, indicate that the Project contributes 0.4% to 61.4% of new vehicle trips to these intersections. The construction of facilities by the Project applicant would be eligible for DIF credit and reimbursement if the construction exceeds the Project's fair share, as identified in Table 1-4 and Table 1-5.

The improvements listed in Table 1-4 and Table 1-5 comprise lane additions/modifications, installation of signals and signal modifications. As noted, the identified improvements are covered either by the City of Chino DIF Program or as a fair-share contribution, if not covered by a fee program. Depending on the width of the existing pavement and right-of-way, these improvements may involve only striping modifications or they may involve construction of additional pavement width. Additional discussion of the relevant pre-existing transportation impact fee programs is provided below.

1.5.1 CITY OF CHINO DEVELOPMENT IMPACT FEE PROGRAM

The City of Chino has created its own local Development Impact Fee (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 recently updated in March 2015 and reviewed/adjusted annually based upon changes in the construction cost index (CCI). The current fee schedule and project transportation impacts fees are shown on Table 1-6. 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.

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Table 1-4

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

#	Intersection Location	Jurisdiction	Existing (2016)	E+P (Phase 1)	E+P (Phase 2)	E+P (Project Buildout)	2018 Without/With Project	2019 Without/With Project	2020 Without/With Project	2040 Without/With Project (Without Limonite Extension)	Improvements in City DIF?[1]	DIF Project #	Total Cost[2,3,4]	Fair Share %[4]	Fair Share Cost[5]	Significant Impact?[14]
2	SR-71 NB Ramps / Chino Hills Pkwy.	Chino	None	None	None	None	None	None	None	Modify the signal timing for a 120 second cycle length	No		$111,300	4.908%	$5,463	Yes
												Total	**$111,300**		**$5,463**	
3	Ramona Av. / Chino Hills Pkwy.	Chino	None	None	None	None	None	None	None	2nd EB left turn lane	No		$74,200	5.607%	$4,161	Yes
												Total	**$74,200**		**$4,161**	
4	Monte Vista Av. West / Chino Hills Pkwy.	Chino	None	None	None	None	None	None	None	Install a traffic signal	No		$250,000	9.494%	$23,736	Yes
												Total	**$250,000**		**$23,736**	
6	Central Av. / Chino Hills Pkwy.	Chino	None	None	None	None	None	Modify traffic signal to implement overlap phasing on the EB right turn lane	Same	Same	No		$111,300	8.488%	$9,447	Yes
										2nd NB left turn lane	No		$74,200		$6,298	
										Modify traffic siganl to implement overlap phasing on the SB right turn lane	No		$111,300		$9,447	
												Total	**$296,800**		**$25,193**	
7	Central Av. / El Prado Rd.	Chino	Modify traffic signal to implement overlap phasing on the NB right turn lane	Same	Same	Same	Same	Same	Same	Same	Yes	TR-31	$111,300	19.814%	$22,053	No
							2nd SB left turn lane	Same	Same	Same	Yes	TR-31	$74,200		$14,702	
												Total	**$185,500**		**$36,755**	
10	El Prado Rd. / Kimball Av.	Chino	None	None	None	None	Restripe the SB approach to provide 2 SB left turn lanes and 1 throguh lane	Same	Same	Same	No		$37,100	61.415%	$22,785	No
												Total	**$37,100**		**$22,785**	
14	Euclid Av. (SR-83) / SR-60 WB Ramps	Caltrans, Ontario	None	None	None	None	2nd NB left turn lane	Same	Same	Same	Yes	TR-39	$74,200	6.530%	$4,845	No
												Total	**$74,200**		**$4,845**	
15	Euclid Av. (SR-83) / SR-60 EB Ramps	Caltrans, Ontario	None	None	None	None	2nd SB left turn lane	Same	Same	Same	Yes	TR-39	$74,200	11.429%	$8,480	Yes
							EB right turn lane	Same	Same	Same	No		$519,400		$59,360	
												Total	**$593,600**		**$67,840**	
17	Euclid Av. (SR-83) / Riverside Dr.	Caltrans, Chino, Ontario	None	None	None	None	3rd NB through lane	Same	Same	Same	No		$267,120	9.177%	$24,514	Yes
							3rd SB through lane	Same	Same	Same	Yes	TR-125	$267,120		$24,514	
												Total	**$534,240**		**$49,028**	
18	Euclid Av. (SR-83) / Chino Av.	Caltrans, Chino, Ontario	None	None	None	None	None	None	None	3rd NB through lane	No		$267,120	9.883%	$26,400	Yes
										3rd SB through lane	No		$267,120		$26,400	
										WB left turn lane	No		$74,200		$7,333	
												Total	**$608,440**		**$60,133**	
19	Euclid Av. (SR-83) / Schaefer Av.	Caltrans, Chino, Ontario	None	None	None	None	3rd NB through lane	Same	Same	Same	No		$267,120	12.658%	$33,811	Yes
							3rd SB through lane	Same	Same	Same	No		$267,120		$33,811	
										2nd EB left turn lane	No		$74,200		$9,392	
												Total	**$608,440**		**$77,014**	

Table 1-4
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Summary of Improvements and Rough Order of Magnitude Costs - Without Limonite Avenue Extension

#	Intersection Location	Jurisdiction	Existing (2016)	E+P (Phase 1)	E+P (Phase 2)	E+P (Project Buildout)	2018 Without/With Project	2019 Without/With Project	2020 Without/With Project	2040 Without/With Project (Without Limonite Extension)	Improvements in City DIF?[1]	DIF Project #	Total Cost[2,3,4]	Fair Share %[4]	Fair Share Cost[5]	Significant Impact?[14]
20	Euclid Av. (SR-83) / Edison Av.	Caltrans, Chino, Ontario	None	None	None	None	3rd NB through lane	Same	Same	Same	No		$267,120	8.646%	$23,096	
							3rd SB through lane	Same	Same	Same	Yes	TR-126	$267,120		$23,096	
										2nd NB left turn lane	No		$74,200		$6,415	
										2nd SB left turn lane	Yes	TR-126	$74,200		$6,415	
										2nd EB left turn lane	Yes	TR-126	$74,200		$6,415	
										2nd EB through lane	Yes	TR-126	$267,120		$23,096	
										2nd WB left turn lane	Yes	TR-126	$74,200		$6,415	Yes
										2nd WB through lane	No		$267,120		$23,096	
										WB right turn lane	Yes	TR-126	$74,200		$6,415	
										Modify traffic signal to protect EB and WB left turn lanes and implement overlap phasing on the WB right turn lane	Yes	TR-126	$111,300		$9,623	
												Total	**$1,550,780**		**$134,084**	
22	Euclid Av. (SR-83) / Merrill Av.	Caltrans, Chino, Ontario	None	None	None	None	3rd NB through lane	Same	Same	Same	Yes	TR-127	$267,120	15.933%	$42,561	
							3rd SB through lane	Same	Same	Same	Yes	TR-127	$267,120		$42,561	
							WB right turn lane	Same	Same	Same	No		$267,120		$42,561	
							Modify traffic signal to implement overlap phasing on the WB right turn lane	Same	Same	Same	No		$111,300		$17,734	Yes
								2nd SB left turn lane	Same	Same	Yes	TR-127	$74,200		$11,823	
												Total	**$986,860**		**$157,240**	
23	Euclid Av. (SR-83) / Kimball Av.	Caltrans, Chino	None	None	SB right turn lane[7]	Same	Same	Same	Same	Same	Yes	TR-128	$74,200	34.707%	$25,753	
					2nd EB left turn lane[7]	Same	Same	Same	Same	Same	Yes	TR-128	$74,200		$25,753	
					Modify traffic signal to implement overlap phasing on the SB right turn lane[7]	Same	Same	Same	Same	Same	Yes	TR-128	$111,300		$38,629	
						2nd SB left turn lane	Same	Same	Same	Same	Yes	TR-128	$74,200		$25,753	
						WB right turn lane	Same	Same	Same	Same	Yes	TR-128	$74,200		$25,753	No
							3rd NB through lane	Same	Same	Same	Yes	TR-128	$267,120		$92,710	
							3rd SB through lane	Same	Same	Same	Yes	TR-128	$267,120		$92,710	
								Modify traffic signal to implement overlap phasing on the WB right turn lane	Same	Same	Yes	TR-128	$111,300		$38,629	
										2nd WB left turn lane	Yes	TR-128	$74,200		$25,753	
												Total	**$1,127,840**		**$391,441**	
24	Euclid Av. (SR-83) / Bickmore Av.	Caltrans, Chino	None	None	None	None	WB right turn lane	Same	Same	Same	No		$74,200	19.774%	$14,672	
									3rd NB through lane	Same	Yes	TR-129	$267,120		$52,819	
									3rd SB through lane	Same	Yes	TR-129	$267,120		$52,819	
									Restripe the WB shared left-through lane to an exclusive through lane	Same	No		$148,400		$29,344	Yes
										2nd SB left turn lane	No		$74,200		$14,672	
										2nd WB left turn lane	No		$74,200		$14,672	
												Total	**$905,240**		**$178,998**	
25	Euclid Av. (SR-83) / Pine Av.	Caltrans, Chino	None	None	None	None	3rd NB through lane	Same	Same	Same	Yes	TR-122	$267,120	11.269%	$30,101	
							3rd SB through lane	Same	Same	Same	Yes	TR-122	$267,120		$30,101	
										2nd NB left turn lane	Yes	TR-122	$74,200		$8,362	
										2nd SB left turn lane	Yes	TR-122	$74,200		$8,362	No
										2nd EB through lane	Yes	TR-122	$267,120		$30,101	
										2nd WB through lane	Yes	TR-122	$267,120		$30,101	
										WB right turn lane	Yes	TR-122	$74,200		$8,362	
												Total	**$1,291,080**		**$145,490**	
27	SR-71 SB Ramps / Euclid Av. (SR-83)	Caltrans, Chino Hills	None	None	None	None	None	None	2nd SB left turn lane	Same	No		$519,400	1.607%	$8,346	Yes
												Total	**$519,400**		**$8,346**	

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

#	Intersection Location	Jurisdiction	Existing (2016)	E+P (Phase 1)	E+P (Phase 2)	E+P (Project Buildout)	2018 Without/With Project	2019 Without/With Project	2020 Without/With Project	2040 Without/With Project (Without Limonite Extension)	Improvements in City DIF?[1]	DIF Project #	Total Cost[2,3,4]	Fair Share %[4]	Fair Share Cost[5]	Significant Impact?[14]
30	Mayhew Av. / Kimball Av.	Chino	None	Install a traffic signal[15]	Same	Same	Same	Same	Same	Same	Yes	TR-151		76.941%		
				NB left turn lane[15]	Same	Same	Same	Same	Same	Same	N/A					
				NB right turn lane[15]	Same	Same	Same	Same	Same	Same	N/A					
				EB right turn lane[15]	Same	Same	Same	Same	Same	Same	N/A					
				WB left turn lane[15]	Same	Same	Same	Same	Same	Same	N/A					Yes
									2nd EB through lane	Same	No		$267,120		$205,526	
									2nd WB through lane	Same	No		$267,120		$205,526	
												Total	**$534,240**		**$411,052**	
42	Mayhew Av. / Bickmore Av.	Chino	None	Install a traffic signal[15]	Same	Same	Same	Same	Same	Same	Yes	TR-147		60.339%		
				NB left turn lane[15]	Same	Same	Same	Same	Same	Same	N/A	TR-147				
				NB right turn lane[15]	Same	Same	Same	Same	Same	Same	N/A	TR-147				
				EB right turn lane[15]	Same	Same	Same	Same	Same	Same	N/A	TR-147				
				WB left turn lane[15]	Same	Same	Same	Same	Same	Same	N/A	TR-147				No
									2nd EB through lane	Same	Yes	TR-147	$267,120		$161,177	
									2nd WB through lane	Same	Yes	TR-147	$267,120		$161,177	
												Total	**$534,240**		**$322,355**	
44	Street B / Kimball Av.	Chinio	None	None	Install a traffic signal[15]	Same	Same	Same	Same	Same	N/A			69.984%		
					Shared NB left-through-right turn lane[15]	Same	Same	Same	Same	Same	N/A					
					2nd EB through lane[15]	Same	Same	Same	Same	Same	N/A					
					EB right turn lane[15]	Same	Same	Same	Same	Same	N/A					Yes
					WB left turn lane[15]	Same	Same	Same	Same	Same	N/A					
								2nd WB through lane	Same	Same	No		$267,120		$186,942	
												Total	**$267,120**		**$186,942**	
52	Flight Av. / Kimball Av.	Chino	None	None	None	None	Install traffic signal	Same	Same	Same	Yes	TR-148	$250,000	12.554%	$31,385	
							2nd WB through lane	Same	Same	Same	No		$267,120		$33,535	Yes
										WB right turn lane	No[6]				--[6]	
												Total	**$517,120**		**$64,920**	
53	Meadow Valley Av. / Kimball Av.	Chino	None	None	None	None	None	Shared SB left-through-right turn lane[6]	Same	Same	No[6]			15.900%	--[6]	
								EB left turn lane[6]	Same	Same	No[6]				--[6]	
								2nd WB through lane[6]	Same	Same	Yes	TR-149	$267,120		$42,471	No
										Install a traffic signal	Yes	TR-149	$250,000		$39,749	
												Total	**$517,120**		**$82,220**	
54	Hellman Av. / Kimball Av.	Chino, Eastvale	Install a traffic signal	Same	Same	Same	Same	Same	Same	Same	Yes	TR-131	$250,000	3.033%	$7,583	
							NB through lane	Same	Same	Same	No		$267,120		$8,102	
							SB through lane	Same	Same	Same	Yes	TR-131	$267,120		$8,102	
							SB right turn lane	Same	Same	Same	Yes	TR-131	$74,200		$2,251	
							EB left turn lane	Same	Same	Same	Yes	TR-131	$74,200		$2,251	
										2nd NB through lane	No		$267,120		$8,102	
										SB left turn lane	Yes	TR-131	$74,200		$2,251	
										2nd SB through lane	Yes	TR-131	$267,120		$8,102	Yes
										EB through lane	Yes	TR-131	$267,120		$8,102	
										WB left turn lane	Yes	TR-131	$74,200		$2,251	
										WB through lane	Yes	TR-131	$267,120		$8,102	
										Modify traffic signal to implement overlap phasing on the EB right turn lane	Yes	TR-131	$111,300		$3,376	
												Total	**$2,260,820**		**$68,575**	

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

#	Intersection Location	Jurisdiction	Existing (2016)	E+P (Phase 1)	E+P (Phase 2)	E+P (Project Buildout)	2018 Without/With Project	2019 Without/With Project	2020 Without/With Project	2040 Without/With Project (Without Limonite Extension)	Improvements in City DIF?[1]	DIF Project #	Total Cost[2,3,4]	Fair Share %[4]	Fair Share Cost[5]	Significant Impact?[14]
55	Archibald Av. / Limonite Av.	Eastvale	None	None	None	None	None	None	None	2nd and 3rd NB through lanes	Yes	TR-304	$534,240	1.400%	$7,478	No
										2nd SB left turn lane	Yes	TR-304	$74,200		$1,039	
										2nd and 3rd SB through lanes	Yes	TR-304	$534,240		$7,478	
										2nd WB left turn lane	Yes	TR-304	$74,200		$1,039	
										2nd WB right turn lane	Yes	TR-304	$74,200		$1,039	
												Total	**$1,291,080**		**$18,073**	
56	Harrison Av. / Limonite Av.	Eastvale	None	None	None	None	None	None	None	3rd WB through lane	No		$267,120	2.285%	$6,103	Yes
												Total	**$267,120**		**$6,103**	
57	Sumner Av. / Limonite Av.	Eastvale	None	None	None	None	None	None	None	2nd NB left turn lane	No		$74,200	1.888%	$1,401	Yes
										EB right turn lane	No		$74,200		$1,401	
										Modify traffic signal to implement overlap phasing on the EB right turn lane	No		$111,300		$2,101	
												Total	**$259,700**		**$4,902**	
58	Scholar Wy. / Limonite Av.	Eastvale	None	None	None	None	None	None	None	3rd EB through lane	No		$267,120	2.550%	$6,813	Yes
										3rd WB through lane	No		$267,120		$6,813	
												Total	**$534,240**		**$13,626**	
59	Hamner Av. / Liminote Av.	Eastvale	None	None	None	None	None	None	None	3rd EB through lane	No		$267,120	6.414%	$17,132	Yes
										3rd WB through lane	No		$267,120		$17,132	
										Modify traffic signal to implement overlap phasing on the SB and EB right turn lanes	No		$111,300		$7,138	
												Total	**$645,540**		**$41,402**	
60	I-15 SB Ramps / Limonite Av.	Caltrans, Eastvale	None	None	None	None	None	None	None	Interchange Redesign[8]	Yes	TR-315	$1,038,800	1.826%	$18,965	No
												Total	**$1,038,800**		**$18,965**	
61	I-15 NB Ramps / Limonite Av.	Caltrans, Jurupa Valley	None	None	None	None	None	None	None	Interchange Redesign[8]	No		$1,038,800	1.390%	$14,438	Yes
												Total	**$1,038,800**		**$14,438**	
Total Costs for Horizon Year (2040) Improvements													**$19,460,960**		**$2,646,124**	
Total Project Fair Share Contribution to the City of Chino (non-DIF/other)[9]													**$827,581**			
Total Project Fair Share Contribution to the City of Ontario[10]													**$197,627**			
Total Project Fair Share Contribution to the City of Eastvale[11]													**$91,720**			
Total Project Fair Share Contribution to the City of Jurupa Valley[12]													**$7,219**			
Total Project Fair Share Contribution to Caltrans[13]													**$89,870**			

[1] Improvements included in City of Chino 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 1-7 for Fair Share Calculations for Without the Limonite Avenue Extension.

[5] Rough order of magnitude cost estimate.

[6] Improvements are to be constructed by other projects since these improvements are needed for site access.

[7] Improvements are currently under construction.

[8] Interchange redesign includes widening the bridge over the I-15 Freeway to three lanes in each direction with loop on-ramps, eliminating the left turns onto the on-ramps.

[9] Total project fair share contribution consists of the improvements which are not already included in the City-wide (Preserve) DIF for those intersections wholly or partially within the City of Chino.

[10] Total project fair share contribution consists of the improvements which are not already included in a fee program for those intersections wholly or partially within the City of Ontario.

[11] Total project fair share contribution consists of the improvements which are not already included in a fee program for those intersections wholly or partially within the City of Eastvale.

[12] Total project fair share contribution consists of the improvements which are not already included in a fee program for those intersections wholly or partially within the City of Jurupa Valley.

[13] Total project fair share contribution consists of the improvements which are not already included in a fee program for those intersections wholly or partially within Caltrans' jurisdiction.

[14] If improvements are not fully covered by an applicable pre-existing fee program, then the intersection has been identified to have a significant impact even after mitigation measures are implements. However, if the improvements in a pre-existing fee program are fully funded by the pre-existing fee program, then the intersection is found to have no significant impact after the implementation of the mitigation measures.

[15] Improvements are to be constructed by the proposed Project to facilitate site access or to be improved as part of the site adjacent roadway improvements.

Table 1-5

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

#	Intersection Location	Jurisdiction	Existing (2016)	E+P (Phase 1)	E+P (Phase 2)	E+P (Project Buildout)	2018 Without/With Project	2019 Without/With Project	2020 Without/With Project	2040 Without/With Project (With Limonite Extension)	Improvements in City DIF?[1]	DIF Project #	Total Cost[2,3,4]	Fair Share %[4]	Fair Share Cost[5]	Significant Impact?[14]
2	SR-71 NB Ramps / Chino Hills Pkwy.	Chino	None	None	None	None	None	None	None	Modify the signal timing for a 120 second cycle length	No		$111,300	4.908%	$5,463	Yes
												Total	**$111,300**		**$5,463**	
3	Ramona Av. / Chino Hills Pkwy.	Chino	None	None	None	None	None	None	None	2nd EB left turn lane	No		$74,200	5.607%	$4,161	Yes
												Total	**$74,200**		**$4,161**	
4	Monte Vista Av. West / Chino Hills Pkwy.	Chino	None	None	None	None	None	None	None	Install a traffic signal	No		$250,000	9.494%	$23,736	Yes
												Total	**$250,000**		**$23,736**	
6	Central Av. / Chino Hills Pkwy.	Chino	None	None	None	None	None	Modify traffic signal to implement overlap phasing on the EB right turn lane	Same	Same	No		$111,300	8.488%	$9,447	Yes
										2nd NB left turn lane	No		$74,200		$6,298	
										Modify traffic siganl to implement overlap phasing on the SB right turn lane	No		$111,300		$9,447	
												Total	**$296,800**		**$25,193**	
7	Central Av. / El Prado Rd.	Chino	Modify traffic signal to implement overlap phasing on the NB right turn lane	Same	Same	Same	Same	Same	Same	Same	Yes	TR-31	$111,300	19.814%	$22,053	No
							2nd SB left turn lane	Same	Same	Same	Yes	TR-31	$74,200		$14,702	
												Total	**$185,500**		**$36,755**	
10	El Prado Rd. / Kimball Av.	Chino	None	None	None	None	Restripe the SB approach to provide 2 SB left turn lanes and 1 throguh lane	Same	Same	Same	No		$37,100	61.415%	$22,785	No
												Total	**$37,100**		**$22,785**	
14	Euclid Av. (SR-83) / SR-60 WB Ramps	Caltrans, Ontario	None	None	None	None	2nd NB left turn lane	Same	Same	Same	Yes	TR-39	$74,200	6.530%	$4,845	No
												Total	**$74,200**		**$4,845**	
15	Euclid Av. (SR-83) / SR-60 EB Ramps	Caltrans, Ontario	None	None	None	None	2nd SB left turn lane	Same	Same	Same	Yes	TR-39	$74,200	11.429%	$8,480	Yes
							EB right turn lane	Same	Same	Same	No		$519,400		$59,360	
												Total	**$593,600**		**$67,840**	
17	Euclid Av. (SR-83) / Riverside Dr.	Caltrans, Chino, Ontario	None	None	None	None	3rd NB through lane	Same	Same	Same	No		$267,120	9.177%	$24,514	Yes
							3rd SB through lane	Same	Same	Same	Yes	TR-125	$267,120		$24,514	
												Total	**$534,240**		**$49,028**	
18	Euclid Av. (SR-83) / Chino Av.	Caltrans, Chino, Ontario	None	None	None	None	None	None	None	3rd NB through lane	No		$267,120	9.883%	$26,400	Yes
										3rd SB through lane	No		$267,120		$26,400	
										WB left turn lane	No		$74,200		$7,333	
												Total	**$608,440**		**$60,133**	
19	Euclid Av. (SR-83) / Schaefer Av.	Caltrans, Chino, Ontario	None	None	None	None	3rd NB through lane	Same	Same	Same	No		$267,120	12.658%	$33,811	Yes
							3rd SB through lane	Same	Same	Same	No		$267,120		$33,811	
										2nd EB left turn lane	No		$74,200		$9,392	
												Total	**$608,440**		**$77,014**	

Table 1-5
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Summary of Improvements and Rough Order of Magnitude Costs - With Limonite Avenue Extension

#	Intersection Location	Jurisdiction	Existing (2016)	E+P (Phase 1)	E+P (Phase 2)	E+P (Project Buildout)	2018 Without/With Project	2019 Without/With Project	2020 Without/With Project	2040 Without/With Project (With Limonite Extension)	Improvements in City DIF?[1]	DIF Project #	Total Cost[2,3,4]	Fair Share %[4]	Fair Share Cost[5]	Significant Impact?[14]
20	Euclid Av. (SR-83) / Edison Av.	Caltrans, Chino, Ontario	None	None	None	None	3rd NB through lane	Same	Same	Same	No		$267,120	8.646%	$23,096	
							3rd SB through lane	Same	Same	Same	Yes	TR-126	$267,120		$23,096	
										2nd NB left turn lane	No		$74,200		$6,415	
										2nd SB left turn lane	Yes	TR-126	$74,200		$6,415	
										2nd EB left turn lane	Yes	TR-126	$74,200		$6,415	
										2nd EB through lane	Yes	TR-126	$267,120		$23,096	
										2nd WB left turn lane	Yes	TR-126	$74,200		$6,415	Yes
										2nd WB through lane	No		$267,120		$23,096	
										WB right turn lane	Yes	TR-126	$74,200		$6,415	
										Modify traffic signal to protect EB and WB left turn lanes and implement overlap phasing on the WB right turn lane	Yes	TR-126	$111,300		$9,623	
												Total	**$1,550,780**		**$134,084**	
22	Euclid Av. (SR-83) / Merrill Av.	Caltrans, Chino, Ontario	None	None	None	None	3rd NB through lane	Same	Same	Same	Yes	TR-127	$267,120	15.933%	$42,561	
							3rd SB through lane	Same	Same	Same	Yes	TR-127	$267,120		$42,561	
							WB right turn lane	Same	Same	Same	No		$267,120		$42,561	
							Modify traffic signal to implement overlap phasing on the WB right turn lane	Same	Same	Same	No		$111,300		$17,734	Yes
								2nd SB left turn lane	Same	Same	Yes	TR-127	$74,200		$11,823	
												Total	**$986,860**		**$157,240**	
23	Euclid Av. (SR-83) / Kimball Av.	Caltrans, Chino	None	None	SB right turn lane[7]	Same	Same	Same	Same	Same	Yes	TR-128	$74,200	34.707%	$25,753	
					2nd EB left turn lane[7]	Same	Same	Same	Same	Same	Yes	TR-128	$74,200		$25,753	
					Modify traffic signal to implement overlap phasing on the SB right turn lane[7]	Same	Same	Same	Same	Same	Yes	TR-128	$111,300		$38,629	
						2nd SB left turn lane	Same	Same	Same	Same	Yes	TR-128	$74,200		$25,753	
						WB right turn lane	Same	Same	Same	Same	Yes	TR-128	$74,200		$25,753	No
							3rd NB through lane	Same	Same	Same	Yes	TR-128	$267,120		$92,710	
							3rd SB through lane	Same	Same	Same	Yes	TR-128	$267,120		$92,710	
								Modify traffic signal to implement overlap phasing on the WB right turn lane	Same	Same	Yes	TR-128	$111,300		$38,629	
										2nd WB left turn lane	Yes	TR-128	$74,200		$25,753	
												Total	**$1,127,840**		**$391,441**	
24	Euclid Av. (SR-83) / Bickmore Av.	Caltrans, Chino	None	None	None	None	WB right turn lane	Same	Same	Same	No		$74,200	19.774%	$14,672	
										3rd NB through lane	Yes	TR-129	$267,120		$52,819	
										3rd SB through lane	Yes	TR-129	$267,120		$52,819	
										Restripe the WB shared left-through lane to an exclusive through lane	No		$148,400		$29,344	Yes
										2nd SB left turn lane	No		$74,200		$14,672	
										2nd WB left turn lane	No		$74,200		$14,672	
												Total	**$905,240**		**$178,998**	
25	Euclid Av. (SR-83) / Pine Av.	Caltrans, Chino	None	None	None	None	3rd NB through lane	Same	Same	Same	Yes	TR-122	$267,120	11.269%	$30,101	
							3rd SB through lane	Same	Same	Same	Yes	TR-122	$267,120		$30,101	
										2nd NB left turn lane	Yes	TR-122	$74,200		$8,362	
										2nd SB left turn lane	Yes	TR-122	$74,200		$8,362	
										2nd EB through lane	Yes	TR-122	$267,120		$30,101	No
										2nd WB through lane	Yes	TR-122	$267,120		$30,101	
										WB right turn lane	Yes	TR-122	$74,200		$8,362	
												Total	**$1,291,080**		**$145,490**	

Table 1-5
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Summary of Improvements and Rough Order of Magnitude Costs - With Limonite Avenue Extension

#	Intersection Location	Jurisdiction	Existing (2016)	E+P (Phase 1)	E+P (Phase 2)	E+P (Project Buildout)	2018 Without/With Project	2019 Without/With Project	2020 Without/With Project	2040 Without/With Project (With Limonite Extension)	Improvements in City DIF?[1]	DIF Project #	Total Cost[2,3,4]	Fair Share %[4]	Fair Share Cost[5]	Significant Impact?[14]
27	SR-71 SB Ramps / Euclid Av. (SR-83)	Caltrans, Chino Hills	None	None	None	None	None	None	2nd SB left turn lane	Same	No		$519,400	1.607%	$8,346	Yes
												Total	**$519,400**		**$8,346**	
30	Mayhew Av. / Kimball Av.	Chino	None	Install a traffic signal[15]	Same	Same	Same	Same	Same	Same	N/A	TR-151		76.941%		Yes
				NB left turn lane[15]	Same	Same	Same	Same	Same	Same	N/A					
				NB right turn lane[15]	Same	Same	Same	Same	Same	Same	N/A					
				EB right turn lane[15]	Same	Same	Same	Same	Same	Same	N/A					
				WB left turn lane[15]	Same	Same	Same	Same	Same	Same	N/A					
									2nd EB through lane	Same	No		$267,120		$205,526	
									2nd WB through lane	Same	No		$267,120		$205,526	
												Total	**$534,240**		**$411,052**	
44	Street B / Kimball Av.	Chinio	None	None	Install a traffic signal[15]	Same	Same	Same	Same	Same	N/A			69.984%		Yes
					Shared NB left-through-right turn lane[15]	Same	Same	Same	Same	Same	N/A					
					2nd EB through lane[15]	Same	Same	Same	Same	Same	N/A					
					EB right turn lane[15]	Same	Same	Same	Same	Same	N/A					
					WB left turn lane[15]	Same	Same	Same	Same	Same	N/A					
								2nd WB through lane	Same	Same	No		$267,120		$186,942	
												Total	**$267,120**		**$186,942**	
52	Flight Av. / Kimball Av.	Chino	None	None	None	None	Install traffic signal	Same	Same	Same	Yes	TR-148	$250,000	8.407%	$21,017	
							2nd WB through lane	Same	Same	Same	No		$267,120		$22,456	
										SB left turn lane	No		$74,200		$6,238	Yes
										WB left turn lane	No[6]				--[6]	
												Total	**$591,320**		**$49,711**	
53	Meadow Valley Av. / Kimball Av.	Chino	None	None	None	None	None	Shared SB left-through-right turn lane[6]	Same	Same	No[6]			8.599%	--[6]	
								EB left turn lane[6]	Same	Same	No[6]				--[6]	
								2nd WB through lane[6]	Same	Same	Yes	TR-149	$267,120		$22,970	No
										Install a traffic signal	Yes	TR-149	$250,000		$21,498	
												Total	**$517,120**		**$44,467**	
54	Hellman Av. / Kimball Av.	Chino, Eastvale	Install a traffic signal	Same	Same	Same	Same	Same	Same	Same	Yes	TR-131	$250,000	3.674%	$9,185	
							NB through lane	Same	Same	Same	No		$267,120		$9,814	
							SB through lane	Same	Same	Same	Yes	TR-131	$267,120		$9,814	
							SB right turn lane	Same	Same	Same	Yes	TR-131	$74,200		$2,726	
							EB left turn lane	Same	Same	Same	Yes	TR-131	$74,200		$2,726	
										2nd NB through lane	No		$267,120		$9,814	
										NB right turn lane	No		$74,200		$2,726	
										SB left turn lane	Yes	TR-131	$74,200		$2,726	
										2nd SB through lane	Yes	TR-131	$267,120		$9,814	Yes
										1st and 2nd EB through lanes	Yes	TR-131	$534,240		$19,627	
										1st and 2nd WB left turn lanes	Yes	TR-131	$148,400		$5,452	
										1st and 2nd WB through lanes	Yes	TR-131	$534,240		$19,627	
										Modify traffic signal to implement overlap phasing on the NB and EB right turn lanes	Yes	TR-131	$111,300		$4,089	
												Total	**$2,943,460**		**$108,138**	

Table 1-5
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Summary of Improvements and Rough Order of Magnitude Costs - With Limonite Avenue Extension

#	Intersection Location	Jurisdiction	Existing (2016)	E+P (Phase 1)	E+P (Phase 2)	E+P (Project Buildout)	2018 Without/With Project	2019 Without/With Project	2020 Without/With Project	2040 Without/With Project (With Limonite Extension)	Improvements in City DIF?[1]	DIF Project #	Total Cost[2,3,4]	Fair Share %[4]	Fair Share Cost[5]	Significant Impact?[14]
55	Archibald Av. / Limonite Av.	Eastvale	None	None	None	None	None	None	None	2nd and 3rd NB through lanes	Yes	TR-304	$534,240	1.844%	$9,850	No
										1st and 2nd NB left turn lanes	Yes	TR-304	$148,400		$2,736	
										2nd SB left turn lane	Yes	TR-304	$74,200		$1,368	
										2nd and 3rd SB through lanes	Yes	TR-304	$534,240		$9,850	
										SB right turn lane	Yes	TR-304	$74,200		$1,368	
										1st and 2nd EB left turn lanes	Yes	TR-304	$148,400		$2,736	
										1st and 2nd EB through lanes	Yes	TR-304	$534,240		$9,850	
										EB right turn lane	Yes	TR-304	$74,200		$1,368	
										2nd WB left turn lane	Yes	TR-304	$74,200		$1,368	
										1st and 2nd WB through lanes	Yes	TR-304	$534,240		$9,850	
										2nd WB right turn lane	Yes	TR-304	$74,200		$1,368	
												Total	**$2,804,760**		**$51,713**	
56	Harrison Av. / Limonite Av.	Eastvale	None	None	None	None	None	None	None	3rd WB through lane	No		$267,120	2.285%	$6,103	Yes
												Total	**$267,120**		**$6,103**	
57	Sumner Av. / Limonite Av.	Eastvale	None	None	None	None	None	None	None	2nd NB left turn lane	No		$74,200	1.888%	$1,401	Yes
										EB right turn lane	No		$74,200		$1,401	
										Modify traffic signal to implement overlap phasing on the EB right turn lane	No		$111,300		$2,101	
												Total	**$259,700**		**$4,902**	
58	Scholar Wy. / Limonite Av.	Eastvale	None	None	None	None	None	None	None	3rd EB through lane	No		$267,120	2.550%	$6,813	Yes
										3rd WB through lane	No		$267,120		$6,813	
												Total	**$534,240**		**$13,626**	
59	Hamner Av. / Liminote Av.	Eastvale	None	None	None	None	None	None	None	3rd EB through lane	No		$267,120	6.414%	$17,132	Yes
										3rd WB through lane	No		$267,120		$17,132	
										Modify traffic signal to implement overlap phasing on the SB and EB right turn lanes	No		$111,300		$7,138	
												Total	**$645,540**		**$41,402**	
60	I-15 SB Ramps / Limonite Av.	Caltrans, Eastvale	None	None	None	None	None	None	None	Interchange Redesign[8]	Yes	TR-315	$1,038,800	1.826%	$18,965	No
												Total	**$1,038,800**		**$18,965**	
61	I-15 NB Ramps / Limonite Av.	Caltrans, Jurupa Valley	None	None	None	None	None	None	None	Interchange Redesign[8]	No		$1,038,800	1.390%	$14,438	Yes
												Total	**$1,038,800**		**$14,438**	
										Total Costs for Horizon Year (2040) Improvements			**$21,197,240**		**$2,344,011**	
										Total Project Fair Share Contribution to the City of Chino (non-DIF/other)[9]			**$822,741**			
										Total Project Fair Share Contribution to the City of Ontario[10]			**$197,627**			
										Total Project Fair Share Contribution to the City of Eastvale[11]			**$97,868**			
										Total Project Fair Share Contribution to the City of Jurupa Valley[12]			**$7,219**			
										Total Project Fair Share Contribution to Caltrans[13]			**$89,870**			

[1] Improvements included in City of Chino 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 1-7 for Fair Share Calculations for Without the Limonite Avenue Extension.

[5] Rough order of magnitude cost estimate.

[6] Improvements are to be constructed by other projects since these improvements are needed for site access.

[7] Improvements are currently under construction.

[8] Interchange redesign includes widening the bridge over the I-15 Freeway to three lanes in each direction with loop on-ramps, eliminating the left turns onto the on-ramps.

[9] Total project fair share contribution consists of the improvements which are not already included in the City-wide (Preserve) DIF for those intersections wholly or partially within the City of Chino.

[10] Total project fair share contribution consists of the improvements which are not already included in a fee program for those intersections wholly or partially within the City of Ontario.

[11] Total project fair share contribution consists of the improvements which are not already included in a fee program for those intersections wholly or partially within the City of Eastvale.

[12] Total project fair share contribution consists of the improvements which are not already included in a fee program for those intersections wholly or partially within the City of Jurupa Valley.

[13] Total project fair share contribution consists of the improvements which are not already included in a fee program for those intersections wholly or partially within Caltrans' jurisdiction.

[14] If improvements are not fully covered by an applicable pre-existing fee program, then the intersection has been identified to have a significant impact even after mitigation measures are implements. However, if the improvements in a pre-existing fee program are fully funded by the pre-existing fee program, then the intersection is found to have no significant impact after the implementation of the mitigation measures.

[15] Improvements are to be constructed by the proposed Project to facilitate site access or to be improved as part of the site adjacent roadway improvements.

TABLE 1-6: ESTIMATED FEE OBLIGATION

Fee Reference	Light Industrial ($ PER SQ. FT.)	Office/Business Park ($ PER SQ. FT.)
Streets, Signals and Bridges (Schedule 5.2)	2.868/SF	5.339/SF

* Preserve DIF rates effective as of December 28, 2017.

Fee Calculation

Program	Category	Unit Cost	Units/Sq.Ft.	Local Circulation
Local/Regional Impacts	Industrial	$2.868	970,000	$2,781,960
	Business Park	$5.339	343,000	$1,831,277
			Total Transportation Impact Fees	**$4,613,237**

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

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

1.5.2 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 the San Bernardino County Transportation Authority (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.

1.5.3 FAIR SHARE CONTRIBUTION

Project mitigation may include a combination of fee payments to established programs, construction of specific improvements, payment of a fair share contribution toward future improvements or a combination of these approaches. 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 1-7 for the deficient intersections shown previously on Table 1-4 for the Without Limonite Avenue Extension alternative and on Table 1-8 for the deficient intersections shown previously on Table 1-5 for the With Limonite Avenue Extension alternative.

Improvements included in a defined program and constructed by development may be eligible for a fee credit or reimbursement through the program where appropriate. A rough order of magnitude cost has been prepared to determine the appropriate contribution value based upon the project's fair share of traffic as part of the project approval process. Table 1-4 and Table 1-5 also summarize the applicable cost associated with each of the recommended improvements based on the preliminary construction cost estimates found in Appendix G of the San Bernardino County CMP in conjunction with a cost escalation factor of 1.484% to reflect current (2016) costs. The total cost of needed study area intersection improvements is $19,460,960 for the Without Limonite Avenue Extension alternative. Based on the Project fair share percentages shown on Table 1-7 for the Without Limonite Avenue Extension alternative, the Project's fair share cost is estimated at $2,646,124. The total cost of needed study area intersection improvements is $21,197,240 for the With Limonite Avenue Extension alternative and based on the Project fair share percentages shown on Table 1-8, the Project's fair share cost is estimated at $2,344,011. These estimates are a rough order of magnitude only as they are intended only for discussion purposes and do not imply any legal responsibility or formula for contributions or mitigation.

Table 1-7

Project Fair Share Calculations for Intersections - Without Limonite Avenue Extension

#	Intersection		Existing	Project	2040 With Project Volume	Total New Traffic	Project % of New Traffic
2	SR-71 NB Ramps / Chino Hills Pkwy.						
		AM:	3,031	64	4,335	1,304	**4.908%**
		PM:	3,010	65	4,471	1,461	4.449%
3	Ramona Av. / Chino Hills Pkwy.						
		AM:	2,872	77	4,258	1,386	5.556%
		PM:	3,448	78	4,839	1,391	**5.607%**
4	Monte Vista Av. West / Chino Hills Pkwy.						
		AM:	1,635	77	2,446	811	**9.494%**
		PM:	1,867	78	2,792	925	8.432%
6	Central Av. / Chino Hills Pkwy.						
		AM:	2,639	96	3,770	1,131	**8.488%**
		PM:	2,884	97	4,337	1,453	6.676%
7	Central Av. / El Prado Rd.						
		AM:	3,501	189	2,939	--[1]	6.431%
		PM:	3,347	192	4,316	969	**19.814%**
10	El Prado Rd. / Kimball Av.						
		AM:	2,154	188	1,579	--[1]	11.906%
		PM:	1,953	191	2,264	311	**61.415%**
14	Euclid Av. (SR-83) / SR-60 WB Ramps						
		AM:	3,556	118	5,363	1,807	**6.530%**
		PM:	3,504	107	5,578	2,074	5.159%
15	Euclid Av. (SR-83) / SR-60 EB Ramps						
		AM:	3,575	204	5,415	1,840	11.087%
		PM:	3,462	208	5,282	1,820	**11.429%**
17	Euclid Av. (SR-83) / Riverside Dr.						
		AM:	3,572	242	6,209	2,637	**9.177%**
		PM:	3,470	248	6,423	2,953	8.398%
18	Euclid Av. (SR-83) / Chino Av.						
		AM:	2,906	262	5,557	2,651	**9.883%**
		PM:	2,890	267	6,024	3,134	8.519%
19	Euclid Av. (SR-83) / Schaefer Av.						
		AM:	2,790	281	5,010	2,220	**12.658%**
		PM:	3,068	287	6,641	3,573	8.032%
20	Euclid Av. (SR-83) / Edison Av.						
		AM:	3,157	327	6,939	3,782	**8.646%**
		PM:	3,278	332	7,810	4,532	7.326%
22	Euclid Av. (SR-83) / Merrill Av.						
		AM:	2,657	373	4,998	2,341	**15.933%**
		PM:	2,517	379	5,690	3,173	11.945%
23	Euclid Av. (SR-83) / Kimball Av.						
		AM:	3,096	640	4,940	1,844	**34.707%**
		PM:	3,273	652	6,282	3,009	21.668%
24	Euclid Av. (SR-83) / Bickmore Av.						
		AM:	1,978	262	3,303	1,325	**19.774%**
		PM:	1,778	266	4,035	2,257	11.786%

Table 1-7

Project Fair Share Calculations for Intersections - Without Limonite Avenue Extension

#	Intersection		Existing	Project	2040 With Project Volume	Total New Traffic	Project % of New Traffic
25	Euclid Av. (SR-83) / Pine Av.						
		AM:	3,084	246	5,267	2,183	**11.269%**
		PM:	3,200	249	6,939	3,739	6.660%
27	SR-71 SB Ramps / Euclid Av. (SR-83)						
		AM:	2,001	13	2,875	874	1.487%
		PM:	1,629	13	2,438	809	**1.607%**
30	Mayhew Av. / Kimball Av.						
		AM:	1,421	644	2,258	837	**76.941%**
		PM:	1,496	655	3,056	1,560	41.987%
42	Mayhew Av. / Bickmore Av.						
		AM:	777	212	1,392	615	34.472%
		PM:	427	178	722	295	**60.339%**
44	Street B / Kimball Av.						
		AM:	1,422	450	2,065	643	**69.984%**
		PM:	1,496	459	2,860	1,364	33.651%
52	Flight Av. / Kimball Av.						
		AM:	1,316	87	2,009	693	**12.554%**
		PM:	1,320	88	2,716	1,396	6.304%
53	Meadow Valley Av. / Kimball Av.						
		AM:	1,190	38	1,429	239	**15.900%**
		PM:	1,168	38	1,835	667	5.697%
54	Hellman Av. / Kimball Av.						
		AM:	1,123	32	2,178	1,055	**3.033%**
		PM:	1,113	32	2,533	1,420	2.254%
55	Archibald Av. / Limonite Av.						
		AM:	2,574	48	6,003	3,429	**1.400%**
		PM:	2,716	49	6,867	4,151	1.180%
56	Harrison Av. / Limonite Av.						
		AM:	2,022	48	4,123	2,101	**2.285%**
		PM:	1,939	49	5,229	3,290	1.489%
57	Sumner Av. / Limonite Av.						
		AM:	2,241	48	4,784	2,543	**1.888%**
		PM:	2,271	49	5,875	3,604	1.360%
58	Scholar Wy. / Limonite Av.						
		AM:	2,212	48	4,094	1,882	**2.550%**
		PM:	2,326	49	4,839	2,513	1.950%
59	Hamner Av. / Liminote Av.						
		AM:	3,343	48	5,838	2,495	1.924%
		PM:	3,893	49	4,657	764	**6.414%**
60	I-15 SB Ramps / Limonite Av.						
		AM:	3,347	48	5,995	2,648	1.813%
		PM:	3,835	49	6,519	2,684	**1.826%**
61	I-15 NB Ramps / Limonite Av.						
		AM:	3,153	40	6,031	2,878	**1.390%**
		PM:	3,626	11	6,681	3,055	0.360%

BOLD = Denotes highest peak hour

[1] Change in traffic is negative. Fair share based on total volumes.

Table 1-8

Project Fair Share Calculations for Intersections - With Limonite Avenue Extension

#	Intersection		Existing	Project	2040 With Project Volume	Total New Traffic	Project % of New Traffic
52	Flight Av. / Kimball Av.						
		AM:	1,316	124	2,791	1,475	**8.407%**
		PM:	1,320	127	3,665	2,345	5.416%
53	Meadow Valley Av. / Kimball Av.						
		AM:	1,190	89	2,225	1,035	**8.599%**
		PM:	1,168	91	2,798	1,630	5.583%
54	Hellman Av. / Kimball Av.						
		AM:	1,123	82	3,355	2,232	**3.674%**
		PM:	1,113	84	4,188	3,075	2.732%
55	Archibald Av. / Limonite Av.						
		AM:	2,574	76	6,696	4,122	**1.844%**
		PM:	2,716	78	8,210	5,494	1.420%

BOLD = Denotes highest peak hour

1.6 CUMULATIVE IMPACTS

A summary of the cumulatively impacted study area intersections and recommended mitigation measures to address cumulatively significant impacts are described in detail within Section 6.0 *Opening Year Cumulative (2018) Traffic Conditions,* Section 7.0 *Opening Year Cumulative (2019) Traffic Conditions,* Section 8.0 *Opening Year Cumulative (2020) Traffic Conditions,* and Section 9.0 *Horizon Year (2040) Traffic Conditions*. Cumulative impacts are deficiencies that would not be directly caused by the Project. The Project would, however, contribute traffic to these deficient facilities along with other cumulative development projects, resulting in a cumulatively considerable impact.

The following mitigation measures are based on the improvements needed under Horizon Year (2040) traffic conditions. The improvements needed to address Opening Year Cumulative deficiencies would be a sub-set of those improvements recommended under Horizon Year (2040) traffic conditions.

1.6.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

A summary of off-site improvements needed to address cumulative traffic impacts for Horizon Year (2040) traffic conditions was included in Table 1-4 (Without Limonite Avenue Extension) and Table 1-5 (With Limonite Avenue Extension). Improvements found to be included in City of Chino (lead agency) DIF program have been identified as such. For improvements that do not appear to be in the City's DIF program, a fair share financial contribution based on the Project's fair share impact shall be imposed (for City of Chino facilities) and may be imposed by other jurisdictions in order to mitigate the Project's share of impacts in lieu of construction. These fees (both to the City of Chino, and as determined, to surrounding agencies as fair-share contributions) are collected as part of a funding mechanism aimed at ensuring that regional highways and arterial expansions keep pace with the projected vehicle trip increases.

A rough order of magnitude cost has been prepared to determine the appropriate contribution value based upon the Project's fair share of traffic as part of the project approval process. Based on the Project fair share percentages, the Project's fair share cost is estimated at $2,646,124 for the Without Limonite Avenue Extension alternative and $2,344,011 for the With Limonite Avenue Extension alternative. Tables 1-4 and 1-5 show the Project's fair share cost associated with each of the two alternatives evaluated for Horizon Year (2040) traffic conditions. These estimates are a rough order of magnitude only as they are intended only for discussion purposes and do not imply any legal responsibility or formula for contributions or mitigation.

1.6.2 CUMULATIVE MITIGATION MEASURES

HORIZON YEAR (2040) – WITHOUT LIMONITE AVENUE EXTENSION

Mitigation Measure 3.1 – Prior to the issuance of building permits, the Project applicant shall participate in the City's DIF program by paying the requisite DIF fee at the time of building permit; and in addition, shall pay the Project's fair share amount of $827,581 for the improvements identified in Table 1-4 that are consistent with the improvements shown on Table 9-5, or as agreed to by the City and Project Applicant.

Mitigation Measure 4.1 – Table 1-4 of the TIA includes 7 intersections that either share a mutual border with the City of Ontario or are wholly located within the City of Ontario that have recommended improvements which are not covered by DIF. Because the City of Chino does not have plenary control over intersections that share a border with the City of Ontario, the City cannot guarantee that such improvements will be constructed. Thus, the following additional mitigation measure is required: The City of Chino shall participate in a multi-jurisdictional effort with the City of Ontario to develop a study to identify fair share contribution funding sources attributable to and paid from private and public development to supplement other regional and State funding sources necessary to implement the improvements identified in Table 1-4 of the TIA, that are located in the City of Ontario. The study shall include fair-share contributions related to private and or public development based on nexus requirements contained in the Mitigation Fee Act (Govt. Code § 66000 et seq.) and 14 Cal. Code of Regs. § 15126.4(a)(4) and, to this end, the study shall recognize that impacts attributable to City of Ontario facilities that are not attributable to development located within the City of Chino are not paying in excess of such developments' fair share obligations. The fee study shall also be compliant with Government Code § 66001(g) and any other applicable provisions of law. The study shall set forth a timeline and other agreed-upon relevant criteria for implementation of the recommendations contained within the study to the extent the other agencies agree to participate in the fee study program. Because the City of Chino and the City of Ontario are responsible to implement this mitigation measure, Developer shall have no compliance obligations with respect to this Mitigation Measure.

Mitigation Measure 4.2 – The Developer's fair-share amount for the intersections that either share a mutual border with the City of Ontario or are wholly located within the City of Ontario that have recommended improvements for Project Buildout which are not covered by DIF equals $197,627. Developer shall be required to pay this $197,627 amount to the City of Chino prior to the issuance of the Project's final certificate of occupancy. The City of Chino shall hold Developer's Fair Share contribution in trust and shall apply Developer's Fair Share Contribution to any fee program adopted or agreed upon by the City of Chino and City of Ontario as a result of implementation of Mitigation Measure 4.1. If, within five years of the date of collection of Developer's Fair Share Contribution, the City of Chino and City of Ontario do not comply with Mitigation Measure 4.1, then Developer's Fair Share Contribution shall be returned to the Developer.

Mitigation Measure 5.1 – Table 1-4 of the TIA includes 7 intersections that either shares a mutual border with the City of Eastvale or are wholly located within the City of Eastvale that have a recommended improvement which is not covered by DIF. Because the City of Chino does not have plenary control over intersections that share a border with the City of Eastvale, the City cannot guarantee that such improvements will be constructed. Thus, the following additional mitigation measure is required: The City of Chino shall participate in a multi-jurisdictional effort with the City of Eastvale to develop a study to identify fair share contribution funding sources attributable to and paid from private and public development to supplement other regional and State funding sources necessary to implement the improvements identified in Table 1-4 of the TIA, that are located in the City of Eastvale. The study shall include fair-share contributions related to private and or public development based on nexus requirements contained in the

Mitigation Fee Act (Govt. Code § 66000 et seq.) and 14 Cal. Code of Regs. § 15126.4(a)(4) and, to this end, the study shall recognize that impacts attributable to City of Eastvale facilities that are not attributable to development located within the City of Chino are not paying in excess of such developments' fair share obligations. The fee study shall also be compliant with Government Code § 66001(g) and any other applicable provisions of law. The study shall set forth a timeline and other agreed-upon relevant criteria for implementation of the recommendations contained within the study to the extent the other agencies agree to participate in the fee study program. Because the City of Chino and the City of Eastvale are responsible to implement this mitigation measure, Developer shall have no compliance obligations with respect to this Mitigation Measure.

Mitigation Measure 5.2 – The Developer's fair-share amount for the 7 intersections that either shares a mutual border with the City of Eastvale or are wholly located within the City of Eastvale that have recommended improvements for Project Buildout which is not covered by DIF equals $91,720. Developer shall be required to pay this $91,720 amount to the City of Chino prior to the issuance of the Project's final certificate of occupancy. The City of Chino shall hold Developer's Fair Share contribution in trust and shall apply Developer's Fair Share Contribution to any fee program adopted or agreed upon by the City of Chino and City of Eastvale as a result of implementation of Mitigation Measure 5.1. If, within five years of the date of collection of Developer's Fair Share Contribution, the City of Chino and City of Eastvale do not comply with Mitigation Measure 5.1, then Developer's Fair Share Contribution shall be returned to the Developer.

Mitigation Measure 6.1 – Table 1-4 of the TIA includes 1 intersection that either shares a mutual border with the City of Jurupa Valley or is wholly located within the City of Jurupa Valley that have a recommended improvement which is not covered by DIF. Because the City of Chino does not have plenary control over intersections that share a border with the City of Jurupa Valley, the City cannot guarantee that such improvements will be constructed. Thus, the following additional mitigation measure is required: The City of Chino shall participate in a multi-jurisdictional effort with the City of Jurupa Valley to develop a study to identify fair share contribution funding sources attributable to and paid from private and public development to supplement other regional and State funding sources necessary to implement the improvements identified in Table 1-4 of the TIA, that are located in the City of Jurupa Valley. The study shall include fair-share contributions related to private and or public development based on nexus requirements contained in the Mitigation Fee Act (Govt. Code § 66000 et seq.) and 14 Cal. Code of Regs. § 15126.4(a)(4) and, to this end, the study shall recognize that impacts attributable to City of Jurupa Valley facilities that are not attributable to development located within the City of Chino are not paying in excess of such developments' fair share obligations. The fee study shall also be compliant with Government Code § 66001(g) and any other applicable provisions of law. The study shall set forth a timeline and other agreed-upon relevant criteria for implementation of the recommendations contained within the study to the extent the other agencies agree to participate in the fee study program. Because the City of Chino and the City of Jurupa Valley are responsible to implement this mitigation measure, Developer shall have no compliance obligations with respect to this Mitigation Measure.

Mitigation Measure 6.2 – The Developer's fair-share amount for the 1 intersection that either shares a mutual border with the City of Jurupa Valley or is wholly located within the City of Jurupa Valley that have recommended improvements for Project Buildout which is not covered by DIF equals $7,219. Developer shall be required to pay this $7,219 amount to the City of Chino prior to the issuance of the Project's final certificate of occupancy. The City of Chino shall hold Developer's Fair Share contribution in trust and shall apply Developer's Fair Share Contribution to any fee program adopted or agreed upon by the City of Chino and City of Jurupa Valley as a result of implementation of Mitigation Measure 6.1. If, within five years of the date of collection of Developer's Fair Share Contribution, the City of Chino and City of Jurupa Valley do not comply with Mitigation Measure 6.1, then Developer's Fair Share Contribution shall be returned to the Developer.

Mitigation Measure 7.1 – Table 1-4 of the TIA includes 5 intersections that either share a mutual border with Caltrans' jurisdiction or are wholly located within Caltrans' jurisdiction and have recommended improvements which are not covered by payment of fees. Because the City of Chino does not have plenary control over the freeway on and off ramps that lie within Caltrans' jurisdiction, the City cannot guarantee that such improvements will be constructed. Thus, the following additional mitigation measure is required: The City of Chino shall participate in a multi-jurisdictional effort with Caltrans to develop a study to identify fair share contribution funding sources attributable to and paid from private and public development to supplement other regional and State funding sources necessary to implement the improvements identified in Table 1-4 of the TIA, that are located in Caltrans' jurisdiction. The study shall include fair-share contributions related to private and or public development based on nexus requirements contained in the Mitigation Fee Act (Govt. Code § 66000 et seq.) and 14 Cal. Code of Regs. § 15126.4(a)(4) and, to this end, the study shall recognize that impacts attributable to Caltrans facilities that are not attributable to development located within the City of Chino are not paying in excess of such developments' fair share obligations. The fee study shall also be compliant with Government Code § 66001(g) and any other applicable provisions of law. The study shall set forth a timeline and other agreed-upon relevant criteria for implementation of the recommendations contained within the study to the extent the other agencies agree to participate in the fee study program. Because the City of Chino and Caltrans are responsible to implement this mitigation measure, Developer shall have no compliance obligations with respect to this Mitigation Measure.

Mitigation Measure 7.2 – The Developer's fair-share amount for the 5 intersections that either share a mutual border with Caltrans or are wholly located within Caltrans' jurisdiction that have recommended improvements for Project Buildout which are not covered by payment of fees equals $89,870. Developer shall be required to pay this $89,870 amount to the City of Chino prior to the issuance of the Project's final certificate of occupancy. The City of Chino shall hold Developer's Fair Share contribution in trust and shall apply Developer's Fair Share Contribution to any fee program adopted or agreed upon by the City of Chino and Caltrans as a result of implementation of Mitigation Measure 7.1. If, within five years of the date of collection of Developer's Fair Share Contribution, the City of Chino and Caltrans do not comply with Mitigation Measure 7.1, then Developer's Fair Share Contribution shall be returned to the Developer.

HORIZON YEAR (2040) – WITH LIMONITE AVENUE EXTENSION

Mitigation Measure 3.1 – Prior to the issuance of building permits, the Project applicant shall participate in the City's DIF program by paying the requisite DIF fee at the time of building permit; and in addition, shall pay the Project's fair share amount of $822,741 for the improvements identified in Table 1-5 that are consistent with the improvements shown on Table 9-5, or as agreed to by the City and Project Applicant.

Mitigation Measure 4.1 – Table 1-5 of the TIA includes 7 intersections that either share a mutual border with the City of Ontario or are wholly located within the City of Ontario that have recommended improvements which are not covered by DIF. Because the City of Chino does not have plenary control over intersections that share a border with the City of Ontario, the City cannot guarantee that such improvements will be constructed. Thus, the following additional mitigation measure is required: The City of Chino shall participate in a multi-jurisdictional effort with the City of Ontario to develop a study to identify fair share contribution funding sources attributable to and paid from private and public development to supplement other regional and State funding sources necessary to implement the improvements identified in Table 1-5 of the TIA, that are located in the City of Ontario. The study shall include fair-share contributions related to private and or public development based on nexus requirements contained in the Mitigation Fee Act (Govt. Code § 66000 et seq.) and 14 Cal. Code of Regs. § 15126.4(a)(4) and, to this end, the study shall recognize that impacts attributable to City of Ontario facilities that are not attributable to development located within the City of Chino are not paying in excess of such developments' fair share obligations. The fee study shall also be compliant with Government Code § 66001(g) and any other applicable provisions of law. The study shall set forth a timeline and other agreed-upon relevant criteria for implementation of the recommendations contained within the study to the extent the other agencies agree to participate in the fee study program. Because the City of Chino and the City of Ontario are responsible to implement this mitigation measure, Developer shall have no compliance obligations with respect to this Mitigation Measure.

Mitigation Measure 4.2 – The Developer's fair-share amount for the 7 intersections that either share a mutual border with the City of Ontario or are wholly located within the City of Ontario that have recommended improvements for Project Buildout which are not covered by DIF equals $197,627. Developer shall be required to pay this $197,627 amount to the City of Chino prior to the issuance of the Project's final certificate of occupancy. The City of Chino shall hold Developer's Fair Share contribution in trust and shall apply Developer's Fair Share Contribution to any fee program adopted or agreed upon by the City of Chino and City of Ontario as a result of implementation of Mitigation Measure 4.1. If, within five years of the date of collection of Developer's Fair Share Contribution, the City of Chino and City of Ontario do not comply with Mitigation Measure 4.1, then Developer's Fair Share Contribution shall be returned to the Developer.

Mitigation Measure 5.1 – Table 1-5 of the TIA includes 7 intersections that either shares a mutual border with the City of Eastvale or are wholly located within the City of Eastvale that have a recommended improvement which is not covered by DIF. Because the City of Chino does not

have plenary control over intersections that share a border with the City of Eastvale, the City cannot guarantee that such improvements will be constructed. Thus, the following additional mitigation measure is required: The City of Chino shall participate in a multi-jurisdictional effort with the City of Eastvale to develop a study to identify fair share contribution funding sources attributable to and paid from private and public development to supplement other regional and State funding sources necessary to implement the improvements identified in Table 1-5 of the TIA, that are located in the City of Eastvale. The study shall include fair-share contributions related to private and or public development based on nexus requirements contained in the Mitigation Fee Act (Govt. Code § 66000 et seq.) and 14 Cal. Code of Regs. § 15126.4(a)(4) and, to this end, the study shall recognize that impacts attributable to City of Eastvale facilities that are not attributable to development located within the City of Chino are not paying in excess of such developments' fair share obligations. The fee study shall also be compliant with Government Code § 66001(g) and any other applicable provisions of law. The study shall set forth a timeline and other agreed-upon relevant criteria for implementation of the recommendations contained within the study to the extent the other agencies agree to participate in the fee study program. Because the City of Chino and the City of Eastvale are responsible to implement this mitigation measure, Developer shall have no compliance obligations with respect to this Mitigation Measure.

Mitigation Measure 5.2 – The Developer's fair-share amount for the 7 intersections that either shares a mutual border with the City of Eastvale or are wholly located within the City of Eastvale that have recommended improvements for Project Buildout which is not covered by DIF equals $97,868. Developer shall be required to pay this $97,868 amount to the City of Chino prior to the issuance of the Project's final certificate of occupancy. The City of Chino shall hold Developer's Fair Share contribution in trust and shall apply Developer's Fair Share Contribution to any fee program adopted or agreed upon by the City of Chino and City of Eastvale as a result of implementation of Mitigation Measure 5.1. If, within five years of the date of collection of Developer's Fair Share Contribution, the City of Chino and City of Eastvale do not comply with Mitigation Measure 5.1, then Developer's Fair Share Contribution shall be returned to the Developer.

Mitigation Measure 6.1 – Table 1-5 of the TIA includes 1 intersection that either share a mutual border with the City of Jurupa Valley or are wholly located within the City of Jurupa Valley that have a recommended improvement which is not covered by DIF. Because the City of Chino does not have plenary control over intersections that share a border with the City of Jurupa Valley, the City cannot guarantee that such improvements will be constructed. Thus, the following additional mitigation measure is required: The City of Chino shall participate in a multi-jurisdictional effort with the City of Jurupa Valley to develop a study to identify fair share contribution funding sources attributable to and paid from private and public development to supplement other regional and State funding sources necessary to implement the improvements identified in Table 1-5 of the TIA, that are located in the City of Jurupa Valley. The study shall include fair-share contributions related to private and or public development based on nexus requirements contained in the Mitigation Fee Act (Govt. Code § 66000 et seq.) and 14 Cal. Code of Regs. § 15126.4(a)(4) and, to this end, the study shall recognize that impacts attributable to City of Jurupa Valley facilities that are not attributable to development located within the City of

Chino are not paying in excess of such developments' fair share obligations. The fee study shall also be compliant with Government Code § 66001(g) and any other applicable provisions of law. The study shall set forth a timeline and other agreed-upon relevant criteria for implementation of the recommendations contained within the study to the extent the other agencies agree to participate in the fee study program. Because the City of Chino and the City of Jurupa Valley are responsible to implement this mitigation measure, Developer shall have no compliance obligations with respect to this Mitigation Measure.

Mitigation Measure 6.2 – The Developer's fair-share amount for the 1 intersection that either share a mutual border with the City of Jurupa Valley or are wholly located within the City of Jurupa Valley that have recommended improvements for Project Buildout which is not covered by DIF equals $7,219. Developer shall be required to pay this $7,219 amount to the City of Chino prior to the issuance of the Project's final certificate of occupancy. The City of Chino shall hold Developer's Fair Share contribution in trust and shall apply Developer's Fair Share Contribution to any fee program adopted or agreed upon by the City of Chino and City of Jurupa Valley as a result of implementation of Mitigation Measure 6.1. If, within five years of the date of collection of Developer's Fair Share Contribution, the City of Chino and City of Jurupa Valley do not comply with Mitigation Measure 6.1, then Developer's Fair Share Contribution shall be returned to the Developer.

Mitigation Measure 7.1 – Table 1-5 of the TIA includes 5 intersections that either share a mutual border with Caltrans' jurisdiction or are wholly located within Caltrans' jurisdiction and have recommended improvements which are not covered by payment of fees. Because the City of Chino does not have plenary control over the freeway on and off ramps that lie within Caltrans' jurisdiction, the City cannot guarantee that such improvements will be constructed. Thus, the following additional mitigation measure is required: The City of Chino shall participate in a multi-jurisdictional effort with Caltrans to develop a study to identify fair share contribution funding sources attributable to and paid from private and public development to supplement other regional and State funding sources necessary to implement the improvements identified in Table 1-5 of the TIA, that are located in Caltrans' jurisdiction. The study shall include fair-share contributions related to private and or public development based on nexus requirements contained in the Mitigation Fee Act (Govt. Code § 66000 et seq.) and 14 Cal. Code of Regs. § 15126.4(a)(4) and, to this end, the study shall recognize that impacts attributable to Caltrans facilities that are not attributable to development located within the City of Chino are not paying in excess of such developments' fair share obligations. The fee study shall also be compliant with Government Code § 66001(g) and any other applicable provisions of law. The study shall set forth a timeline and other agreed-upon relevant criteria for implementation of the recommendations contained within the study to the extent the other agencies agree to participate in the fee study program. Because the City of Chino and Caltrans are responsible to implement this mitigation measure, Developer shall have no compliance obligations with respect to this Mitigation Measure.

Mitigation Measure 7.2 – The Developer's fair-share amount for the 5 intersections that either share a mutual border with Caltrans or are wholly located within Caltrans' jurisdiction that have recommended improvements for Project Buildout which are not covered by payment of fees

equals $89,870. Developer shall be required to pay this $89,870 amount to the City of Chino prior to the issuance of the Project's final certificate of occupancy. The City of Chino shall hold Developer's Fair Share contribution in trust and shall apply Developer's Fair Share Contribution to any fee program adopted or agreed upon by the City of Chino and Caltrans as a result of implementation of Mitigation Measure 7.1. If, within five years of the date of collection of Developer's Fair Share Contribution, the City of Chino and Caltrans do not comply with Mitigation Measure 7.1, then Developer's Fair Share Contribution shall be returned to the Developer.

1.7 ON-SITE ROADWAY AND SITE ACCESS IMPROVEMENTS

This section summarizes Project site access and on-site circulation recommendations.

The Project is proposed to have access on Bickmore Avenue, Mayhew Avenue, and Kimball Avenue. All Project access points are assumed to allow full-access with the exception of the following:

- Driveway 1 / Bickmore Avenue – Right-in/right-out driveway providing access to passenger cars only for Buildings 7A/7B
- Driveway 2 / Bickmore Avenue – Right-in/right-out driveway providing access to both passenger cars only for Buildings 7A/7B and 8/9
- Mayhew Avenue / Driveway 3 – Right-in/right-out driveway providing access to passenger cars only for Building 4
- Driveway 14 / Kimball Avenue – Right-in/right-out driveway providing access to passenger cars only for Buildings A, B, C, and D
- Driveway 19 / Kimball Avenue - Right-in/right-out driveway providing access to passenger cars only for Buildings I through K

Regional access to the Project site is provided via the SR-60 Freeway at Euclid Avenue (SR-83), the SR-71 Freeway at Chino Hills Parkway, Central Avenue, and Euclid Avenue (SR-83), and the I-15 Freeway at Limonite Avenue interchanges. Roadway improvements necessary to provide site access and on-site circulation are assumed to be constructed in conjunction with site development and are described below. These improvements are required to be in place prior to occupancy.

1.7.1 SITE ADJACENT ROADWAY AND SITE ACCESS IMPROVEMENTS

The recommended site-adjacent roadway improvements for the Project are described below. These improvements need to be incorporated into the Project description prior to Project approval or imposed as conditions of approval as part of the Project approval (see Exhibit 1-1 for phasing of roadway improvements).

Construction of on-site and site adjacent improvements are recommended to occur in conjunction with adjacent Project development activity or as needed for Project access purposes. Ultimate improvements along Kimball Avenue at Mayhew Avenue and Street B and the intersection of Mayhew Avenue at Bickmore Avenue are consistent with the City of Chino General Plan/Preserve Specific Plan.

Mayhew Avenue – Mayhew Avenue is a north-south oriented roadway bisecting the Project. Construct Mayhew Avenue from Kimball Avenue to Bickmore Avenue at its ultimate full-section width as a commercial collector with paseo (92-foot right-of-way) in compliance with the circulation recommendations found in The Preserve Specific Plan. The cross-section includes a curb-to-curb width of 44-feet with one travel lane in each direction and a 23-foot shared sidewalk/bike path (two-way) and equestrian trail.

Mayhew Avenue will be constructed in conjunction with Phase 1 development (see Exhibit 1-1) between Kimball Avenue and Bickmore Avenue. This includes the traffic signal at Mayhew Avenue and Kimball Avenue, the traffic signal at Mayhew Avenue and Bickmore Avenue, and all access points needed to serve the areas proposed for development in Phase 1. Driveways needed to serve Phase 2 development along Mayhew Avenue will be constructed in conjunction with Phase 2 (see Exhibit 1-1). The intersection of Street B and Kimball Avenue will be constructed under Phase 2 in conjunction with Street B to accommodate site access for Phase 2 development, including the traffic signal at Street B and Kimball Avenue.

Kimball Avenue – Kimball Avenue is an east-west oriented roadway located along the Project's northern boundary. Although not required as mitigation, the Project will construct Kimball Avenue from Euclid Avenue (SR-83) to Rincon Meadows Avenue at its ultimate full-section width as a major arterial highway with Paseo (124-foot right-of-way), consistent with the circulation recommendations found in The Preserve Specific Plan. The roadway cross-section is proposed to include two travel lanes in each direction separated by a 14-foot landscaped median with a 46-foot parkway, which will include landscaping and a shared meandering sidewalk/bike path. Kimball Avenue widens at intersections in order to accommodate turn lanes. The cross-section includes a curb-to-curb width of 66-feet where on-street parking is prohibited. Shared bicycle lanes (Class I) and pedestrian paths are accommodated through the meandering sidewalk.

Ultimate full-section improvements to Kimball Avenue will be constructed west of Mayhew Avenue in conjunction with Phase 1 development with full-section improvements to Kimball Avenue east of Mayhew Avenue by Project Buildout (Phase 3). Driveways along Kimball Avenue to the east of Mayhew Avenue will be constructed as needed to facilitate site access for Project Buildout (Phase 3).

Bickmore Avenue – Bickmore Avenue is an east-west oriented roadway located along the Project's southern boundary. Construct Bickmore Avenue from the western Project boundary to Mayhew Avenue at its ultimate full-section width as a local collector with transit and paseo (94-foot right-of-way), consistent with the circulation recommendations found in The Preserve Specific Plan. The roadway cross-section is proposed to include one travel lane in each direction separated by a 10-foot turn lane with a 12-foot transit lane. The cross-section includes a curb-to-curb width of 46-feet where on-street parking is prohibited. Shared bicycle lanes (Class I) and pedestrian paths are accommodated through the shared sidewalk/bike path in the meandering 13-foot sidewalk.

Bickmore Avenue is to be improved in conjunction with Project Buildout (Phase 1) development along the Project's frontage. Access points necessary to serve Project Buildout (Phase 3) development will also be constructed as needed.

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

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

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

1.7.2 QUEUING ANALYSIS AT THE PROJECT DRIVEWAYS

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

The traffic modeling and signal timing optimization software package Synchro (Version 9 Build 904) has been utilized to assess queues at the Project access points. Synchro is a macroscopic traffic software program that is based on the signalized and unsignalized intersection capacity analyses as specified in the HCM. Macroscopic level models represent traffic in terms of aggregate measures for each movement at the study intersections. Equations are used to determine measures of effectiveness such as delay and queue length in Synchro. The level of service (LOS) and capacity analysis performed by Synchro takes into consideration optimization and coordination of signalized intersections within a network.

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

maximum queues observed by SimTraffic. The maximum back of queue observed for every two-minute period is recorded by SimTraffic.

SimTraffic has been utilized to assess peak hour queuing at the site access driveways for Horizon Year (2040) With Project traffic conditions. The random simulations generated by SimTraffic have been utilized to determine the 50th and 95th percentile queue lengths observed for each turn lane. A SimTraffic simulation has been recorded five (5) times, during the weekday AM and weekday PM peak hours, and has been seeded for 15-minute periods with 60-minute recording intervals.

A vehicle is considered queued whenever it is traveling at less than 10 feet/second. A vehicle will only become queued when it is either at the stop bar or behind another queued vehicle. Although only the 95th percentile queue has been utilized for purposes of determining the necessary turn pocket storage lengths, the 50th percentile queues are also reported. The 50th percentile queue is the maximum back of queue on a typical cycle during the peak hour, while the 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes during the peak hour.

The Horizon Year (2040) queuing results are provided in Appendix 1.2 of this report.

1.8 PEDESTRIAN AND BICYCLE ACCOMMODATIONS

1.8.1 PEDESTRIAN ACCOMMODATIONS

The Project will construct its ultimate full-section of Kimball Avenue, Mayhew Avenue, and Bickmore Avenue including curb and gutter and sidewalk improvements. Some of these sections will also include sidewalks and shared sidewalk/bicycle paths.

1.8.2 BICYCLE ACCOMMODATIONS

Consistent with The Preserve Specific Plan, both Kimball Avenue and Mayhew Avenue are proposed to have Class I bikeways via a wide sidewalk, in the vicinity of the Project. An equestrian trail is also proposed along Mayhew Avenue, along the Project's frontage.

2 METHODOLOGIES

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

2.1 LEVEL OF SERVICE

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

2.2 INTERSECTION CAPACITY ANALYSIS

The definitions of LOS for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control. The LOS is typically dependent on the quality of traffic flow at the intersections along a roadway. The *Highway Capacity Manual* (HCM) methodology expresses the LOS at an intersection in terms of delay time for the various intersection approaches. (4) The HCM uses different procedures depending on the type of intersection control.

2.2.1 SIGNALIZED INTERSECTIONS

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

The City of Chino, City of Chino Hills, City of Ontario, City of Eastvale, and City of Jurupa Valley require signalized intersection operations analysis based on the methodology described in the HCM. (4) Intersection LOS operations are based on an intersection's average control delay. Control delay includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. For signalized intersections LOS is directly related to the average control delay per vehicle and is correlated to a LOS designation as described in Table 2-1.

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

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 average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.01 to 35.00	C	F
Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.01 to 55.00	D	F
Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.01 to 80.00	E	F
Operation with delays unacceptable to most drivers occurring due to over saturation, poor progression, or very long cycle lengths.	80.01 and up	F	F

Source: HCM

Consistent with Appendix B of the San Bernardino County CMP, the following saturation flow rates, in vehicles per hour green per hour (vphgph), will be utilized in the traffic analysis for signalized intersections:

Existing and Opening Year Cumulative Traffic Conditions:

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

The traffic modeling and signal timing optimization software package Synchro (Version 9) has been utilized to analyze signalized intersections within the City of Chino, City of Chino Hills, City of Ontario, 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. (4)

California Department of Transportation (Caltrans)

Per the Caltrans *Guide for the Preparation of Traffic Impact Studies*, the traffic modeling and signal timing optimization software package Synchro (Version 9) has also been utilized to analyze signalized intersections under Caltrans' jurisdiction, which include interchange to arterial ramps (i.e. SR-71 Freeway ramp at Chino Hills Parkway, SR-71 Freeway ramps at Central Avenue, SR-60 Freeway ramps at Euclid Avenue (SR-83), SR-71 Freeway ramps at Euclid Avenue (SR-83), and I-15 Freeway ramps at Limonite Avenue). (2) Signal timing for the freeway arterial-to-ramp intersections have been obtained from Caltrans District 8 and were utilized for the purposes of this analysis.

2.2.2 UNSIGNALIZED INTERSECTIONS

The City of Chino, City of Chino Hills, City of Ontario, City of Eastvale, and City of Jurupa Valley require the operations of unsignalized intersections be evaluated using the methodology described in the HCM. (4) 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

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 Federal Highway Administration's (FHWA) *Manual on Uniform Traffic Control Devices (MUTCD)*, as amended by *the MUTCD 2014 California Supplement*, for all study area intersections. (5)

The signal warrant criteria for Existing study area intersections are based upon several factors, including volume of vehicular and pedestrian traffic, frequency of accidents, and location of school areas. Both the FHWA's *MUTCD* and the *MUTCD 2014 California Supplement* indicate that the installation of a traffic signal should be considered if one or more of the signal warrants are met. (5) Specifically, this TIA utilizes the Peak Hour Volume-based Warrant 3 as the appropriate representative traffic signal warrant analysis for existing traffic conditions. Warrant 3 criteria are basically identical for both the FHWA's *MUTCD* and the *MUTCD 2014 California Supplement*. Warrant 3 is appropriate to use for this TIA because it provides specialized warrant criteria for intersections with rural characteristics (e.g. located in communities with populations of less than 10,000 persons or with adjacent major streets operating above 40 miles per hour). For the purposes of this study, the speed limit was the basis for determining whether Urban or Rural warrants were used for a given intersection.

Future unsignalized intersections, that currently do not exist, have been assessed regarding the potential need for new traffic signals based on future average daily traffic (ADT) volumes, using the Caltrans planning level ADT-based signal warrant analysis worksheets.

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

TABLE 2-3: TRAFFIC SIGNAL WARRANT ANALYSIS LOCATIONS

ID	Intersection Location	Jurisdiction
4	Monte Vista Av. West / Chino Hills Pkwy.	Chino
28	Dwy. 1 / Bickmore Av.	Chino
30	Mayhew Av. / Kimball Av.	Chino
32	Mayhew Av. / Dwy. 4	Chino
33	Mayhew Av. / Dwy. 5	Chino
34	Mayhew Av. / Dwy. 6	Chino
35	Mayhew Av. / Dwy. 7	Chino
36	Mayhew Av. / Dwy. 8	Chino
37	Mayhew Av. / Dwy. 9	Chino
38	Mayhew Av. / Dwy. 10	Chino
39	Mayhew Av. / Dwy. 11	Chino
40	Mayhew Av. / Dwy. 12	Chino
41	Mayhew Av. / Dwy. 13	Chino
42	Mayhew Av. / Bickmore Av.	Chino
44	Street B / Kimball Av.	Chino
45	Street B / Dwy. 15	Chino
46	Street B / Dwy. 16	Chino
47	Street B/Dwy.17 / Dwy. 18	Chino
49	Rincon Meadows Av. / Kimball Av.	Chino

ID	Intersection Location	Jurisdiction
52	Flight Av. / Kimball Av.	Chino
53	Meadow Valley Av. / Kimball Av.	Chino
54	Hellman Av. / Kimball Av.	Chino/Eastvale

The Existing conditions traffic signal warrant analysis is presented in the subsequent section, Section 3 *Area Conditions* of this report. The traffic signal warrant analyses for future conditions are presented in Section 5 *Existing Plus Project Traffic Analysis,* Section 6 *Opening Year Cumulative (2018) Traffic Analysis,* Section 7 *Opening Year Cumulative (2019) Traffic Analysis,* Section 8 *Opening Year Cumulative (2020) Traffic Analysis,* and Section 9 *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 freeway-to-arterial interchanges of the SR-71 Freeway at Chino Hills Parkway off-ramps, SR-71 Freeway at Central Avenue off-ramps, SR-60 Freeway at Euclid Avenue (SR-83) off-ramps, SR-71 Freeway at Euclid Avenue (SR-83) off-ramps, and I-15 Freeway at Limonite Avenue off-ramps. Consistent with Caltrans requirements, the 95th percentile queuing of vehicles has been assessed at the off-ramps to determine potential queuing impacts at the freeway ramp intersections on Chino Hills Parkway, Central Avenue, Euclid Avenue (SR-83), and Limonite Avenue. Specifically, the queuing analysis is utilized to identify any potential queuing and "spill back" onto the SR-60 Freeway, SR-71 Freeway, and I-15 Freeway mainline from the off-ramps.

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

A vehicle is considered queued whenever it is traveling at less than 10 feet/second. A vehicle will only become queued when it is either at the stop bar or behind another queued vehicle. Although only the 95th percentile queue has been reported in the tables, the 50th percentile queue can be found in the appendix alongside the 95th percentile queue for each ramp location. The 50th percentile maximum queue is the maximum back of queue on a typical cycle during the peak hour, while the 95th percentile queue is the maximum back of queue with 95th percentile traffic volumes during the peak hour. In other words, if traffic were observed for 100 cycles, the 95th percentile queue would be the queue experienced with the 95th busiest cycle (or 5% of the time). The 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 impacts to freeway segments dissipate with distance from the point of SHS entry, quantitative study of freeway segments beyond those immediately adjacent to the point of entry is not required. As such, the traffic study has evaluated the freeway segments along the SR-71 Freeway, SR-60 Freeway, and I-15 Freeway where the Project is anticipated to contribute 25 or more one-way peak hour trips. The Project trip distribution pattern shows Project-related traffic utilizing Limonite Avenue to reach the I-15 Freeway (for the Without Limonite Avenue Extension alternative) is anticipated to contribute less than 25 one-way peak hour trips to these segments. As such, the I-15 Freeway and Limonite Avenue interchange has only been evaluated for Existing and Horizon Year (2040) With Limonite Avenue Extension conditions. Because impacts to freeway segments dissipate with distance from the point of SHS entry, quantitative evaluation of freeway segments with less than 25 peak hour trips is not necessary.

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

The number of lanes for existing baseline conditions has been obtained from field observations conducted by Urban Crossroads in May 2016. 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 Chino Hills Parkway, SR-71 Freeway north of Central Avenue, SR-71 Freeway north of Euclid Avenue (SR-83), SR-60 Freeway west of Euclid Avenue (SR-83), and the I-15

Freeway north of Limonite Avenue. The data was obtained from May 2016. 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. (6)

TABLE 2-4: DESCRIPTION OF FREEWAY MAINLINE LOS

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

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

2.6 FREEWAY MERGE/DIVERGE RAMP JUNCTION ANALYSIS

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

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

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

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

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

Similar to the basic freeway segment analysis, the 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 Chino Hills Parkway, SR-71 Freeway north of Central Avenue, SR-71 Freeway north of Euclid Avenue (SR-83), SR-60 Freeway west of Euclid Avenue (SR-83), and the I-15 Freeway north of Limonite Avenue. The ramp data (per the count data presented in Appendix 3.1) were then utilized to flow conserve the mainline volumes to determine the remaining 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 May 2016. 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. (6) As such, actual vehicles (as opposed to passenger-car-equivalent volumes) have been utilized for the purposes of the freeway ramp junction (merge/diverge) analysis.

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

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

2.7.1 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. Therefore, any intersection operating at LOS E or F is considered deficient. LOS will also be reported by movement for the City's review. A higher LOS standard of LOS C has been applied to the Project driveways.

2.7.2 CITY OF CHINO HILLS

The City of Chino Hills utilizes a minimum acceptable LOS of LOS D, where feasible.

2.7.3 CITY OF ONTARIO

The City of Ontario utilizes a minimum acceptable LOS of LOS E, 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 impacts, LOS D has been utilized for the CMP intersections for the purposes of this analysis.

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, roadway segments, and intersections is LOS D. Consistent with the City of Chino 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 THRESHOLDS OF SIGNIFICANCE

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 (as defined through the comparison of Existing traffic conditions to E+P traffic conditions) at a study intersection would result in a direct project-specific traffic impact, the following will be utilized:

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

However, when the pre-Project condition is already below LOS D/LOS E (i.e., unacceptable LOS), the Project will be responsible for mitigating its impact to a level of service equal to or better than it was without the Project for intersections that receive 50 or more peak hour project-

related trips. This is a standard protocol in many urban jurisdictions because to require a Project to mitigate to LOS D/LOS E or better would in effect force the Project to mitigate beyond its Project impacts, which is prohibited under California law. Thus, for intersections currently operating at unacceptable LOS during either the AM and/or PM peak hour under Existing traffic conditions, improvements have been identified to mitigate the impacts of the Project to an intersection LOS that is equal to or better than pre-Project conditions.

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

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

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

2.8.2 CALTRANS FACILITIES

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

- The traffic study finds that the LOS of a segment will degrade from D or better to E or F.
- The traffic study finds that the project will exacerbate an already deficient condition by contributing 25 or more one-way peak hour trips. A segment that is operating at or near capacity is deemed to be deficient.

2.9 PROJECT FAIR SHARE CALCULATION METHODOLOGY

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

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

The Project fair share contribution calculations are presented in Section 1.5 *Local and Regional Funding Mechanisms* of this TIA. The cost of implementing the improvements shown on Table 1-4 for Without Limonite Avenue Extension and Table 1-5 for With Limonite Avenue Extension 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 (2016) 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 cumulative improvements (see Table 1-7 and Table 1-8). These estimates are a rough order of magnitude only as they are intended only for discussion purposes and do not imply any legal responsibility or formula for contributions or mitigation.

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3 AREA CONDITIONS

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

3.1 EXISTING CIRCULATION NETWORK

Pursuant to the agreement with City of Chino staff (Appendix 1.1), the study area includes a total of 61 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 CHINO GENERAL PLAN CIRCULATION ELEMENT

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

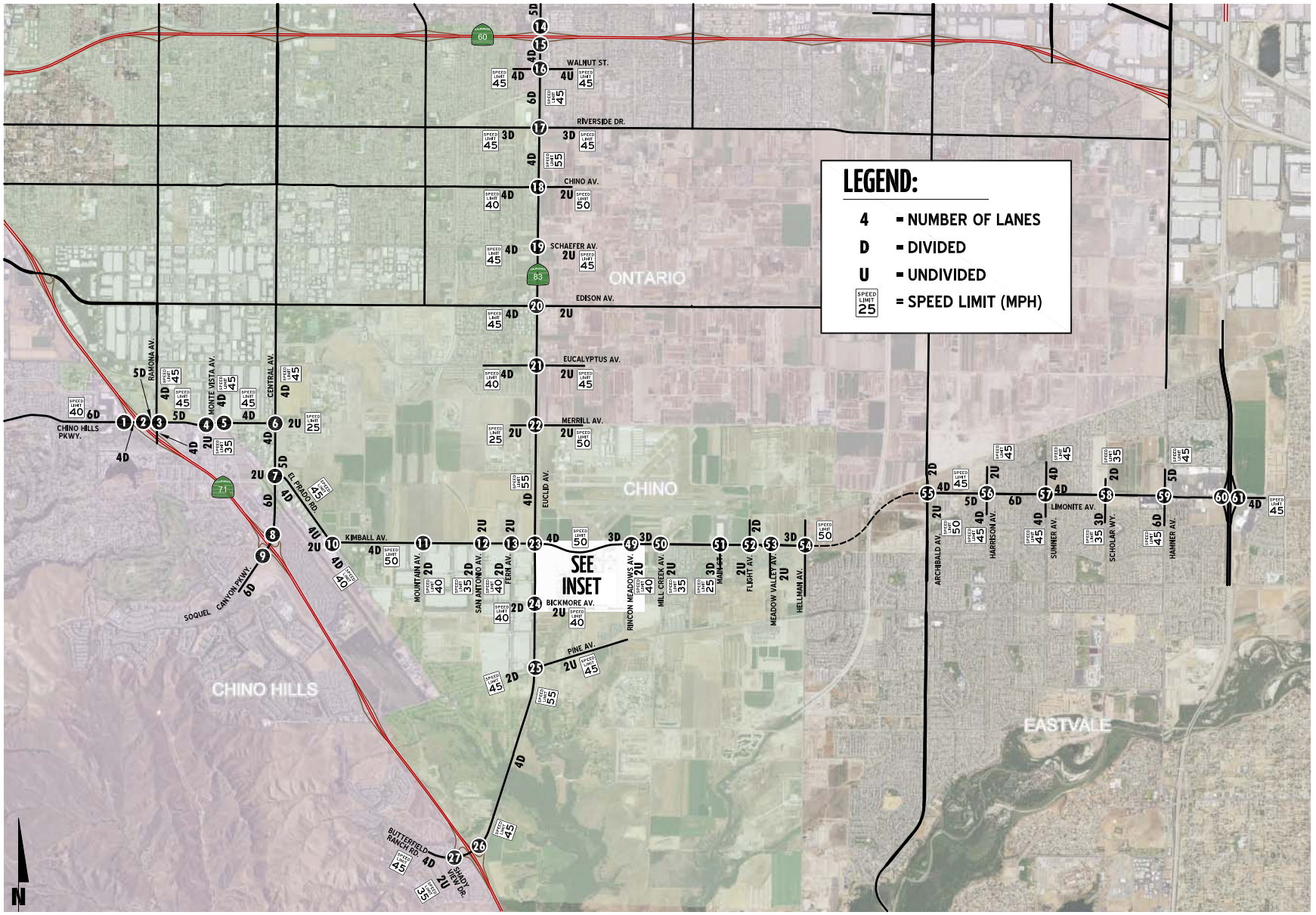
The study area roadway that is classified as an Expressway is identified as having a 142-foot right-of-way and 104-foot curb-to-curb measurement. Expressways include four lanes of travel in each direction and a 64-foot curbed and/or landscaped median. The following study area roadway within the City of Chino is classified as an Expressway:

- Euclid Avenue (SR-83) from SR-71 Freeway to Riverside Drive

The study area roadway that is classified as a Major Arterial is identified as having a 120-foot right-of-way and 100-foot curb-to-curb measurement. Major Arterials include three lanes of travel in each direction and a 14-foot curbed and/or landscaped median. The following study area roadway within the City of Chino is classified as a Major Arterial:

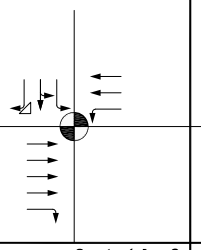
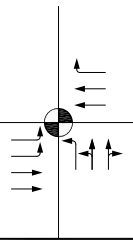
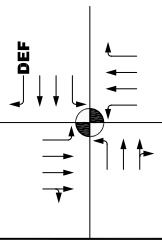
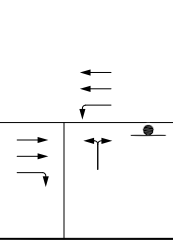
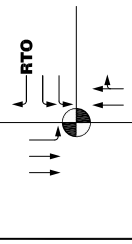
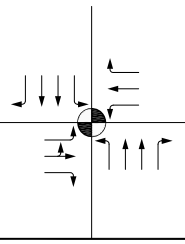
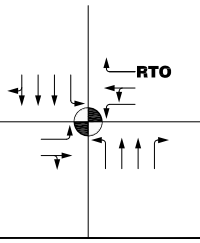
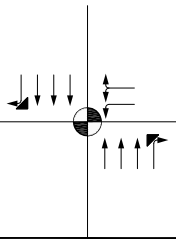
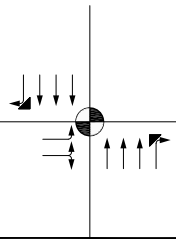
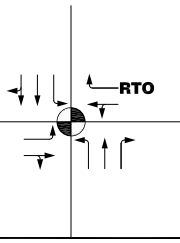
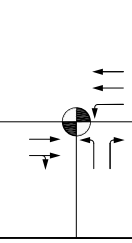
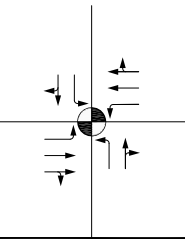
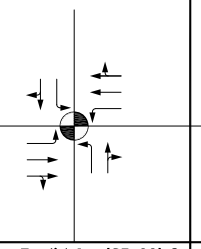
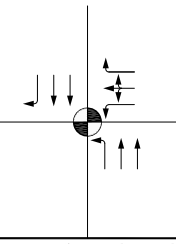
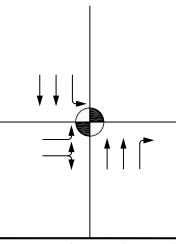
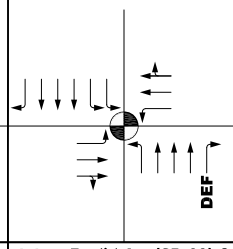
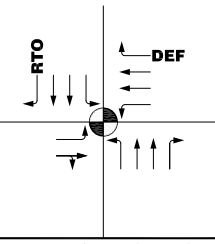
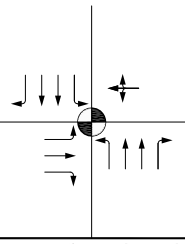
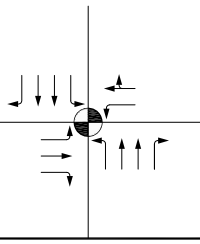
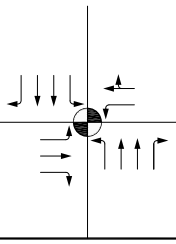
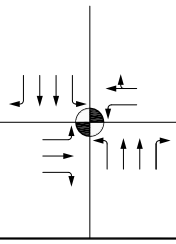
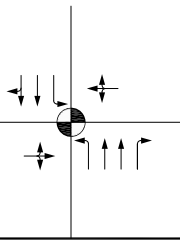
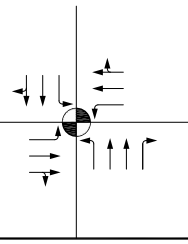
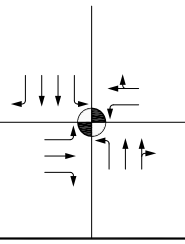
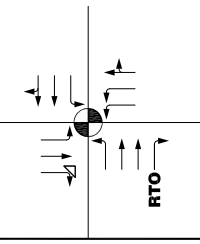
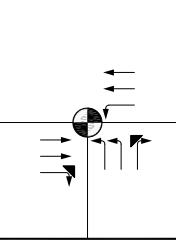
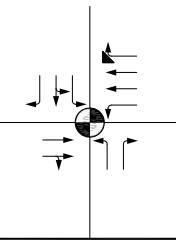
- Ramona Avenue from Grand Avenue to Chino Hills Parkway
- Central Avenue from Phillips Boulevard to El Prado Road
- Riverside Drive from Reservoir Street to Fern Avenue
- Edison Avenue from Grand Avenue to Euclid Avenue
- Pine Avenue from Euclid Avenue to Hellman Avenue

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



URBAN CROSSROADS

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

1 SR-71 SB Ramps & Chino Hills Pkwy.	2 SR-71 NB Ramps & Chino Hills Pkwy.	3 Ramona Av. & Chino Hills Pkwy.	4 Monte Vista Av. & Chino Hills Pkwy.	5 Monte Vista Av. & Chino Hills Pkwy.	6 Central Av. & Chino Hills Pkwy./ Manuel Gonzalez Dr.
					
7 Central Av. & El Prado Rd.	8 Central Av. & SR-71 NB Ramps	9 Soquel Canyon Pkwy. & SR-71 SB Ramps	10 El Prado Rd. & Kimball Ct./Kimball Av.	11 Mountain Av. & Kimball Av.	12 San Antonio Av. & Kimball Av.
					
13 Fern Av. & Kimball Av.	14 Euclid Av. (SR-83) & SR-60 WB Ramps	15 Euclid Av. (SR-83) & SR-60 EB Ramps	16 Euclid Av. (SR-83) & Walnut St.	17 Euclid Av. (SR-83) & Riverside Dr.	18 Euclid Av. (SR-83) & Chino Av.
					
19 Euclid Av. (SR-83) & Schaefer Av.	20 Euclid Av. (SR-83) & Edison Av.	21 Euclid Av. (SR-83) & Eucalyptus Av.	22 Euclid Av. (SR-83) & E. Facility Dr./ Merrill Av.	23 Euclid Av. (SR-83) & Kimball Av.	24 Euclid Av. (SR-83) & Bickmore Av.
					
25 Euclid Av. (SR-83) & Pine Av.	26 SR-71 NB Ramps & Butterfield Ranch Rd./ Euclid Av. (SR-83)	27 SR-71 SB Ramps/ Shady View Dr. & Butterfield Ranch Rd.	28 Dwy. 1 & Bickmore Av.	29 Dwy. 2 & Bickmore Av.	30 Mayhew Av. & Kimball Av.
			Future Intersection	Future Intersection	Future Intersection
31 Mayhew Av. & Dwy. 3	32 Mayhew Av. & Dwy. 4	33 Mayhew Av. & Dwy. 5	34 Mayhew Av. & Dwy. 6		
Future Intersection	Future Intersection	Future Intersection	Future Intersection		

LEGEND:

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

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

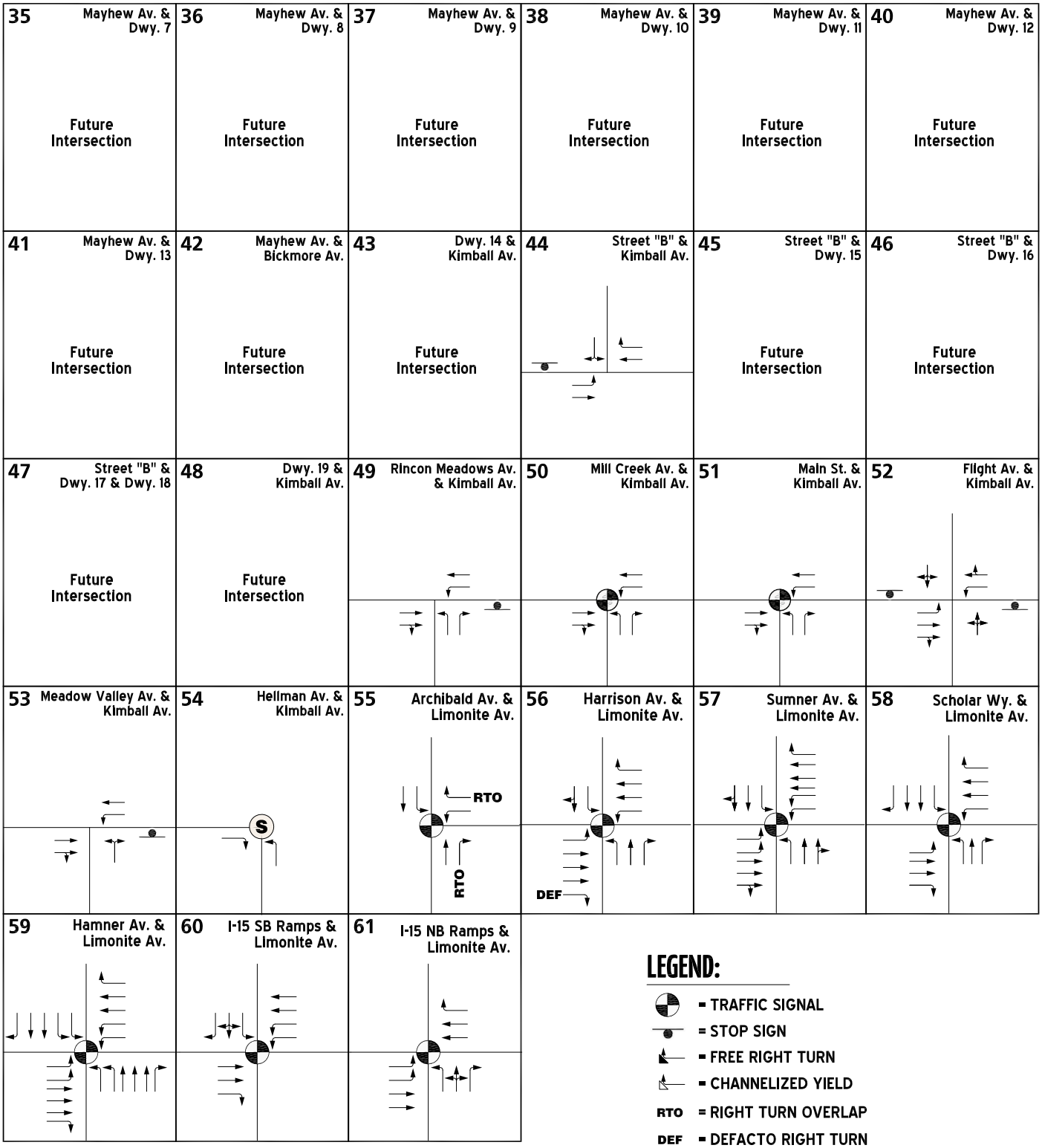


EXHIBIT 3-2: CITY OF CHINO GENERAL PLAN CIRCULATION ELEMENT

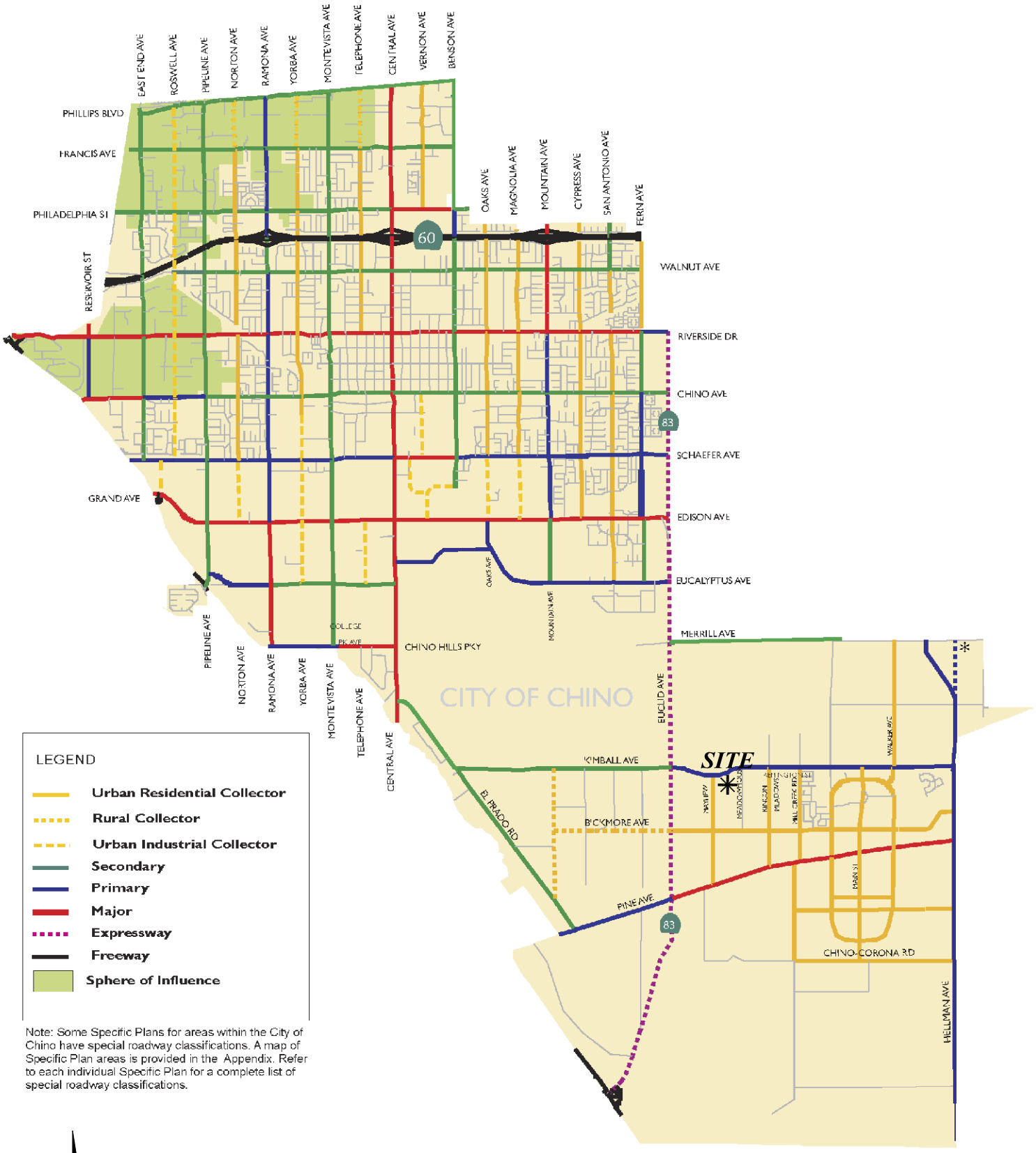
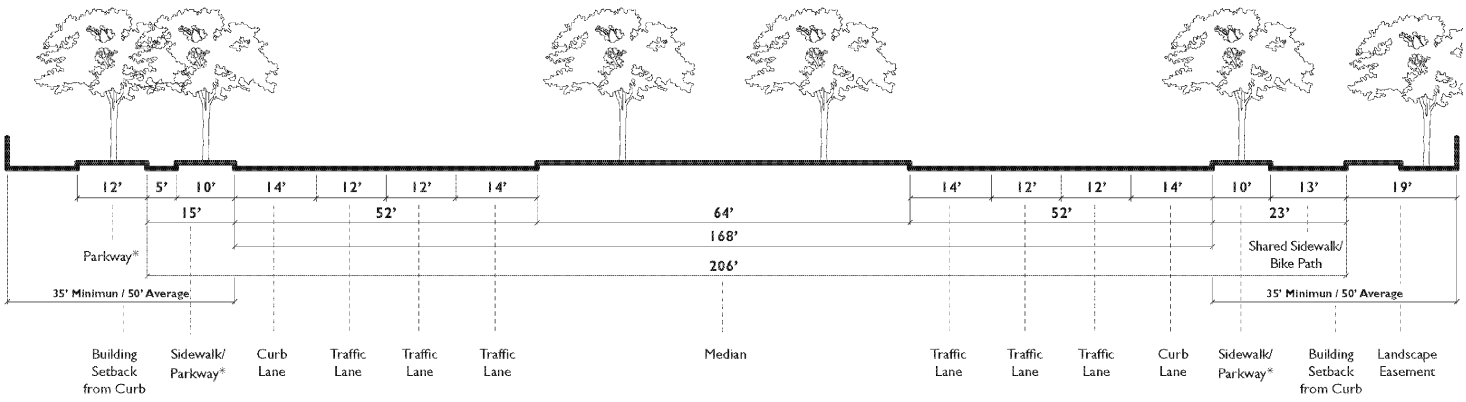
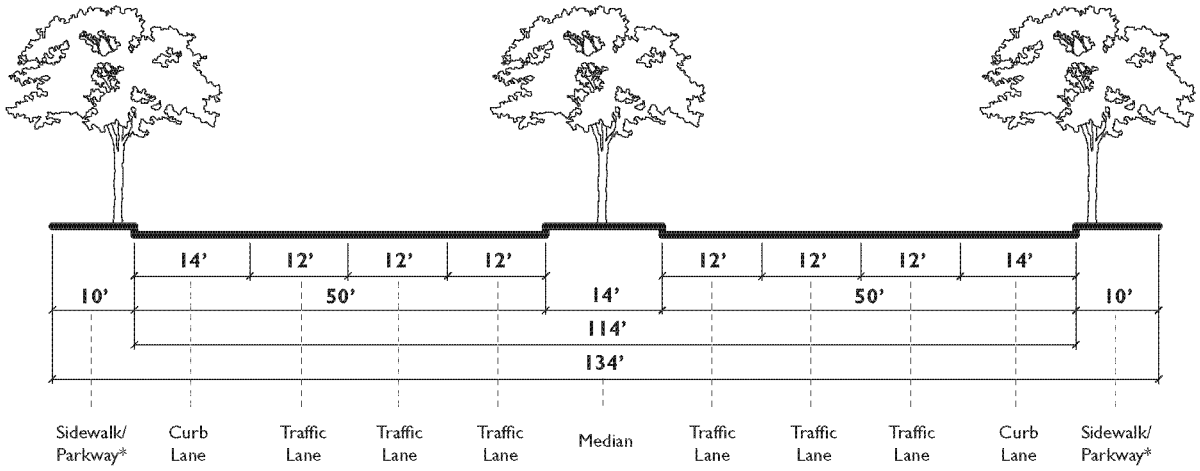


EXHIBIT 3-3 (1 of 3): CITY OF CHINO GENERAL PLAN ROADWAY CROSS-SECTIONS

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

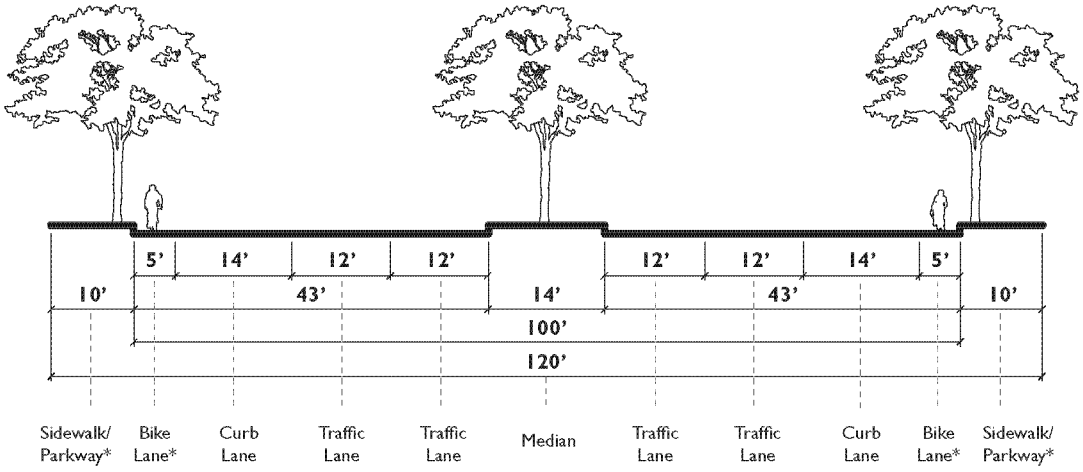
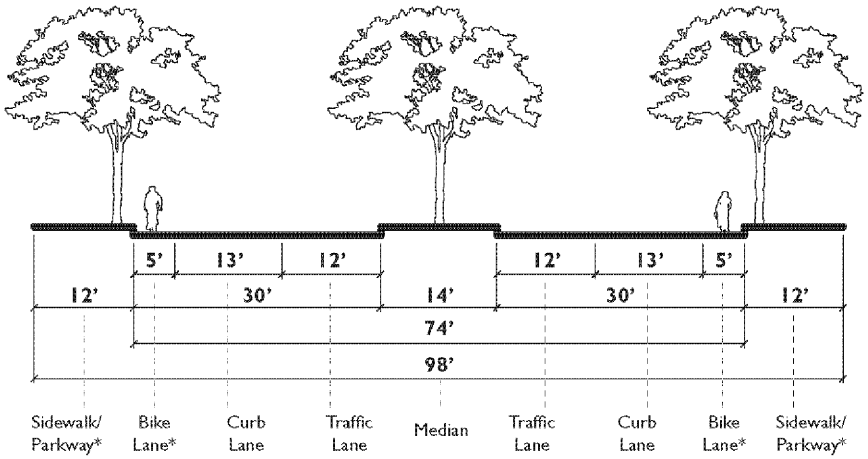


EXHIBIT 3-3 (2 of 3): CITY OF CHINO GENERAL PLAN ROADWAY CROSS-SECTIONS

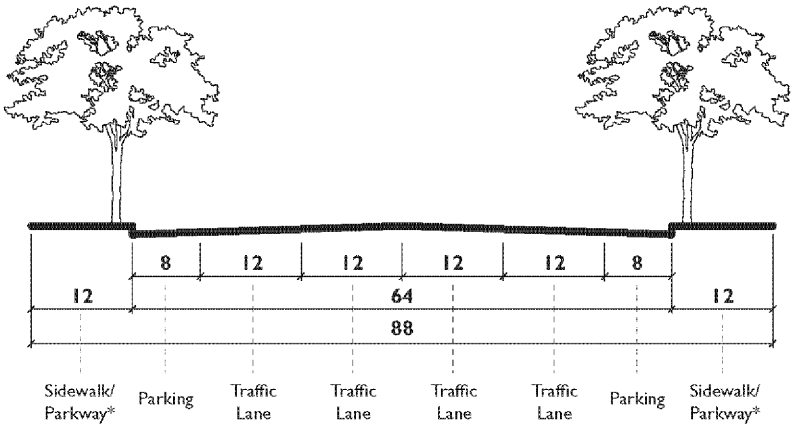
Primary Arterial: Typical 4 Lane

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

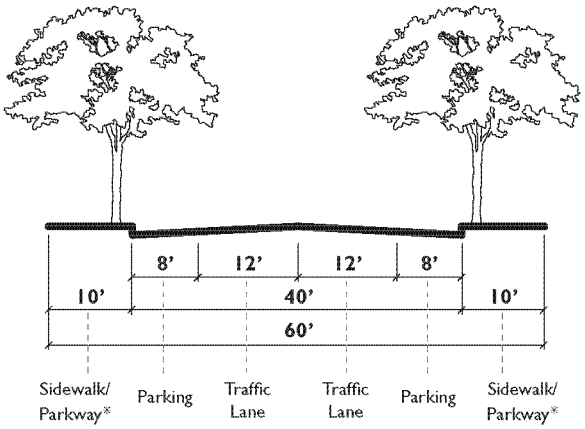
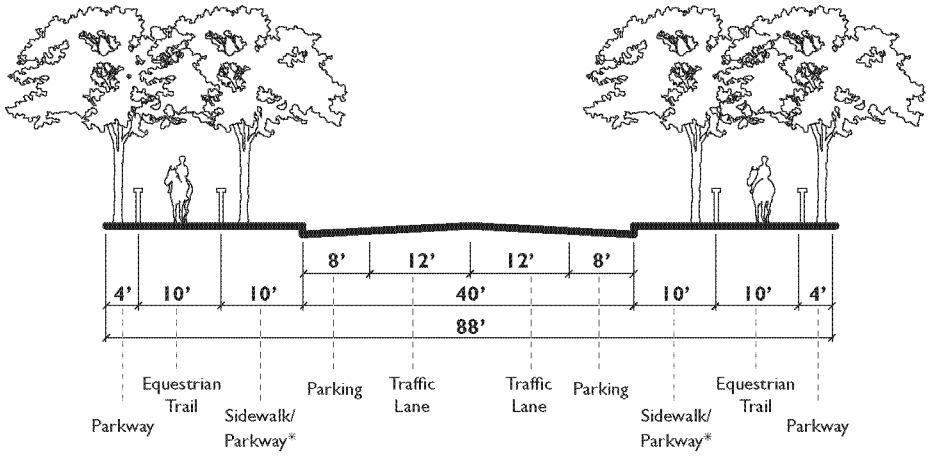


EXHIBIT 3-3 (3 of 3): CITY OF CHINO GENERAL PLAN ROADWAY CROSS-SECTIONS

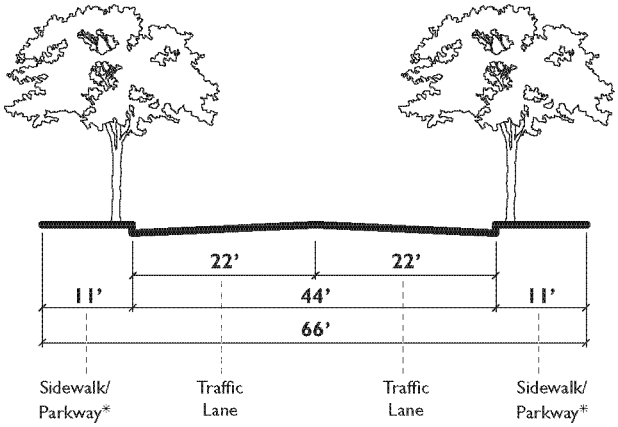
Urban Residential/Rural Collector with Equestrian Trails

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



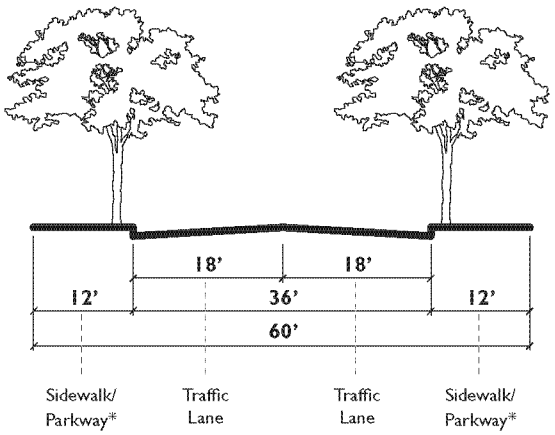
Urban Industrial Collector

Provides 2 traffic lanes



Local Street

Provides 2 traffic lanes



The study area roadway that is classified as a Primary Arterial is identified as having a 98-foot right-of-way and 74-foot curb-to-curb measurement. Primary Arterials include two lanes of travel in each direction and a 14-foot curbed and/or landscaped median. The following study area roadways within the City of Chino are classified as a Primary Arterial:

- Schaefer Avenue from Benson Avenue to Euclid Avenue
- Eucalyptus Avenue from Central Avenue to Euclid Avenue
- Kimball Avenue from Euclid Ave to Hellman Avenue
- Pine Avenue from El Prado Road to Euclid Avenue

The study area roadway that is classified as an Urban Residential Collector is identified as having a 60-foot right-of-way and 40-foot curb-to-curb measurement. Urban Residential Collectors include one lane of travel in each direction and 8-feet of parking in both directions. The following study area roadways within the City of Chino are classified as an Urban Residential Collector:

- Mayhew Avenue from Kimball Avenue to Bickmore Avenue
- Bickmore Avenue from Euclid Avenue to Hellman Avenue

3.3 THE PRESERVE SPECIFIC PLAN

The Project site is also located within The Preserve Specific Plan. The roadway classifications and planned (ultimate) roadway cross-sections of the major roadways within the study area, as identified on The Preserve Specific Plan, are described subsequently. Exhibit 3-4 shows The Preserve Specific Plan Circulation Element, and Exhibit 3-5 illustrates The Preserve Specific Plan roadway cross-sections.

Major Arterials, are intended to accommodate a significant volume of traffic and provide access to collectors, some local connectors, and major traffic generators. There are five unique roadway sections for Kimball Avenue and Hellman Avenue as shown on Roadway Sections D, E, F, G and H. A Major Arterial is a four-lane roadway, with right-of-way varying between 78-feet and 123-feet (excluding landscape lots) and varying curb-to-curb widths of 58-feet to 74-feet. A 14-foot landscaped median is included on Kimball Avenue and on Hellman Avenue. On-street parking is prohibited, except in emergency situations. Shared bicycle lanes (Class I) and pedestrian paths are provided via a meandering sidewalk/bike path, with a proposed equestrian trail provided along Hellman Avenue between Remington Avenue and the Southern California Edison (SCE) easement. The following study area roadways within The Preserve Specific Plan are classified as a Major Arterial:

- Hellman Avenue
- Kimball Avenue

EXHIBIT 3-4: THE PRESERVE SPECIFIC PLAN CIRCULATION PLAN

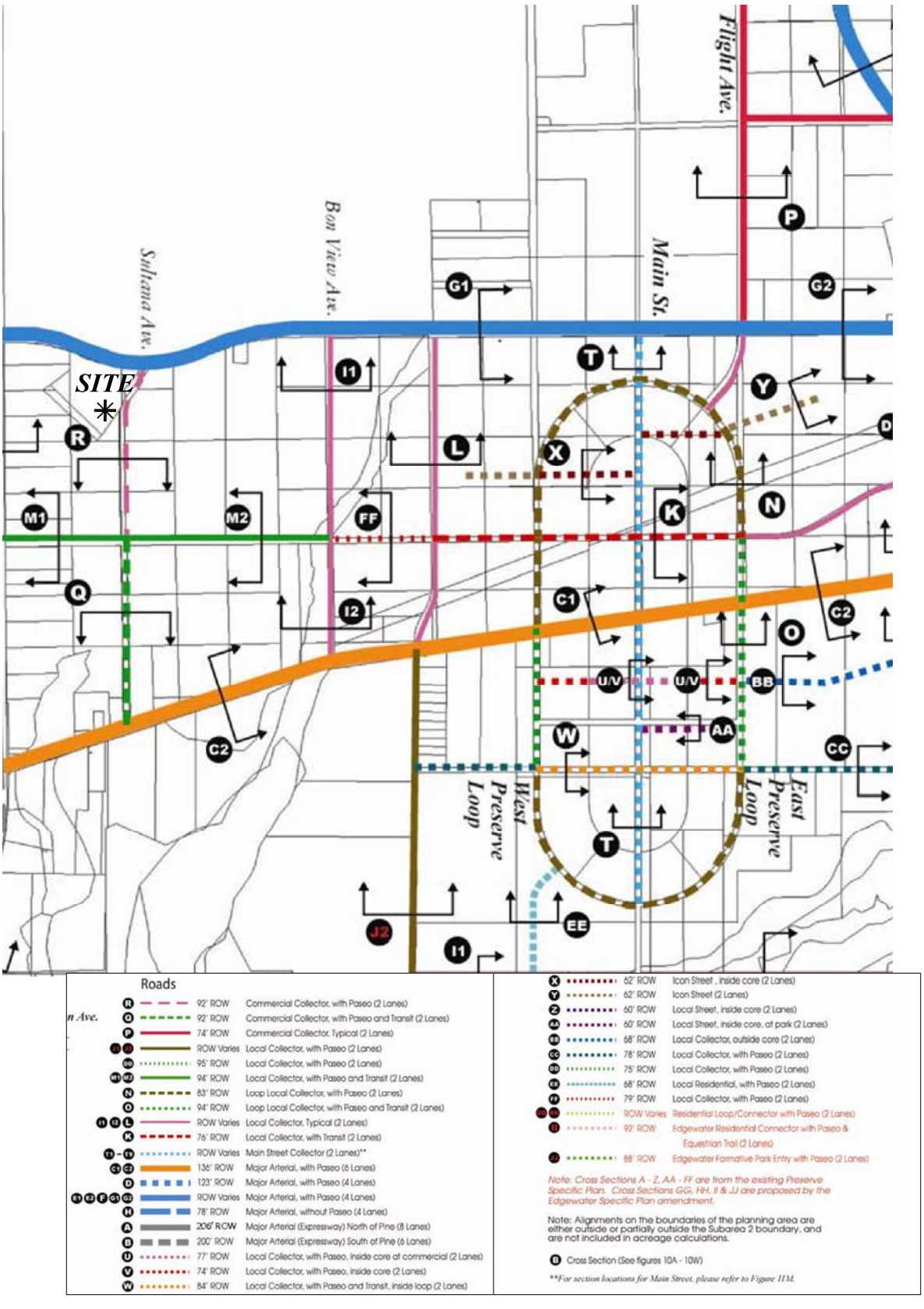
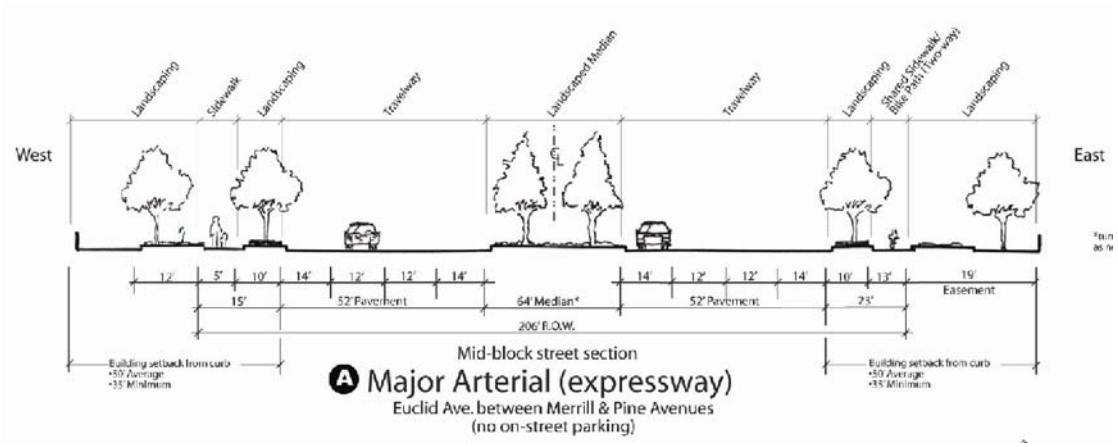
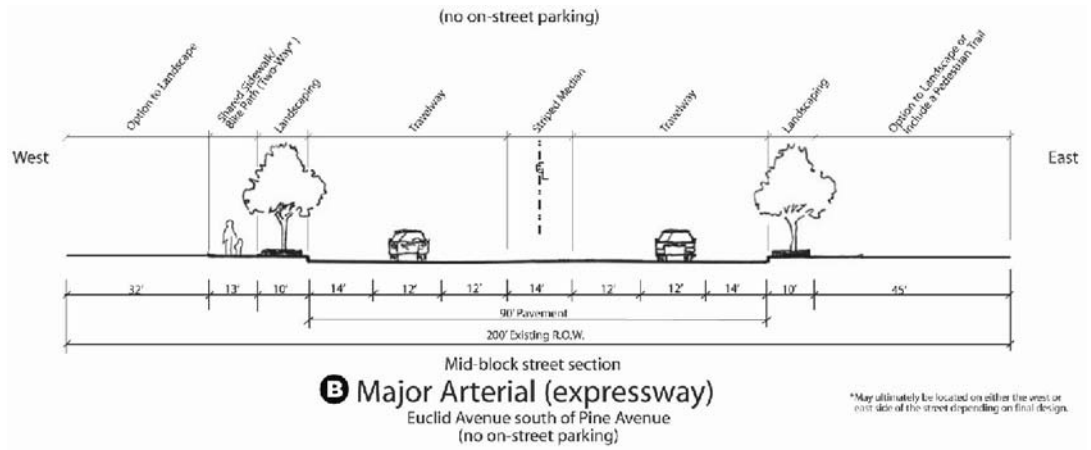
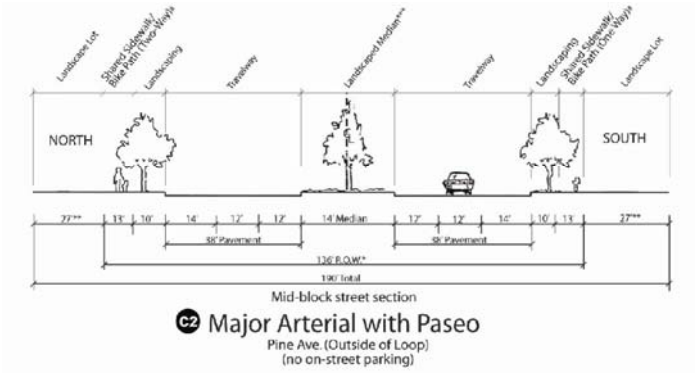
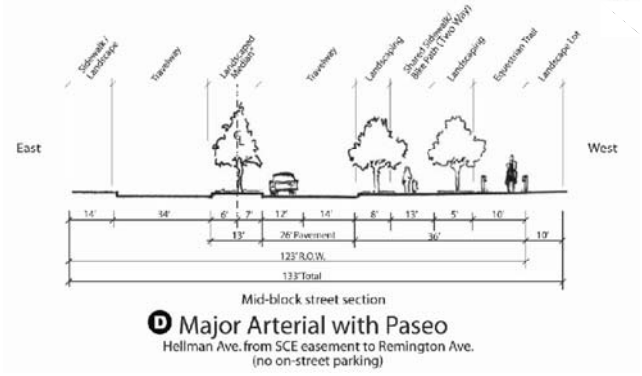


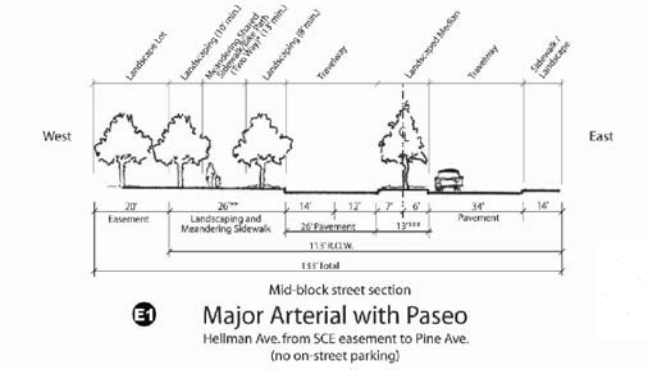
EXHIBIT 3-5 (1OF2): THE PRESERVE SPECIFIC PLAN ROADWAY CROSS-SECTIONS











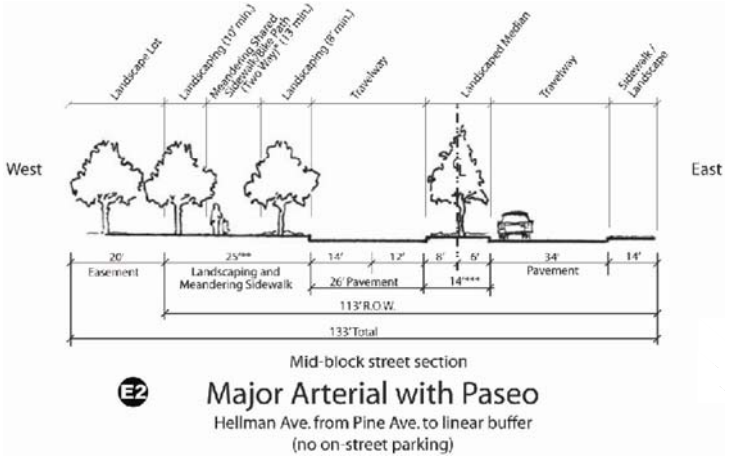
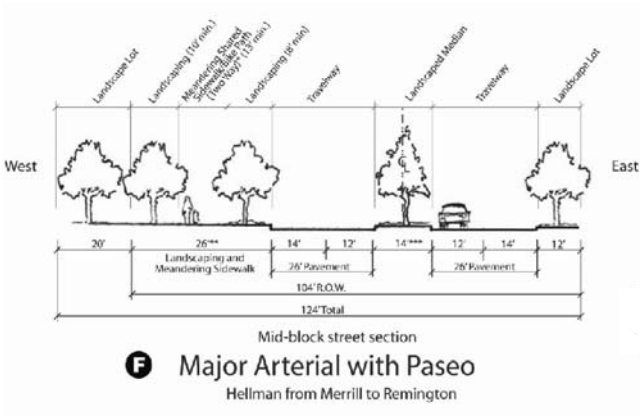


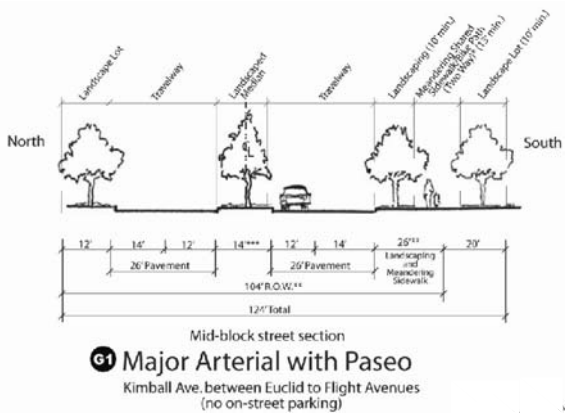
EXHIBIT 3-5 (2OF2): THE PRESERVE SPECIFIC PLAN ROADWAY CROSS-SECTIONS



Mid-block street section

F Major Arterial with Paseo

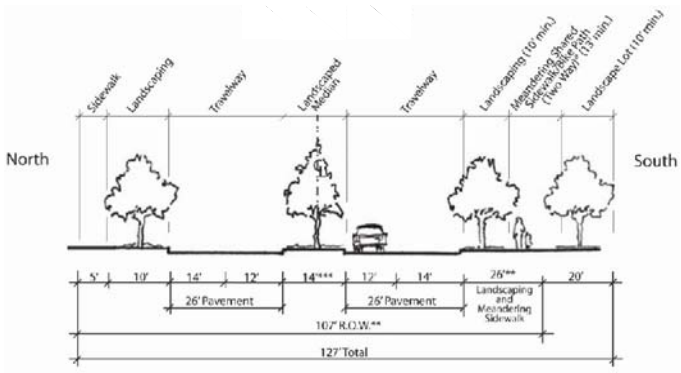
Hellman from Merrill to Remington



Mid-block street section

G1 Major Arterial with Paseo

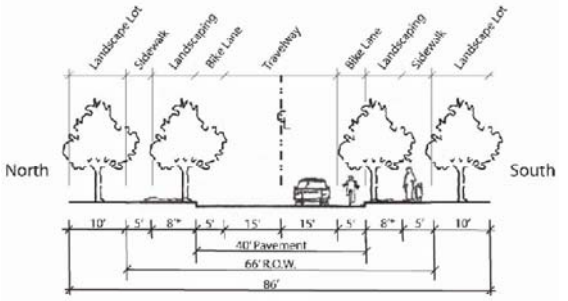
Kimball Ave. between Euclid to Flight Avenues
(no on-street parking)



Mid-block street section

G2 Major Arterial with Paseo

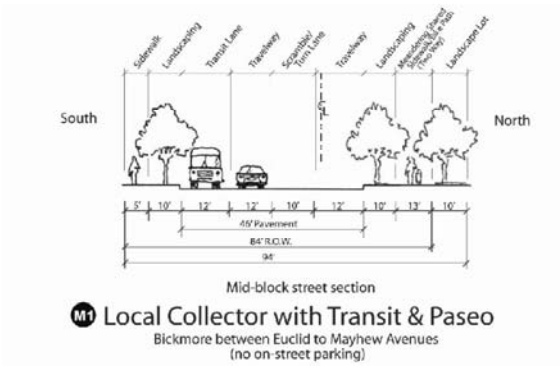
Kimball Ave. between Flight to Hellman Avenues
(no on-street parking)



Mid-block cross section

I1 Local Collector, Typical

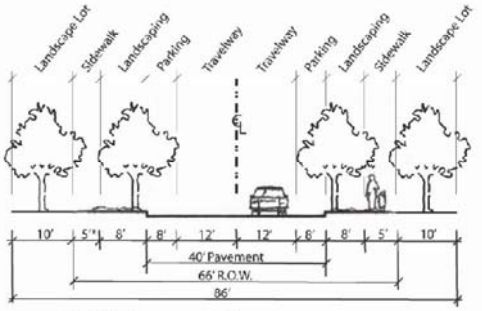
(with bike lane, no on-street parking)



Mid-block street section

M1 Local Collector with Transit & Paseo

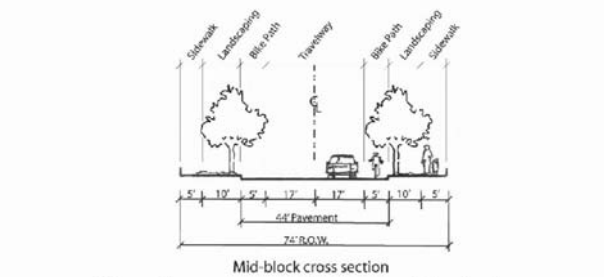
Bickmore between Euclid to Mayhew Avenues
(no on-street parking)



Mid-block cross section

L Local Collector, Typical

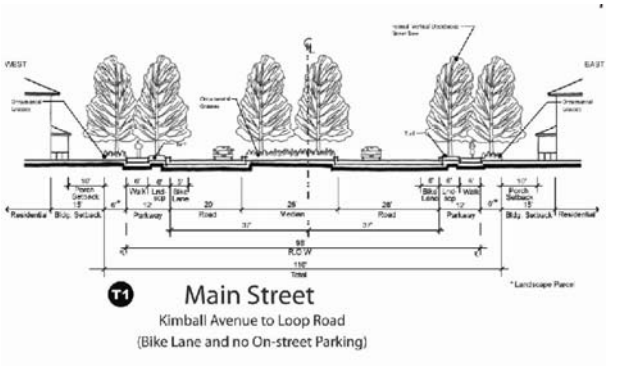
(with parking)



Mid-block cross section

P Commercial Collector, Typical

(no on-street parking)



T1 Main Street

Kimball Avenue to Loop Road
(Bike Lane and no On-street Parking)

Local collectors are intended to accommodate the bulk of local traffic within the Specific Plan, provide conditions with arterials and other local street(s), and provide immediate access to each land use. On-street parking is permitted in some locations and exclusive (Class II) or striped (Class II) bicycle lanes are accommodated along some roadways. A Commercial Collector (with Paseo) has two travel lanes, with a 92-foot right-of-way and 44-foot curb-to-curb pavement width. The following study area roadway within The Preserve Specific Plan is classified as a Commercial Collector:

- Mayhew Avenue

3.4 CITY OF ONTARIO AND CITY OF EASTVALE GENERAL PLAN CIRCULATION ELEMENT

Exhibits 3-6 and 3-7 show the City of Ontario 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.

3.5 TRUCK ROUTES

The City of Chino designated truck route map is shown on Exhibit 3-10. There are State truck routes and other truck routes throughout the City of Chino. Kimball Avenue, Mayhew Avenue, Bickmore Avenue (west of Mayhew Avenue), and Pine Avenue are some of the designated City of Chino truck routes near the Project while Euclid Avenue (SR-83) is designated as a State Truck Route. Other truck routes in the study area include, Riverside Drive, Edison Avenue, Central avenue, Chino Hills Parkway, El Prado Road, and Hellman Avenue. The designated truck route map has been utilized to route truck traffic from both the proposed Project and future cumulative development projects throughout the study area.

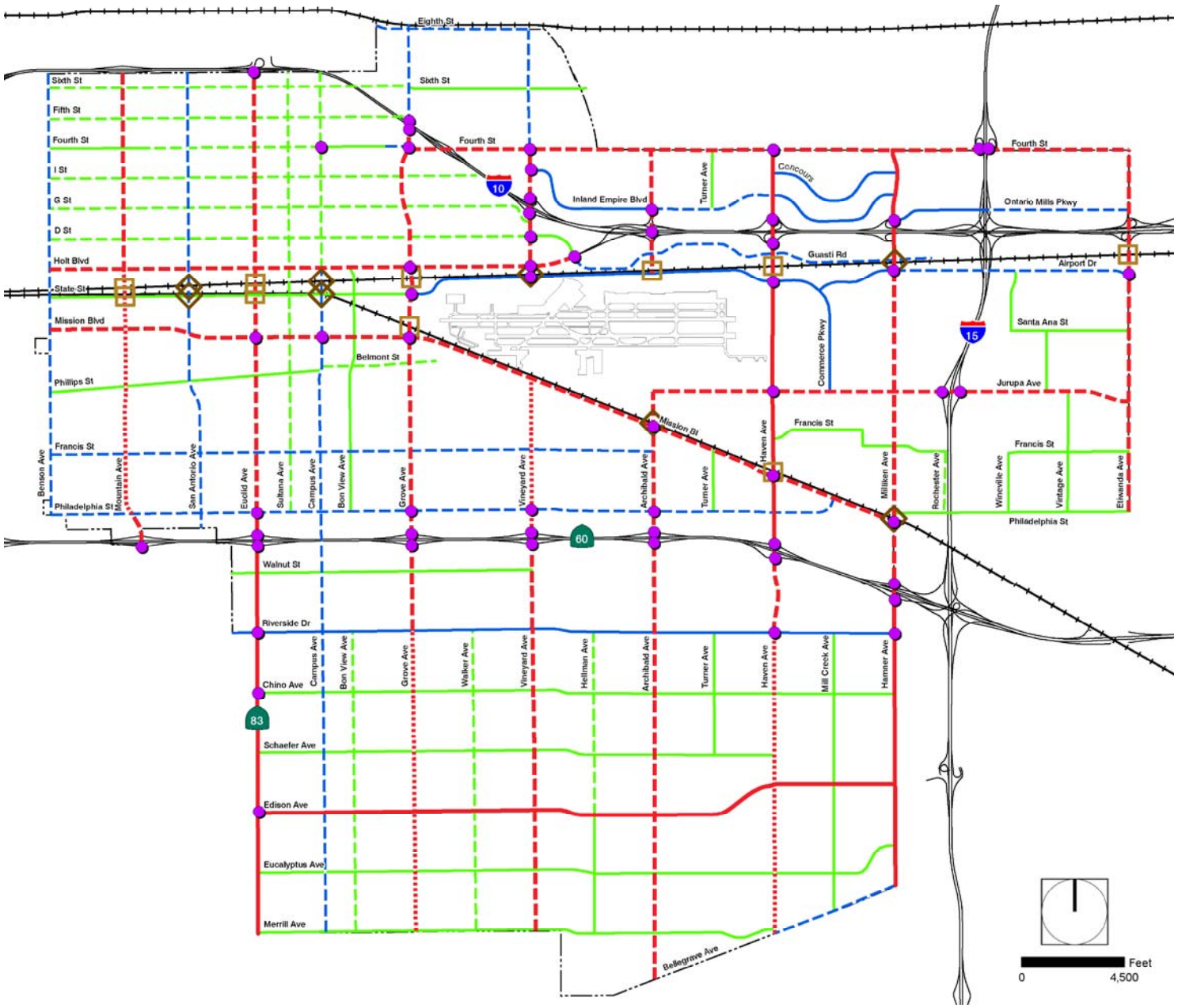
The City of Ontario designated truck route map is shown on Exhibit 3-11. Euclid Avenue (SR-83), Edison Avenue, Merrill Avenue, and Archibald Avenue are designated as a Truck Route in the City of Ontario. The designated truck route map has been utilized to route truck traffic from both the proposed Project and future cumulative development projects throughout the study area.

3.6 BICYCLE, EQUESTRIAN, & PEDESTRIAN FACILITIES

Field observations conducted in May 2016 indicate nominal pedestrian and bicycle activity within the study area. Exhibit 3-12 illustrates the City of Chino future planned bicycle facilities, which proposes Class I bike lanes along Kimball Avenue, Mayhew Avenue, and Bickmore Avenue near the vicinity of the site. Euclid Avenue (SR-83) is planned to have Class II bike lanes near the vicinity of the site. Exhibit 3-13 illustrates The Preserve Specific Plan bicycle and paseo plan, which proposes community paseos and an open space system along the previously identified streets of Kimball Avenue, Mayhew Avenue, Bickmore Avenue, and Euclid Avenue (SR-83) near the vicinity of the site.

Exhibit 3-14 illustrates The Preserve Specific Plan equestrian trails, which proposes an equestrian trail along Mayhew Avenue near the vicinity of the site. Exhibit 3-15 illustrates the City of Ontario General Plan trails and bikeway systems. 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.

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



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

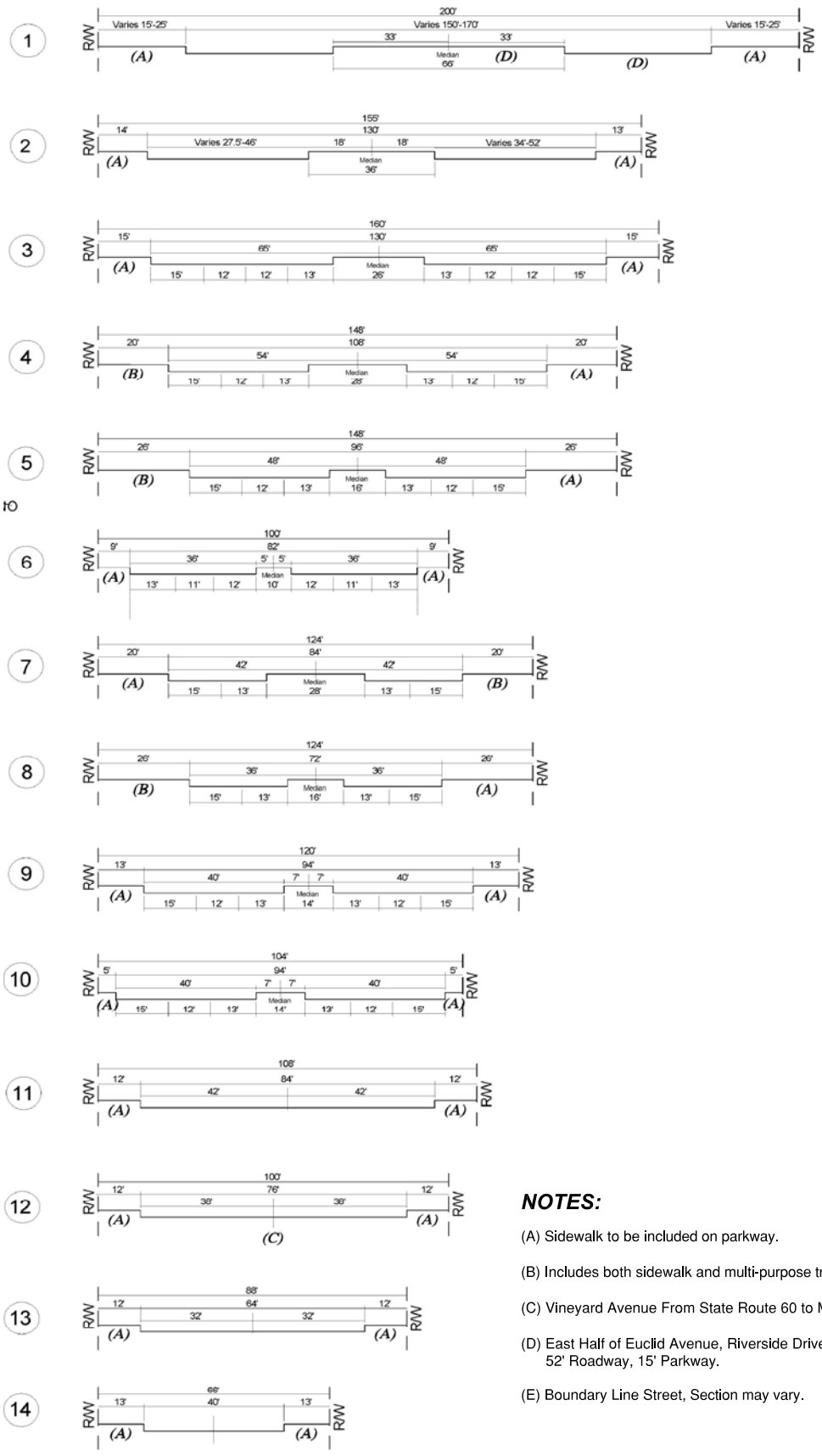
Minor Arterial
- 6 Lanes
- 4 Lanes

Collector Street
- 4 Lanes
- 2 Lanes

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

N

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



NOTES:

(A) Sidewalk to be included on parkway.

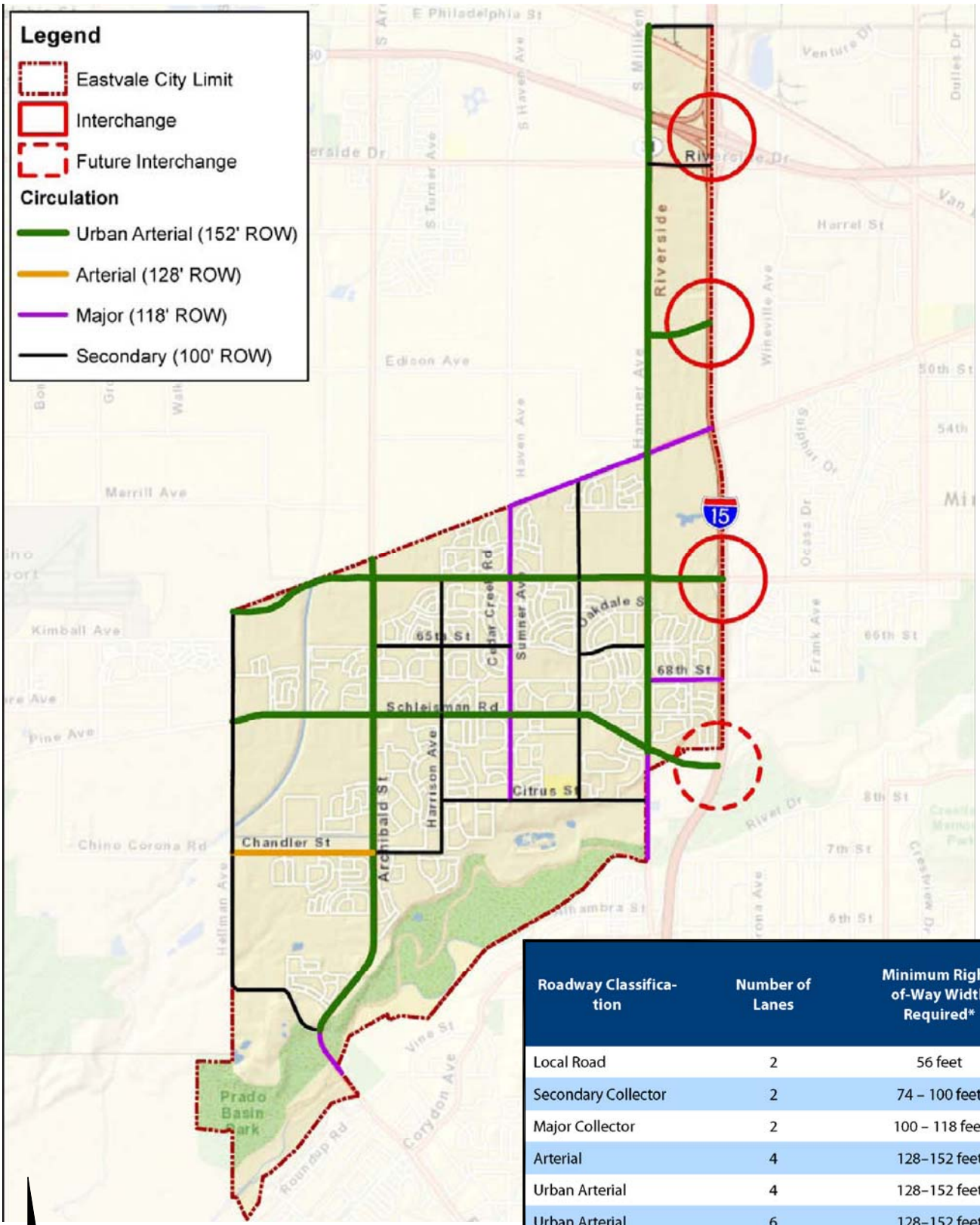
(B) Includes both sidewalk and multi-purpose trail.

(C) Vineyard Avenue From State Route 60 to Mission Boulevard 72' Roadway, 14' Parkway.

(D) East Half of Euclid Avenue, Riverside Drive to Merrill Avenue 100' ROW, 33' Median, 52' Roadway, 15' Parkway.

(E) Boundary Line Street, Section may vary.

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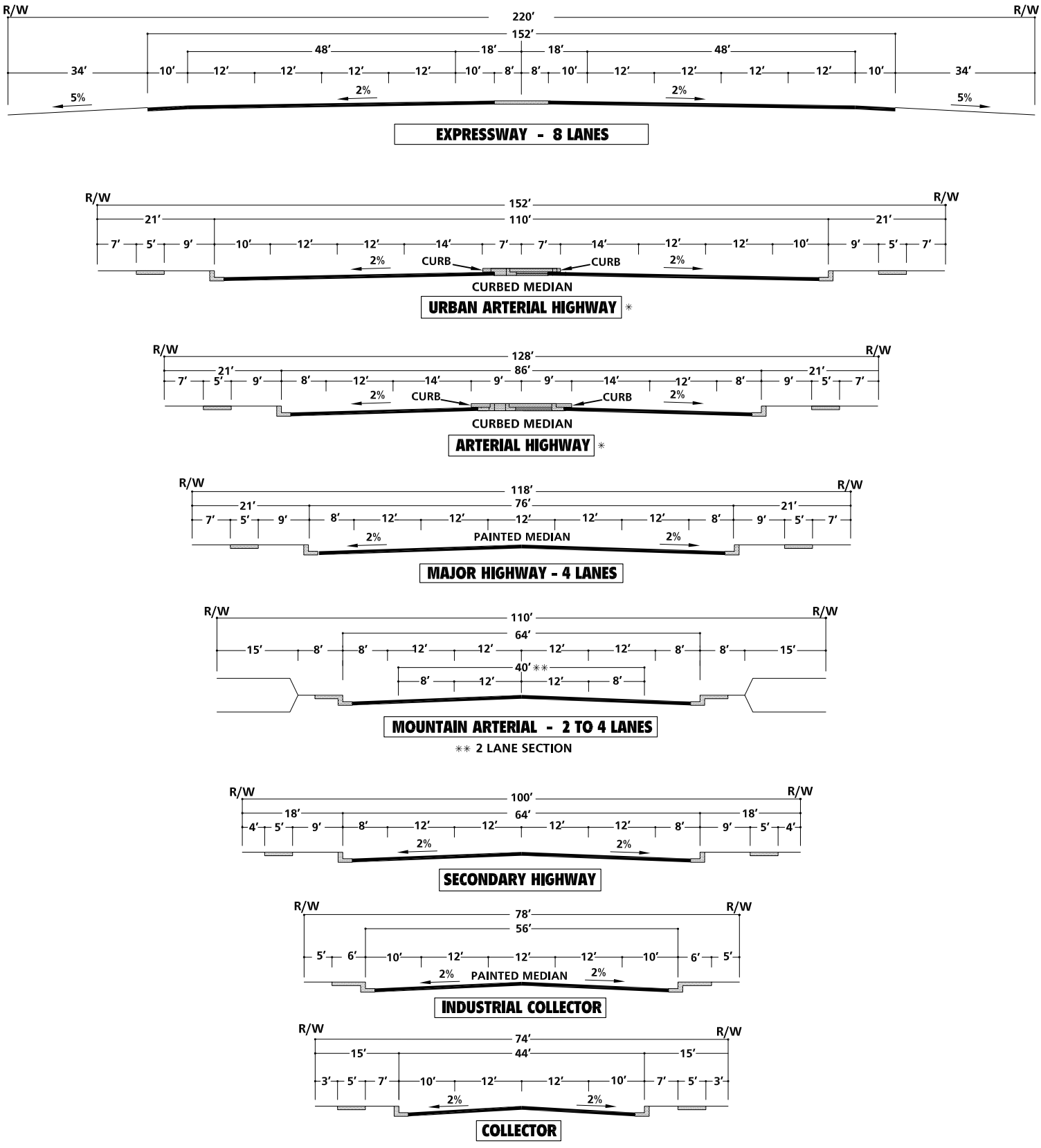
EXHIBIT 3-9: CITY OF EASTVALE GENERAL PLAN ROADWAY CROSS-SECTIONS



* *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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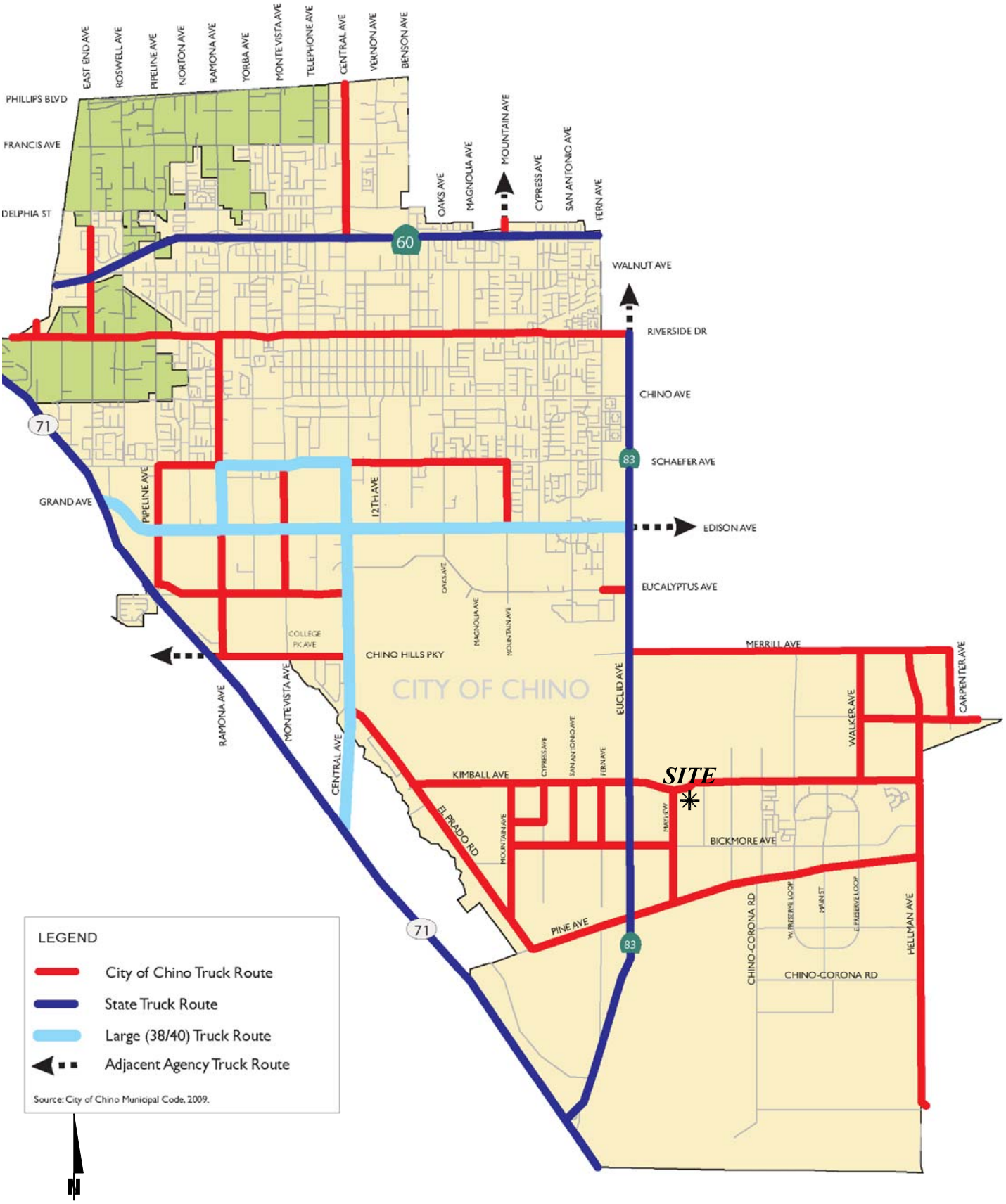
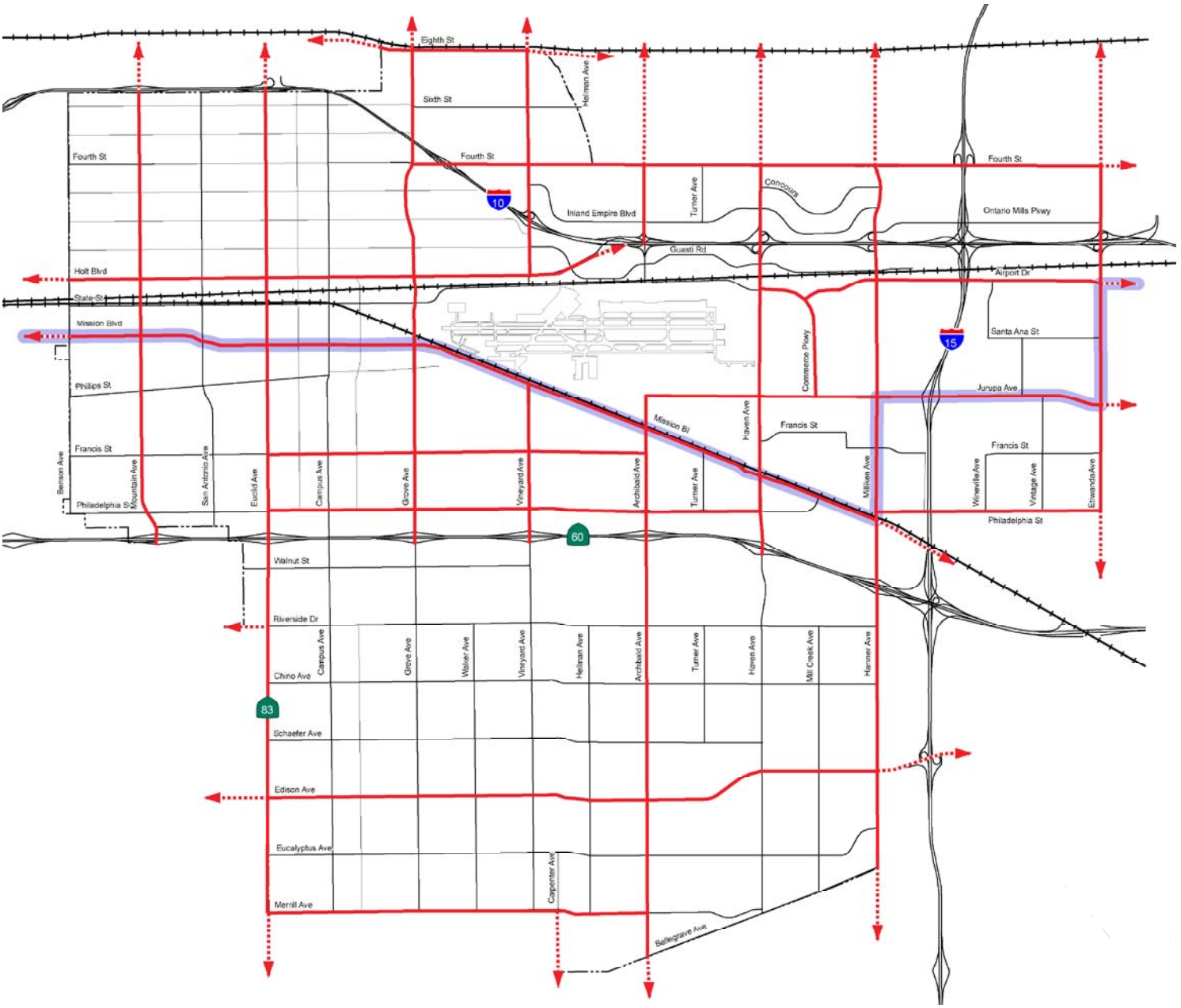
URBAN CROSSROADS

EXHIBIT 3-10: CITY OF CHINO TRUCK ROUTES



09774 - chino-trucks.dwg

EXHIBIT 3-11: CITY OF ONTARIO TRUCK ROUTES



LEGEND:

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

N

09774 - ontario truck routes.dwg

EXHIBIT 3-12: CITY OF CHINO FUTURE BICYCLE FACILITIES

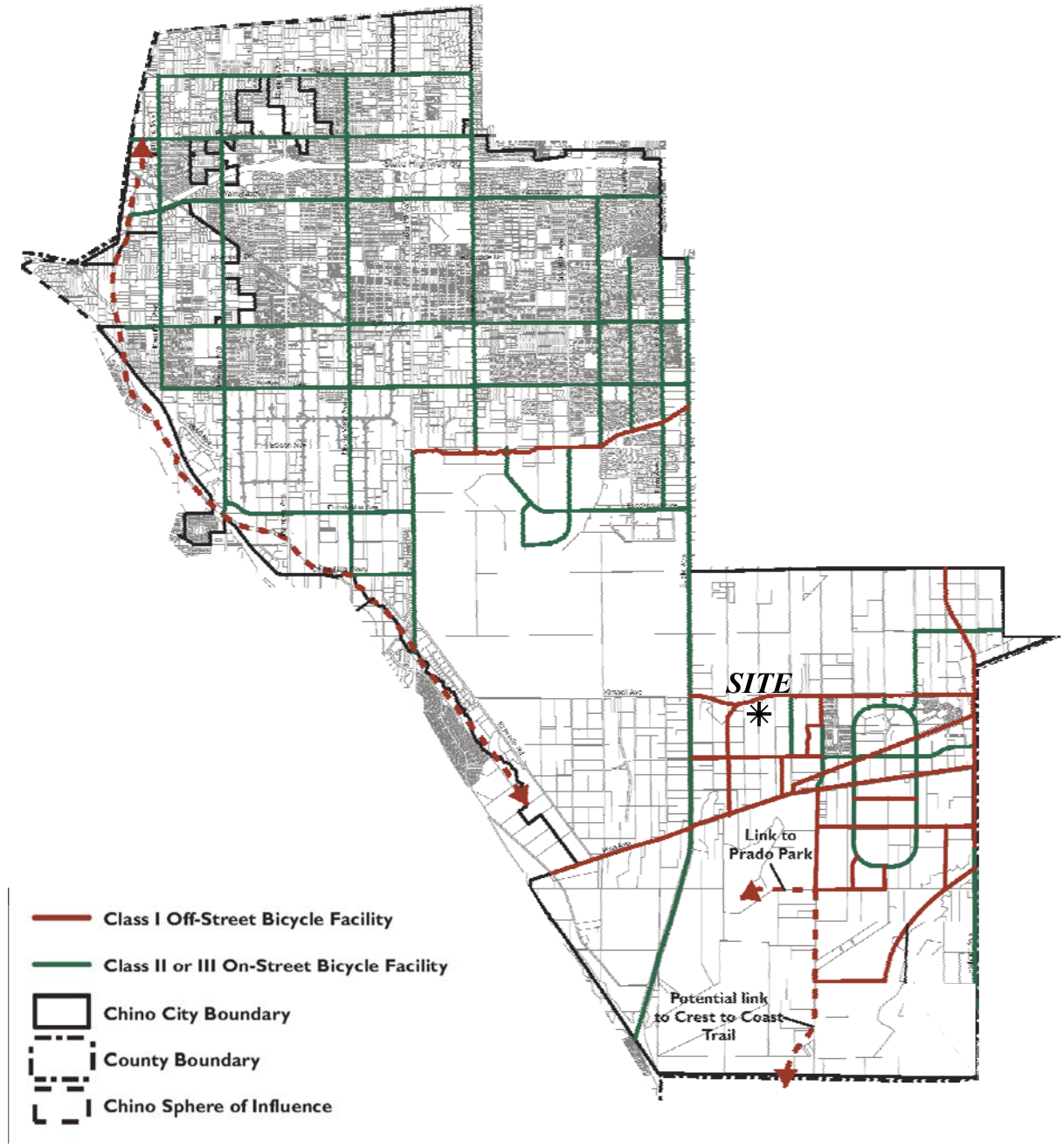


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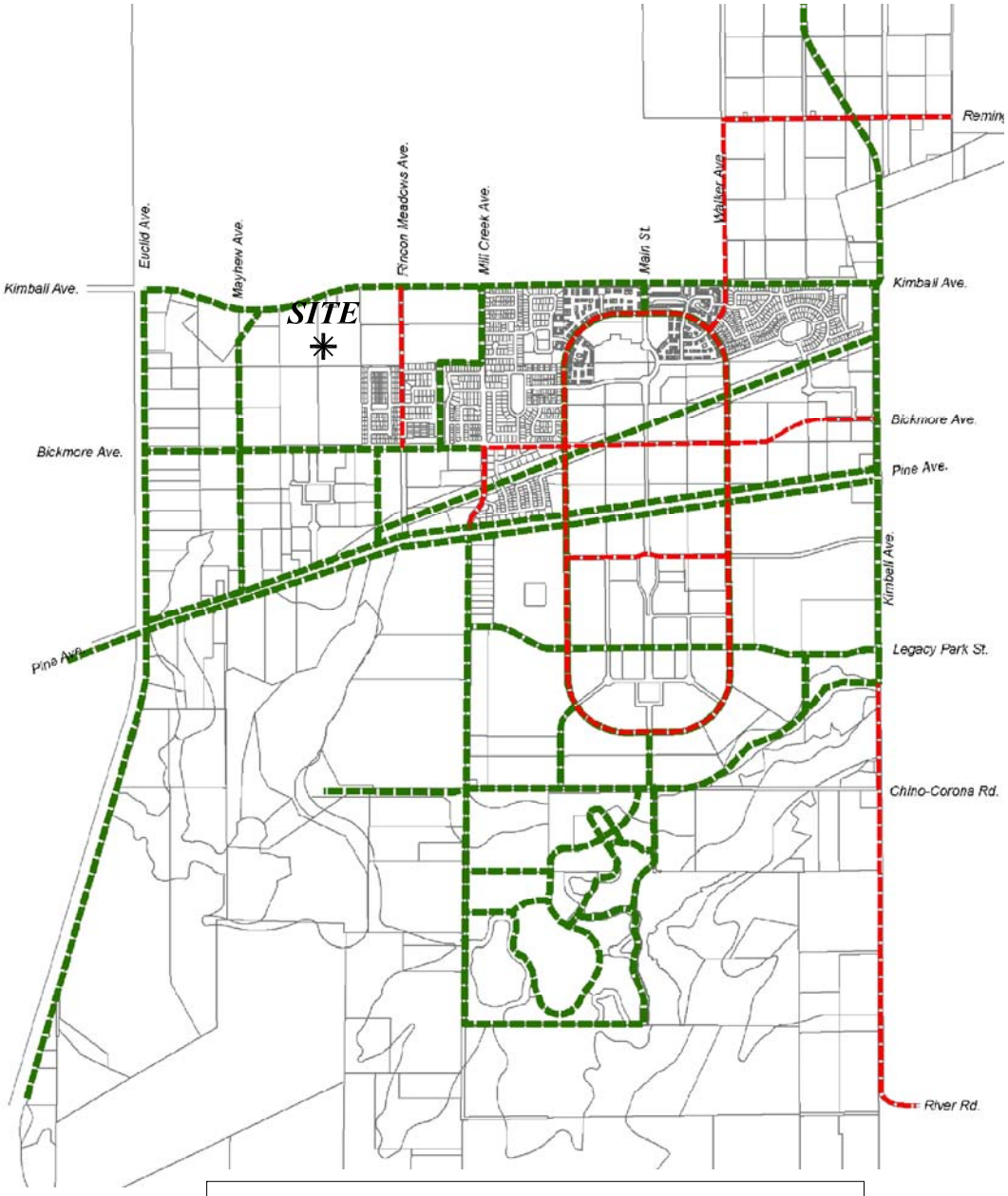
EXHIBIT 3-13: THE PRESERVE SPECIFIC PLAN BICYCLE PLAN

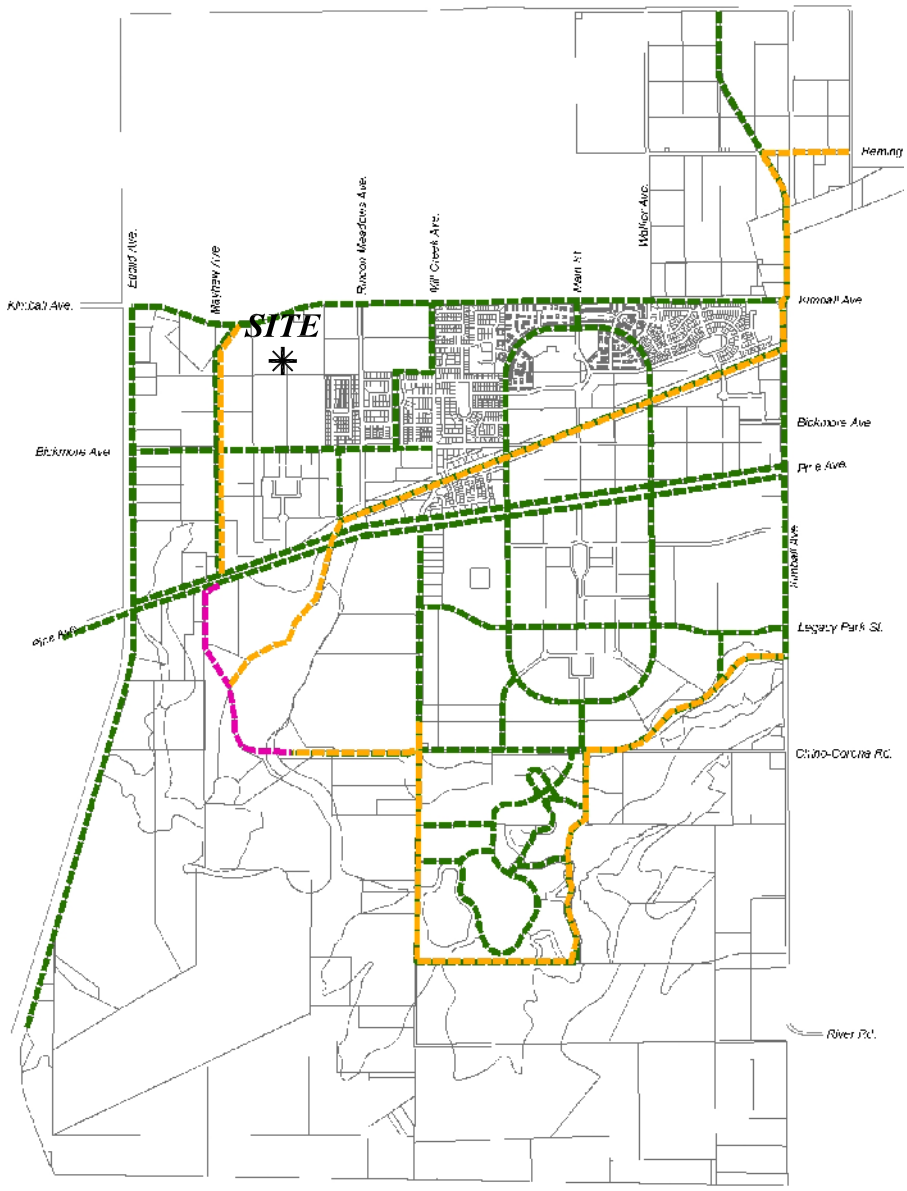


Notes:

Paseo width varies. Bike lane on Loop Road alternates between Class I and Class II facilities. See street sections for detailed information.

Refer to Landscape Structure Plan (Section VI Figure 22) for the location of the Urban Fringe Buffer within the Edgewater Neighborhood.

EXHIBIT 3-14: THE PRESERVE SPECIFIC PLAN EQUESTRIAN PLAN



Equestrian Trails

Conceptual Equestrian Trails

Community Paseo and Open Space System

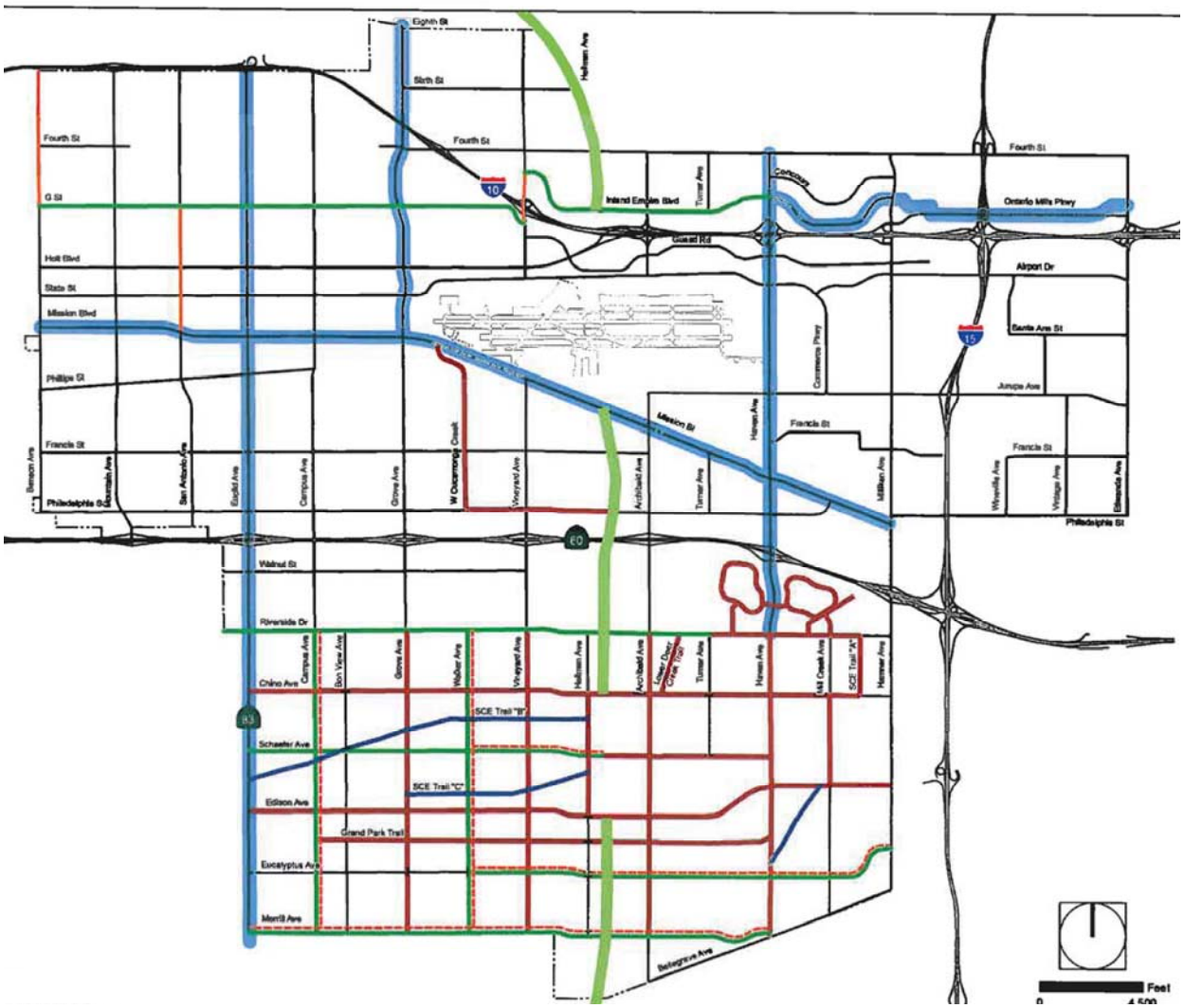
Notes:

Paseo width varies. See street sections for detailed information.

Refer to Landscape Structure Plan (Section VI Figure 22) for the location of the Urban Fringe Buffer within the Edgewater Neighborhood.

N

EXHIBIT 3-15: CITY OF ONTARIO GENERAL PLAN TRAILS AND BIKEWAY SYSTEMS



LEGEND:

- Freeways
- Backbone Street System
- Multipurpose Trail
- Class II & Multipurpose Trail
- Class II
- Class III
- SCE Trails
- Cucamonga Creek Multipurpose Trail
- Bicycle Corridors

N

EXHIBIT 3-16: EASTVALE AREA TRAILS AND BIKEWAYS SYSTEM

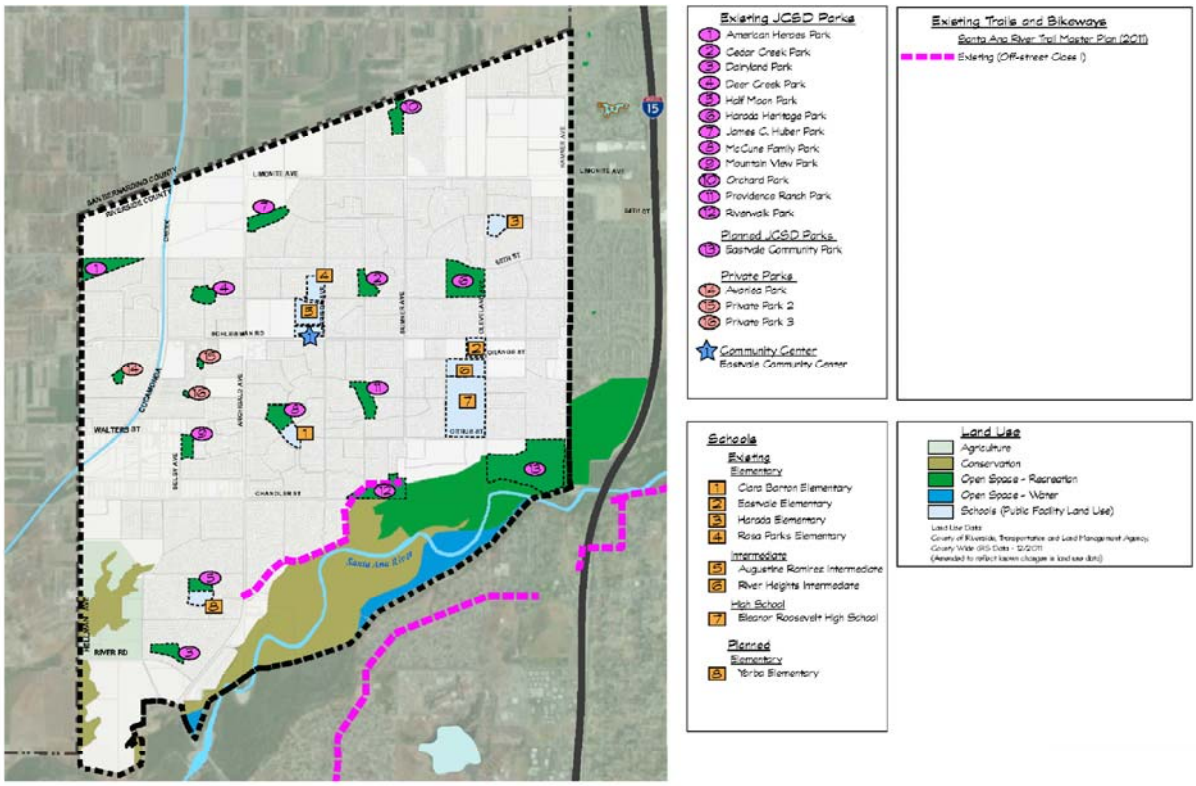


Exhibit 2.8-1 Existing Trails

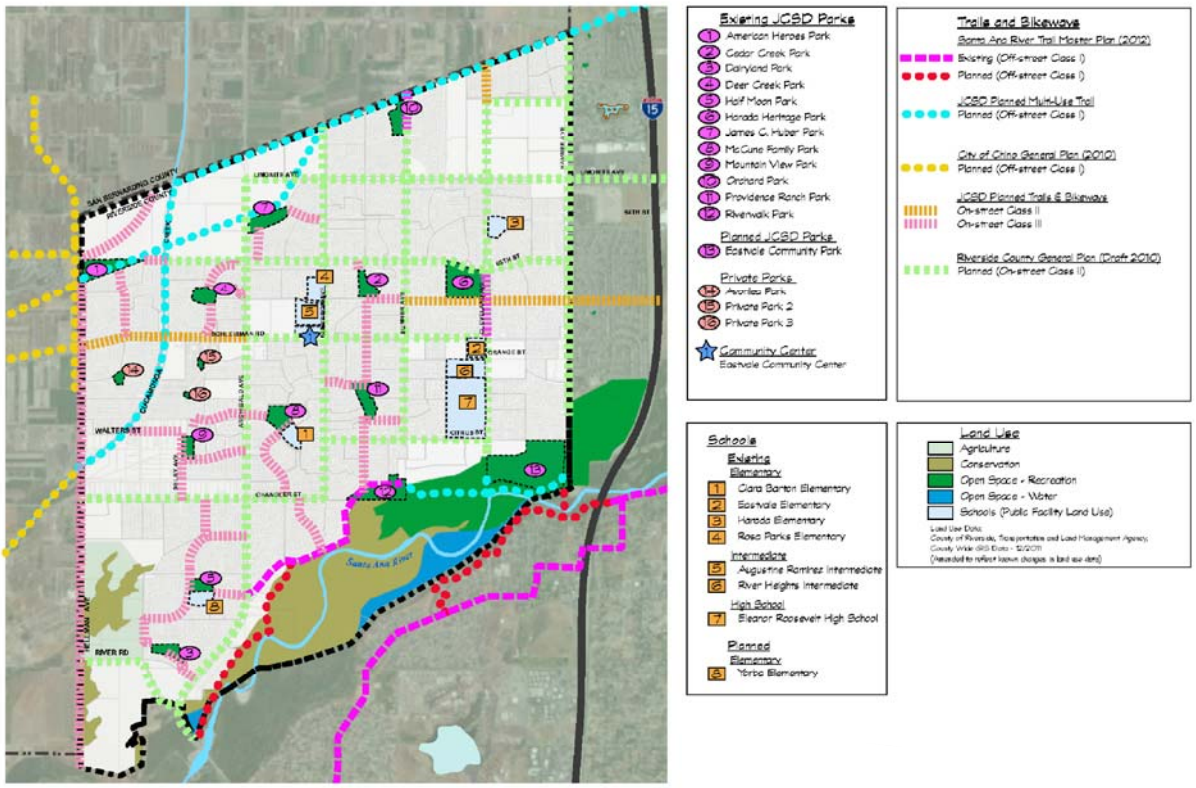
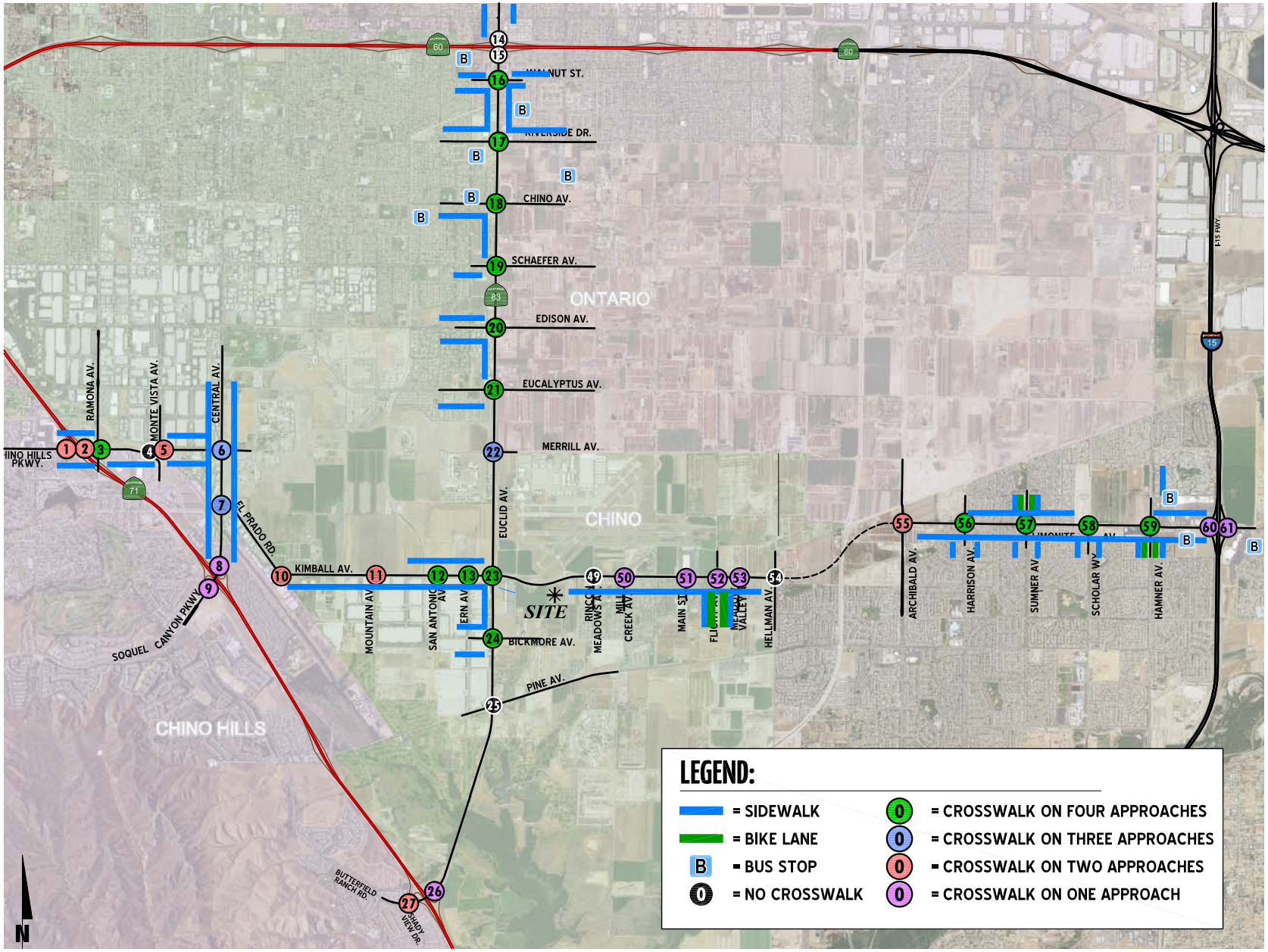


Exhibit 2.8-2 Planned Trails

EXHIBIT 3-17: EXISTING PEDESTRIAN FACILITIES



3.7 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, there are no existing Omnitrans routes that operate near the vicinity of the site. The Riverside Transit Authority (RTA) serves the City of Eastvale. However, 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 bus service to the site. Existing transit routes in the vicinity of the study area are illustrated on Exhibit 3-18.

The Preserve Specific Plan proposes a local transit loop proposed from Euclid Avenue (SR-83) east on Bickmore Avenue to E. Preserve Loop and circling back on Pine Avenue to Mayhew Avenue and back to Bickmore Avenue. There are potential transit stops identified at Euclid Avenue (SR-83) at Bickmore Avenue and Mayhew Avenue at Bickmore Avenue within the study area.

3.8 EXISTING (2016) TRAFFIC COUNTS

The intersection LOS analysis is based on the traffic volumes observed during the peak hour conditions using traffic count data collected in May 2016. The following peak hours were selected for analysis:

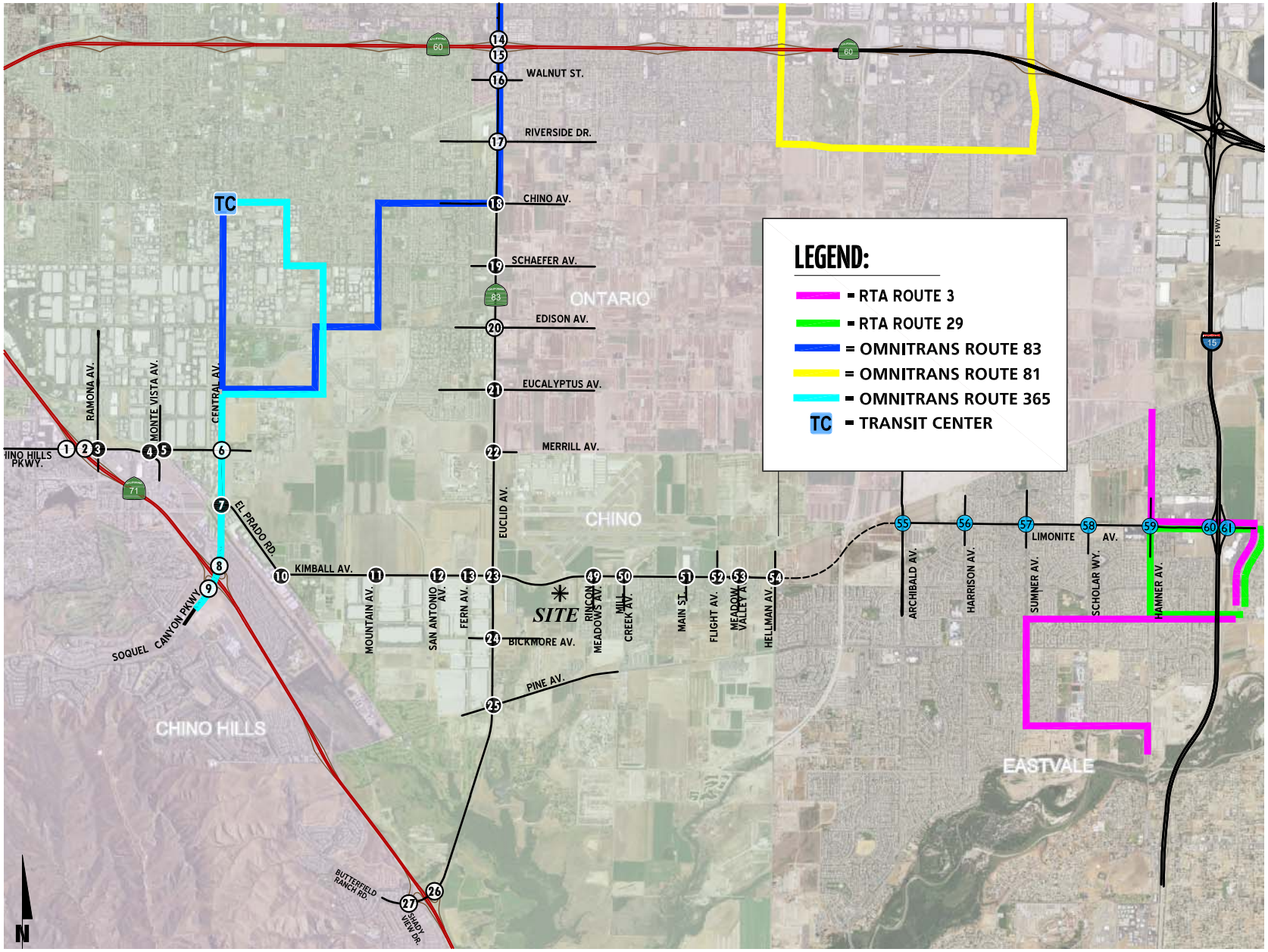
- Weekday AM Peak Hour (peak hour between 7:00 AM and 9:00 AM)
- Weekday PM Peak Hour (peak hour between 4:00 PM and 6:00 PM)

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.

The traffic counts collected in April/May 2016 include the following vehicle classifications: Passenger Cars, 2-Axle Trucks, 2-Axle Trucks, and 4 or More Axle Trucks.

To represent the impact large trucks, buses and recreational vehicles have on traffic flow; all trucks were converted into Passenger Car Equivalents (PCEs). 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.

EXHIBIT 3-18: EXISTING TRANSIT ROUTES



Existing weekday average daily traffic (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 12.7572 = 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 7.84 percent. As such, the above equation utilizing a factor of 12.7572 estimates the ADT volumes on the study area roadway segments assuming a peak-to-daily relationship of approximately 7.84 percent (i.e., 1/0.0784 = 12.7572) 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.

3.9 INTERSECTION OPERATIONS ANALYSIS

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

- Central Av. / El Prado Rd. (#7) – LOS F PM peak hour only
- Hellman Av. / Kimball Av. (#54) – LOS F AM and PM peak hours

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.

3.10 TRAFFIC SIGNAL WARRANTS ANALYSIS

Traffic signal warrants for Existing traffic conditions are based on existing peak hour intersection turning volumes. The following study area intersections currently warrant a traffic signal for Existing traffic conditions:

- Monte Vista Av. West / Chino Hills Pkwy. (#4)
- Flight Av. / Kimball Av. (#52)
- Hellman Av. / Kimball Av. (#54)

However, the intersections of Monte Vista Avenue West at Chino Hills Parkway (#4) and Flight Avenue at Kimball Avenue (#52) are currently operating at an acceptable LOS as cross-street stop controlled intersections and the installation of a traffic signal does not appear necessary with respect to peak hour operations. Existing conditions traffic signal warrant analysis worksheets are provided in Appendix 3.3.

EXHIBIT 3-19: EXISTING (2016) AVERAGE DAILY TRAFFIC (ADT)

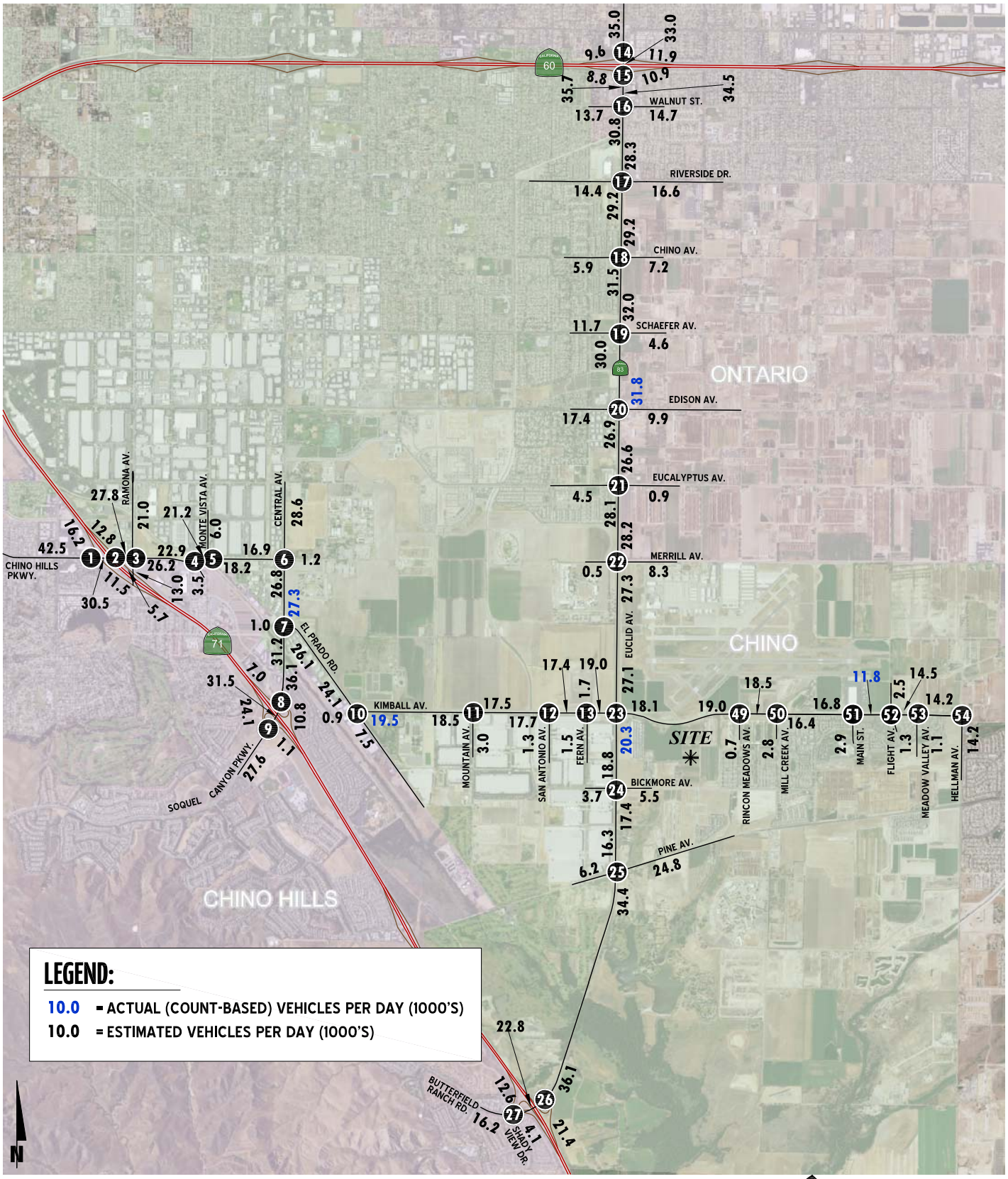


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EXHIBIT 3-20 (1OF2): EXISTING (2016) TRAFFIC VOLUMES (IN PCE)

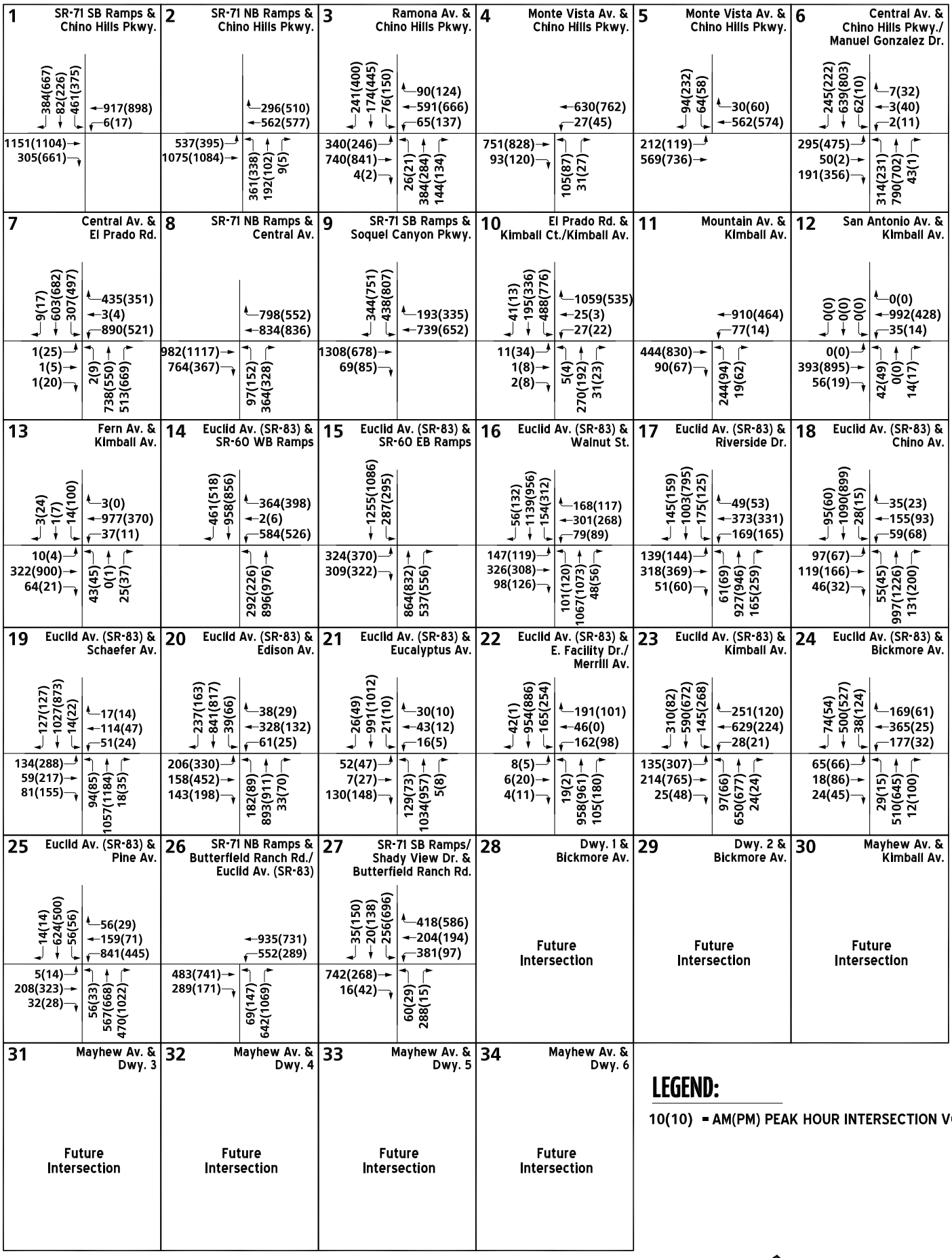

EXHIBIT 3-20 (2OF2): EXISTING (2016) TRAFFIC VOLUMES (IN PCE)

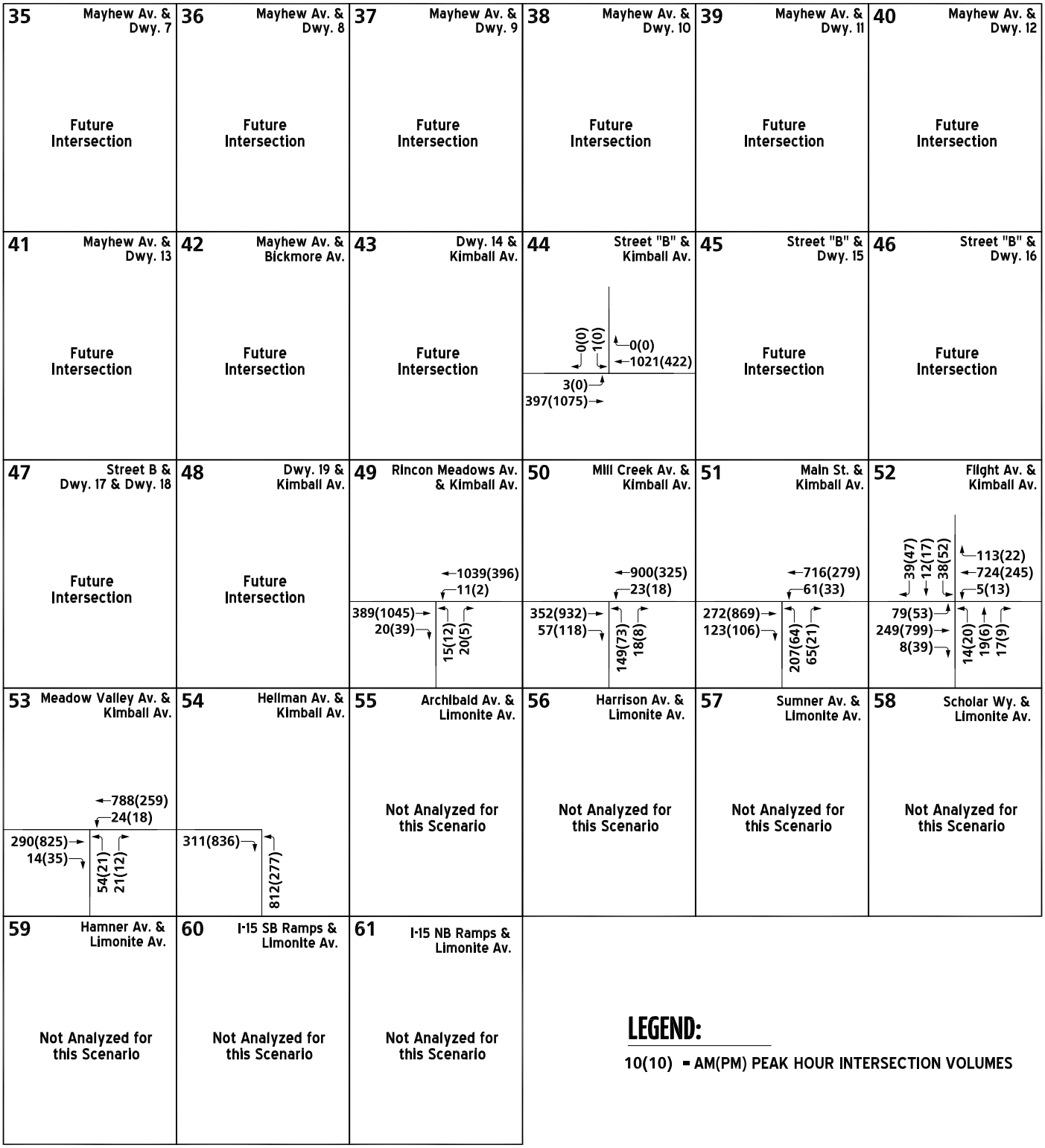

EXHIBIT 3-21: SUMMARY OF LOS FOR EXISTING (2016) CONDITIONS

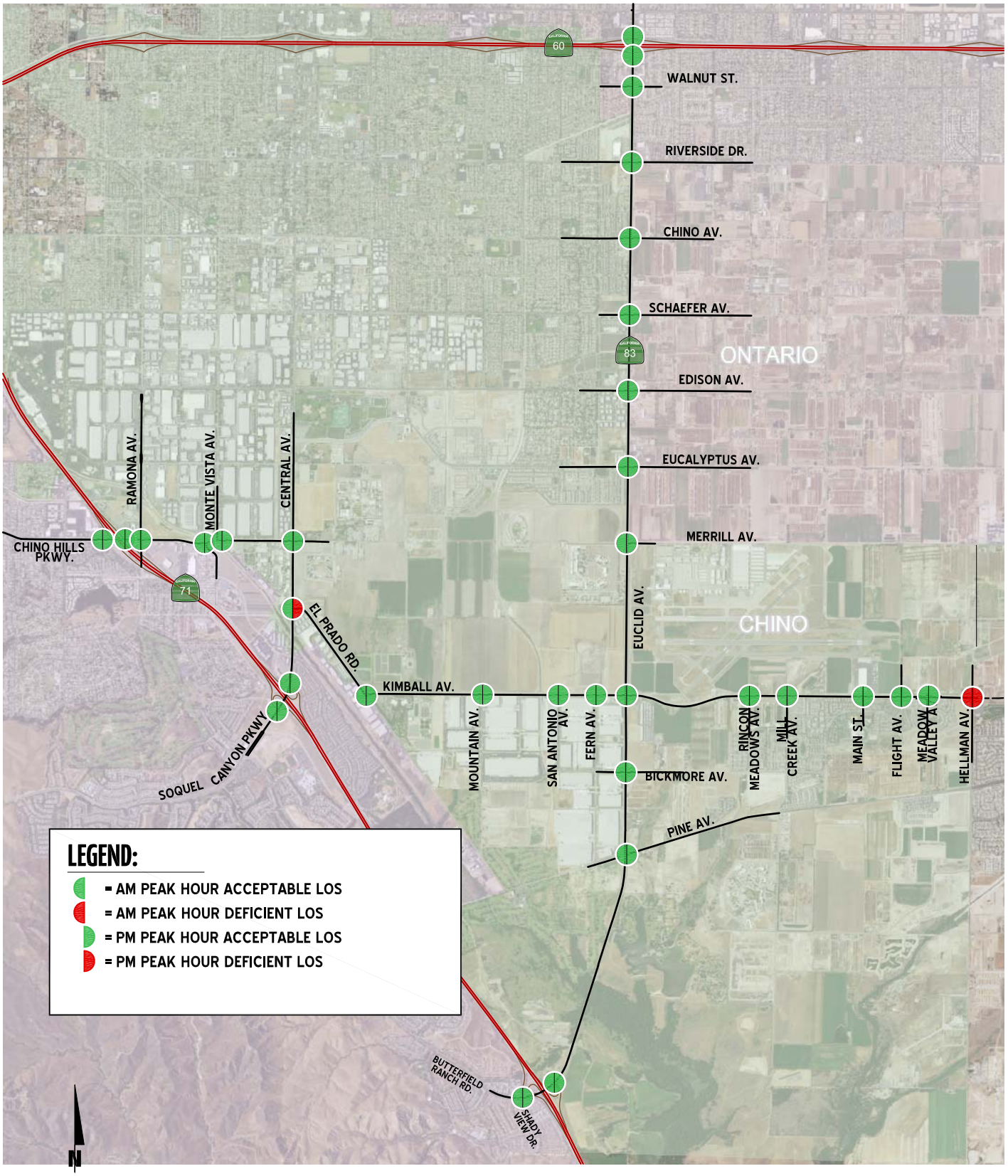

Table 3-1

Intersection Analysis for Existing (2016) Conditions

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service		Acceptable LOS
			Northbound			Southbound			Eastbound			Westbound							
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM	
1	SR-71 SB Ramps / Chino Hills Pkwy.	TS	0	0	0	1	1	1>>	0	4	1	1	2	0	11.8	14.7	B	B	D
2	SR-71 NB Ramps / Chino Hills Pkwy.	TS	1	2	0	0	0	0	2	2	0	0	2	1	24.5	21.9	C	C	D
3	Ramona Av. / Chino Hills Pkwy.	TS	1	2	0	1	2	d	1	3	0	1	2	1	40.5	41.8	D	D	D
4	Monte Vista Av. West / Chino Hills Pkwy.	CSS	0	1	0	0	0	0	0	2	1	1	2	0	24.3	22.5	C	C	D
5	Monte Vista Av. East / Chino Hills Pkwy.	TS	0	0	0	2	0	1>	1	2	0	0	2	0	18.5	16.1	B	B	D
6	Central Av. / Chino Hills Pkwy.	TS	1	2	1	1	2	1	1	1	1	1	1	1	24.9	36.9	C	D	D
7	Central Av. / El Prado Rd.	TS	1	2	1	1	3	0	1	1	0	1	1	1>	50.3	**88.1**	D	**F**	D
8	Central Av. / SR-71 NB Ramps	TS	0	3	1>>	0	3	1>>	0	0	0	1	1	0	7.3	7.1	A	A	D
9	Central Av. / SR-71 SB Ramps	TS	0	3	1>>	0	3	1>>	1	1	0	0	0	0	14.3	25.8	B	C	D
10	El Prado Rd. / Kimball Av.	TS	1	1	1	1	2	0	1	1	0	0	1	1>	22.3	47.3	C	D	D
11	Mountain Av. / Kimball Av.	TS	1	0	1	0	0	0	0	2	0	1	2	0	10.0	10.3	A	B	D
12	San Antonio Av. / Kimball Av.	TS	1	1	0	1	1	0	1	2	0	1	2	0	8.3	9.3	A	A	D
13	Fern Av. / Kimball Av.	TS	1	1	0	1	1	0	1	2	0	1	2	0	9.5	9.6	A	A	D
14	Euclid Av. (SR-83) / SR-60 WB Ramps	TS	1	2	0	0	2	1	0	0	0	1	1	1	27.9	22.3	C	C	D
15	Euclid Av. (SR-83) / SR-60 EB Ramps	TS	0	2	1	1	2	0	1	1	0	0	0	0	24.6	28.2	C	C	D
16	Euclid Av. (SR-83) / Walnut St.	TS	1	3	d	2	3	1	1	2	0	1	2	0	34.1	28.1	C	C	E
17	Euclid Av. (SR-83) / Riverside Dr.	TS	1	2	1	1	2	1>	1	2	0	1	2	d	33.7	49.7	C	D	D
18	Euclid Av. (SR-83) / Chino Av.	TS	1	2	1	1	2	1	1	1	1	0	1	0	17.2	8.9	B	A	D
19	Euclid Av. (SR-83) / Schaefer Av.	TS	1	2	1	1	2	1	1	1	1	1	1	0	36.8	49.8	D	D	D
20	Euclid Av. (SR-83) / Edison Av.	TS	1	2	1	1	2	1	1	1	1	1	1	0	31.0	31.2	C	C	D
21	Euclid Av. (SR-83) / Eucalyptus Av.	TS	1	2	1	1	2	1	1	1	1	1	1	0	22.2	8.0	C	A	D
22	Euclid Av. (SR-83) / Merrill Av.	TS	1	2	1	1	2	0	0	1	0	0	1	0	28.3	23.0	C	C	D
23	Euclid Av. (SR-83) / Kimball Av.	TS	1	2	1	1	2	0	1	2	0	1	2	0	48.2	49.3	D	D	D
24	Euclid Av. (SR-83) / Bickmore Av.	TS	1	2	0	1	2	1	1	1	1	1	1	0	45.6	16.6	D	B	D
25	Euclid Av. (SR-83) / Pine Av.	TS	1	2	1>	1	2	0	1	1	1>>	2	1	0	47.9	37.3	D	D	D
26	SR-71 NB Ramps / Euclid Av. (SR-83)	TS	2	0	1>>	0	0	0	0	2	1>>	1	2	0	16.3	13.0	B	B	D
27	SR-71 SB Ramps / Euclid Av. (SR-83)	TS	1	0	1	1	1	1	0	2	0	1	2	1>>	40.9	34.1	D	C	D
28	Dwy. 1 / Bickmore Av.		Future Intersection																C
29	Dwy. 2 / Bickmore Av.		Future Intersection																C
30	Mayhew Av. / Kimball Av.		Future Intersection																D
31	Mayhew Av. / Dwy. 3		Future Intersection																C
32	Mayhew Av. / Dwy. 4		Future Intersection																C
33	Mayhew Av. / Dwy. 5		Future Intersection																C
34	Mayhew Av. / Dwy. 6		Future Intersection																C
35	Mayhew Av. / Dwy. 7		Future Intersection																C
36	Mayhew Av. / Dwy. 8		Future Intersection																C
37	Mayhew Av. / Dwy. 9		Future Intersection																C
38	Mayhew Av. / Dwy. 10		Future Intersection																C
39	Mayhew Av. / Dwy. 11		Future Intersection																C
40	Mayhew Av. / Dwy. 12		Future Intersection																C
41	Mayhew Av. / Dwy. 13		Future Intersection																C
42	Mayhew Av. / Bickmore Av.		Future Intersection																D

Intersection Analysis for Existing (2016) Conditions

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service		Acceptable LOS
			Northbound			Southbound			Eastbound			Westbound							
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM	
43	Dwy. 14 / Kimball Av.		Future Intersection																C
44	Street B / Kimball Av.	CSS	0	0	0	0	1	0	1	1	0	0	1	1	20.1	0.0	C	A	C
45	Street B / Dwy. 15		Future Intersection																C
46	Street B / Dwy. 16		Future Intersection																C
47	Street B/Dwy. 17 / Dwy. 18		Future Intersection																C
48	Dwy. 19 / Kimball Av.		Future Intersection																C
49	Rincon Meadows Av. / Kimball Av.	CSS	1	0	1	0	0	0	0	2	0	1	1	0	18.5	20.4	C	C	D
50	Mill Creek Av. / Kimball Av.	TS	1	0	1	0	0	0	0	2	0	1	1	0	15.7	11.7	B	B	D
51	Main St. / Kimball Av.	TS	1	0	1	0	0	0	0	2	0	1	1	0	15.2	11.6	B	B	D
52	Flight Av. / Kimball Av.	CSS	0	1	0	0	1	0	1	2	0	1	1	0	22.9	22.1	C	C	D
53	Meadow Valley Av. / Kimball Av.	CSS	0	1	0	0	0	0	0	2	0	1	1	0	15.8	16.0	C	C	D
54	Hellman Av. / Kimball Av.	AWS	1	0	0	0	0	0	0	0	1	0	0	0	**>100.0**	**65.7**	**F**	**F**	D
55	Archibald Av. / Limonite Av.	TS	0	1	1>	1	1	0	0	0	0	1	0	1>	33.5	46.9	C	D	D
56	Harrison Av. / Limonite Av.	TS	1	1	1	1	1	0	1	3	d	1	2	1	20.2	18.6	C	B	D
57	Sumner Av. / Limonite Av.	TS	1	2	0	1	2	0	2	3	0	2	3	1	17.4	16.2	B	B	D
58	Scholar Wy. / Limonite Av.	TS	1	1	1	1	2	1	1	2	1	1	2	1	16.5	15.2	B	B	D
59	Hamner Av. / Limonite Av.	TS	2	3	1	2	2	1	2	3	1	2	2	1	32.6	33.6	C	C	D
60	I-15 SB Ramps / Limonite Av.	TS	0	0	0	1	1	1	0	2	1	2	2	0	29.1	29.7	C	C	D
61	I-15 NB Ramps / Limonite Av.	TS	1	1	1	0	0	0	2	2	0	0	2	1	24.7	25.0	C	C	D

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

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing; >> = Channelized Yield; >>> = Free-Right Turn Lane; d = Defacto Right Turn Lane

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

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

3.11 OFF-RAMP QUEUING ANALYSIS

A queuing analysis was performed for the off-ramps at the SR-71 Freeway and Chino Hills Parkway, SR-71 Freeway and Central Avenue, Euclid Avenue (SR-83) and SR-60 Freeway, SR-71 Freeway and Euclid Avenue (SR-83), and I-15 Freeway and Limonite Avenue interchanges 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 in Table 3-2. It is important to note that off-ramp lengths are consistent with the measured distance between the intersection and the freeway mainline. As shown 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.

3.12 BASIC FREEWAY SEGMENT ANALYSIS

Existing (2016) mainline directional volumes for the AM and PM peak hours are provided on Exhibit 3-22. As shown on Table 3-3, the SR-71, SR-60, and I-15 Freeway segments analyzed for this study were found to operate at an acceptable LOS (i.e., LOS D or better) during the peak hours for Existing (2016) traffic conditions, with exception of the following:

- SR-71 Freeway Southbound, South of Euclid Av. (SR-83) (#4) – LOS E AM peak hour only
- SR-71 Freeway Northbound, North of Central Av. (#7)– LOS E AM peak hour only
- I-15 Freeway Southbound, South of Limonite Av. (#14)– LOS E AM peak hour only

Existing (2016) basic freeway segment analysis worksheets are provided in Appendix 3.5.

3.13 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for Existing (2016) conditions and the results of this analysis are presented in Table 3-4. As shown in Table 3-4, the following merge and diverge areas currently do not operate at LOS D or better during the peak hours under Existing (2016) traffic conditions:

- SR-60 Freeway, Westbound Off-Ramp at Euclid Av. (SR-83) (#9) – LOS E PM peak hour only

Existing (2016) freeway ramp junction operations analysis worksheets are provided in Appendix 3.6. Existing freeway mainline volumes are shown on Exhibit 3-22.

EXHIBIT 3-22: EXISTING (2016) FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

Table 3-2

Peak Hour Freeway Off-Ramp Queuing Summary for Existing (2016) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	95th Percentile Queue (Feet)		Acceptable?[1]	
			AM Peak Hour	PM Peak Hour	AM	PM
SR-71 SB Ramps / Chino Hills Pkwy.	SBL	775	155	181	Yes	Yes
	SBL/T	1,210	151	178	Yes	Yes
	SBR	510	171	485 [2]	Yes	Yes
SR-71 NB Ramps / Chino Hills Pkwy.						
	NBL	100	202 [2]	165 [2]	Yes[3]	Yes[3]
	NBT/R	530	160 [2]	91	Yes	Yes
Central Avenue / SR-71 NB Ramps	NBL	1,490	162	167	Yes	Yes
Central Avenue / SR-71 SB Ramps	SBL	1,530	261	389	Yes	Yes
	SBL/R	740	235	662 [2]	Yes	Yes
Euclid Avenue/ SR-60 WB Ramps	WBL	400	372 [2]	320 [2]	Yes	Yes
	WBL/T/R	1,430	373 [2]	303 [2]	Yes	Yes
	WBR	400	196	201	Yes	Yes
Euclid Avenue/ SR-60 EB Ramps	EBL	900	301 [2]	334 [2]	Yes	Yes
	EBL/R	1,270	316 [2]	301 [2]	Yes	Yes
SR-71 NB Ramps / Euclid Avenue	NBL	1,745	41	78	Yes	Yes
	NBR	420	117	1,000 [2]	Yes	Yes[3]
SR-71 SB Ramps / Euclid Avenue	SBL	1,100	173	403	Yes	Yes
	SBL/T	1,560	171	402	Yes	Yes
	SBR	255	0	40	Yes	Yes
I-15 SB Ramps / Limonite Avenue	SBL	400	178	190	Yes	Yes
	SBL/T/R	400	95	249	Yes	Yes
	SBR	1,200	74	227	Yes	Yes
I-15 NB Ramps / Limonite Avenue	NBL	450	225 [2]	347	Yes	Yes
	NBL/T/R	1,235	89	245	Yes	Yes
	NBR	400	65	231	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-71, SR-60, or I-15 Freeway mainline.

Table 3-3

Basic Freeway Segment Analysis for Existing (2016) Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	Volume		Truck %	Truck %	Density[2]		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM
SR-71 Freeway	SB	North of Chino Hills Pkwy.	3	3,731	3,334	4%	3%	19.8	17.5	C	B
		South of Chino Hills Pkwy.	3	2,894	2,110	2%	3%	15.1	11.1	B	B
		North of Central Av.	3	3,487	3,410	3%	3%	18.3	17.9	C	B
		South of Euclid Av. (SR-83)	2	4,002	3,215	3%	2%	**37.9**	26.6	**E**	D
	NB	North of Chino Hills Pkwy.	3	4,120	4,059	4%	4%	22.1	21.8	C	C
		South of Chino Hills Pkwy.	3	3,156	3,104	4%	4%	16.7	16.4	B	B
		North of Central Av.	3	5,722	5,122	12%	9%	**37.6**	30.5	**E**	D
		South of Euclid Av. (SR-83)	3	4,136	4,276	15%	12%	23.7	24.2	C	C
SR-60 Freeway	WB	West of Euclid Av. (SR-83)	4	6,394	6,601	3%	2%	26.6	27.6	D	D
		East of Euclid Av. (SR-83)	4	6,492	6,747	3%	3%	27.2	28.7	D	D
	EB	West of Euclid Av. (SR-83)	4	6,488	5,925	6%	4%	27.7	24.2	D	C
		East of Euclid Av. (SR-83)	4	6,596	6,017	6%	4%	28.3	24.7	D	C
I-15 Freeway	SB	North of Limonite Av.	3	5,244	5,234	7%	7%	31.1	31.0	D	D
		South of Limonite Av.	3	5,757	5,249	6%	7%	**36.1**	31.2	**E**	D
	NB	North of Limonite Av.	3	5,464	4,771	1%	2%	31.7	26.2	D	D
		South of Limonite Av.	3	4,908	5,104	1%	2%	27.1	28.8	D	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).

Table 3-4

Freeway Ramp Junction Merge/Diverge Analysis for Existing (2016) Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	AM Peak Hour		PM Peak Hour	
				Density[2]	LOS	Density[2]	LOS
SR-71 Freeway	SB	Off-Ramp at Chino Hills Pkwy.	3	27.9	C	26.7	C
		Off-Ramp at Central Av.	3	26.2	C	27.8	C
		Loop On-Ramp at Euclid Av. (SR-83) (Upstream)	2	32.4	D	29.1	D
		Loop On-Ramp at Euclid Av. (SR-83) (Downstream)	2	32.4	D	29.1	D
	NB	On-Ramp at Chino Hills Pkwy.	3	26.7	C	26.3	C
		On-Ramp at Central Av.	3	35.0	D	30.6	D
		Off-Ramp at Euclid Av. (SR-83)	3	31.9	D	33.4	D
SR-60 Freeway	WB	On-Ramp at Euclid Av. (SR-83)	4	25.9	C	26.7	C
		Off-Ramp at Euclid Av. (SR-83)	4	33.8	D	**35.2**	**E**
	EB	Off-Ramp at Euclid Av. (SR-83)	4	32.6	D	30.4	D
		On-Ramp at Euclid Av. (SR-83)	4	28.7	D	26.7	C
I-15 Freeway	SB	Off-Ramp at Limonite Av.	3	34.3	D	34.7	D
		On-Ramp at Limonite Av.	3	34.4	D	31.1	D
	NB	On-Ramp at Limonite Av.	3	32.1	D	27.4	C
		Off-Ramp at Limonite Av.	3	32.0	D	34.0	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).

3.14 RECOMMENDED IMPROVEMENTS

Improvement strategies have been recommended at intersections, roadway segments, and freeway segments that have been identified as impacted under Existing (2016) traffic conditions in an effort to achieve an acceptable LOS (i.e., LOS D or better).

3.14.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Table 3-5 indicates the physical improvements needed to address LOS deficiencies at each of the study area intersections under Existing (2016) traffic conditions. The following improvements are recommended to reduce Existing (2016) impacts to less-than-significant; the improvement strategies identified below are consistent with City of Chino General Plan and The Preserve Specific Plan roadway cross-sections:

Recommended Improvement – Central Av. / El Prado Rd. (#7) – The following improvement is necessary to reduce the existing impact to acceptable levels:

- Modify the traffic signal to implement overlap phasing on the northbound right turn lane.

Recommended Improvement – Hellman Av. / Kimball Av. (#54) – The following improvement is necessary to reduce the existing impact to acceptable levels:

- Install a traffic signal.

3.14.2 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 and Chino Hills Parkway, SR-71 Freeway and Central Avenue, Euclid Avenue (SR-83) and SR-60 Freeway, SR-71 Freeway and Euclid Avenue (SR-83), and I-15 Freeway and Limonite Avenue interchanges. As such, no improvements have been recommended.

3.13.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

At this time, Caltrans has no fee programs or other improvement programs in place to address the deficiencies caused by development projects in the City of Chino (or other neighboring jurisdictions) on SHS roadway segments. As such, no improvements have been recommended to address the Existing (2016) deficiencies on the SHS, because there is no feasible mitigation available.

Table 3-5

Intersection Analysis for Existing (2016) 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
7	Central Av. / El Prado Rd.																	
	- Without Improvements	TS	1	2	1	1	3	0	1	1	0	1	1	1>	50.3	**88.1**	D	**F**
	- With Improvements	TS	1	2	**1>**	1	3	0	1	1	0	1	1	1>	41.5	39.5	D	D
54	Hellman Av. / Kimball Av.																	
	- Without Improvements	AWS	1	0	0	0	0	0	0	0	1	0	0	0	**>100.0**	**65.7**	**F**	**F**
	- With Improvements	**TS**	1	0	0	0	0	0	0	0	1	0	0	0	3.4	1.9	A	A

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

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

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

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

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4 PROJECTED FUTURE TRAFFIC

This section presents the traffic volumes estimated to be generated by the Project, as well as the Project's trip assignment onto the study area roadway network. The Project is proposed to consist of up to 1,313,000 square feet (sf) of business center use, with 715,000 sf of warehouse, 255,000 sf of general light industrial use, 233,000 sf of business park use, and a 110,000 sf self-storage facility, and is anticipated to be developed in 3 phases with a projected Project Buildout of 2020. Regional access to the project site is provided via the SR-60 Freeway, the SR-71 Freeway, and the I-15 Freeway.

The Project is approximately 2.50 miles northeast from the Euclid Avenue and State Route 71 (SR-71) Interchange and approximately 4.65 miles south of the State Route 60 (SR-60) Freeway. Vehicular and truck traffic access will be provided via the following driveways:

- Driveway 1 / Bickmore Avenue – Right-in/right-out driveway providing access to passenger cars only for Buildings 7A/7B
- Driveway 2 / Bickmore Avenue – Right-in/right-out driveway providing access to both passenger cars only for Buildings 7A/7B and 8/9
- Mayhew Avenue / Driveway 3 – Right-in/right-out driveway providing access to passenger cars only for Building 4
- Mayhew Avenue / Driveway 4 – Full access driveway providing access to both passenger cars and trucks for Buildings A, B, M, and 4
- Mayhew Avenue / Driveway 5 – Full access driveway providing access to both passenger cars and trucks for Building 3
- Mayhew Avenue / Driveway 6 – Full access driveway providing access to passenger cars only for Building 4
- Mayhew Avenue / Driveway 7 – Full access driveway providing access to passenger cars only for Building 3
- Mayhew Avenue / Driveway 8 – Full access driveway providing access to both passenger cars and trucks for Building 6
- Mayhew Avenue / Driveway 9 – Full access driveway providing access to both passenger cars and trucks for Building 5
- Mayhew Avenue / Driveway 10 – Full access driveway providing access to both passenger cars and trucks for Buildings 5 & 6
- Mayhew Avenue / Driveway 11 – Full access driveway providing access to both passenger cars and trucks for Building 6
- Mayhew Avenue / Driveway 12 – Full access driveway providing access to both passenger cars and trucks for Buildings 8 and 9

- Mayhew Avenue / Driveway 13 – Full access driveway providing access to passenger cars only for Buildings 8 and 9
- Driveway 14 / Kimball Avenue – Right-in/right-out driveway providing access to passenger cars only for Buildings A, B, C, and D
- Street B / Driveway 15 – Full access driveway providing access to both passenger cars and trucks for Buildings E through K
- Street B / Driveway 16 – Full access driveway providing access to passenger cars only for Buildings L and M
- Street B/Driveway 17 / Driveway 18 – Full access driveway providing access to both passenger cars and trucks for Buildings 1, 2, and 3
- Driveway 19 / Kimball Avenue - Right-in/right-out driveway providing access to passenger cars only for Buildings I through K

4.1 PROJECT TRIP GENERATION

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

Trip generation rates used to estimate Project traffic are shown in Table 4-1. A summary of the Project's trip generation based on PCE is shown in Table 4-2 while the trip generation based on actual vehicles is shown on Table 4-3 for informational purposes. The trip generation rates used for this analysis are based upon information collected by the Institute of Transportation Engineers (ITE) as provided in their *Trip Generation* manual, 9th Edition, 2012. (3)

Table 4-1

Project Trip Generation Rates

Land Use[1]	Units[2]	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Project Trip Generation Rates (PCE)									
General Light Industrial[3]	TSF	110	0.810	0.110	0.920	0.120	0.850	0.970	6.970
Passenger Cars			0.637	0.086	0.723	0.094	0.668	0.762	5.478
2-Axle Trucks (PCE = 1.5)			0.097	0.013	0.110	0.014	0.102	0.116	0.836
3-Axle Trucks (PCE = 2.0)			0.063	0.009	0.072	0.009	0.066	0.076	0.544
4-Axle+ Trucks (PCE = 3.0)			0.231	0.031	0.262	0.034	0.242	0.276	1.986
Warehouse[4]	TSF	150	0.240	0.060	0.300	0.080	0.240	0.320	3.560
Passenger Cars			0.191	0.048	0.239	0.064	0.191	0.255	2.833
2-Axle Trucks (PCE = 1.5)			0.012	0.003	0.016	0.004	0.012	0.017	0.185
3-Axle Trucks (PCE = 2.0)			0.022	0.006	0.028	0.007	0.022	0.030	0.330
4-Axle+ Trucks (PCE = 3.0)			0.089	0.022	0.111	0.030	0.089	0.118	1.317
Mini-Warehouse[5]	TSF	151	0.080	0.060	0.140	0.130	0.130	0.260	2.500
Passenger Cars			0.068	0.051	0.119	0.111	0.111	0.221	2.125
2-Axle Trucks (PCE = 1.5)			0.004	0.003	0.008	0.007	0.007	0.014	0.139
3-Axle Trucks (PCE = 2.0)			0.005	0.004	0.009	0.008	0.008	0.016	0.155
4-Axle+ Trucks (PCE = 3.0)			0.020	0.015	0.034	0.032	0.032	0.064	0.614
Business Park[6]	TSF	770	1.190	0.210	1.400	0.330	0.930	1.260	12.440
Passenger Cars			1.035	0.183	1.218	0.287	0.809	1.096	10.823
2-Axle Trucks (PCE = 1.5)			0.057	0.010	0.067	0.016	0.045	0.061	0.599
3-Axle Trucks (PCE = 2.0)			0.064	0.011	0.075	0.018	0.050	0.067	0.666
4-Axle+ Trucks (PCE = 3.0)			0.253	0.045	0.298	0.070	0.198	0.268	2.649

Table 4-1

Project Trip Generation Rates

Land Use[1]	Units[2]	ITE LU Code	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Project Trip Generation Rates (Actual Vehicles)									
General Light Industrial[3]	TSF	110	0.810	0.110	0.920	0.120	0.850	0.970	6.970
Passenger Cars			0.637	0.086	0.723	0.094	0.668	0.762	5.478
2-Axle Trucks (PCE = 1.5)			0.065	0.009	0.074	0.010	0.068	0.078	0.558
3-Axle Trucks (PCE = 2.0)			0.032	0.004	0.036	0.005	0.033	0.038	0.272
4-Axle+ Trucks (PCE = 3.0)			0.077	0.010	0.087	0.011	0.081	0.092	0.662
Warehouse[4]	TSF	150	0.240	0.060	0.300	0.080	0.240	0.320	3.560
Passenger Cars			0.191	0.048	0.239	0.064	0.191	0.255	2.833
2-Axle Trucks			0.008	0.002	0.010	0.003	0.008	0.011	0.123
3-Axle Trucks			0.011	0.003	0.014	0.004	0.011	0.015	0.165
4-Axle+ Trucks			0.030	0.007	0.037	0.010	0.030	0.039	0.439
Mini-Warehouse[5]	TSF	151	0.080	0.060	0.140	0.130	0.130	0.260	2.500
Passenger Cars			0.068	0.051	0.119	0.111	0.111	0.221	2.125
2-Axle Trucks			0.003	0.002	0.005	0.005	0.005	0.010	0.093
3-Axle Trucks			0.002	0.002	0.004	0.004	0.004	0.008	0.077
4-Axle+ Trucks			0.007	0.005	0.011	0.011	0.011	0.021	0.205
Business Park[6]	TSF	770	1.190	0.210	1.400	0.330	0.930	1.260	12.440
Passenger Cars			1.035	0.183	1.218	0.287	0.809	1.096	10.823
2-Axle Trucks			0.038	0.007	0.045	0.011	0.030	0.040	0.399
3-Axle Trucks			0.032	0.006	0.037	0.009	0.025	0.034	0.333
4-Axle+ Trucks			0.084	0.015	0.099	0.023	0.066	0.089	0.883

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

[2] TSF = thousand square feet

[3] General Light Industrial Vehicle Mix Source: City of Fontana Truck Trip Generation Study for LU 110, August 2003. PCE rates are per SANBAG.

[4] Warehouse Vehicle Mix Source: City of Fontana Truck Trip Generation Study for LU 150, August 2003. PCE rates are per SANBAG.

[5] 15% trucks per ITE Trip Generation manua; Truck mix per City of Fontana Truck Trip Generation Study for LU 150, August 2003. PCE rates are per SANBAG.

[6] 13% trucks per ITE Trip Generation manua; Truck mix per City of Fontana Truck Trip Generation Study for LU 150, August 2003. PCE rates are per SANBAG.

Table 4-2
Page 1 of 2

Project Trip Generation Summary (PCE)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Phase 1									
Building 4 (Warehouse)	185.000	TSF							
Passenger Cars:			35	9	44	12	35	47	524
Truck Trips:									
2-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*34*
3-axle:			*4*	*1*	*5*	*1*	*4*	*5*	*61*
4+-axle:			*16*	*4*	*21*	*5*	*16*	*22*	*244*
- Net Truck Trips (PCE)[2]			*23*	*6*	*29*	*8*	*23*	*30*	*339*
BUILDING 4 TOTAL NET TRIPS (PCE)[3]			***58***	***15***	***73***	***19***	***58***	***78***	***863***
Building 5 (Warehouse)	200.000	TSF							
Passenger Cars:			38	10	48	13	38	51	567
Truck Trips:									
2-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*37*
3-axle:			*4*	*1*	*6*	*1*	*4*	*6*	*66*
4+-axle:			*18*	*4*	*22*	*6*	*18*	*24*	*263*
- Net Truck Trips (PCE)[2]			*25*	*6*	*31*	*8*	*25*	*33*	*366*
BUILDING 5 TOTAL NET TRIPS (PCE)[3]			***63***	***16***	***79***	***21***	***63***	***84***	***933***
Building 6 (Warehouse)	130.000	TSF							
Passenger Cars:			25	6	31	8	25	33	368
Truck Trips:									
2-axle:			*2*	*0*	*2*	*1*	*2*	*2*	*24*
3-axle:			*3*	*1*	*4*	*1*	*3*	*4*	*43*
4+-axle:			*12*	*3*	*14*	*4*	*12*	*15*	*171*
- Net Truck Trips (PCE)[2]			*16*	*4*	*20*	*5*	*16*	*21*	*238*
BUILDING 6 TOTAL NET TRIPS (PCE)[3]			***41***	***10***	***51***	***14***	***41***	***55***	***606***
Total (Phase 1)			***162***	***40***	***202***	***54***	***162***	***216***	***2,402***
Phase 2									
Building 1 (General Light Industrial)	91.500	TSF							
Passenger Cars:			58	8	66	9	61	70	501
Truck Trips:									
2-axle:			*9*	*1*	*10*	*1*	*9*	*11*	*77*
3-axle:			*6*	*1*	*7*	*1*	*6*	*7*	*50*
4+-axle:			*21*	*3*	*24*	*3*	*22*	*25*	*182*
- Net Truck Trips (PCE)[2]			*36*	*5*	*41*	*5*	*38*	*43*	*308*
BUILDING 1 TOTAL NET TRIPS (PCE)[3]			***94***	***13***	***107***	***14***	***99***	***113***	***809***
Building 2 (General Light Industrial)	102.500	TSF							
Passenger Cars:			65	9	74	10	68	78	562
Truck Trips:									
2-axle:			*10*	*1*	*11*	*1*	*10*	*12*	*86*
3-axle:			*6*	*1*	*7*	*1*	*7*	*8*	*56*
4+-axle:			*24*	*3*	*27*	*4*	*25*	*28*	*204*
- Net Truck Trips (PCE)[2]			*40*	*5*	*46*	*6*	*42*	*48*	*345*
BUILDING 2 TOTAL NET TRIPS (PCE)[3]			***105***	***14***	***120***	***16***	***111***	***126***	***907***
Building 3 (Warehouse)	200.000	TSF							
Passenger Cars:			38	10	48	13	38	51	567
Truck Trips:									
2-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*37*
3-axle:			*4*	*1*	*6*	*1*	*4*	*6*	*66*
4+-axle:			*18*	*4*	*22*	*6*	*18*	*24*	*263*
- Net Truck Trips (PCE)[2]			*25*	*6*	*31*	*8*	*25*	*33*	*366*
BUILDING 3 TOTAL NET TRIPS (PCE)[3]			***63***	***16***	***79***	***21***	***63***	***84***	***933***
Total (Phase 2)			***262***	***43***	***305***	***51***	***272***	***323***	***2,649***
Total (Phase 1+2)			***424***	***83***	***508***	***104***	***434***	***539***	***5,051***

Project Trip Generation Summary (PCE)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Phase 3 (Buildout)									
Building N + O (General Light Industrial)	61.000	TSF							
Passenger Cars:			39	5	44	6	41	47	334
Truck Trips:									
2-axle:			*6*	*1*	*7*	*1*	*6*	*7*	*51*
3-axle:			*4*	*1*	*4*	*1*	*4*	*5*	*33*
4+-axle:			*14*	*2*	*16*	*2*	*15*	*17*	*121*
- Net Truck Trips (PCE)[2]			*24*	*3*	*27*	*4*	*25*	*29*	*205*
BUILDING N + O TOTAL NET TRIPS (PCE)[3]			***63***	***9***	***71***	***9***	***66***	***75***	***540***
Building M (Self Storage)	110.000	TSF							
Passenger Cars:			7	6	13	12	12	24	234
Truck Trips:									
2-axle:			*0*	*0*	*1*	*1*	*1*	*2*	*15*
3-axle:			*1*	*0*	*1*	*1*	*1*	*2*	*17*
4+-axle:			*2*	*2*	*4*	*4*	*4*	*7*	*68*
- Net Truck Trips[2]			*3*	*2*	*6*	*5*	*5*	*10*	*100*
BUILDING m TOTAL NET TRIPS (PCE)[3]			***11***	***8***	***19***	***17***	***17***	***35***	***334***
Buildings 7A + 7B + 8 + 9 (Business Park)	93.000	TSF							
Passenger Cars:			96	17	113	27	75	102	1,007
Truck Trips:									
2-axle:			*4*	*1*	*4*	*1*	*3*	*4*	*37*
3-axle:			*3*	*1*	*3*	*1*	*2*	*3*	*31*
4+-axle:			*8*	*1*	*9*	*2*	*6*	*8*	*82*
- Net Truck Trips[2]			*14*	*3*	*17*	*4*	*11*	*15*	*150*
BUILDING 7A + 7B + 8 + 9 TOTAL NET TRIPS (PCE)[3]			***111***	***20***	***130***	***31***	***86***	***117***	***1,157***
Buildings A-L (Business Park)	140.000	TSF							
Passenger Cars:			145	26	171	40	113	153	1,515
Truck Trips:									
2-axle:			*8*	*1*	*9*	*2*	*6*	*8*	*84*
3-axle:			*9*	*2*	*10*	*2*	*7*	*9*	*93*
4+-axle:			*35*	*6*	*42*	*10*	*28*	*38*	*371*
- Net Truck Trips[2]			*52*	*9*	*62*	*15*	*41*	*56*	*548*
BUILDINGS A-l TOTAL NET TRIPS (PCE)[3]			***197***	***35***	***232***	***55***	***154***	***209***	***2,063***
Total (Phase 3)			***381***	***71***	***452***	***112***	***324***	***436***	***4,093***
Total (Project Buildout)			***806***	***154***	***960***	***217***	***758***	***975***	***9,144***

[1] TSF = thousand square feet

[2] Warehouse Vehicle Mix Source: City of Fontana Truck Trip Generation Study for LU 150, August 2003. PCE rates are per SANBAG.

[3] TOTAL NET TRIPS (PCE) = Passenger Cars + Net Truck Trips (PCE).

Table 4-3
Page 1 of 2

Project Trip Generation Summary (Actual Vehicles)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Phase 1									
Building 4 (Warehouse)	185.000	TSF							
Passenger Cars:			35	9	44	12	35	47	524
Truck Trips:									
2-axle:			*2*	*0*	*2*	*1*	*2*	*2*	*23*
3-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*31*
4+-axle:			*5*	*1*	*7*	*2*	*5*	*7*	*81*
- Net Truck Trips[2]			*9*	*2*	*11*	*3*	*9*	*12*	*135*
BUILDING 4 TOTAL NET TRIPS (PCE)[3]			***44***	***11***	***56***	***15***	***44***	***59***	***659***
Building 5 (Warehouse)	200.000	TSF							
Passenger Cars:			38	10	48	13	38	51	567
Truck Trips:									
2-axle:			*2*	*0*	*2*	*1*	*2*	*2*	*25*
3-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*33*
4+-axle:			*6*	*1*	*7*	*2*	*6*	*8*	*88*
- Net Truck Trips[2]			*10*	*2*	*12*	*3*	*10*	*13*	*145*
BUILDING 5 TOTAL NET TRIPS[3]			***48***	***12***	***60***	***16***	***48***	***64***	***712***
Building 6 (Warehouse)	130.000	TSF							
Passenger Cars:			25	6	31	8	25	33	368
Truck Trips:									
2-axle:			*1*	*0*	*1*	*0*	*1*	*1*	*16*
3-axle:			*1*	*0*	*2*	*0*	*1*	*2*	*21*
4+-axle:			*4*	*1*	*5*	*1*	*4*	*5*	*57*
- Net Truck Trips[2]			*6*	*2*	*8*	*2*	*6*	*8*	*95*
BUILDING 6 TOTAL NET TRIPS[3]			***31***	***8***	***39***	***10***	***31***	***42***	***463***
Total (Phase 1)			***124***	***31***	***155***	***41***	***124***	***165***	***1,833***
Phase 2									
Building 1 (General Light Industrial)	91.500	TSF							
Passenger Cars:			58	8	66	9	61	70	501
Truck Trips:									
2-axle:			*6*	*1*	*7*	*1*	*6*	*7*	*51*
3-axle:			*3*	*0*	*3*	*0*	*3*	*3*	*25*
4+-axle:			*7*	*1*	*8*	*1*	*7*	*8*	*61*
- Net Truck Trips[2]			*16*	*2*	*18*	*2*	*17*	*19*	*136*
BUILDING 1 TOTAL NET TRIPS[3]			***74***	***10***	***84***	***11***	***78***	***89***	***638***
Building 2 (General Light Industrial)	102.500	TSF							
Passenger Cars:			65	9	74	10	68	78	562
Truck Trips:									
2-axle:			*7*	*1*	*8*	*1*	*7*	*8*	*57*
3-axle:			*3*	*0*	*4*	*0*	*3*	*4*	*28*
4+-axle:			*8*	*1*	*9*	*1*	*8*	*9*	*68*
- Net Truck Trips[2]			*18*	*2*	*20*	*3*	*19*	*21*	*153*
BUILDING 2 TOTAL NET TRIPS[3]			***83***	***11***	***94***	***12***	***87***	***99***	***714***
Building 3 (Warehouse)	200.000	TSF							
Passenger Cars:			38	10	48	13	38	51	567
Truck Trips:									
2-axle:			*2*	*0*	*2*	*1*	*2*	*2*	*25*
3-axle:			*2*	*1*	*3*	*1*	*2*	*3*	*33*
4+-axle:			*6*	*1*	*7*	*2*	*6*	*8*	*88*
- Net Truck Trips[2]			*10*	*2*	*12*	*3*	*10*	*13*	*145*
BUILDING 3 TOTAL NET TRIPS[3]			***48***	***12***	***60***	***16***	***48***	***64***	***712***
Total (Phase 2)			***205***	***33***	***238***	***39***	***213***	***252***	***2,064***
Total (Phase 1+2)			***329***	***64***	***393***	***80***	***337***	***417***	***3,898***

Project Trip Generation Summary (Actual Vehicles)

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Daily
			In	Out	Total	In	Out	Total	
Phase 3 (Buildout)									
Building N + O (General Light Industrial)	61.000	TSF							
Passenger Cars:			39	5	44	6	41	47	334
Truck Trips:									
2-axle:			*4*	*1*	*4*	*1*	*4*	*5*	*34*
3-axle:			*2*	*0*	*2*	*0*	*2*	*2*	*17*
4+-axle:			*5*	*1*	*5*	*1*	*5*	*6*	*40*
- Net Truck Trips[2]			*11*	*1*	*12*	*2*	*11*	*13*	*91*
BUILDING N + O TOTAL NET TRIPS[3]			***49***	***7***	***56***	***7***	***52***	***59***	***425***
Building M (Self Storage)	110.000	TSF							
Passenger Cars:			7	6	13	12	12	24	234
Truck Trips:									
2-axle:			*0*	*0*	*1*	*1*	*1*	*1*	*10*
3-axle:			*0*	*0*	*0*	*0*	*0*	*1*	*8*
4+-axle:			*1*	*1*	*1*	*1*	*1*	*2*	*23*
- Net Truck Trips[2]			*1*	*1*	*2*	*2*	*2*	*4*	*41*
BUILDING M TOTAL NET TRIPS[3]			***9***	***7***	***15***	***14***	***14***	***29***	***275***
Buildings 7A + 7B + 8 + 9 (Business Park)	93.000	TSF							
Passenger Cars:			96	17	113	27	75	102	1,007
Truck Trips:									
2-axle:			*4*	*1*	*4*	*1*	*3*	*4*	*37*
3-axle:			*3*	*1*	*3*	*1*	*2*	*3*	*31*
4+-axle:			*8*	*1*	*9*	*2*	*6*	*8*	*82*
- Net Truck Trips[2]			*14*	*3*	*17*	*4*	*11*	*15*	*150*
BUILDING 7A + 7B + 8 + 9 TOTAL NET TRIPS[3]			***111***	***20***	***130***	***31***	***86***	***117***	***1,157***
Buildings A-L (Business Park)	140.000	TSF							
Passenger Cars:			145	26	171	40	113	153	1,515
Truck Trips:									
2-axle:			*5*	*1*	*6*	*1*	*4*	*6*	*56*
3-axle:			*4*	*1*	*5*	*1*	*3*	*5*	*47*
4+-axle:			*12*	*2*	*14*	*3*	*9*	*13*	*124*
- Net Truck Trips[2]			*22*	*4*	*25*	*6*	*17*	*23*	*226*
BUILDINGS A-L TOTAL NET TRIPS[3]			***167***	***29***	***196***	***46***	***130***	***176***	***1,741***
Total (Phase 3)			***335***	***62***	***398***	***98***	***283***	***381***	***3,598***
Total (Project Buildout)			***664***	***126***	***791***	***179***	***619***	***798***	***7,496***

[1] TSF = thousand square feet

[2] Warehouse Vehicle Mix Source: City of Fontana Truck Trip Generation Study for LU 150, August 2003.

[3] 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:

- ITE land use code 110 (General Light Industrial) has been used to derive site specific trip generation estimates for Buildings 1, 2, N, and O. The ITE *Trip Generation* manual includes very limited data regarding the types of vehicles that are generated for general light industrial uses (passenger cars and various sizes of trucks). As such, data regarding the vehicle mix has been obtained from a separate report; the City of Fontana *Truck Trip Generation Study* (August 2003) for the general light industrial uses proposed as part of the Project. Buildings 1, 2, N, and O have been identified as light industrial. The "Light Industrial" vehicle mix data has been utilized for all 4 buildings.
- ITE land use code 150 (Warehousing) has been used to derive site specific trip generation estimates for Buildings 3, 4, 5, and 6. The ITE *Trip Generation* manual includes very limited data regarding the types of vehicles that are generated for warehousing uses (passenger cars and various sizes of trucks). Data regarding the vehicle mix has therefore been obtained from a separate report; the City of Fontana *Truck Trip Generation Study* (August 2003) for the warehousing use proposed as part of the Project. Buildings 6, 4, 5, and 6 have been identified as heavy warehouses. The "Heavy Warehouse" vehicle mix data has been utilized for all 4 buildings.
- ITE land use code 151 (Mini-Warehouse) has been used to derive the site specific trip generation estimates for Building M (self-storage facility). Although not typically applied, the ITE truck mix of 15% from the Trip Generation manual has been utilized to reflect potential truck traffic associated with the self-storage use. As such, the trip generation estimates for the self-storage use is anticipated to overstate as opposed to understate potential traffic impacts.
- ITE land use code 770 (Business Park) has been used to derive the site specific trip generation estimates for Buildings 7A, 7B, 8, 9, and A through L. Per the ITE *Trip Generation* manual and as shown on the preliminary site plan, the business park uses are not anticipated to generate any heavy truck traffic (i.e., absence of dock doors). As such, no vehicle mix has been applied to the business park uses proposed as part of the Project. Although there are no dock doors proposed, the ITE truck mix (13%) from the Trip Generation manual has been utilized in response to recent comments received on other projects prepared within the City. As such, the trip generation estimates for the business park use is anticipated to overstate as opposed to understate potential traffic impacts.

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 ITE Trip Generation manual or the City of Fontana's Truck Trip Generation Study. (3) (7) Lastly, PCE factors were applied to the trip generation rates for heavy trucks (large 2-axles, 3-axles, 4+-axles). PCEs allow the typical "real-world" mix of vehicle types to be represented as a single, standardized unit, such as the passenger car, to be used for the purposes of capacity and level of service analyses. The PCE factors are consistent with the recommended PCE factors in Appendix B of the San Bernardino County CMP, 2016 Update. Trip generation rates for actual vehicles and with PCE factors are shown on Table 4-1.

As shown on Table 4-2, the proposed Project (Project buildout) is anticipated to generate a net total of 9,144 PCE trip-ends per day, 960 PCE AM peak hour trips and 975 PCE PM peak hour trips.

In comparison, the proposed Project (Project Buildout) is anticipated to generate a net total of 7,496 actual vehicle trip-ends per day with 791 AM peak hour trips and 798 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 Chino. Given these differences, separate trip distributions were generated for both passenger cars and truck trips, for each analysis scenario.

Both the near-term and Horizon Year trip distribution patterns are primarily based on the existing roadway system in relation to the Horizon Year trip distribution patterns. The Project trip distribution patterns are also affected by near-term development patterns in the vicinity of the Project site. It is our understanding that the Pine Avenue Extension west of El Prado Road is anticipated to occur after the Project's anticipated Opening Year. As such, the Pine Avenue Extension would only be assumed to be in place for Horizon Year traffic conditions.

Although funding has not been secured, roadway network changes in the vicinity of the Project study area, such as the Limonite Avenue/Kimball Avenue extension between Hellman Avenue and Archibald Avenue, will be evaluated as part of an Alternative Horizon Year condition.

Exhibits 4-1 illustrates the Project truck trip distribution patterns used for both interim (Opening Year Cumulative) and Horizon Year (2040) Without Limonite Extension conditions and Exhibit 4-2 illustrates the truck trip distribution patterns used for Horizon Year (2040) With Limonite Extension. Trucks are anticipated to utilize designated truck routes such as Kimball Avenue, Euclid Avenue (SR-83), and Central Avenue to reach regional freeways such as the SR-71 and SR-60 Freeways. The With Limonite Extension alternative will allow for Project access to the I-15 freeway via the future proposed intersection of Limonite Avenue/Kimball Avenue between Hellman Avenue and Archibald Avenue.

Exhibit 4-3 illustrates the Project passenger car trip distribution patterns for interim (Opening Year Cumulative) traffic conditions only. Exhibits 4-4 and 4-5 illustrates the passenger trip distribution patterns Without and With the Limonite Extension for the Horizon Year conditions, respectively. Similar to the truck trip distributions, passenger cars are anticipated to utilize Kimball Avenue and Bickmore Avenue to reach destinations to the west of the Project site for Opening Year Cumulative traffic conditions and the extension of Pine Avenue west of El Prado Road will also be assumed for Horizon Year (2040) traffic conditions. Horizon Year (2040) With Limonite Extension trip distribution patterns assumes that the anticipated extension of Limonite Avenue/Kimball Avenue would be in place between Hellman Avenue and Archibald Avenue.

EXHIBIT 4-1 (1 OF 2): PROJECT TRUCK TRIP DISTRIBUTION (INTERIM YEAR AND HORIZON YEAR WITHOUT LIMONITE EXTENSION)

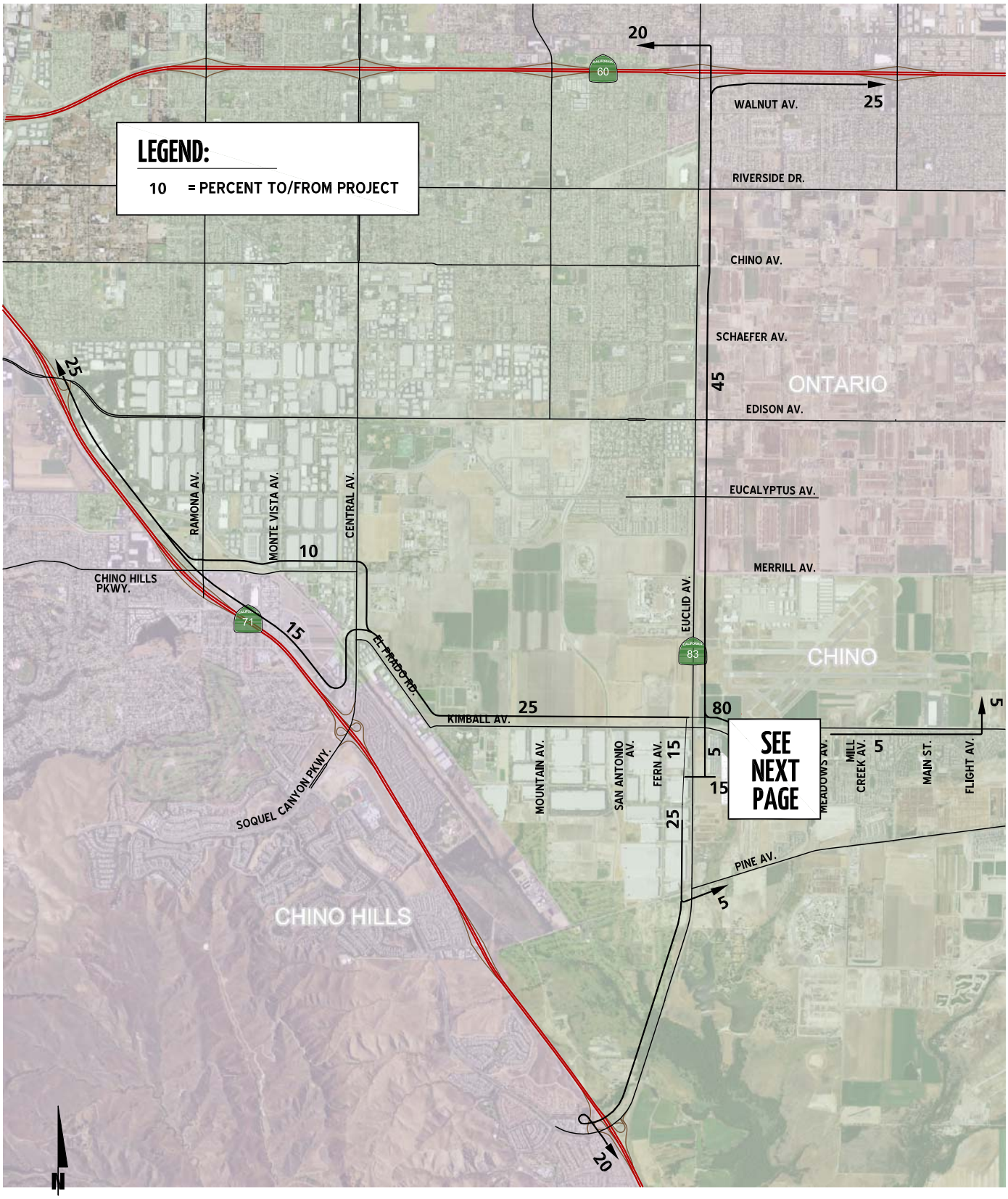
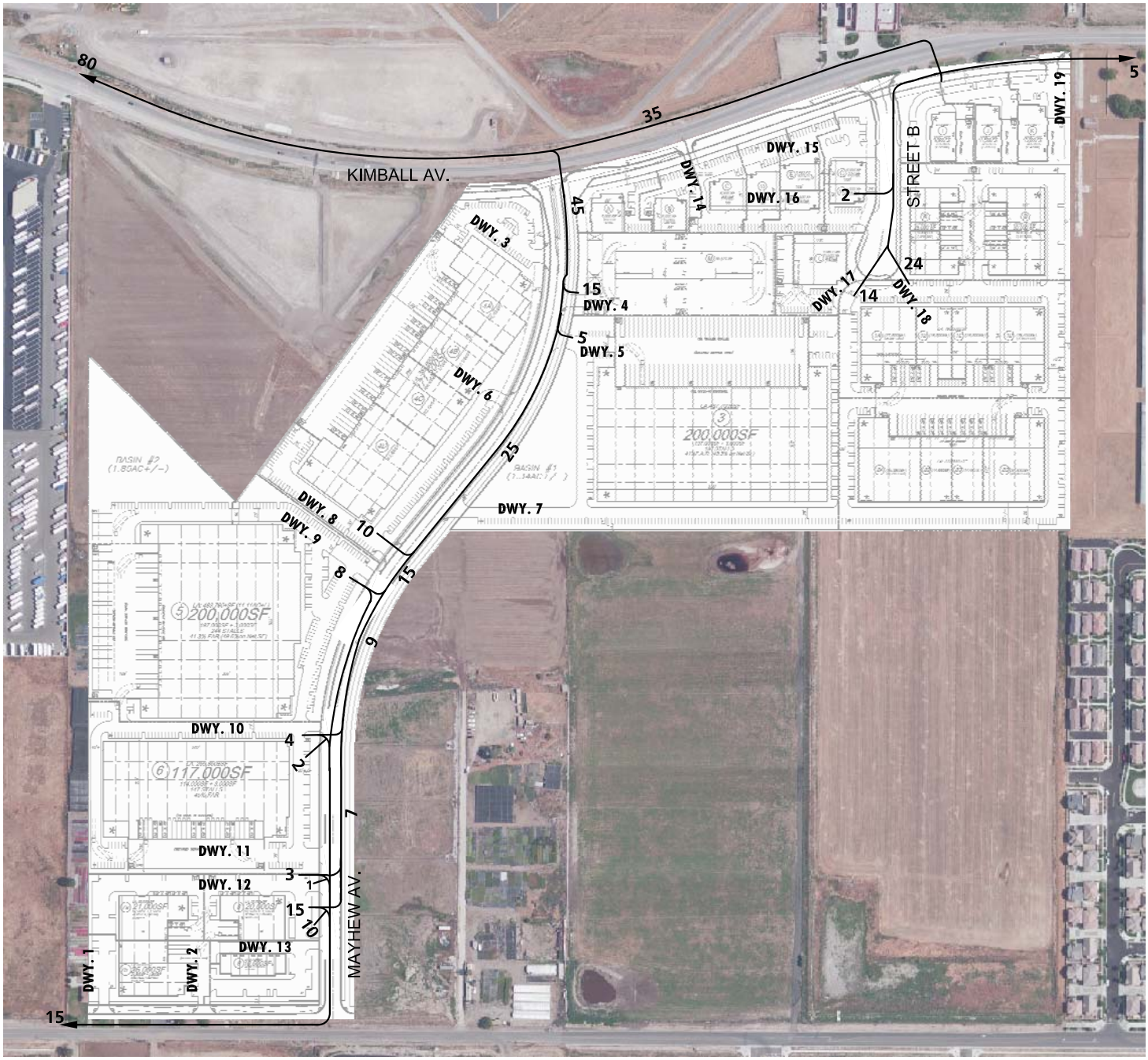


EXHIBIT 4-1 (2 OF 2): PROJECT TRUCK TRIP DISTRIBUTION (INTERIM YEAR AND HORIZON YEAR WITHOUT LIMONITE EXTENSION)

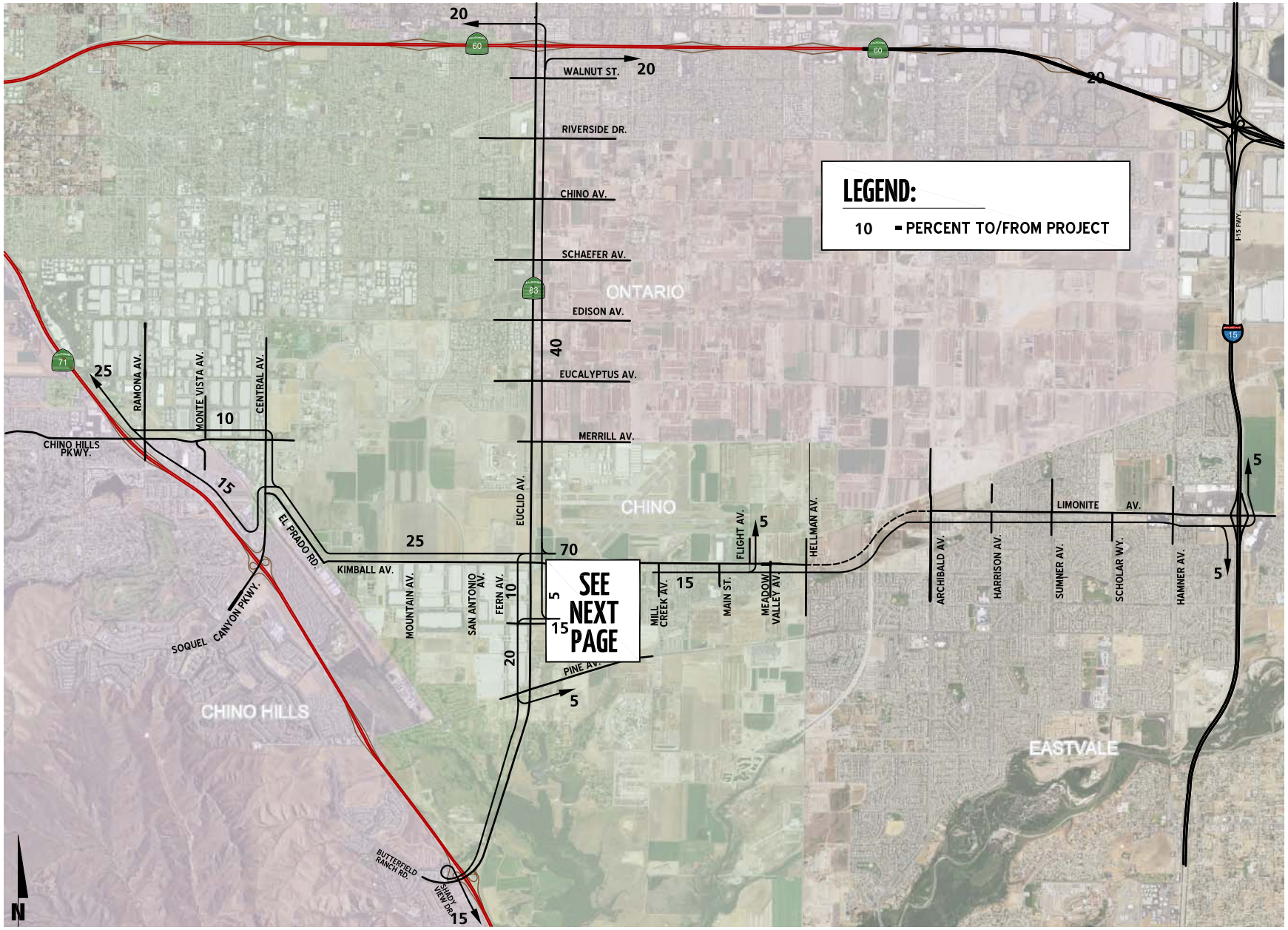


LEGEND:

10 = PERCENT TO/FROM PROJECT

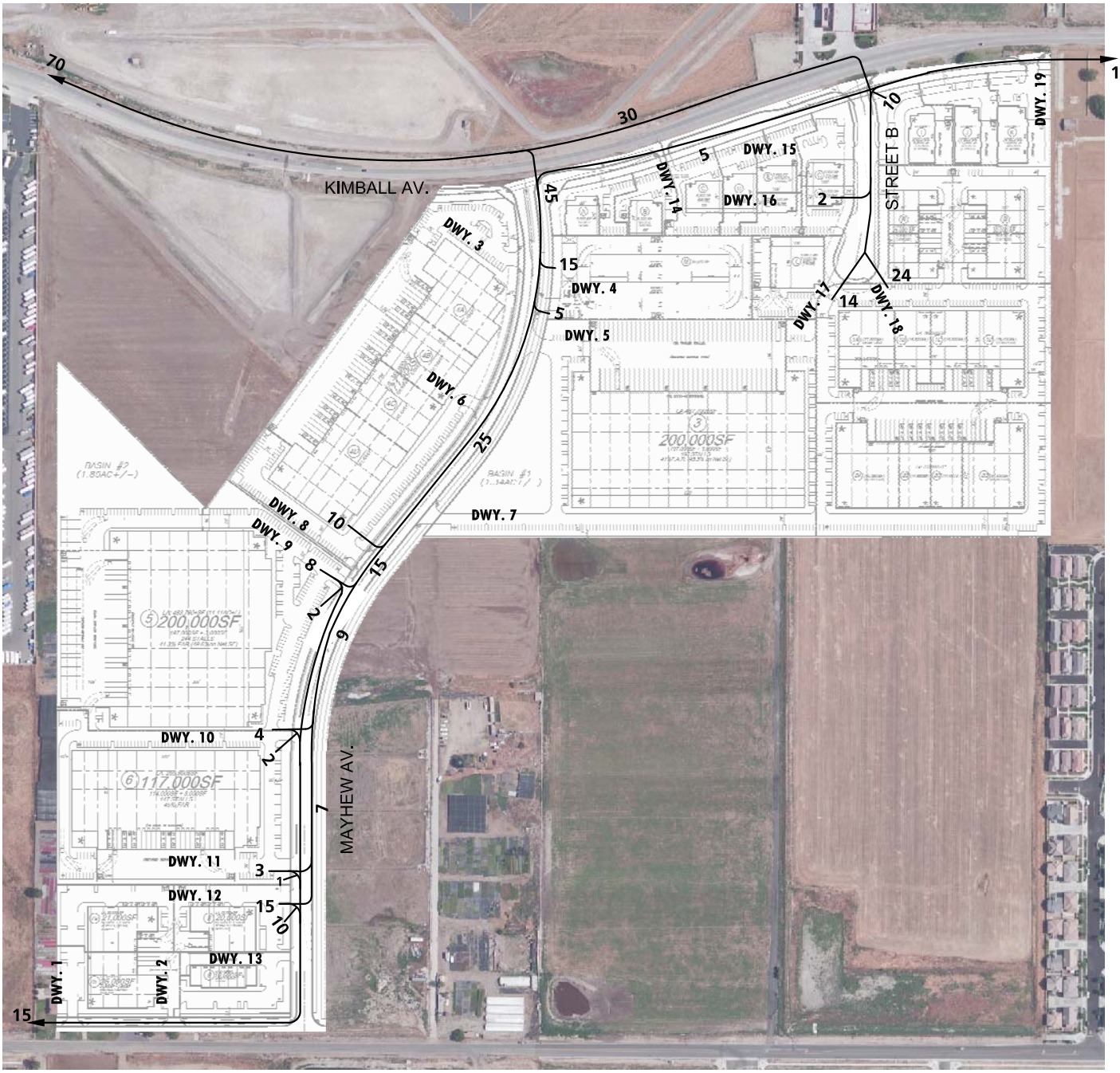
N

EXHIBIT 4-2 (1 OF 2): PROJECT TRUCK TRIP DISTRIBUTION (HORIZON YEAR WITH LIMONITE AVENUE EXTENSION)



URBAN CROSSROADS

EXHIBIT 4-2 (2 OF 2): PROJECT TRUCK TRIP DISTRIBUTION (HORIZON YEAR WITH LIMONITE AVENUE EXTENSION)



LEGEND:

10 = PERCENT TO/FROM PROJECT

← = OUTBOUND

N

EXHIBIT 4-3 (1 OF 2): PROJECT PASSENGER CAR TRIP DISTRIBUTION (INTERIM YEAR)

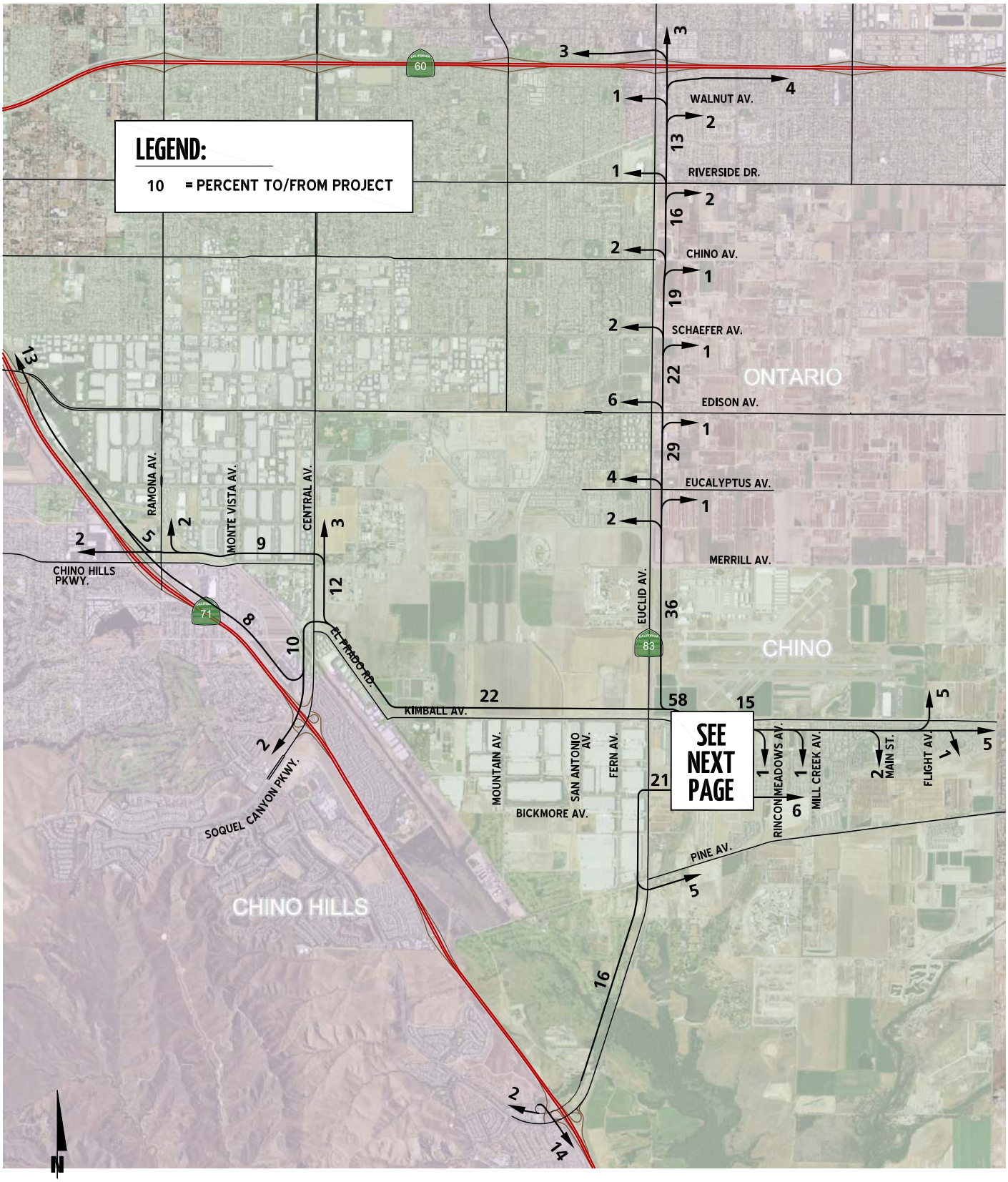
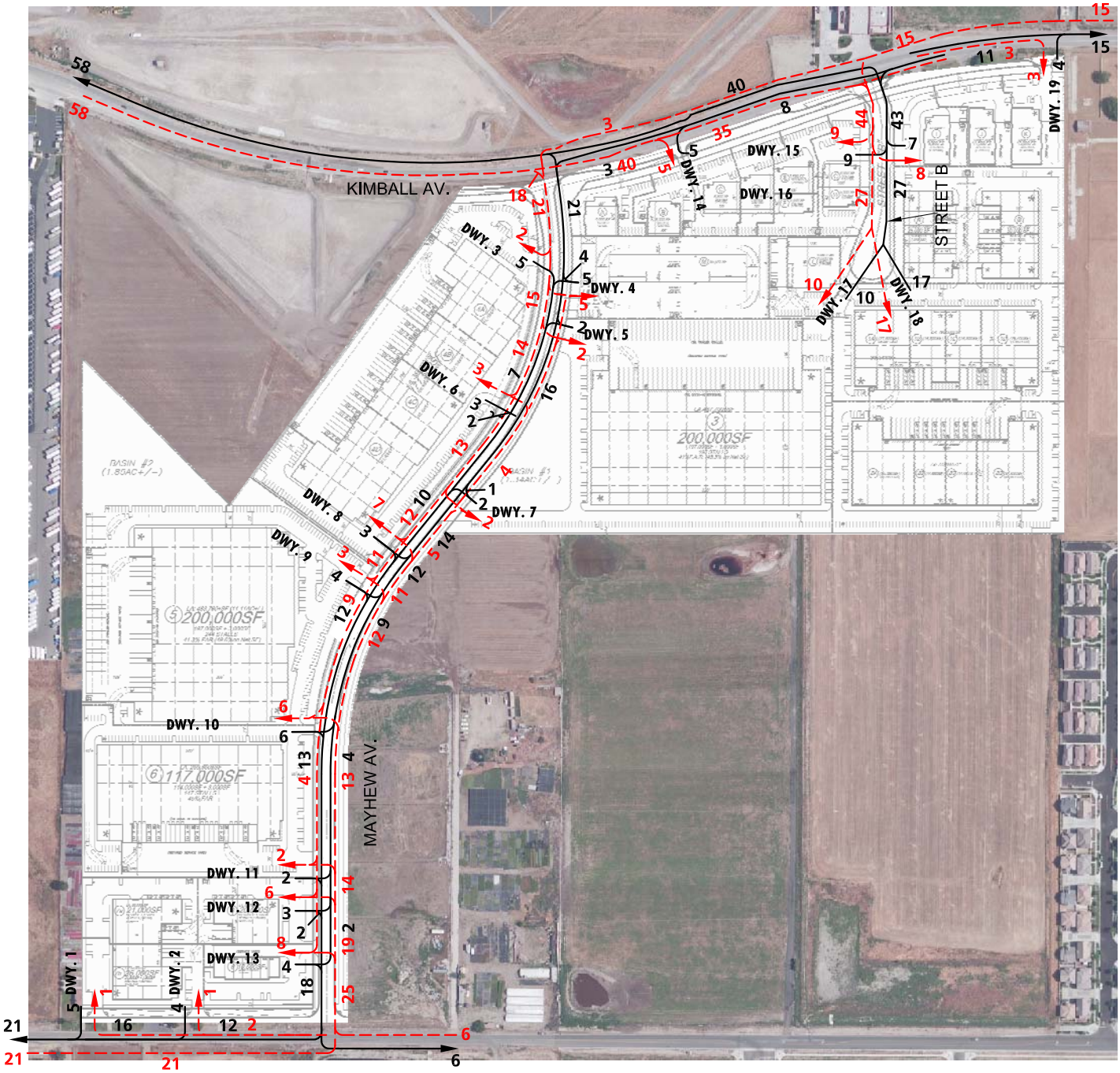


EXHIBIT 4-3 (2 OF 2): PROJECT PASSENGER CAR TRIP DISTRIBUTION (INTERIM YEAR)



LEGEND:

10 = PERCENT TO/FROM PROJECT

← = OUTBOUND

<- - = INBOUND

N

EXHIBIT 4-4 (1 OF 2): PROJECT PASSENGER CAR TRIP DISTRIBUTION (HORIZON YEAR WITHOUT LIMONITE AVENUE EXTENSION)

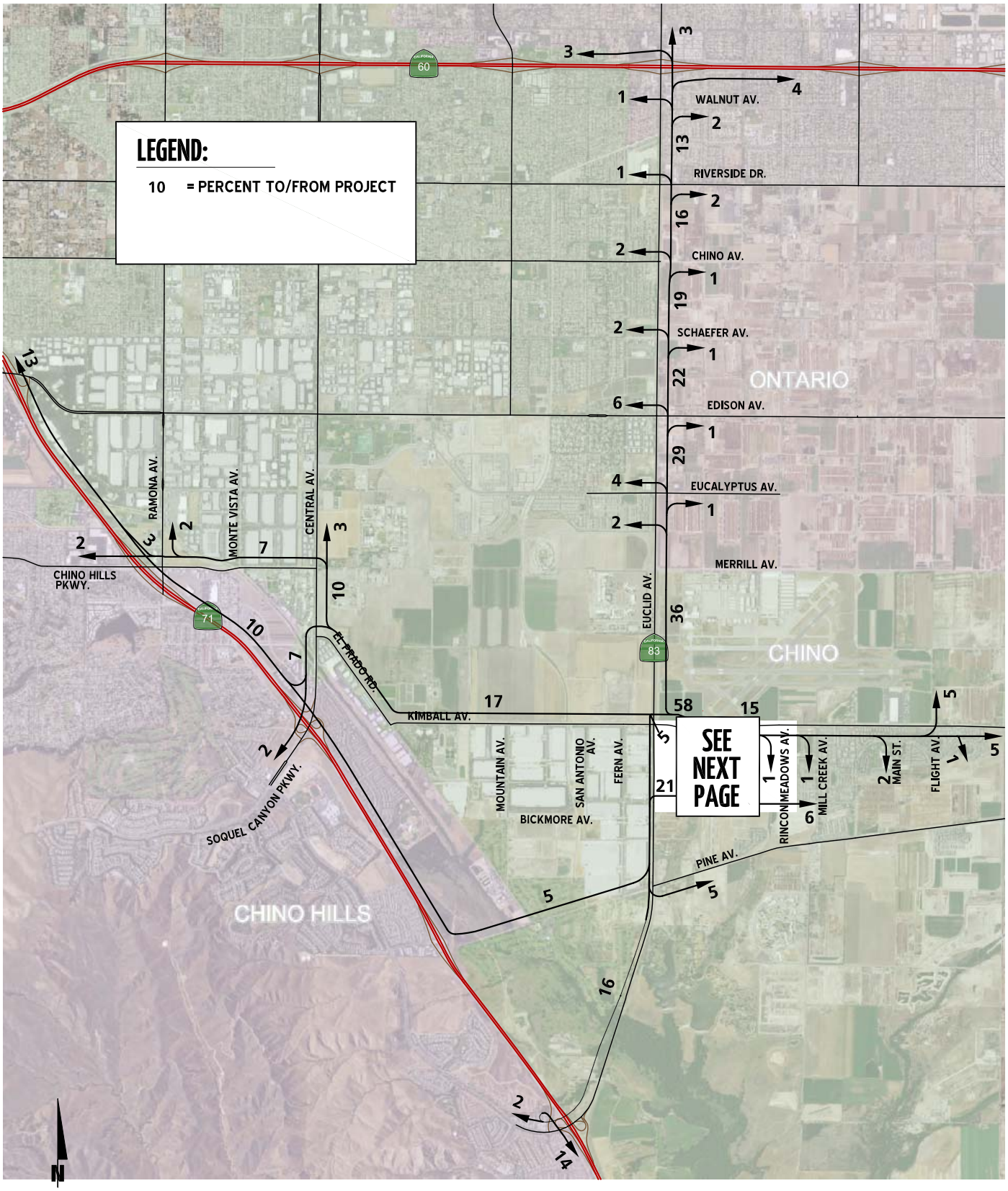
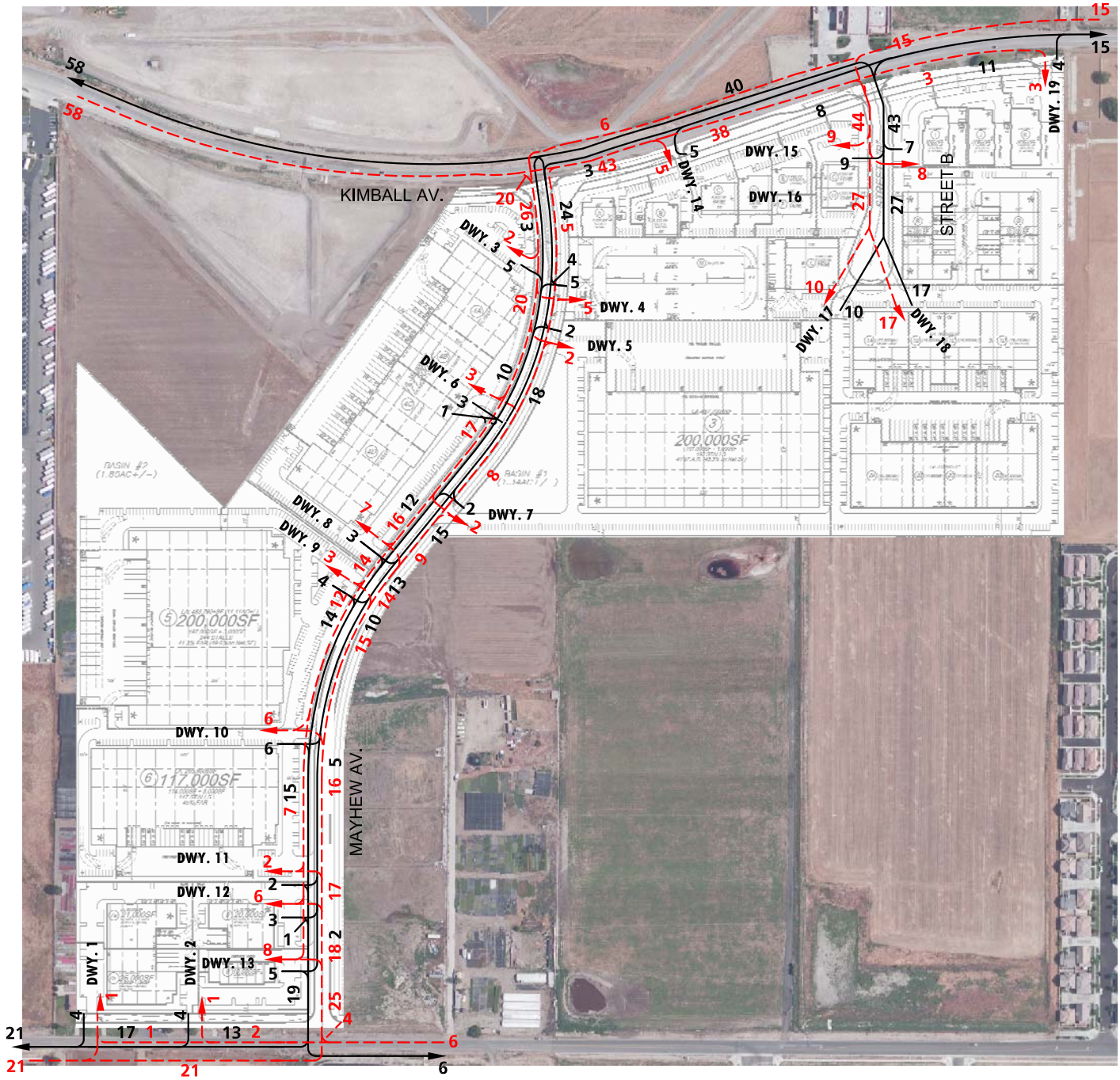


EXHIBIT 4-4 (2 OF 2): PROJECT PASSENGER CAR TRIP DISTRIBUTION (HORIZON YEAR WITHOUT LIMONITE AVENUE EXTENSION)



LEGEND:

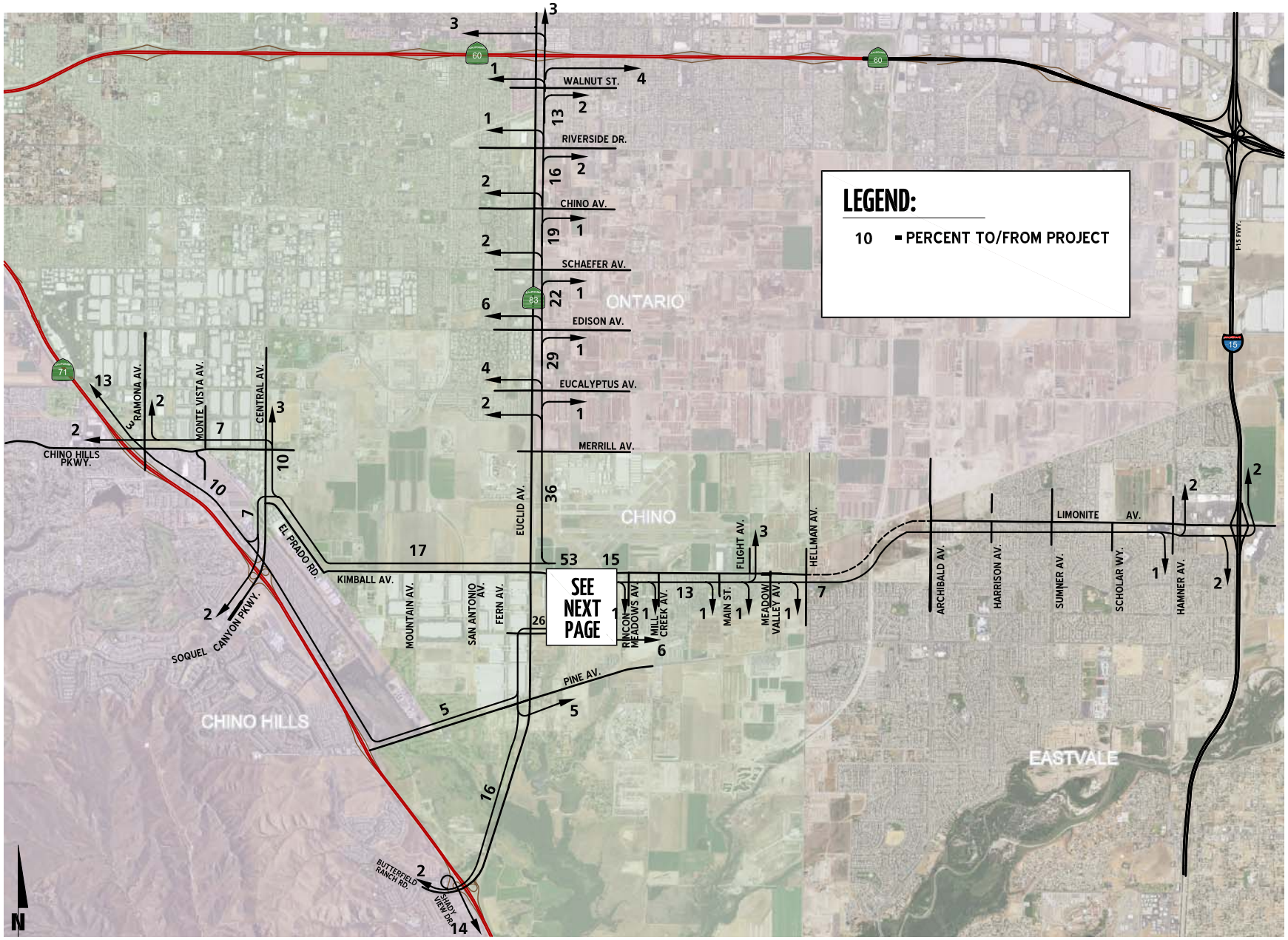
10 = PERCENT TO/FROM PROJECT

◄— = OUTBOUND

◄- - = INBOUND

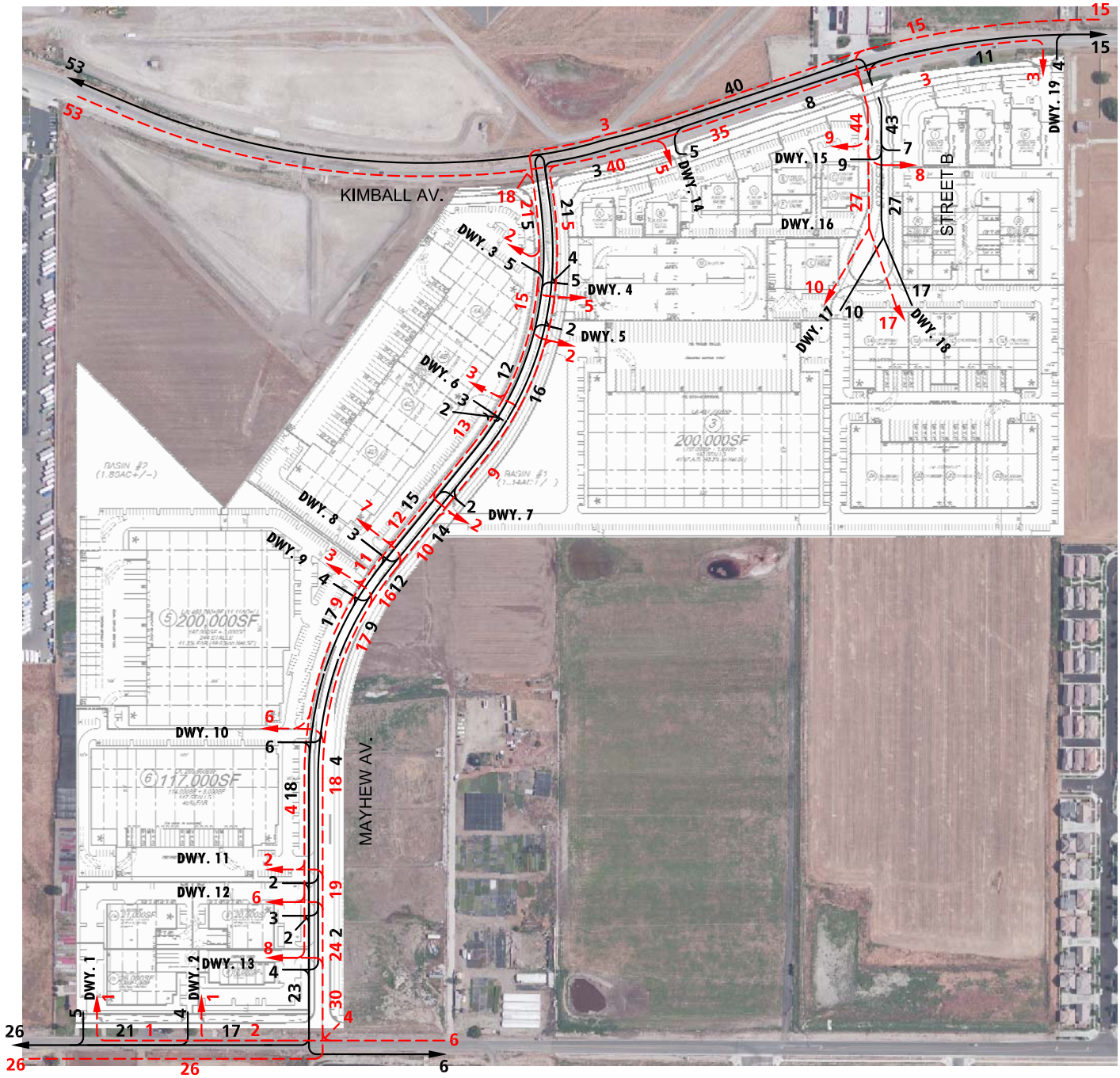
N

EXHIBIT 4-5 (1 OF 2): PROJECT PASSENGER CAR TRIP DISTRIBUTION (HORIZON YEAR WITH LIMONITE AVENUE EXTENSION)



URBAN CROSSROADS

EXHIBIT 4-5 (2 OF 2): PROJECT PASSENGER CAR TRIP DISTRIBUTION (HORIZON YEAR WITH LIMONITE AVENUE EXTENSION)



LEGEND:

10 = PERCENT TO/FROM PROJECT

◄— = OUTBOUND

◄- - = INBOUND

N

The Project trip distribution does not assign measurable project-related trips onto City of Chino Hills arterials. As shown on Exhibit 4-1, 25% of the Project's truck trips are expected to circulate west on Kimball Avenue to access the SR-71 Freeway (with 10% accessing the SR-71 Freeway at Chino Hills Parkway and 15% access the SR-71 Freeway at Central Avenue). Additionally, 20% of the Project's truck trips are expected to circulate south on Euclid Avenue (SR-83) to access the SR-71 Freeway. Based on the Project's trip distribution and trip generation factors presented previously, the Project would contribute a maximum of 81 PCE trips to the SR-71 Freeway segments north of Central Avenue with 52 PCE trips accessing the SR-71 Freeway at Chino Hills Parkway for a total of 133 PCE trips to the SR-71 Freeway segments north of Chino Hills Parkway. The Project would contribute a maximum of 155 PCE trips to the SR-71 Freeway segments south of Euclid Avenue (SR-83).

In order to meet the City of Chino Hills' threshold for evaluation (i.e., 50 peak hour trips at an intersection), 17% of the Project traffic traveling to the SR-71 Freeway would need to "spill over" onto City of Chino Hills arterials adjacent to the SR-71 Freeway during peak hour conditions. The probability of 17% of the Project's SR-71 traffic choosing to use Pine Avenue (as opposed to Kimball Avenue or Euclid Avenue (SR-83)) to access the SR-71 Freeway is extremely low and highly speculative. Northbound traffic would have to travel approximately an additional 1.11 miles if they were to access the SR-71 Freeway via Pine Avenue. Similarly, southbound traffic would have to travel approximately an additional 1.22 miles if they were to access the SR-71 Freeway via Pine Avenue. There is no substantial evidence to conclude that a scenario where 17% of the Project's peak hour traffic is likely to spill over onto streets in the City of Chino Hills would have any reasonable probability to occur.

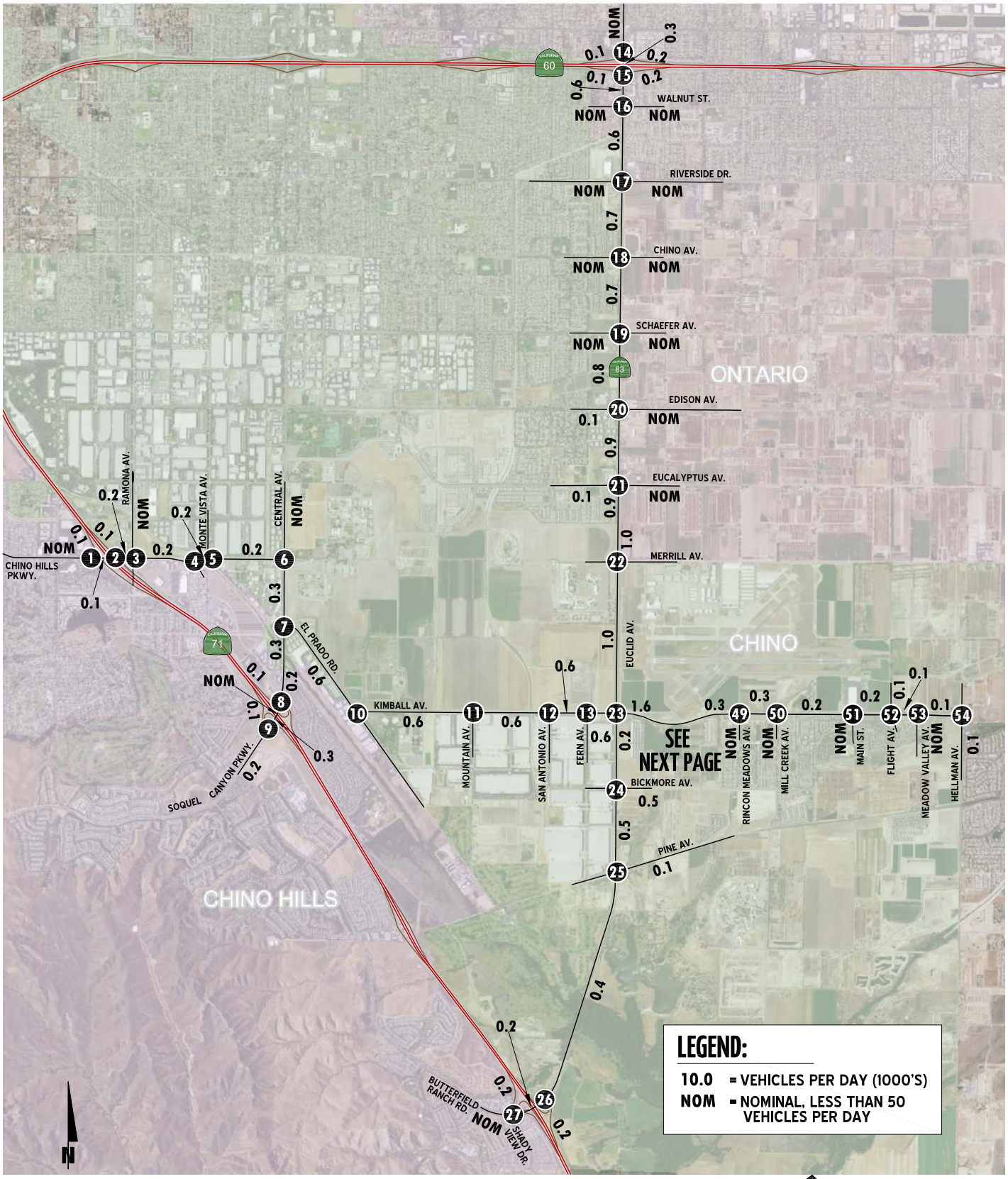
4.3 MODAL SPLIT

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

4.4 PROJECT TRIP ASSIGNMENT

The assignment of traffic from the Project area to the adjoining roadway system is based upon the Project trip generation, trip distribution, and the arterial highway and local street system improvements that would be in place by the time of initial occupancy of the Project. Based on the identified Project traffic generation and trip distribution patterns, Project ADT and peak hour intersection turning movement volumes are shown on Exhibits 4-6 and 4-7 for E+P (Phase 1), Exhibits 4-8 and 4-9 for E+P (Phase 2), Exhibits 4-10 and 4-11 for E+P (Project Buildout), Exhibits 4-12 and 4-13 for Horizon Year (2040) Without Limonite extension, and Exhibits 4-14 and 4-15 for Horizon Year (2040) With Limonite extension, respectively.

EXHIBIT 4-6 (1OF2): PROJECT ONLY (PHASE 1) AVERAGE DAILY TRAFFIC (ADT)



09774 - adt.dwg

EXHIBIT 4-6 (2OF2): PROJECT ONLY (PHASE 1) AVERAGE DAILY TRAFFIC (ADT)

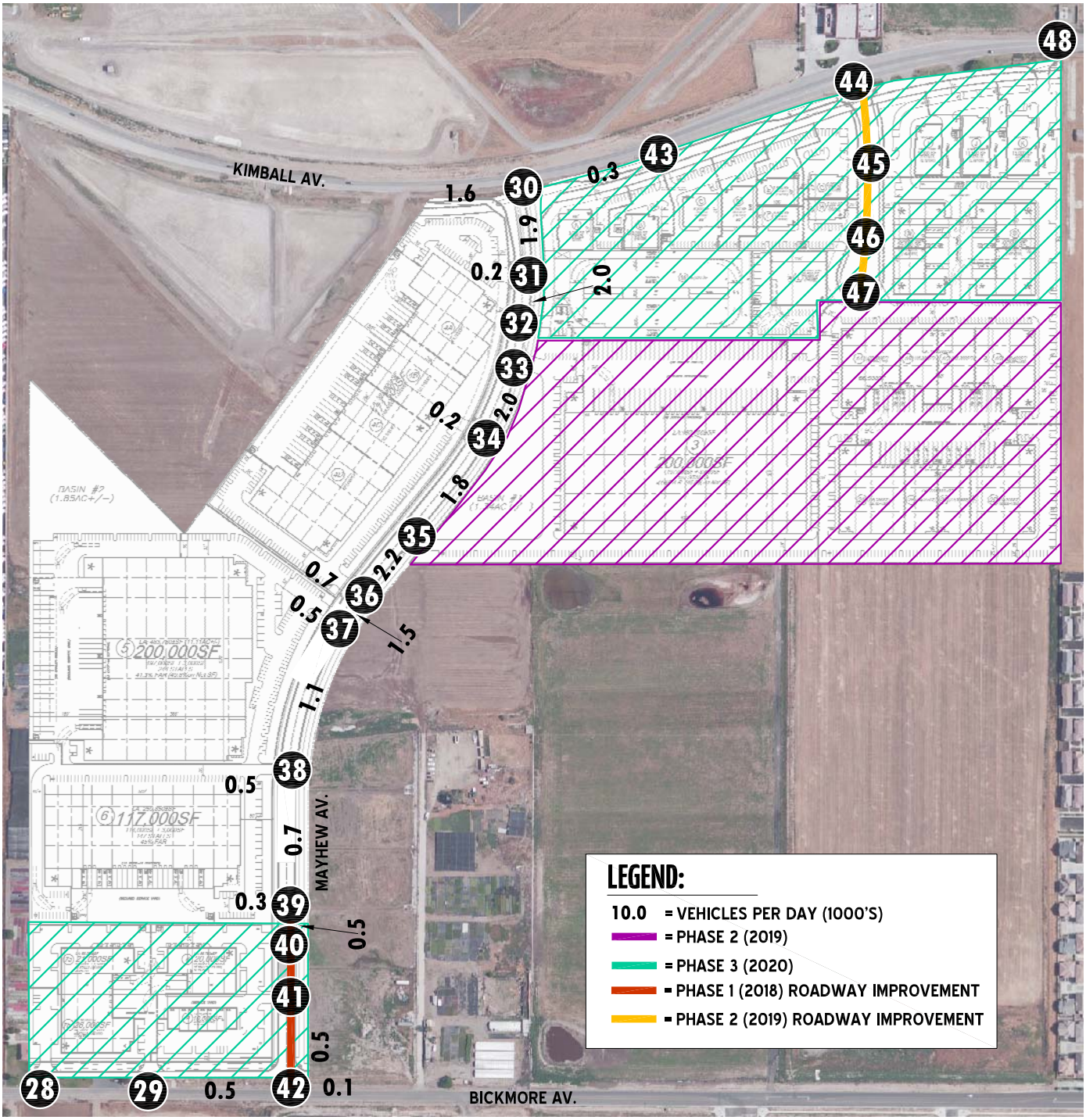


EXHIBIT 4-7 (1OF2): PROJECT ONLY (PHASE 1) TRAFFIC VOLUMES (IN PCE)

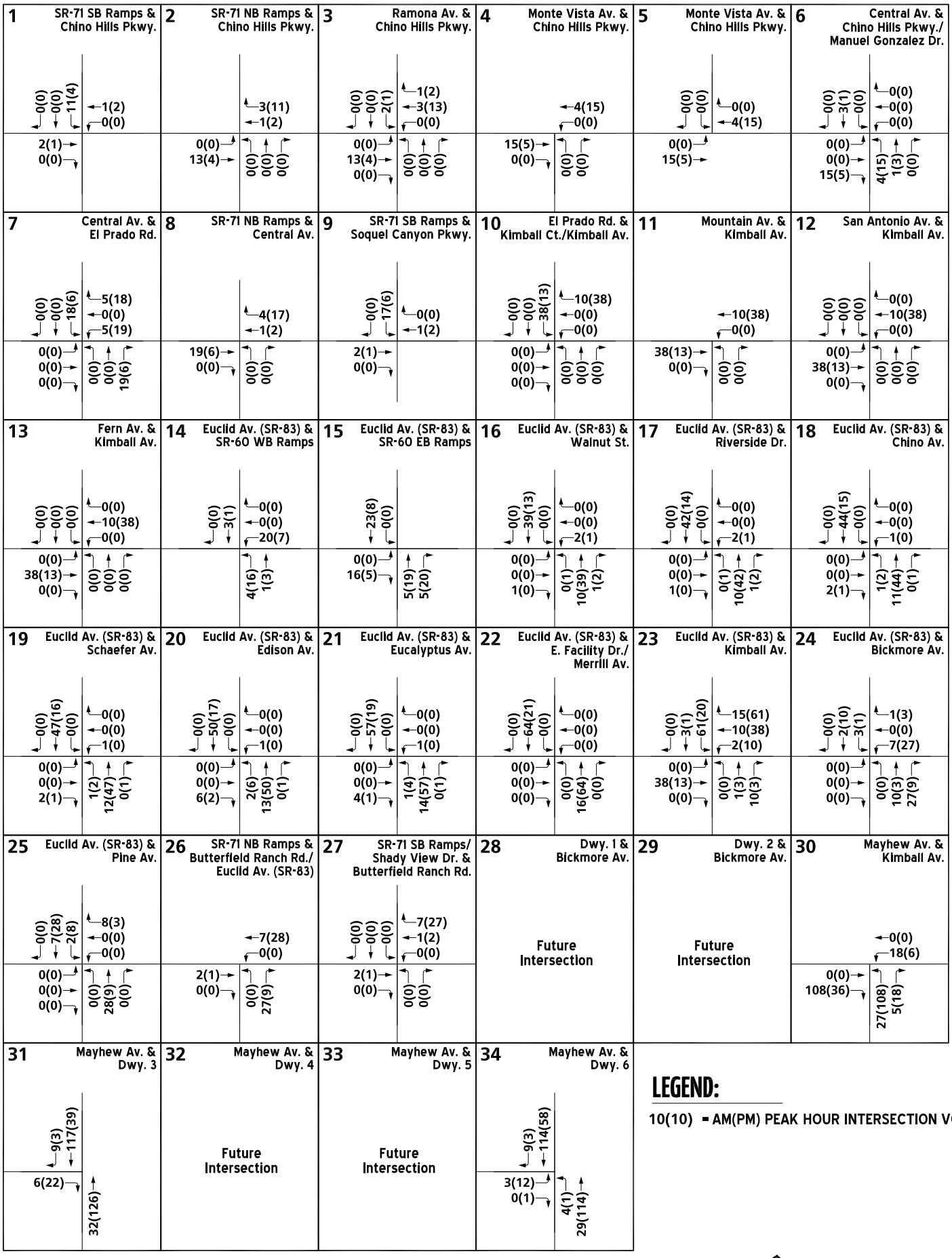


EXHIBIT 4-7 (2OF2): PROJECT ONLY (PHASE 1) TRAFFIC VOLUMES (IN PCE)

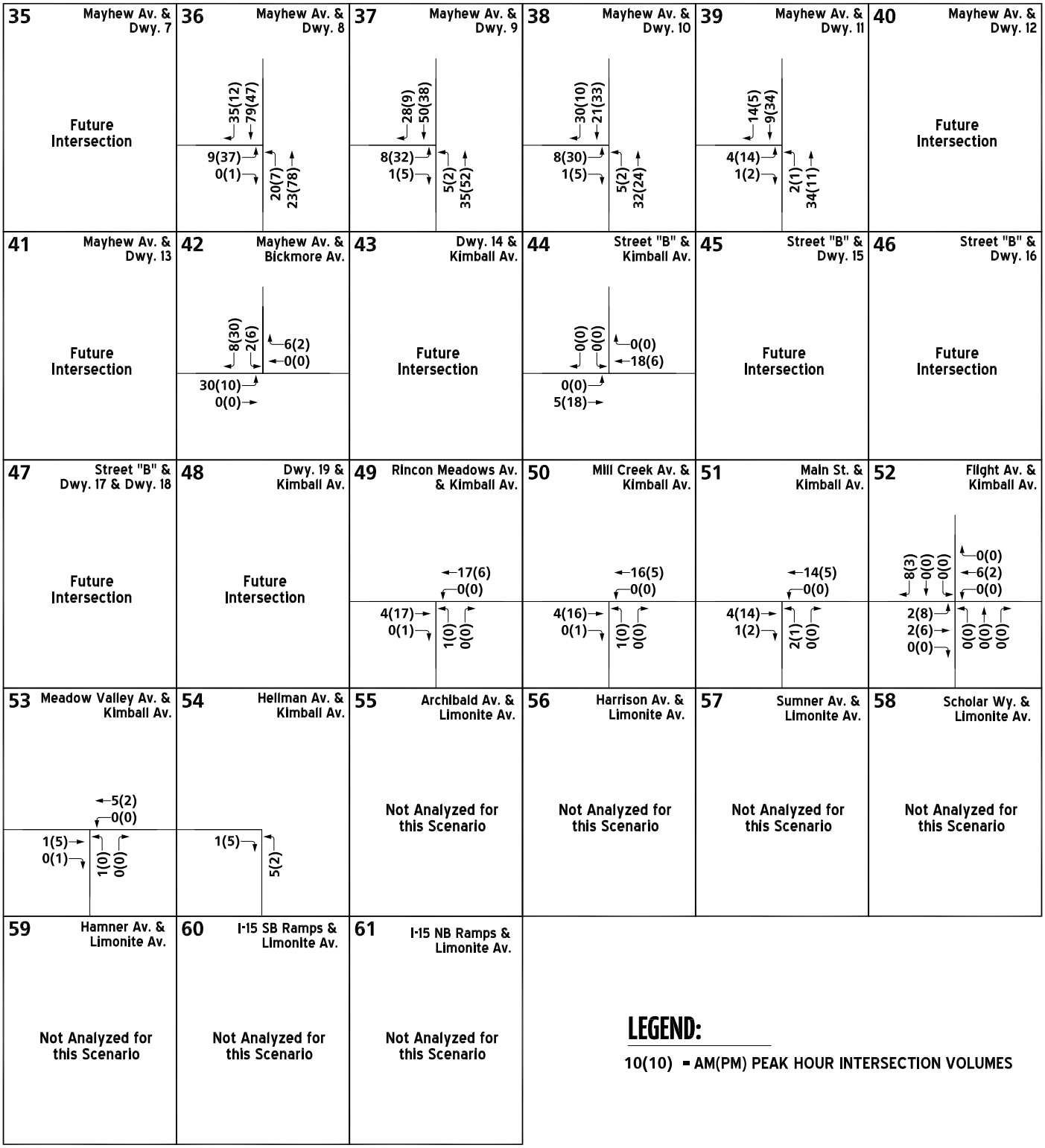


EXHIBIT 4-8 (1OF2): PROJECT ONLY (PHASE 2) AVERAGE DAILY TRAFFIC (ADT)

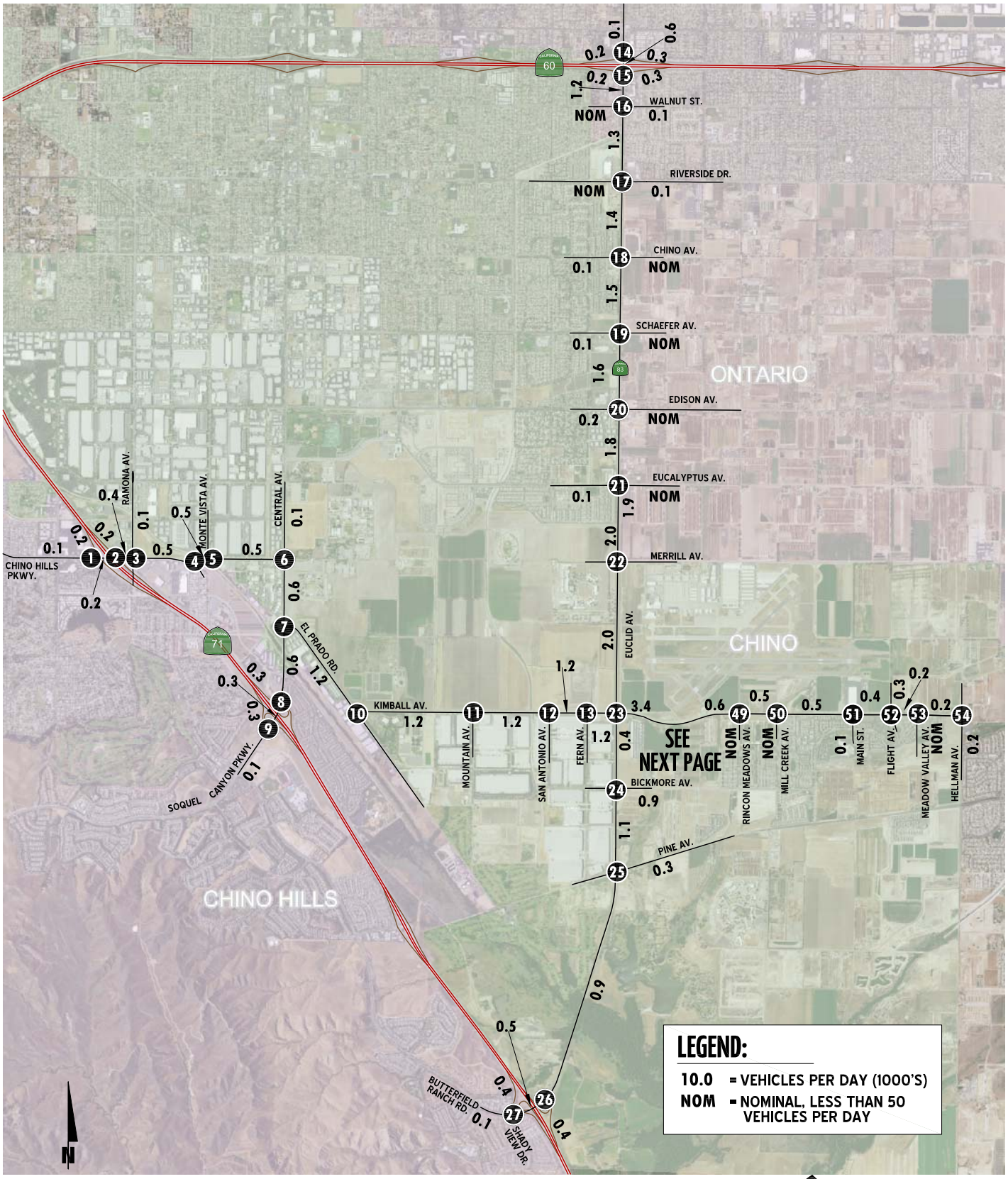


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EXHIBIT 4-8 (2OF2): PROJECT ONLY (PHASE 2) AVERAGE DAILY TRAFFIC (ADT)

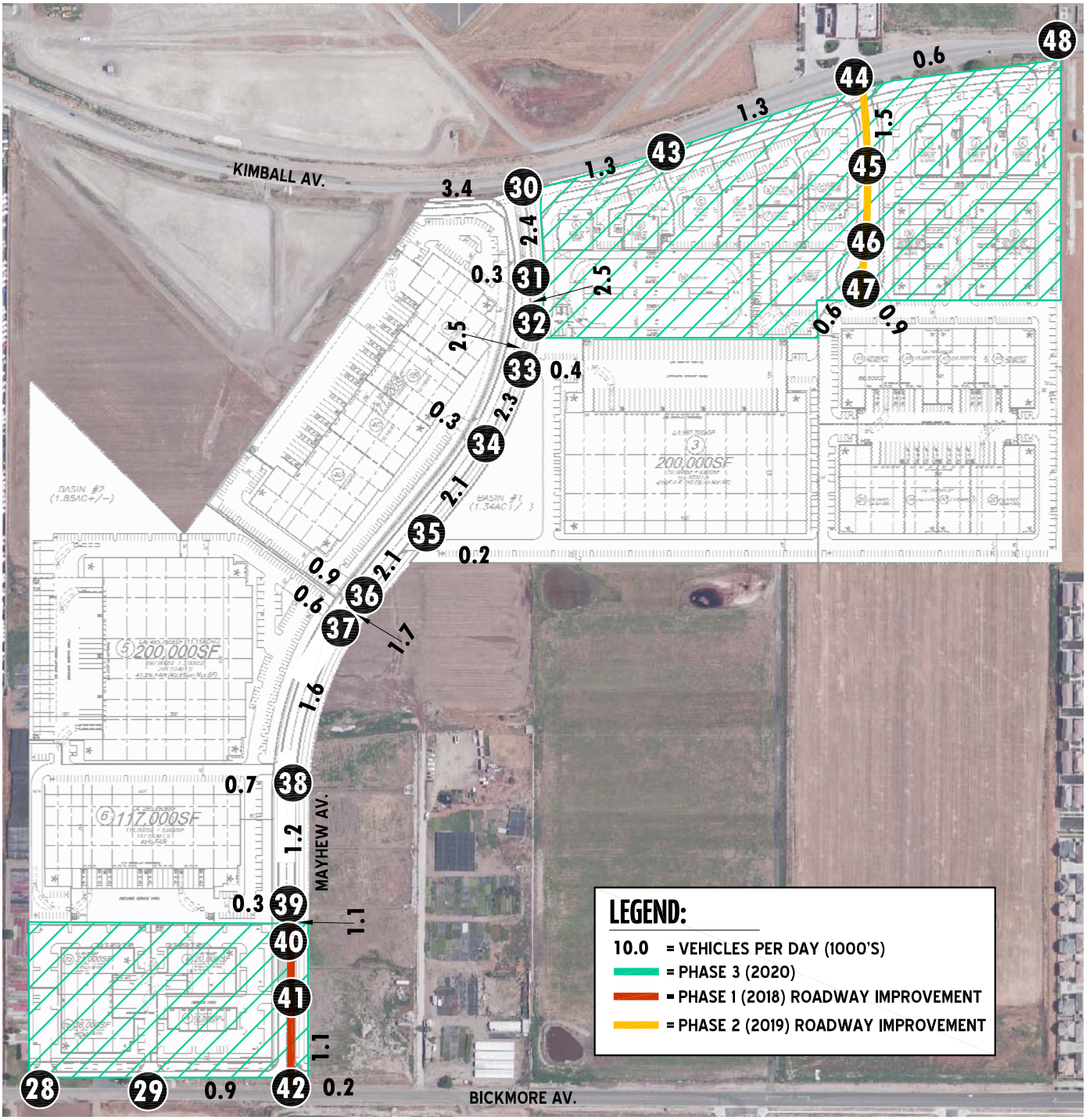
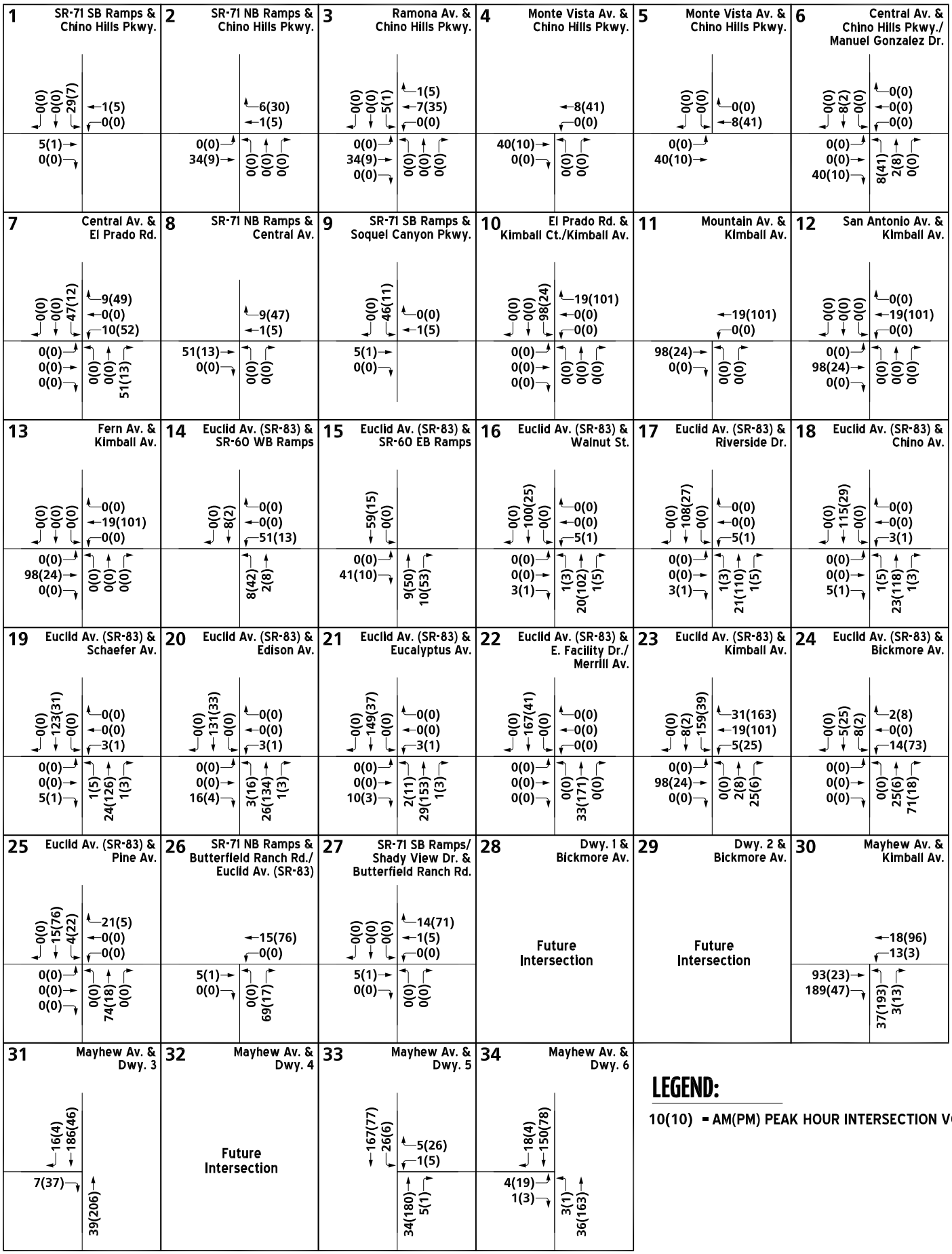


EXHIBIT 4-9 (1OF2): PROJECT ONLY (PHASE 2) TRAFFIC VOLUMES (IN PCE)



LEGEND:

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

EXHIBIT 4-9 (2OF2): PROJECT ONLY (PHASE 2) TRAFFIC VOLUMES (IN PCE)

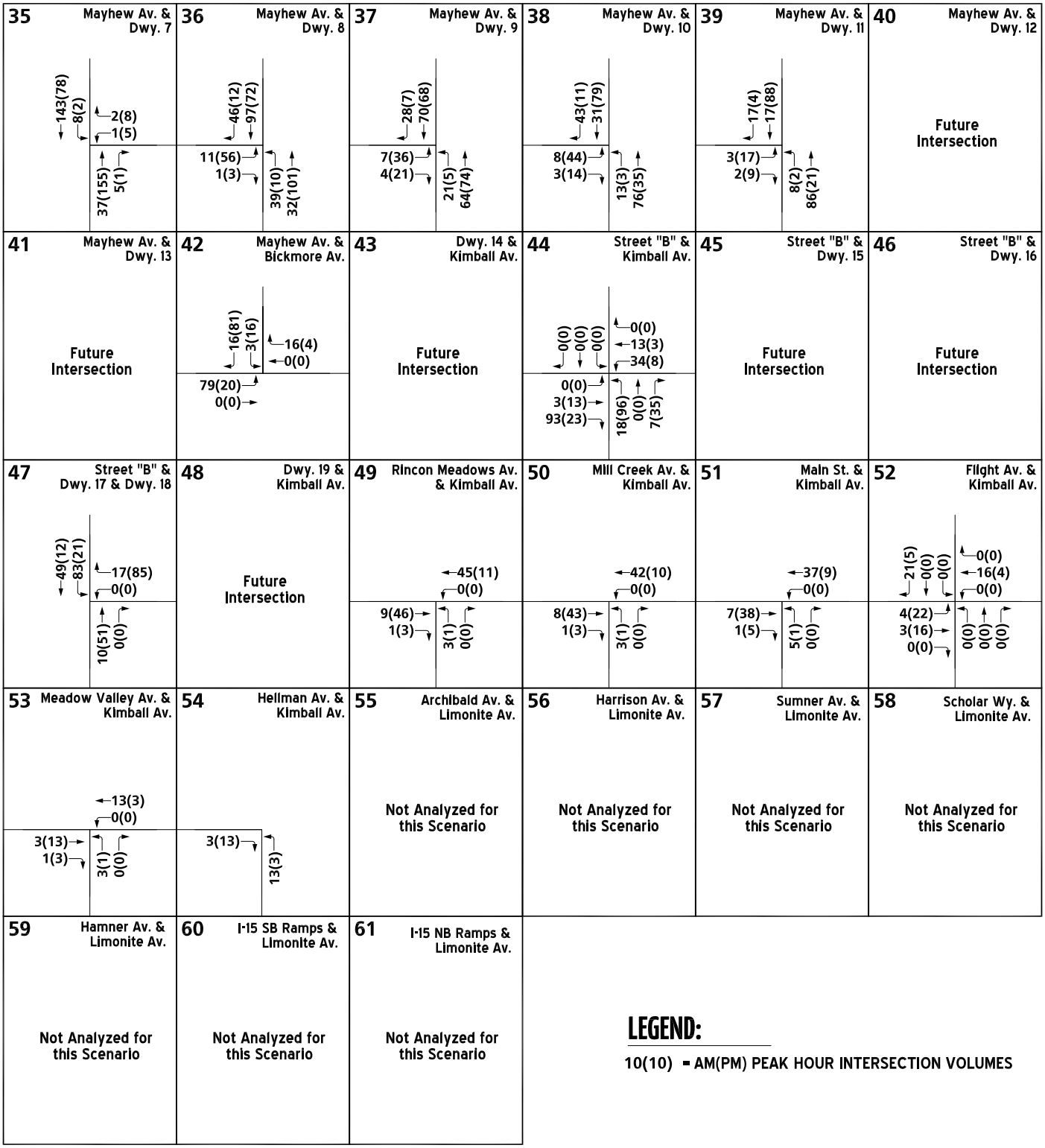


EXHIBIT 4-10 (1OF2): PROJECT ONLY (PROJECT BUILDOUT) AVERAGE DAILY TRAFFIC (ADT)

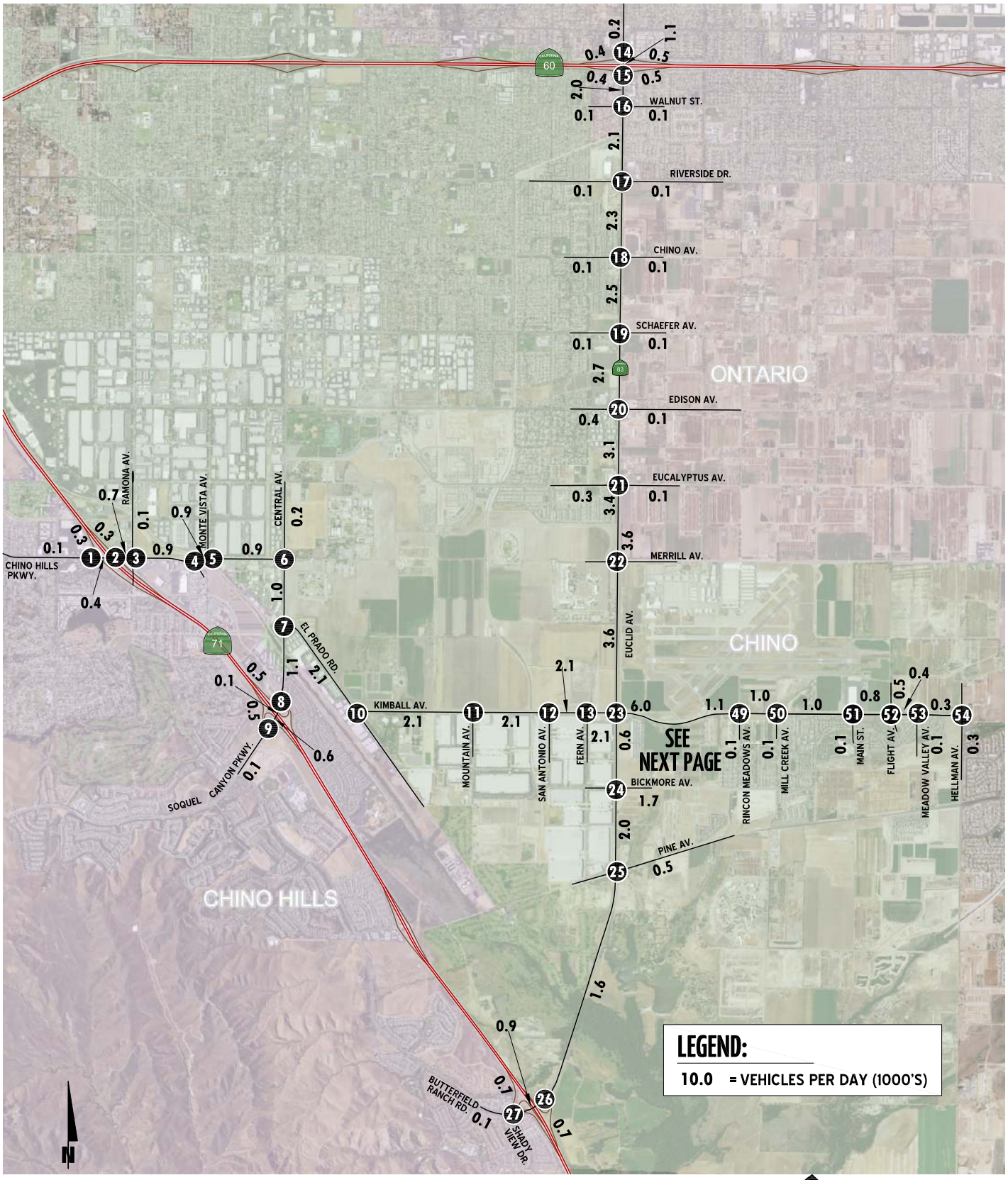


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EXHIBIT 4-10 (2OF2): PROJECT ONLY (PROJECT BUILDOUT) AVERAGE DAILY TRAFFIC (ADT)

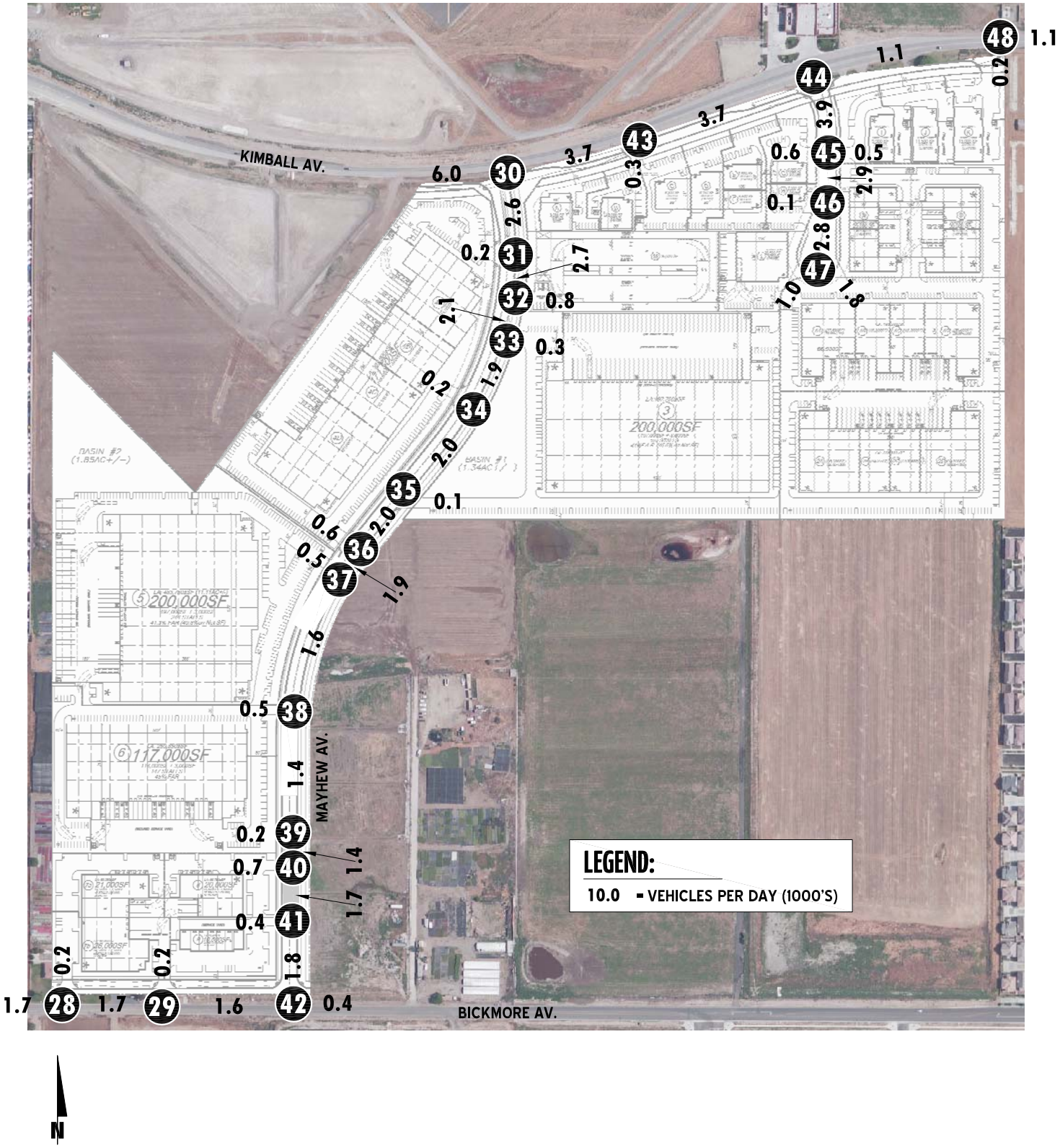
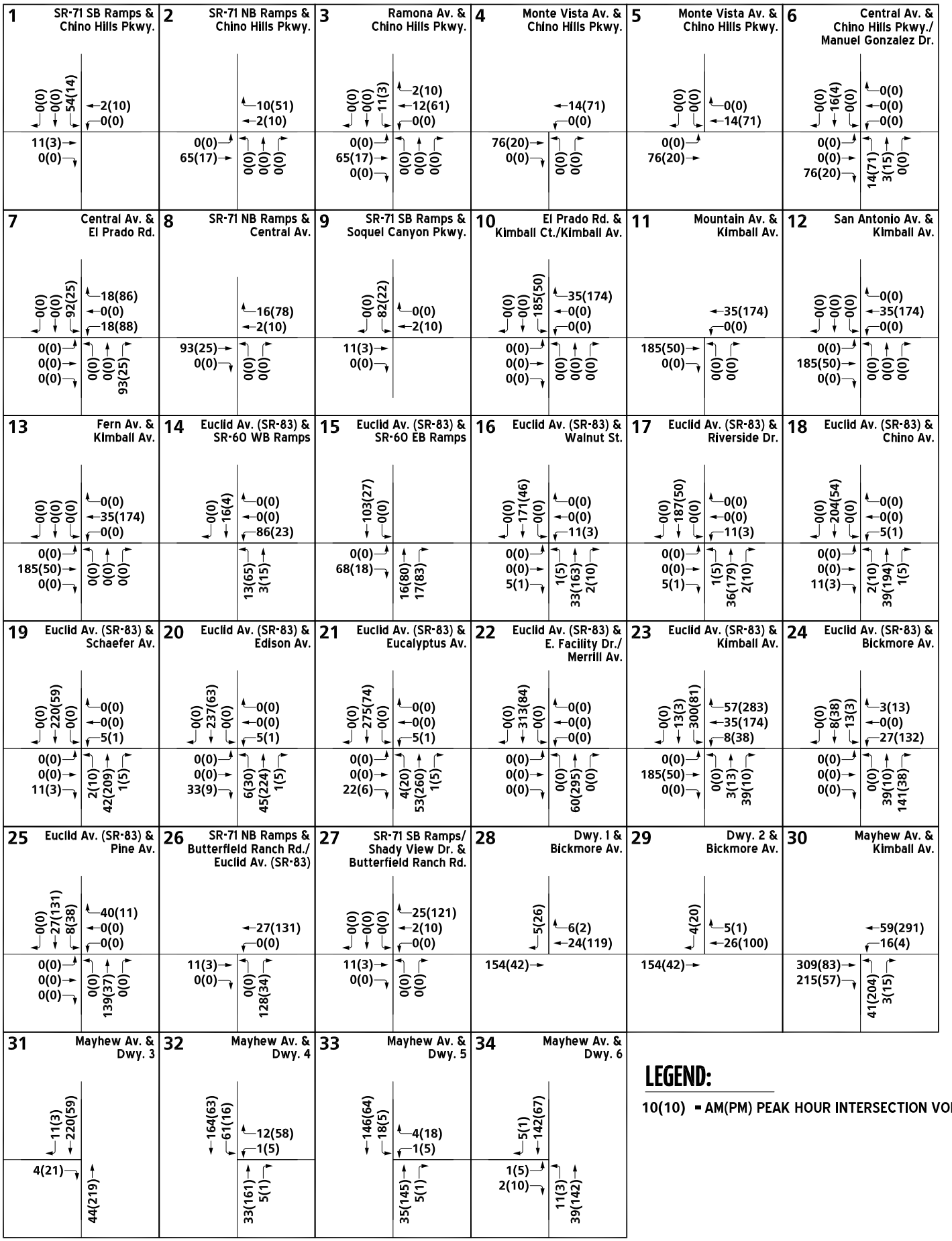


EXHIBIT 4-11 (1OF2): PROJECT ONLY (PROJECT BUILDOUT) TRAFFIC VOLUMES (IN PCE)



LEGEND:

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

EXHIBIT 4-11 (2OF2): PROJECT ONLY (PROJECT BUILDOUT) TRAFFIC VOLUMES (IN PCE)

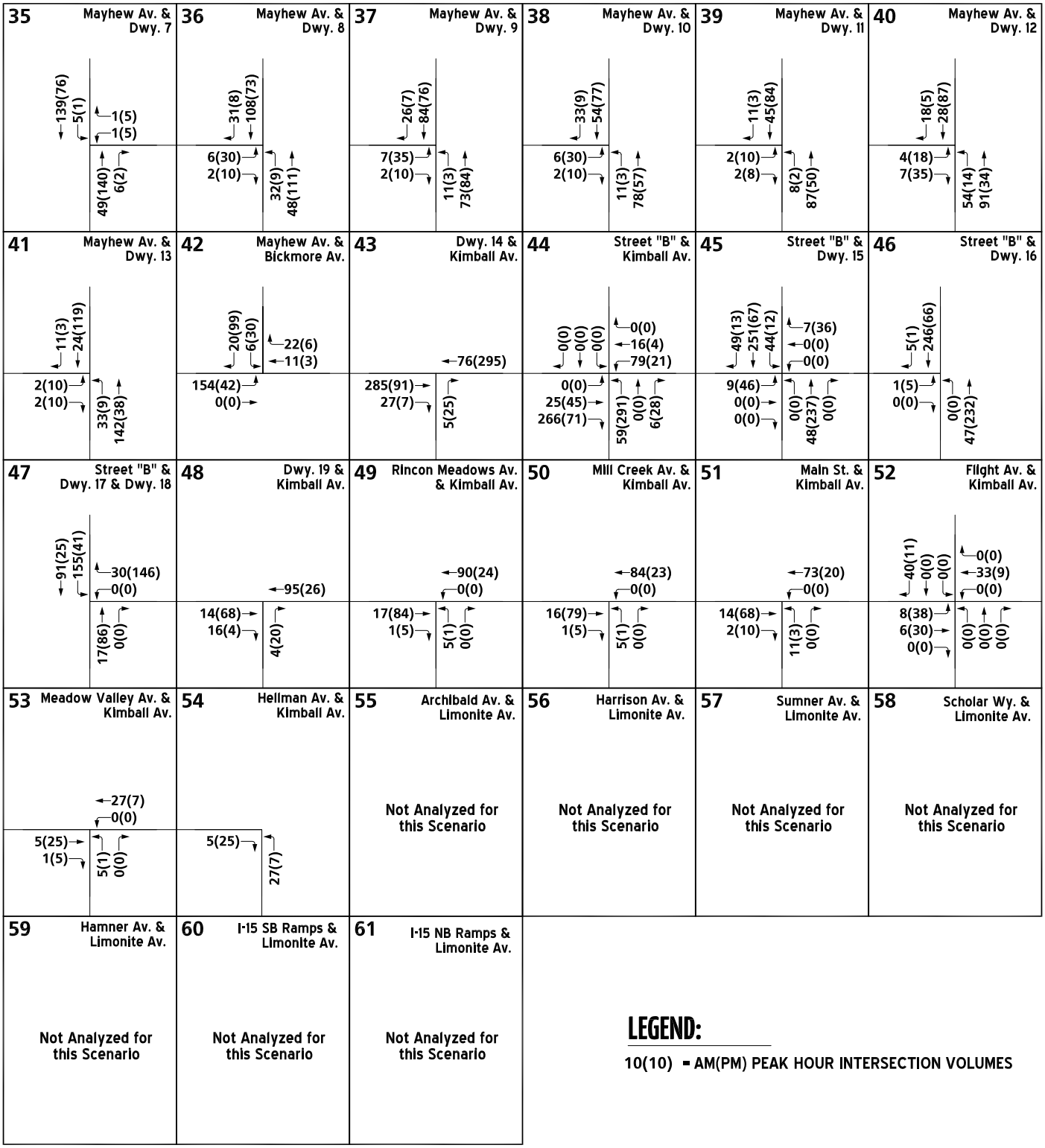


EXHIBIT 4-12 (1OF2): PROJECT ONLY (2040) (PROJECT BUILDOUT) (WITHOUT LIMONITE AVENUE EXTENSION) AVERAGE DAILY TRAFFIC (ADT)

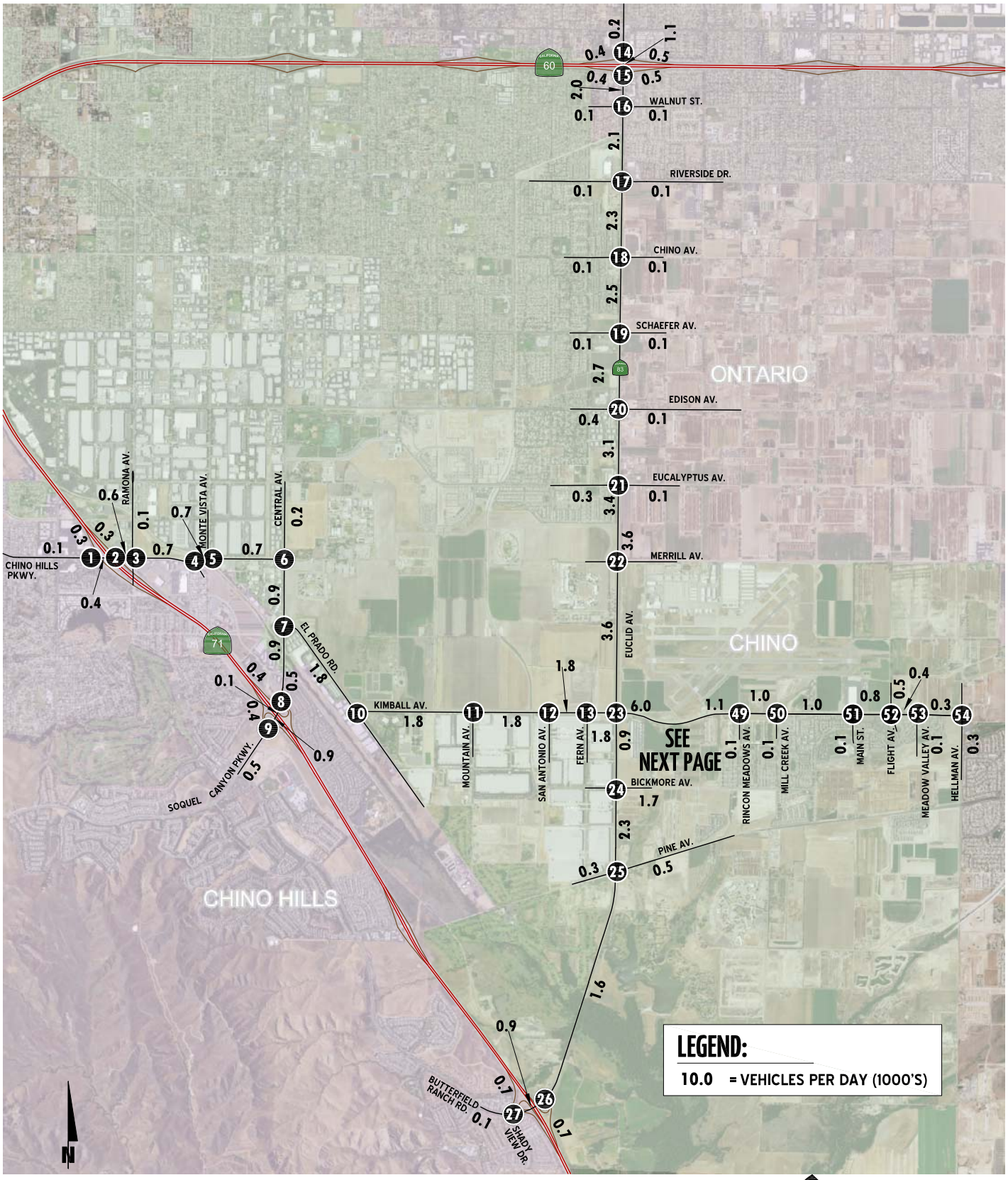


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EXHIBIT 4-12 (2OF2): PROJECT ONLY (2040) (PROJECT BUILDOUT) (WITHOUT LIMONITE AVENUE EXTENSION) AVERAGE DAILY TRAFFIC (ADT)

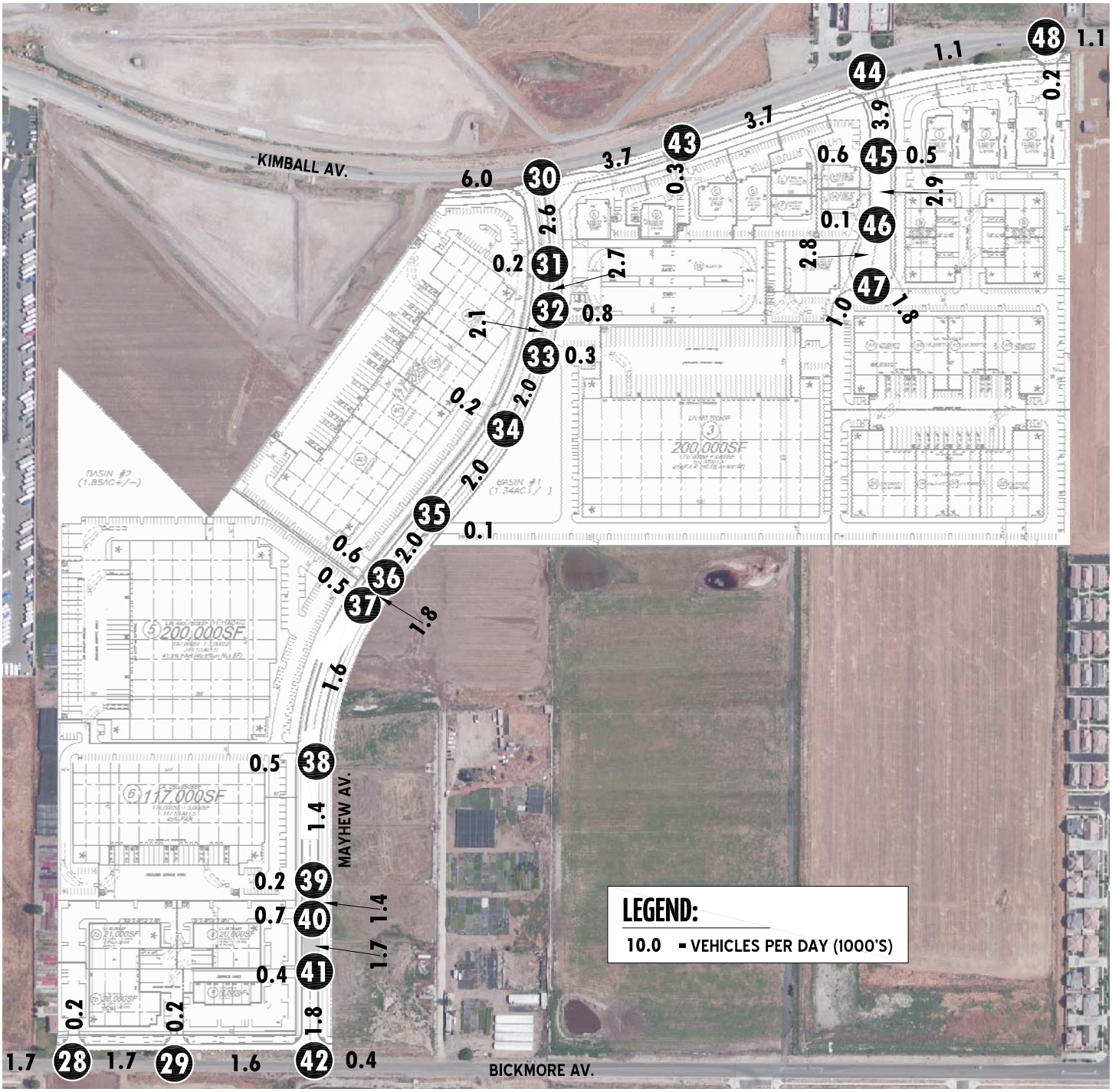
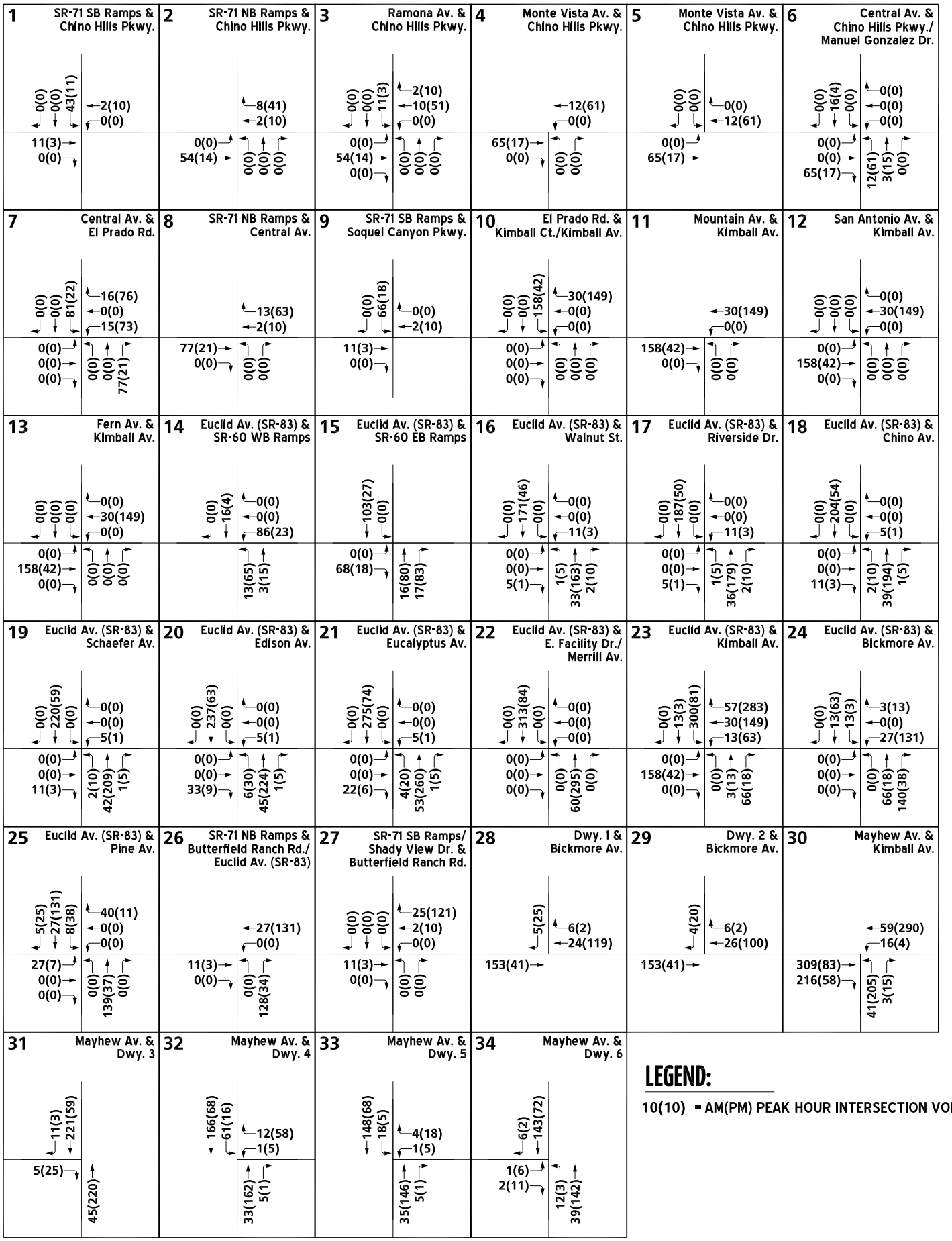


EXHIBIT 4-13 (1OF2): PROJECT ONLY (2040) (PROJECT BUILDOUT) (WITHOUT LIMONITE AVENUE EXTENSION) TRAFFIC VOLUMES (IN PCE)



LEGEND:

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

EXHIBIT 4-13 (2OF2): PROJECT ONLY (2040) (PROJECT BUILDOUT) (WITHOUT LIMONITE AVENUE EXTENSION) TRAFFIC VOLUMES (IN PCE)

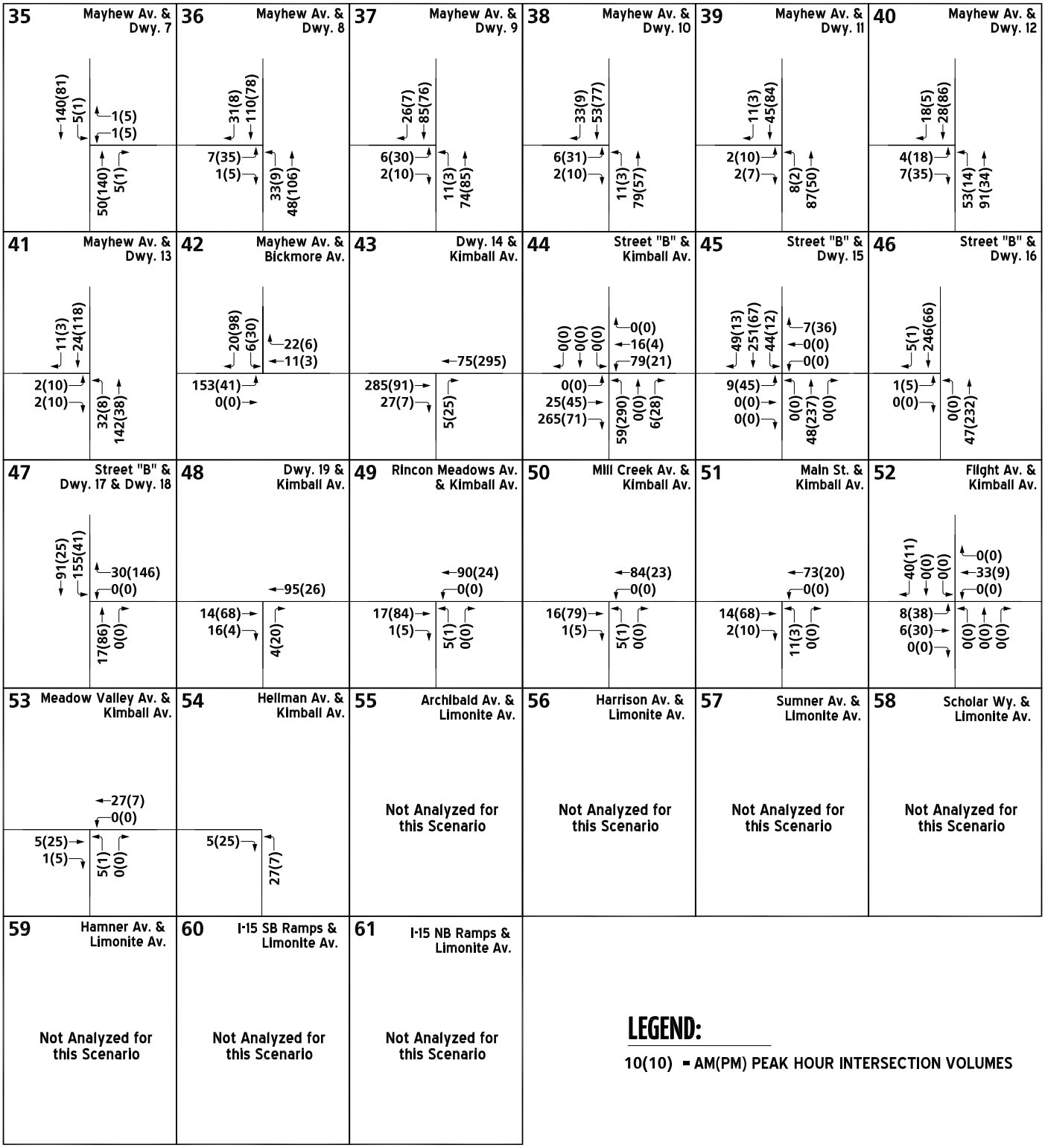
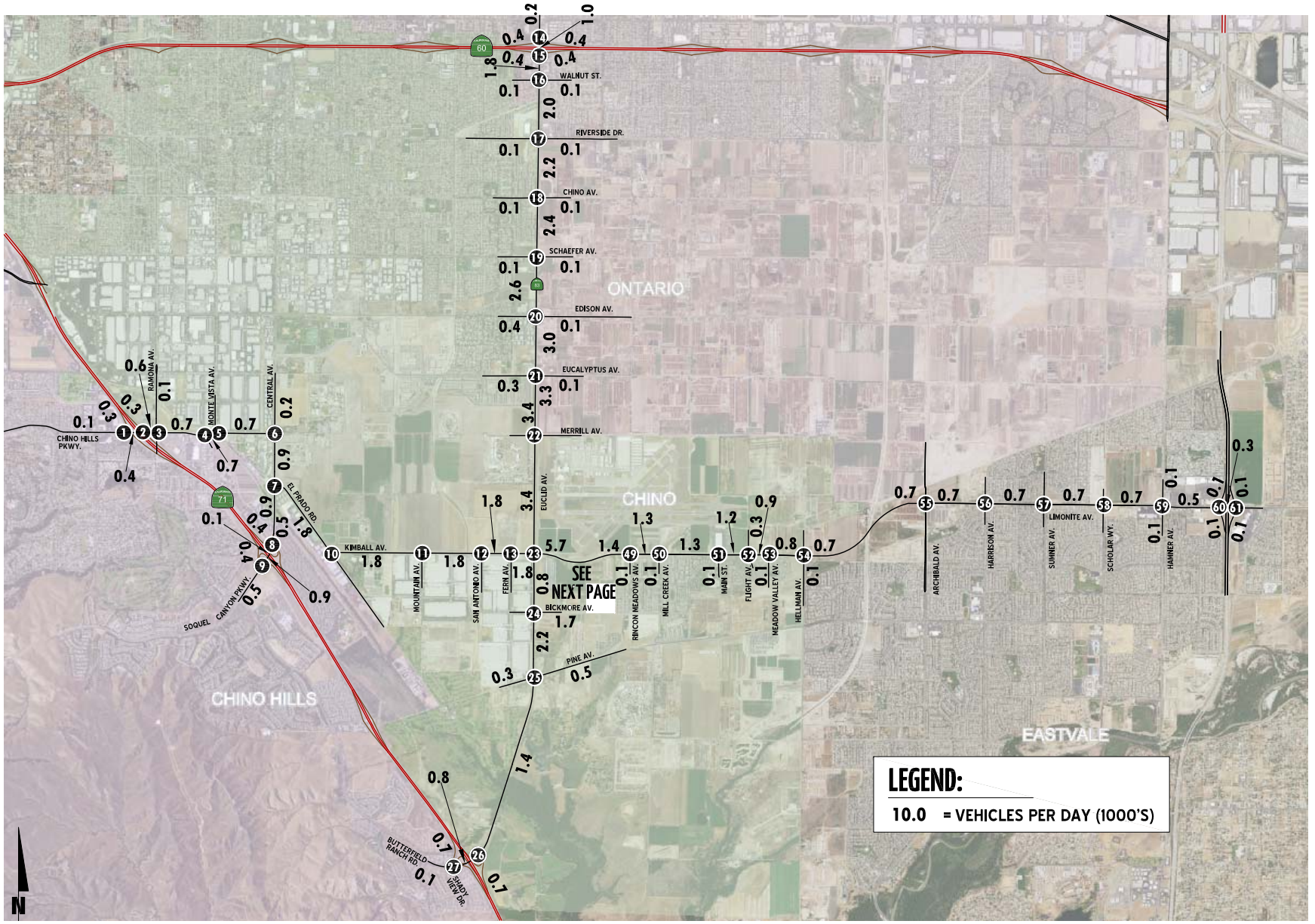


EXHIBIT 4-14 (1OF2): PROJECT ONLY (2040) (PROJECT BUILDOUT) (WITH LIMONITE AVENUE EXTENSION) AVERAGE DAILY TRAFFIC (ADT)



URBAN CROSSROADS

EXHIBIT 4-14 (2OF2): PROJECT ONLY (2040) (PROJECT BUILDOUT) (WITH LIMONITE AVENUE EXTENSION) AVERAGE DAILY TRAFFIC (ADT)

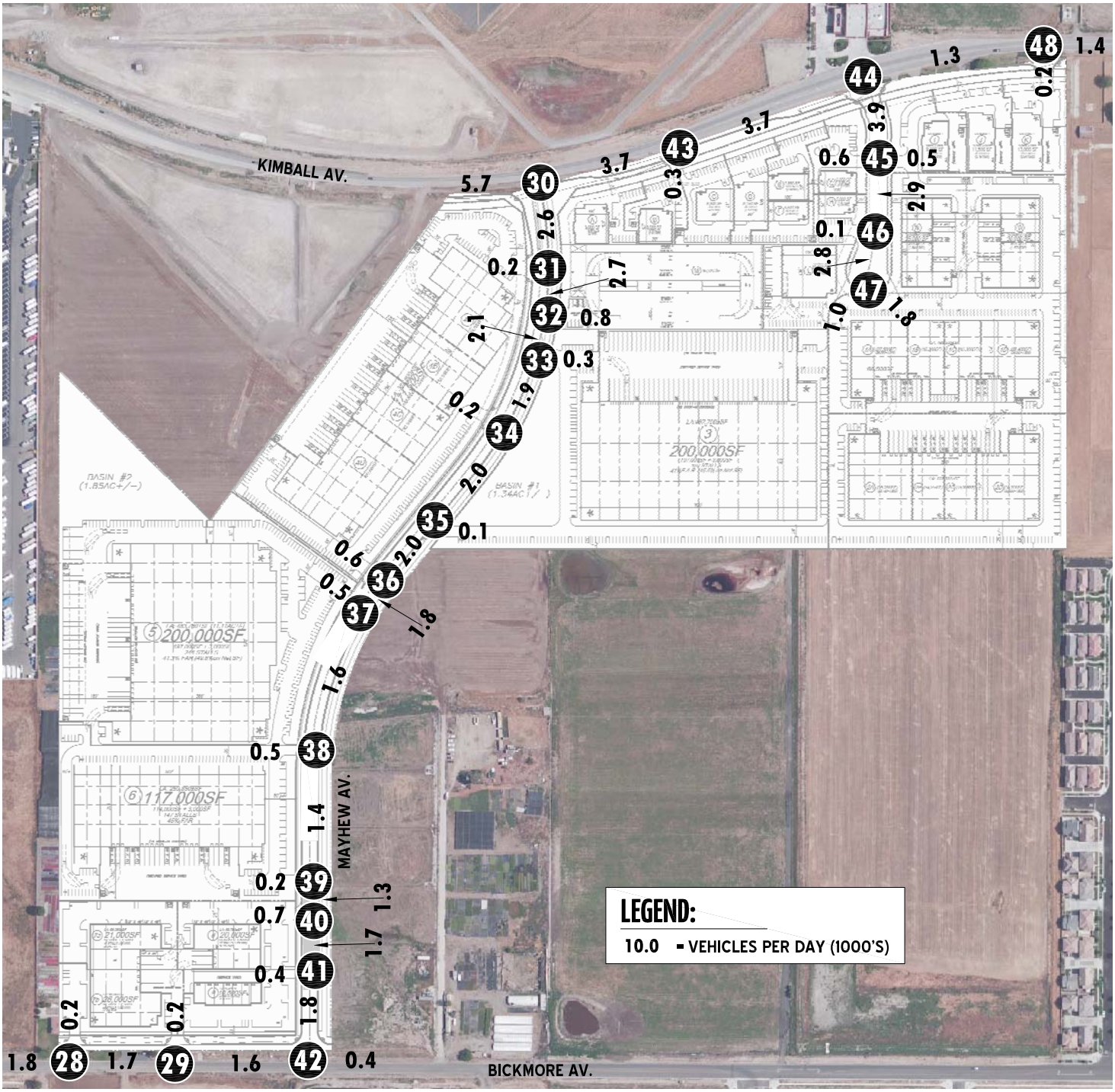


EXHIBIT 4-15 (1OF2): PROJECT ONLY (2040) (PROJECT BUILDOUT) (WITH LIMONITE AVENUE EXTENSION) TRAFFIC VOLUMES (IN PCE)

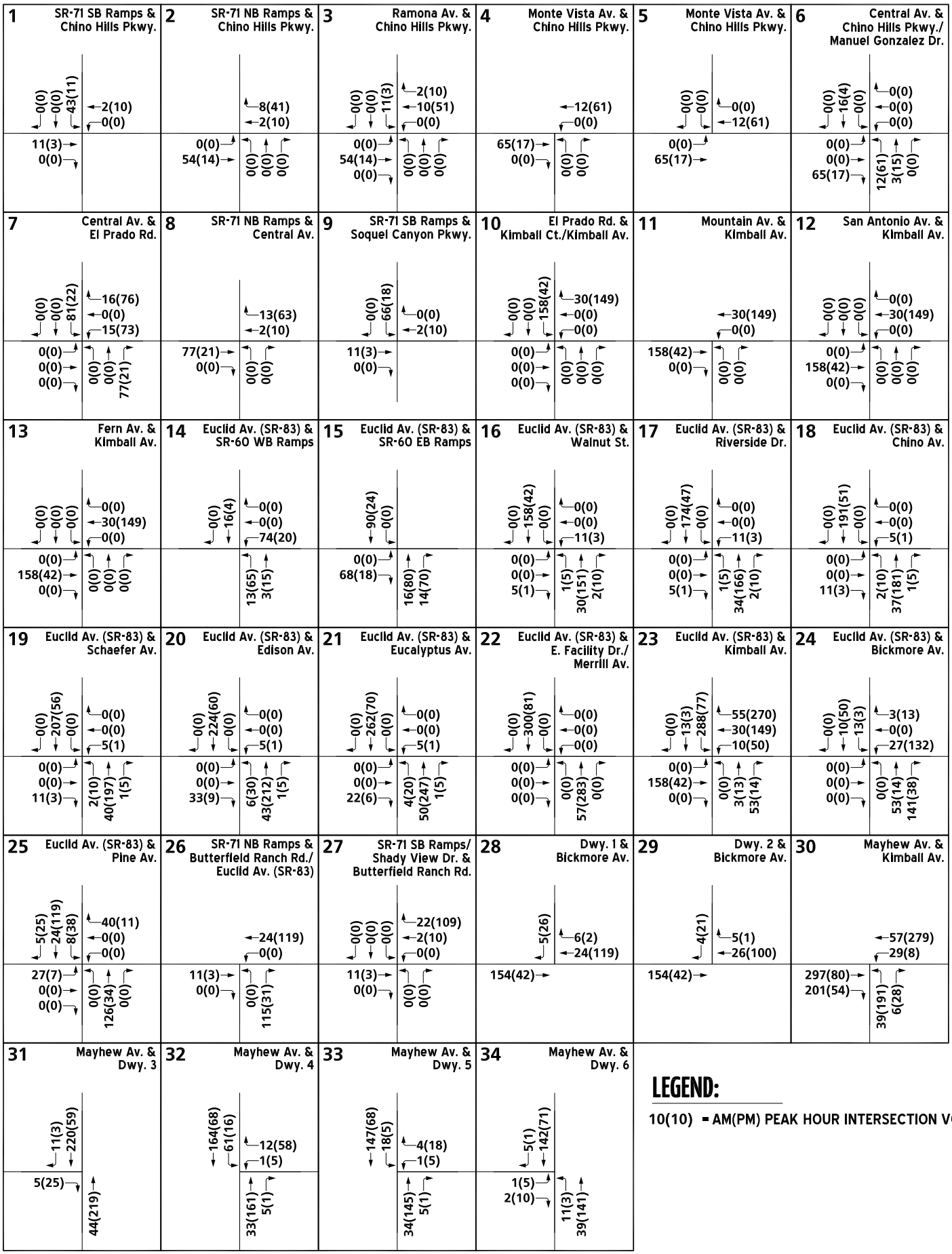
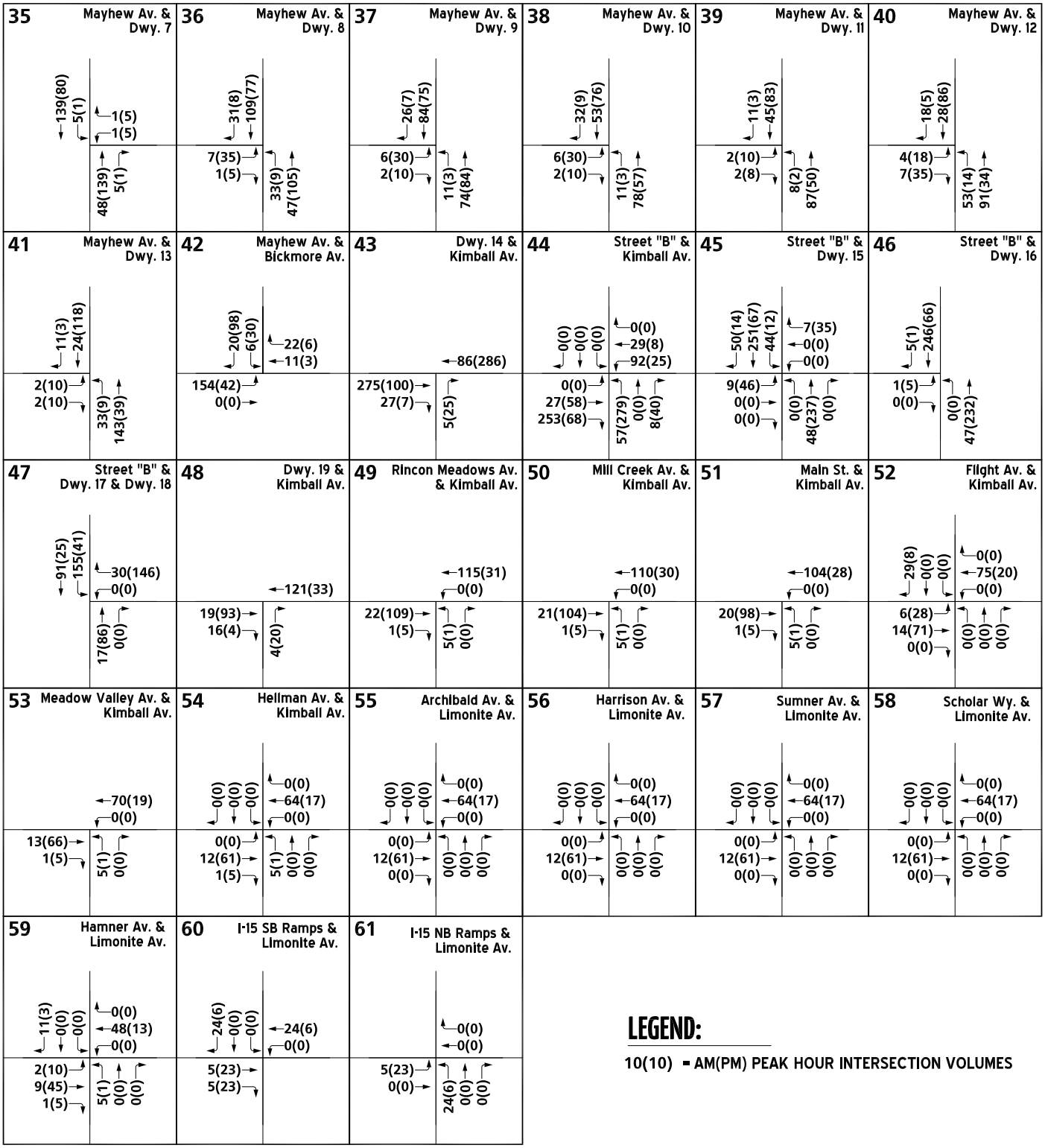


EXHIBIT 4-15 (2OF2): PROJECT ONLY (2040) (PROJECT BUILDOUT) (WITH LIMONITE AVENUE EXTENSION) TRAFFIC VOLUMES (IN PCE)



LEGEND:

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

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 2018, 2019, and 2020 traffic conditions. The ambient growth factor is intended to approximate regional traffic growth. The total ambient growth is 4.04%, 6.12%, and 8.24% for 2018, 2019, and 2020 traffic conditions (compounded growth of 2 percent per year over 2-4 years or $1.02^{2\text{-}4 \text{ years}}$), respectively. 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 (2018, 2019, and 2020) traffic volumes are provided in Section 6.0 *Opening Year Cumulative (2018),* Section 7.0 *Opening Year Cumulative (2019) Traffic Conditions Traffic Conditions,* and Section 8.0 *Opening Year Cumulative (2020) Traffic Conditions* of this report. The traffic generated by the proposed Project was then manually added to the base volume to determine Opening Year Cumulative "With Project" forecasts for 2018, 2019, and 2020.

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 Chino identifies projected growth in population of 79,400 in 2012 to 120,400 in 2040, or a 51.64% increase over the 28-year period. (8) The change in population equates to roughly a 1.50% growth rate, compounded annually. Similarly, growth over the same 28-year period in households is projected to increase by 61.90%, or a 1.74% annual growth rate. Finally, growth in employment over the same 28-year period is projected to increase by 18.78%, or a 0.62% annual growth rate.

Based on a comparison of Existing (2016) traffic volumes to the Horizon Year (2040) forecasts, the average growth rate is estimated at approximately 2.06%, compounded annually between Existing (2016) and 2040 traffic conditions. The annual growth rate at each individual intersection is not lower than 0.98% compounded annually to as high as 4.22% 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 Chino for Opening Year Cumulative and Horizon Year (2040) traffic conditions, especially when considered along with the addition of project-related traffic. As such, the growth in traffic volumes assumed in this traffic impact analysis would tend to overstate as opposed to understate the potential impacts to traffic and circulation.

4.6 CUMULATIVE DEVELOPMENT TRAFFIC

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

Exhibit 4-16 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 in Table 4-4 are reflected as part of the background traffic.

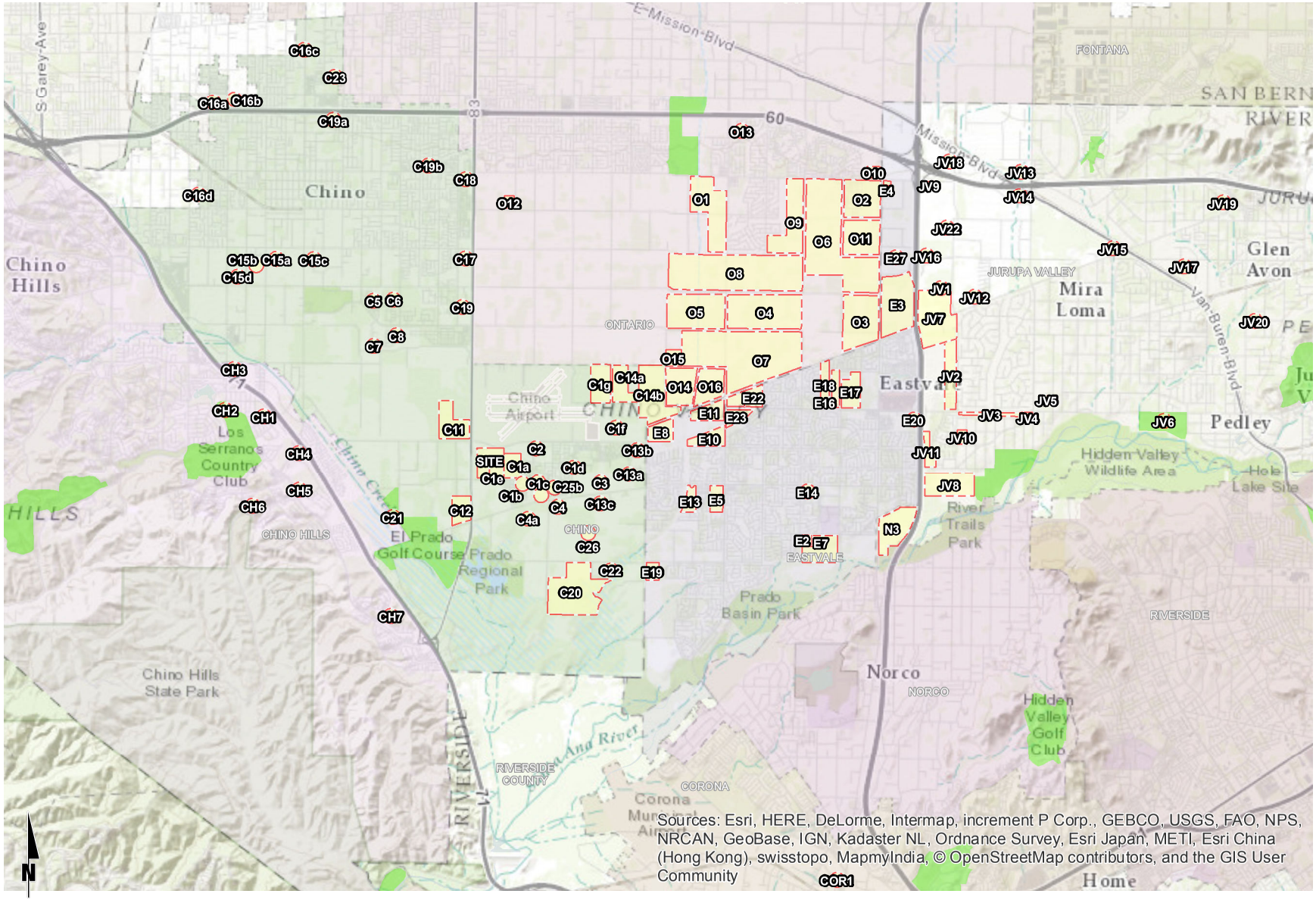
4.7 HORIZON YEAR (2040) VOLUME DEVELOPMENT

Traffic projections for Horizon Year (2040) without Project conditions were derived from the San Bernardino Transportation Analysis Model (SBTAM) modified to represent buildout of the City of Chino using accepted procedures for model forecast refinement and smoothing for study area intersections located within the City of Chino.

The traffic forecasts reflect the area-wide growth anticipated between Existing (2016) 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 May 2016. The SBTAM has a base (validation) year of 2012 and a horizon (future forecast) year of 2040. The difference in model volumes (2040-2012) defines the growth in traffic over the 28-year period. The Riverside Transportation Analysis Model (RivTAM) has a base (validation) year of 2008 and a horizon (future forecast) year of 2035. The RivTAM 2035 model utilized for the purposes of this analysis assumes buildout of the City of Eastvale. A compounded growth rate consistent with the SCAG RTP/SCS has been applied to the Eastvale locations to determine 2040 forecasts.

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

EXHIBIT 4-16: CUMULATIVE DEVELOPMENT LOCATION MAP



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

Table 4-4
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Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
City of Chino				
C1a	Bickmore Street Residential	SFDR	196	DU
C1b	TM 17611	SFDR	21	DU
C1c	TM 17612	SFDR	42	DU
C1d	TM17635	SFDR	67	DU
C1e	Bouma Residential	SFDR	106	DU
		Condo/Townhouse	94	DU
C1f	Kimball Business Park	Light Industrial	140.500	TSF
		Warehousing	564.000	TSF
		High-Cube Warehouse	352.000	TSF
		Business Park	146.550	TSF
C1g	Chino Parcel Delivery	Parcel Delivery Facility	765.274	TSF
C2	TM17574	Condo/Townhouse	108	DU
C3	Falloncrest at the Preserve	SFDR	204	DU
		Condo/Townhouse	786	DU
		Apartments	412	DU
		Shopping Center	77.597	TSF
		General Office	77.597	TSF
C4a	West Preserve (Barthelemy Project)	SFDR	193	DU
		Condo/Townhouse	198	DU
		Apartments	288	DU
		Youth Soccer	1	Field
C4b	TM18778	SFDR	65	DU
C5	PL11-0047	Apartments	135	DU
	TM 18873	Condo/Townhouse	149	DU
	TM 16838-2 PA 7B	SFDR	67	DU
C6	TM17898	SFDR	77	DU
	TM 17899	SFDR	66	DU
	PL 13-0435	SFDR	41	DU
C7	TM18848	Condo/Townhouse	101	DU
C8	TM17891	SFDR	75	DU
	TM 17890	SFDR	94	DU
	TM 18891	SFDR	118	DU
	TM 17892	SFDR	63	DU
	TM 17893	SFDR	34	DU
	TM 17894	SFDR	39	DU
	TM 17895	SFDR	19	DU
	TM 17896	SFDR	67	DU
	TM 17897	SFDR	93	DU
C9	PL11-0299	General Light Industrial	50.000	TSF
	PL13-0601	SFDR	209	DU
C10	South of Pine	SFDR	1,351	DU
		Condo/Townhouse	732	DU
		Apartments	670	DU
C11	Majestic Airport Center	High-Cube Warehouse	2,890.400	TSF
		Warehousing	180.000	TSF
		Specialty Retail	25.000	TSF
		Pharmacy/Drugstore with Drive-Thru	13.000	TSF
		Fast-Food with Drive-Thru	8.600	TSF

Table 4-4
Page 2 of 5

Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
C12	PM18635	General Light Industrial	99.164	TSF
		High-Cube Warehouse	2,077.594	TSF
C13a	TM16420-1	Apartments	799	DU
C13b	TM 18890	Condo/Townhouse	94	DU
C13c	Lewis Residential	Apartments	400	DU
C14a	PM19368 (Chino East Industrial)	General Light Industrial	1,593.500	TSF
C14b	Watson Industrial Park	High-Cube Warehouse	3,889.900	TSF
C15a	PL 08-0334	Manufacturing	421.031	TSF
C15b	Hillwood @ Monte Vista Av./Schaefer Av.	Industrial	409.000	TSF
C15c	PL 10-0726	General Office	13.672	TSF
C15d	Yorba Avenue Commerce Center	High-Cube Warehouse	256.000	TSF
C16a	TM 18880	SFDR	33	DU
C16b	SEC Philadelphia/Ramona	Shopping Center	27.000	TSF
C16c	Chino Central Residential (PL13-0618)	SFDR	94	DU
	Central and Francis Residential	SFDR	113	DU
C16d	Pipeline and Norton Residential	SFDR	45	DU
C17	Brewart Residential	SFDR	127	DU
C18	Fern and Riverside Residential	SFDR	94	DU
C19a	Chino Riverside Residential	SFDR	59	DU
C19b	Borba Chino Residential	SFDR	84	DU
C20	Edgewater Communities	SFDR	415	DU
		Condo/Townhouse	659	DU
		Museum/Retail	6.500	TSF
		Church	15.200	TSF
		Park	15.0	AC
C21	Carson Industrial El Prado	High-Cube Warehouse	442.363	TSF
	Carson Mountain Industrial	High-Cube Warehouse	227.977	TSF
C22	Mill Creek	SFDR	1,074	DU
C23	DR Horton Brewer	SFDR	191	DU
C24a	Church	Church	47.979	TSF
		Daycare	190	STU
C24b	Flores Site	Shopping Center	4.000	TSF
		Gas Station w/ convenience store	16	VFP
		Express Car Wash	5.000	TSF
City of Chino Hills				
CH1	Country Club Villas	Condo/Townhouse	46	DU
CH2	Lago Los Serranos	Condo/Townhouse	95	DU
CH3	The Commons	Shopping Center	150.000	DU
CH4	The Golden Triangle	Shopping Center	106.700	TSF
CH5	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
CH6	Vista Bella Townhomes	Condo/Townhouse	65	DU

Table 4-4
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Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
CH7	Vila Borba Specific Plan	SFDR	176	DU
	City of Eastvale			
E1	14-1077 - Grainger Site (APN:156-050-025, 156-050-026, 156-020-027)	Industrial	546.000	TSF
E2	10-0117 (TM36373)	SFDR	51	DU
E3	10-0271 - Eastvale Commerce Center (Phase 1 and 2)	Shopping Center	249.000	TSF
		Hotel	130	RM
		High Cube Warehouse	3,100.000	TSF
		Business Park	610.000	TSF
E4	11-0354 - Arco Gas Station	Gas Station w/ convenience store and car wash	18.000	VFP
		Fast-Food w/o Drive-Thru	2.800	TSF
		Fast-Food with Drive-Thru	2.100	TSF
E5	The Marketplace at Enclave	Shopping Center	42.000	TSF
E6	Eastvale Shopping Center	Free-Standing Discount Superstore	192.000	TSF
		Specialty Retail	9.200	TSF
		Fast-Food Without Drive-Thru	7.200	TSF
		Coffee/Donut Shop w/ Drive Thru	2.000	TSF
		Fast-Food with Drive-Thru	3.500	TSF
		Gas Station w/ convenience store and car wash	16	VFP
E7	11-0363 TTM 36382 (Altfillisch Residential Project[5])	SFDR	146	DU
E8	SP00358 - The Ranch at Eastvale	Shopping Center	267.200	TSF
		General Light Industrial	801.500	TSF
		Business Park	1,121.100	TSF
E9	SC Limonite, LLC	SFDR	330	TSF
E10	13-0395 - 65th Street Residential (Copper Sky)	SFDR	250	DU
E11	PP23219 (PM35865)	General Light Industrial	738.430	TSF
E12	Dairy Property	SFDR	119	DU
E13	TR35751	Condo/Townhouse	243	DU
E14	13-0632 - Sumner Residential (Stratham Homes)	SFDR	129	DU
E15	14-0046 - Kasbergen/William Lyons Homes	Condo/Townhouse	220	DU
E16	TR32821	Condo/Townhouse	350	DU
E17	TR32909	SFDR	140	DU
E18	10-0124 - TR31252 (The Lodge)	SFDR	205	DU
E19	TR29997	SFDR	122	DU

Table 4-4
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Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
City of Jurupa Valley				
JV1	Silverlakes Equestrian[6]	Soccer Field	14	Fields
		Soccer Field	10	Fields
		Equestrian Facility	400	Stalls
JV2	TR33428	SFDR	338	DU
JV3	TR33258	SFDR	45	DU
JV4	CUP03555	Mini-Warehouse	141.460	TSF
JV5	CUP03488 (Self Storage)	Mini-Warehouse	89.642	TSF
JV6	TR35655	SFDR	9	DU
JV7	TR31644	SFDR	213	DU
	TR31768	SFDR	95	DU
	TR31778	SFDR	64	DU
	TR33461	SFDR	102	DU
	Thorobred Farms	High-Cube Warehouse	1,176.120	TSF
JV8	Ter Maaten (TTM No. 36391)	SFDR	468	DU
		Park	8.4	AC
JV9	Riverside Drive Development	General Light Industrial	167.020	TSF
JV10	6316 Wineville Av. (Daycare)	Daycare	40	STU
JV11	Vernola Marketplace Apartments	Apartments	597	DU
JV12	TR36692	SFDR	176	DU
	TR31768	SFDR	189	DU
	TR31778-1	SFDR	128	DU
	TR33461	SFDR	203	DU
	TR31644	SFDR	425	DU
JV13	PP23203	Industrial/Business Park	821.77	TSF
JV14	PP23390	Warehousing	78.31	TSF
JV15	PP23580	Fast-Food with Drive-Thru	1.832	TSF
JV16	PP24596	Warehousing	122.59	TSF
JV17	Galena Business Park (SDP31204)	General Light Industrial	173.39	TSF
JV18	Swift Transportation (ST00934)	General Office	8.000	TSF
City of Ontario				
O1	Countryside	SFDR	819	DU
O2	Edenglen	SFDR	310	DU
		Multi-Family Attached (Condo)	274	DU
		Shopping Center	217.520	TSF
		Business Park	550.000	TSF
O3	Esperanza	SFDR	914	DU
		Multi-Family Attached (Apartments)	496	DU
O4	Grand Park	SFDR	484	DU
		Multi-Family Attached (Apartments)	843	DU
O5	Parkside	SFDR	437	DU
		Multi-Family Attached (Apartments)	1,510	DU
		Shopping Center	115.000	TSF
O6	Rich Haven	SFDR	2,732	DU
		Multi-Family Attached (Condo)	1,524	DU
		Shopping Center	317.400	TSF

Table 4-4
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Cumulative Development Land Use Summary

#	Project/Location	Land Use[1]	Quantity	Units[2]
O7	Subarea 29 & Amendment	SFDR	2,149	DU
		Shopping Center	87.000	TSF
O8	The Avenue	SFDR	2,020	DU
		Multi-Family Attached (Apartments)	586	DU
		Shopping Center	250.000	TSF
O9	West Haven	SFDR	753	DU
		Shopping Center	87.000	TSF
O10	Tuscana Village	SFDR	176	DU
		Shopping Center	26.000	TSF
O11	PDEV10-011	SFDR	11	DU
O12	PDEV10-008 - Dry Food Storage	Mini-Warehouse	17.000	TSF
O13	PDEV08-008	Shopping Center	3.920	TSF
O14	Colony Commerce West	High-Cube Warehouse	2,213.360	TSF
		Manufacturing	737.786	TSF
O15	West Ontario Commerce Center SP	High-Cube Warehouse	1,976.535	TSF
		Manufacturing	658.845	TSF
		Business Park	548.856	TSF
O16	Colony Commerce East	High-Cube Warehouse	998.680	TSF
		Manufacturing	226.279	TSF
		Warehousing	678.836	TSF
City of Corona				
COR1	Watermarke Properties	Apartments	450	DU
		Shopping Center	77.000	TSF

[1] SFDR = Single Family Detached Residential

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

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

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

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

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

The SBTAM uses an AM peak period-to-peak hour factor of 0.35 and a PM peak period-to-peak hour factor of 0.28. These factors represent the relationship of the highest single AM peak hour to the modeled 3 hour AM peak period (an even distribution would result in a factor of 0.33) and the highest single PM peak hour to the modeled 4 hour PM peak period (an even distribution would result in a factor of 0.25). 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 (2020) 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 (2020) 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 (2016) and Opening Year Cumulative (2020) 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 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 (2020) traffic forecasts, which are presented and evaluated in PCE (see Section 3.6 *Existing Traffic Counts* for discussion on PCE). As such, the Horizon Year (2040) forecasts are also assumed to be in PCE for the purposes of this analysis.

Post-processing worksheets for Horizon Year (2040) without Project traffic conditions are provided in Appendix 4.1.

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5 EXISTING PLUS PROJECT TRAFFIC CONDITIONS

This section discusses the traffic forecasts for Existing plus Project (E+P) conditions and the resulting intersection operations, freeway mainline operations, and traffic signal warrant analyses for each phase of development.

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).

The intersection of Street "B" and Kimball Avenue would be constructed under Phase 2 of the Project and operate with split phasing for the northbound and southbound approaches and with protected left turn phasing on the eastbound and westbound approaches. It is our understanding that fire engines enter the westerly driveway, drive behind the building, then pull forward into the garage aligning with Street "B". Emergency preemption would be utilized for the egress of emergency vehicles. However, the intersection would operate similar to any other signalized intersection during non-emergency times. The westerly fire station driveway will be signed with a stop sign, and with signage prohibiting left turns out. The median cannot be extended to the east in order to accommodate returning fire engines. Passenger vehicles wishing to make a southbound left turn, can do so at the signalized intersection of Street "B" and Kimball Avenue.

5.2 EXISTING PLUS PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus Project traffic. The ADT volumes which can be expected for E+P traffic conditions are shown on Exhibits 5-1, 5-3, and 5-5 for E+P (Phase 1), E+P (Phase 2), and E+P (Project Buildout), respectively. E+P weekday AM and PM peak hour intersection turning movement volumes are shown on Exhibits 5-2, 5-4, and 5-6 for E+P (Phase 1), E+P (Phase 2), and E+P (Project Buildout), respectively.

5.3 INTERSECTION OPERATIONS ANALYSIS

E+P (Phase 1) peak hour traffic operations have been evaluated for the study area intersections based on the analysis methodologies presented in Section 2 *Methodologies* of this TIA. The intersection analysis results are summarized in Table 5-1, which indicates that there are no additional study area intersections anticipated to operate at an unacceptable LOS during the peak hours from those previously operating at a deficient LOS under Existing traffic conditions.

EXHIBIT 5-1 (1OF2): E+P (PHASE 1) AVERAGE DAILY TRAFFIC (ADT)

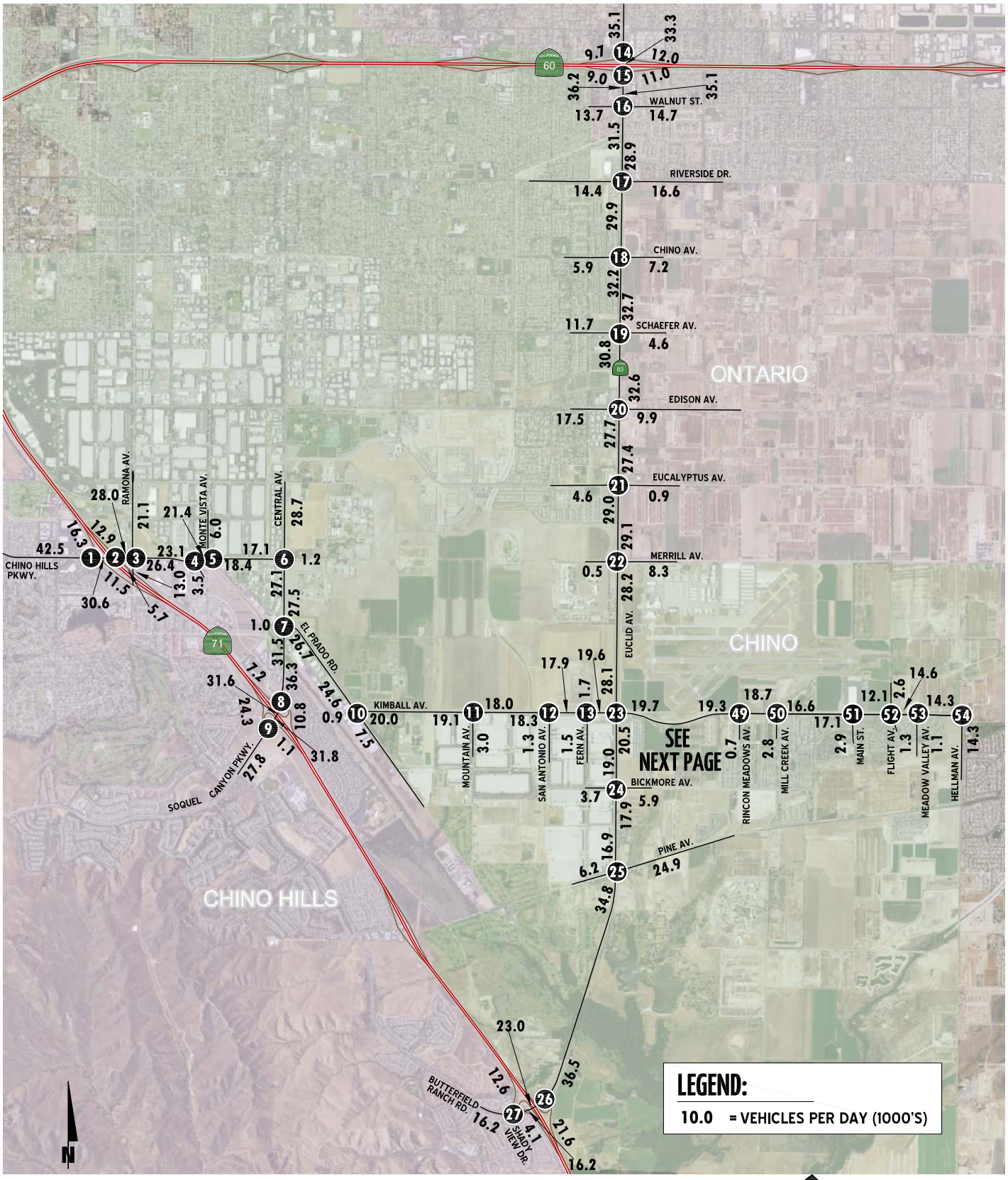

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EXHIBIT 5-1 (2OF2): E+P (PHASE 1) AVERAGE DAILY TRAFFIC (ADT)

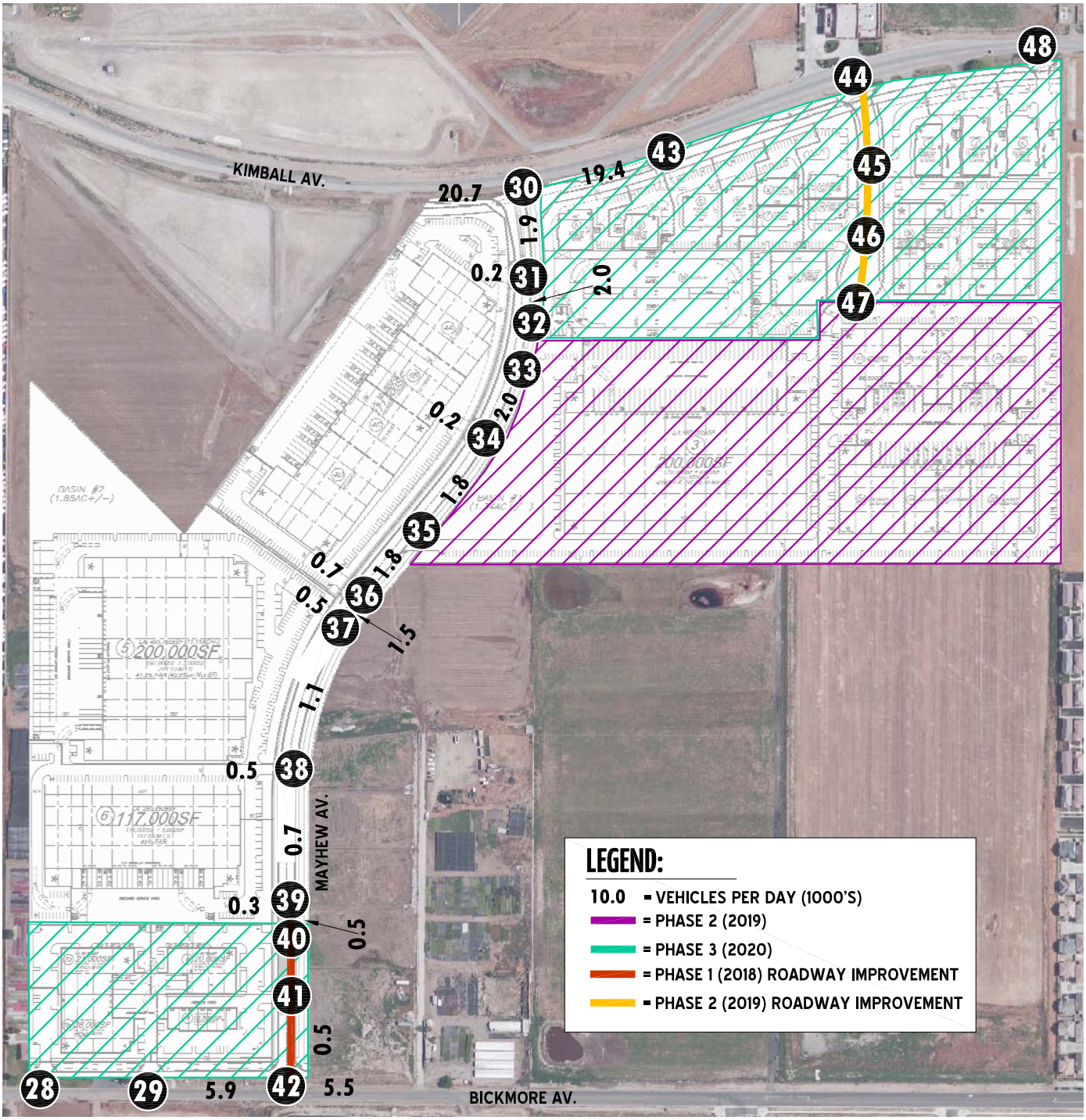

EXHIBIT 5-2 (1OF2): E+P (PHASE 1) TRAFFIC VOLUMES (IN PCE)

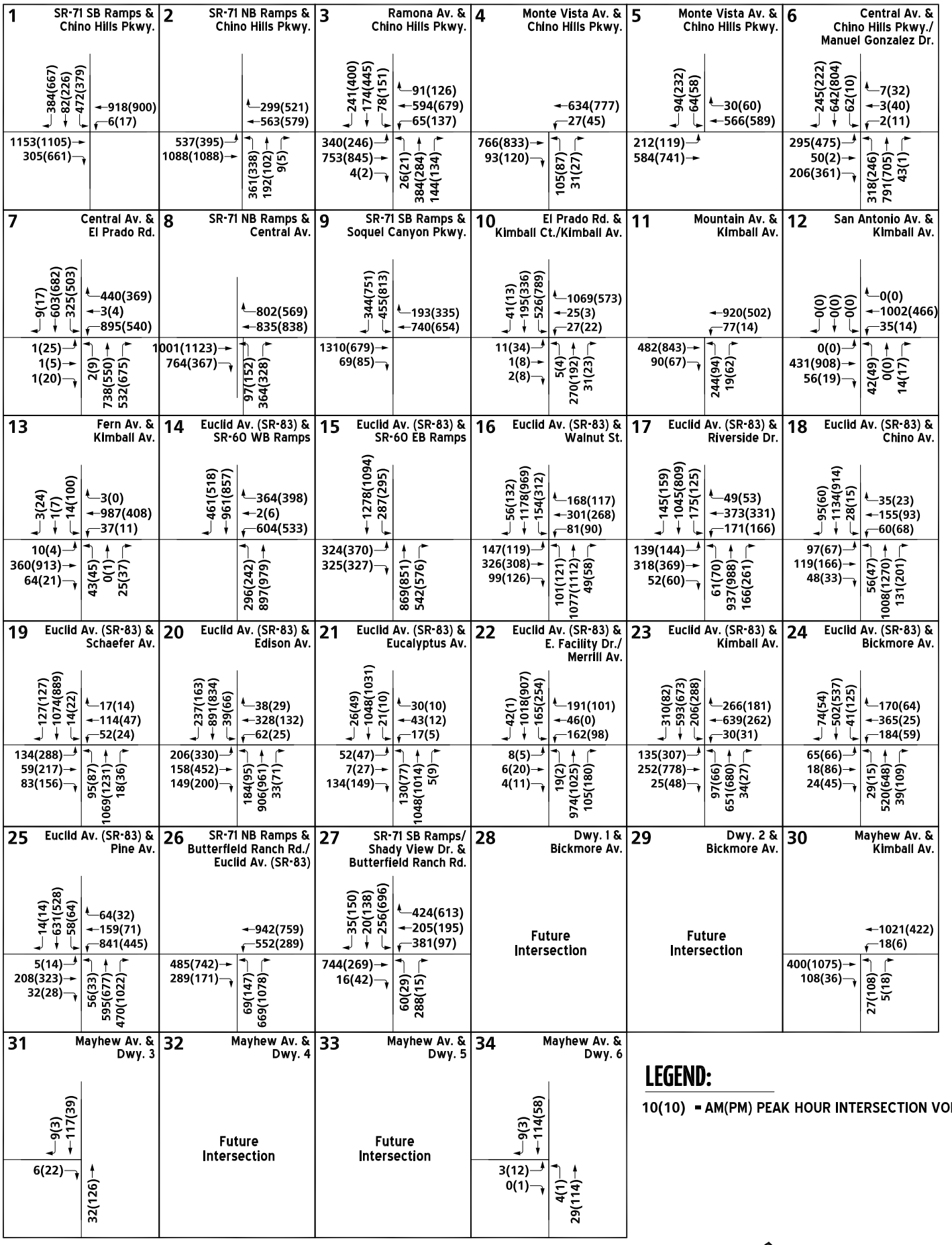

EXHIBIT 5-2 (2OF2): E+P (PHASE 1) TRAFFIC VOLUMES (IN PCE)

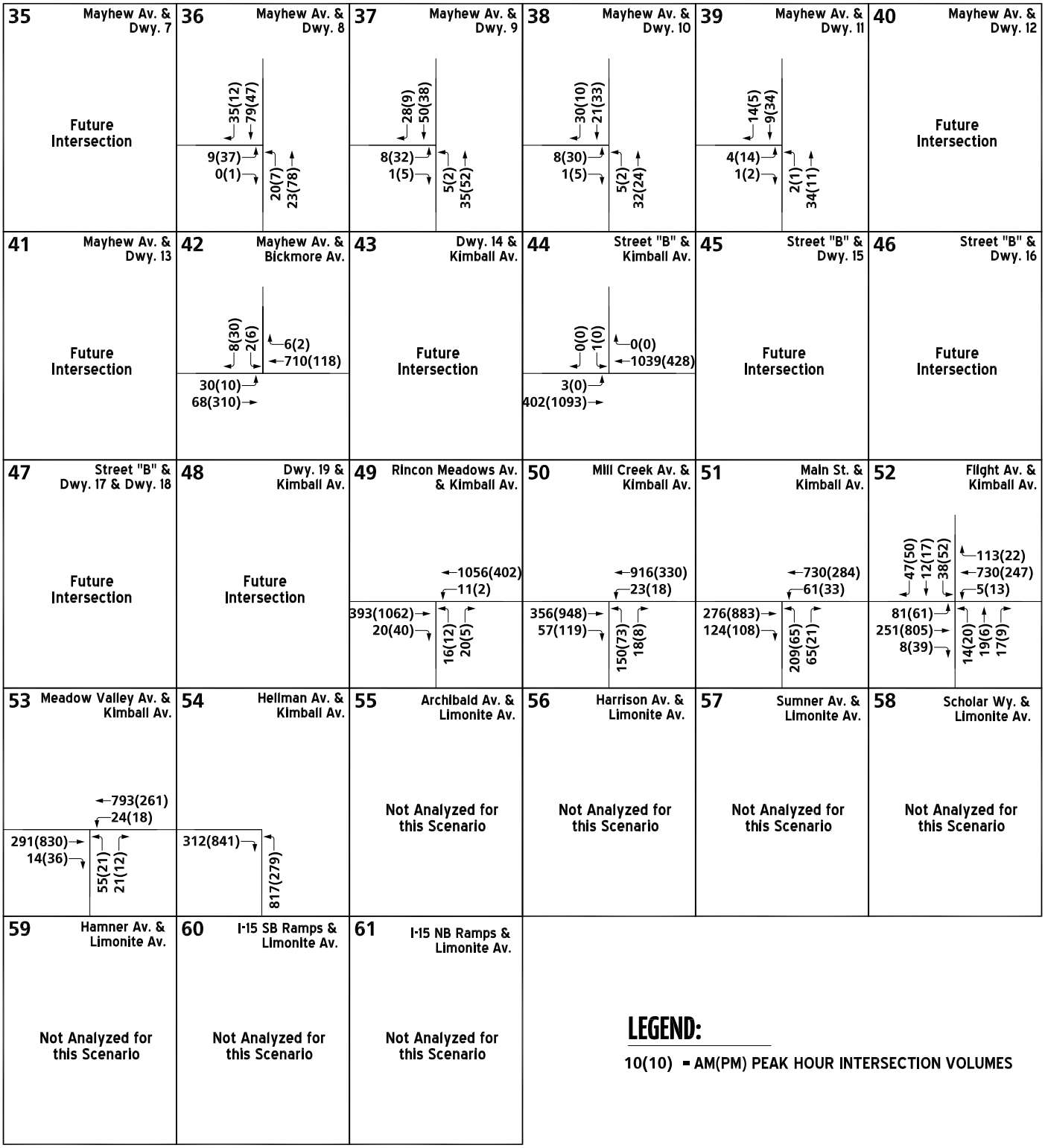

EXHIBIT 5-3 (1OF2): E+P (PHASE 2) AVERAGE DAILY TRAFFIC (ADT)

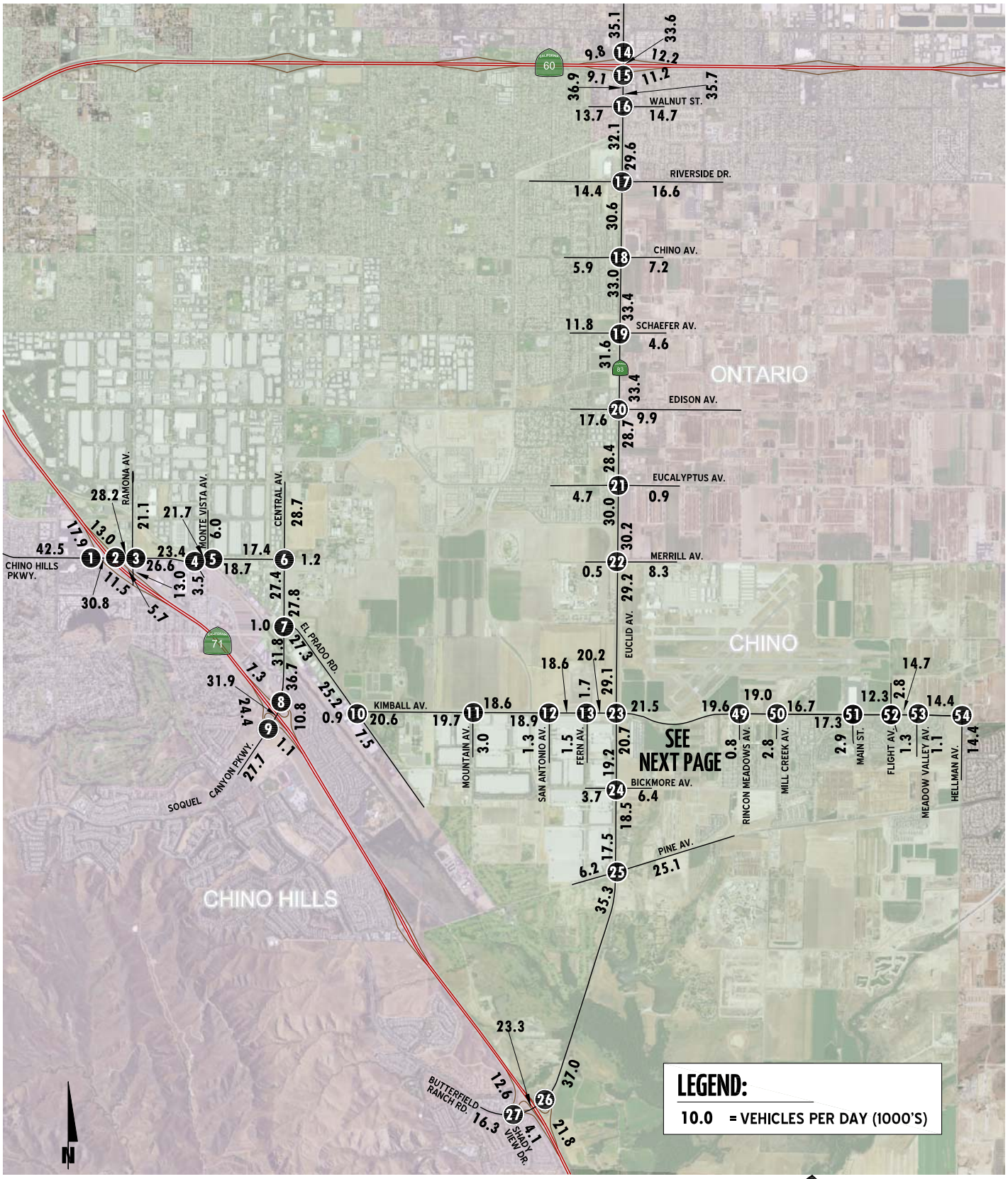

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EXHIBIT 5-3 (2OF2): E+P (PHASE 2) AVERAGE DAILY TRAFFIC (ADT)

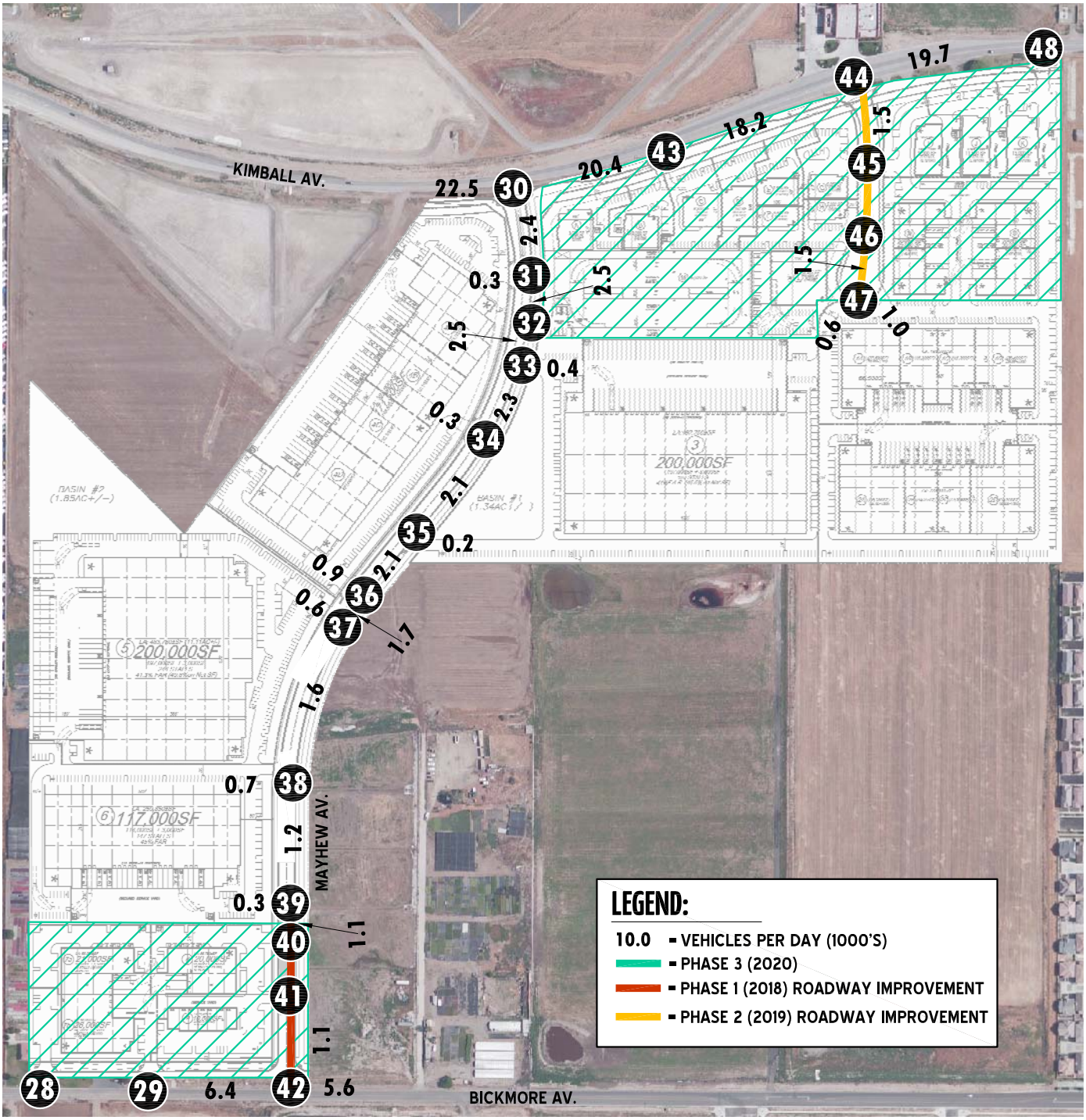

EXHIBIT 5-4 (1OF2): E+P (PHASE 2) TRAFFIC VOLUMES (IN PCE)

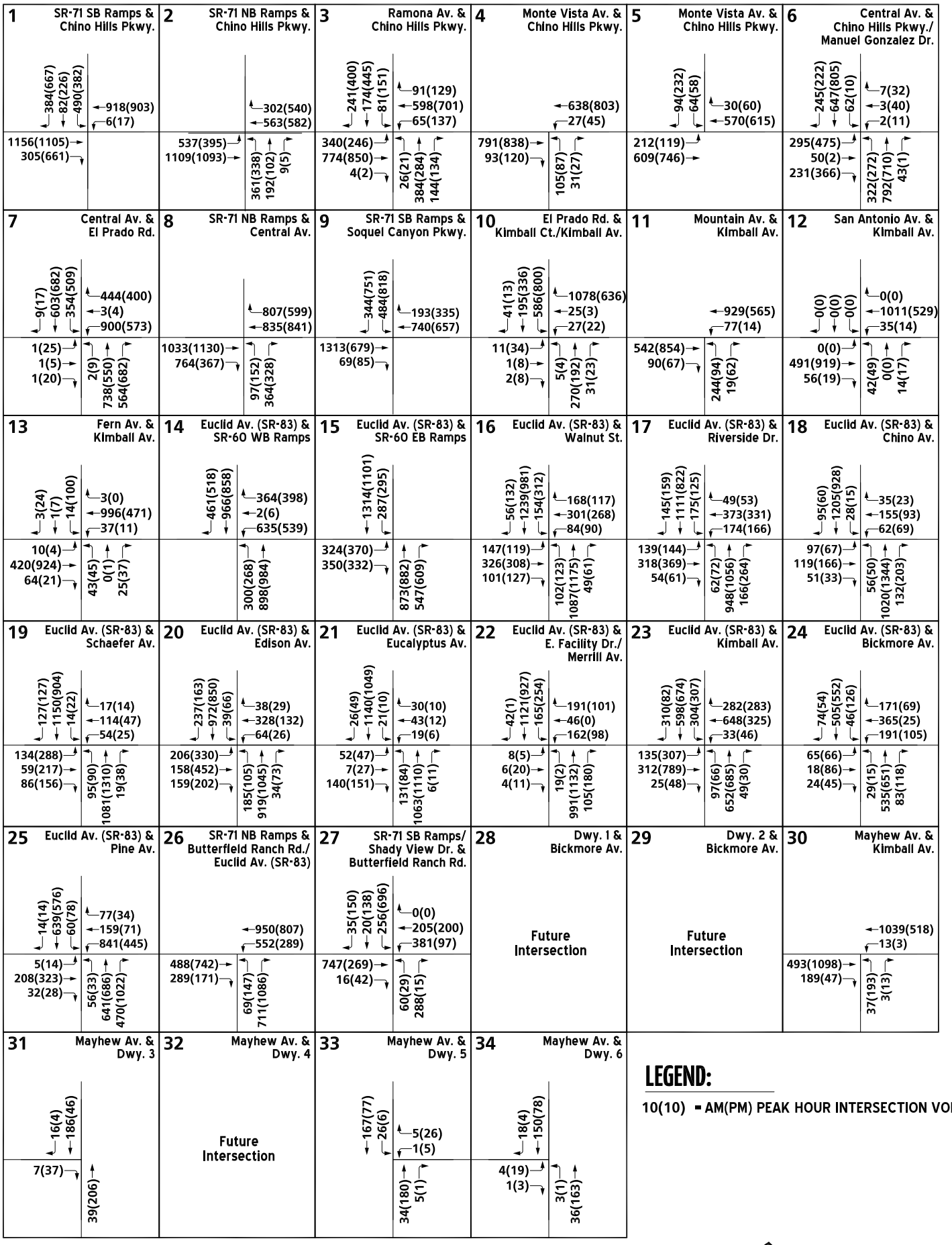

EXHIBIT 5-4 (2OF2): E+P (PHASE 2) TRAFFIC VOLUMES (IN PCE)

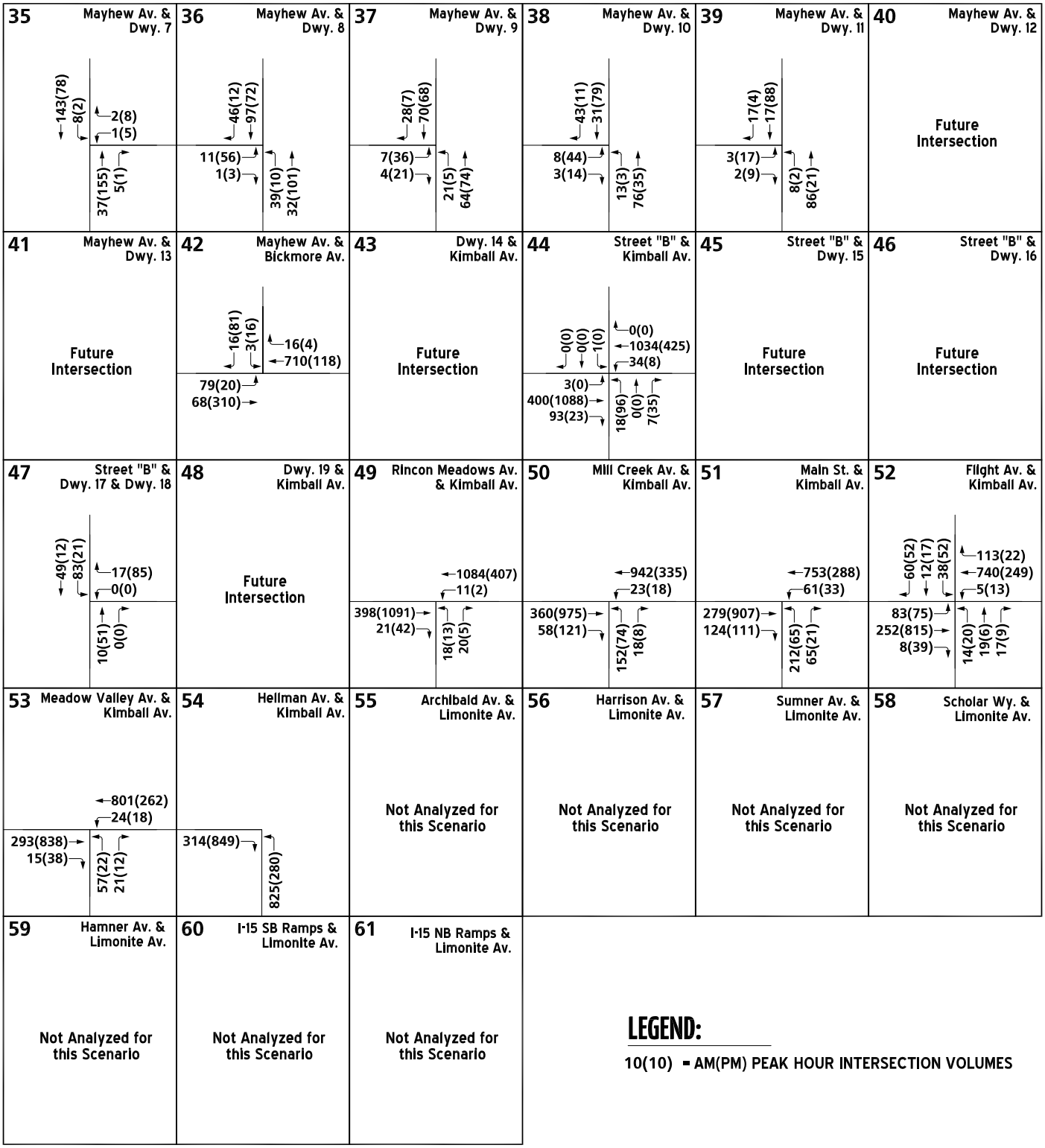

EXHIBIT 5-5 (1OF2): E+P (PROJECT BUILDOUT) AVERAGE DAILY TRAFFIC (ADT)

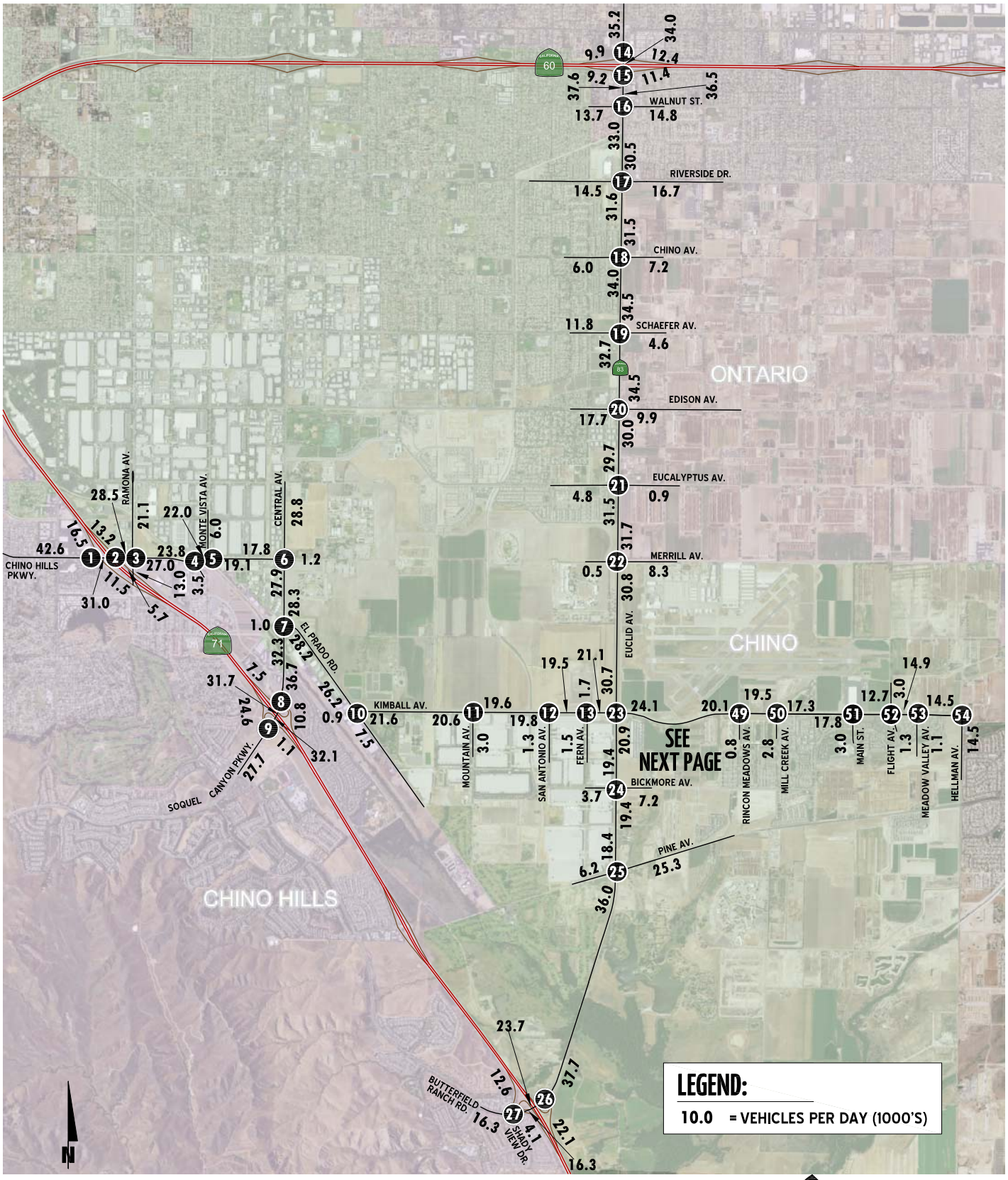

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EXHIBIT 5-5 (2OF2): E+P (PROJECT BUILDOUT) AVERAGE DAILY TRAFFIC (ADT)

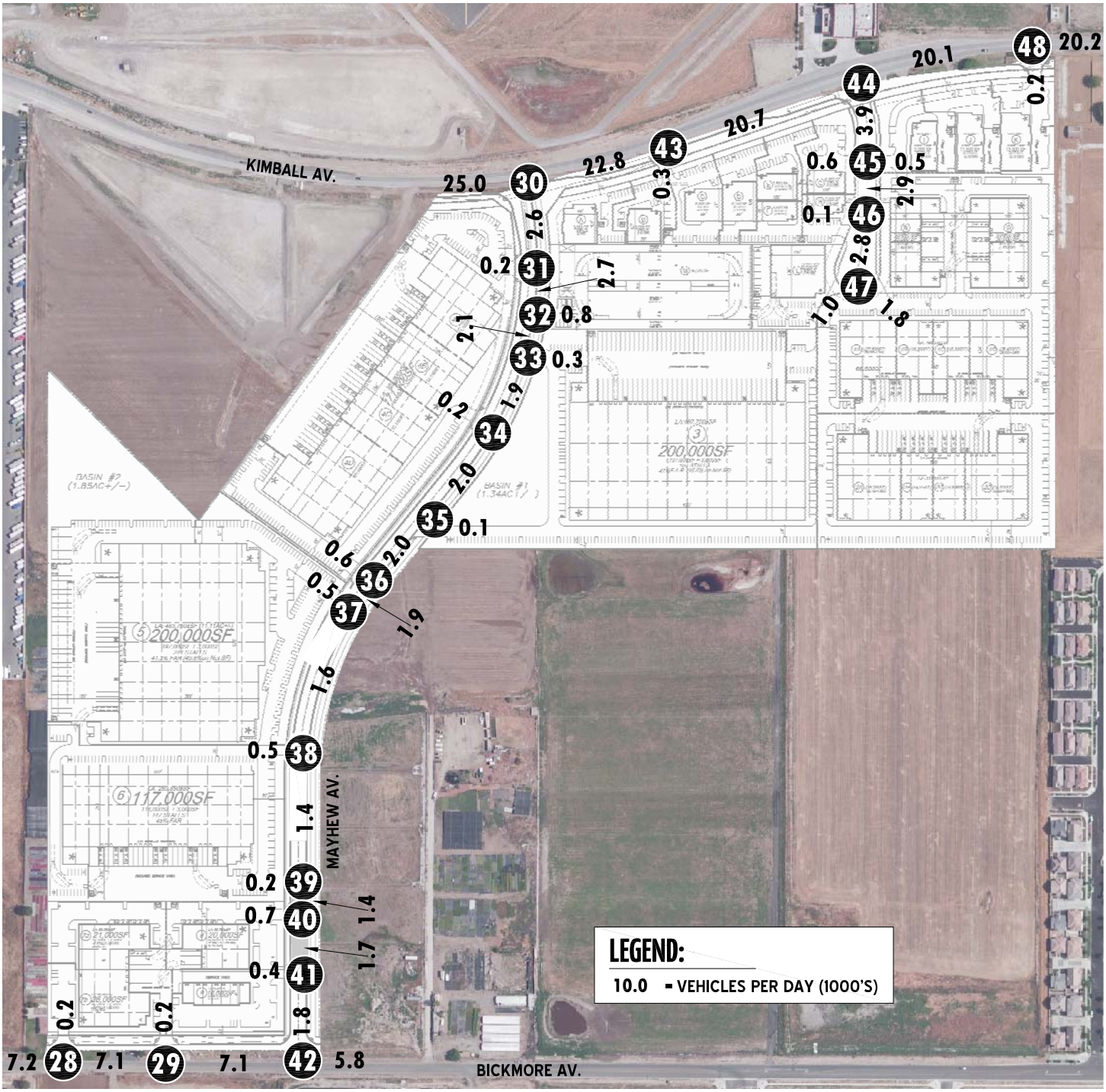

EXHIBIT 5-6 (1OF2): E+P (PROJECT BUILDOUT) TRAFFIC VOLUMES (IN PCE)

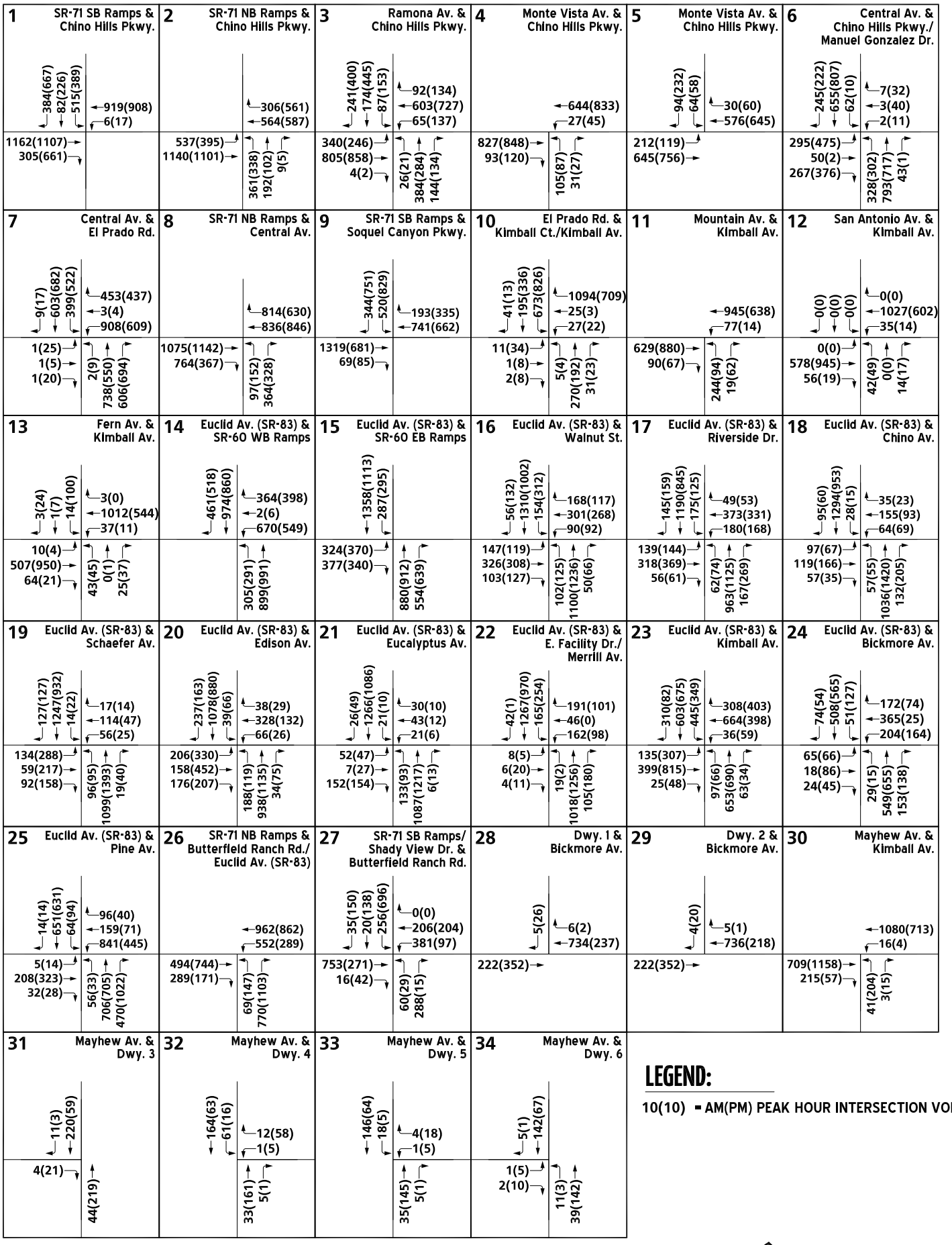

EXHIBIT 5-6 (2OF2): E+P (PROJECT BUILDOUT) TRAFFIC VOLUMES (IN PCE)

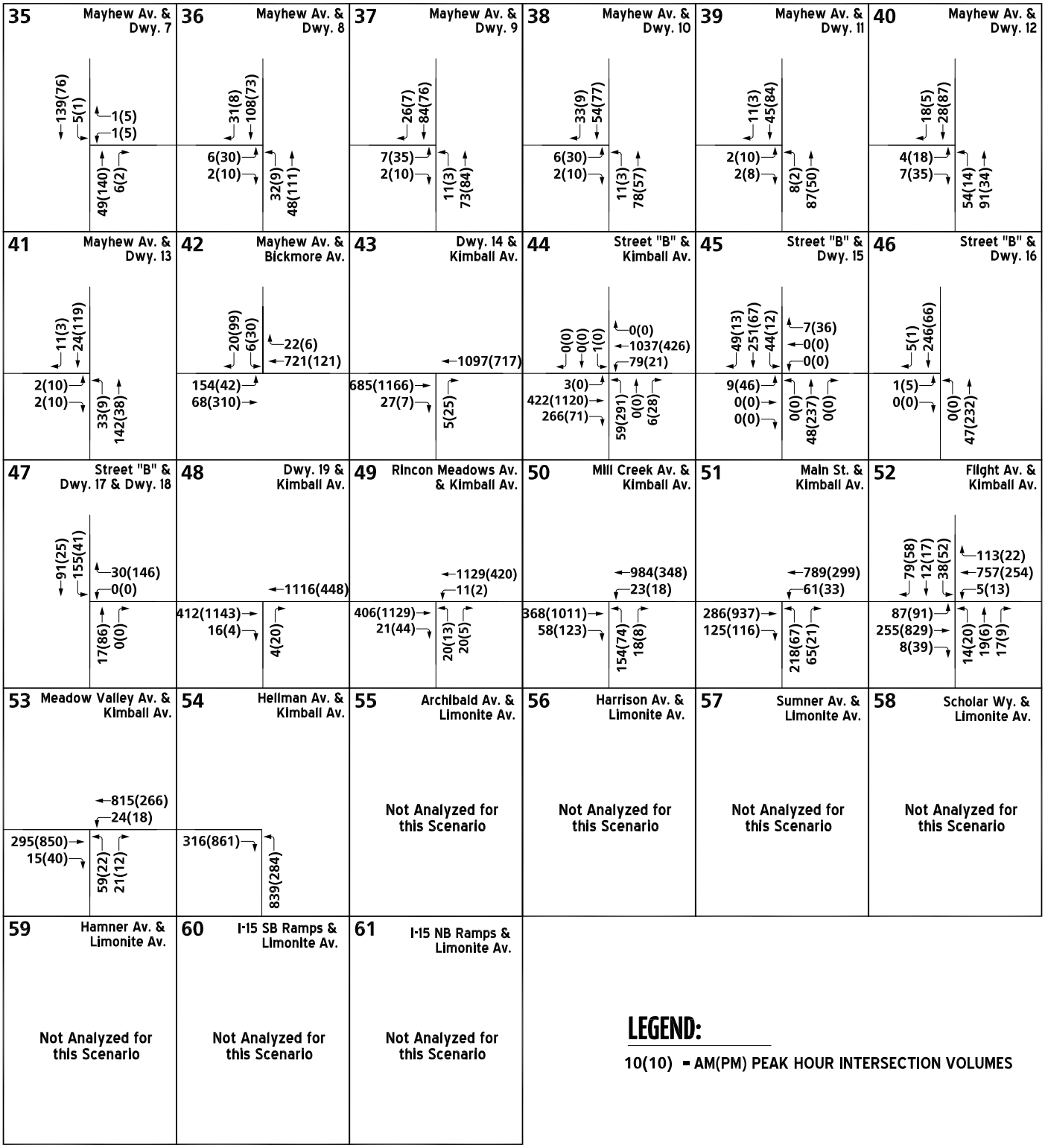

Table 5-1

Intersection Analysis for E+P (Phase 1) Conditions

#	Intersection	Traffic Control[2]	Existing (2016)				E+P (Phase 1)				Acceptable LOS
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
			AM	PM	AM	PM	AM	PM	AM	PM	
1	SR-71 SB Ramps / Chino Hills Pkwy.	TS	11.8	14.7	B	B	11.9	15.9	B	B	D
2	SR-71 NB Ramps / Chino Hills Pkwy.	TS	24.5	21.9	C	C	28.5	22.8	C	C	D
3	Ramona Av. / Chino Hills Pkwy.	TS	40.5	41.8	D	D	40.6	42.2	D	D	D
4	Monte Vista Av. West / Chino Hills Pkwy.	CSS	24.3	22.5	C	C	20.9	22.7	C	C	D
5	Monte Vista Av. East / Chino Hills Pkwy.	TS	18.5	16.1	B	B	18.5	16.2	B	B	D
6	Central Av. / Chino Hills Pkwy.	TS	24.9	36.9	C	D	25.2	38.3	C	D	D
7	Central Av. / El Prado Rd.	TS	50.3	**88.1**	D	**F**	54.3	**92.2**	D	**F**	D
8	Central Av. / SR-71 NB Ramps	TS	7.3	7.1	A	A	7.7	8.0	A	A	D
9	Central Av. / SR-71 SB Ramps	TS	14.3	25.8	B	C	14.3	34.9	B	C	D
10	El Prado Rd. / Kimball Av.	TS	22.3	47.3	C	D	24.3	49.5	C	D	D
11	Mountain Av. / Kimball Av.	TS	10.0	10.3	A	B	10.1	10.3	B	B	D
12	San Antonio Av. / Kimball Av.	TS	8.3	9.3	A	A	8.3	9.3	A	A	D
13	Fern Av. / Kimball Av.	TS	9.5	9.6	A	A	9.5	9.7	A	A	D
14	Euclid Av. (SR-83) / SR-60 WB Ramps	TS	27.9	22.3	C	C	28.8	23.2	C	C	D
15	Euclid Av. (SR-83) / SR-60 EB Ramps	TS	24.6	28.2	C	C	25.2	29.9	C	C	D
16	Euclid Av. (SR-83) / Walnut St.	TS	34.1	28.1	C	C	34.1	28.1	C	C	E
17	Euclid Av. (SR-83) / Riverside Dr.	TS	33.7	49.7	C	D	33.7	50.1	C	D	D
18	Euclid Av. (SR-83) / Chino Av.	TS	17.2	8.9	B	A	24.1	9.0	C	A	D
19	Euclid Av. (SR-83) / Schaefer Av.	TS	36.8	49.8	D	D	37.1	50.0	D	D	D
20	Euclid Av. (SR-83) / Edison Av.	TS	31.0	31.2	C	C	31.6	31.9	C	C	D
21	Euclid Av. (SR-83) / Eucalyptus Av.	TS	22.2	8.0	C	A	22.7	8.0	C	A	D
22	Euclid Av. (SR-83) / Merrill Av.	TS	28.3	23.0	C	C	28.3	23.0	C	C	D
23	Euclid Av. (SR-83) / Kimball Av.	TS	48.2	49.3	D	D	52.4	53.0	D	D	D
24	Euclid Av. (SR-83) / Bickmore Av.	TS	45.6	16.6	D	B	46.0	18.1	D	B	D
25	Euclid Av. (SR-83) / Pine Av.	TS	47.9	37.3	D	D	48.0	38.6	D	D	D
26	SR-71 NB Ramps / Euclid Av. (SR-83)	TS	16.3	13.0	B	B	18.8	13.0	B	B	D
27	SR-71 SB Ramps / Euclid Av. (SR-83)	TS	40.9	34.1	D	C	43.6	34.2	D	C	D
28	Dwy. 1 / Bickmore Av.		Intersection Does Not Exist				Intersection Does Not Exist				C
29	Dwy. 2 / Bickmore Av.		Intersection Does Not Exist				Intersection Does Not Exist				C
30	Mayhew Av. / Kimball Av.	**TS**	Intersection Does Not Exist				10.6	18.2	B	B	D
31	Mayhew Av. / Dwy. 3	**CSS**	Intersection Does Not Exist				8.9	8.6	A	A	C
32	Mayhew Av. / Dwy. 4		Intersection Does Not Exist				Intersection Does Not Exist				C
33	Mayhew Av. / Dwy. 5		Intersection Does Not Exist				Intersection Does Not Exist				C
34	Mayhew Av. / Dwy. 6	**CSS**	Intersection Does Not Exist				9.5	9.6	A	A	C
35	Mayhew Av. / Dwy. 7		Intersection Does Not Exist				Intersection Does Not Exist				C
36	Mayhew Av. / Dwy. 8	**CSS**	Intersection Does Not Exist				9.6	9.7	A	A	C
37	Mayhew Av. / Dwy. 9	**CSS**	Intersection Does Not Exist				9.2	9.3	A	A	C
38	Mayhew Av. / Dwy. 10	**CSS**	Intersection Does Not Exist				9.1	9.2	A	A	C
39	Mayhew Av. / Dwy. 11	**CSS**	Intersection Does Not Exist				8.9	9.0	A	A	C
40	Mayhew Av. / Dwy. 12		Intersection Does Not Exist				Intersection Does Not Exist				C
41	Mayhew Av. / Dwy. 13		Intersection Does Not Exist				Intersection Does Not Exist				C
42	Mayhew Av. / Bickmore Av.	**CSS**	Intersection Does Not Exist				14.1	10.6	B	B	D

Table 5-1

Intersection Analysis for E+P (Phase 1) Conditions

#	Intersection	Traffic Control[2]	Existing (2016) Delay[1] (secs.) AM	Existing (2016) Delay[1] (secs.) PM	Existing (2016) Level of Service AM	Existing (2016) Level of Service PM	E+P (Phase 1) Delay[1] (secs.) AM	E+P (Phase 1) Delay[1] (secs.) PM	E+P (Phase 1) Level of Service AM	E+P (Phase 1) Level of Service PM	Acceptable LOS
43	Dwy. 14 / Kimball Av.		Intersection Does Not Exist				Intersection Does Not Exist				C
44	Street B / Kimball Av.	CSS	20.1	0.0	C	A	20.4	0.0	C	A	C
45	Street B / Dwy. 15		Intersection Does Not Exist				Intersection Does Not Exist				C
46	Street B / Dwy. 16		Intersection Does Not Exist				Intersection Does Not Exist				C
47	Street B/Dwy. 17 / Dwy. 18		Intersection Does Not Exist				Intersection Does Not Exist				C
48	Dwy. 19 / Kimball Av.		Intersection Does Not Exist				Intersection Does Not Exist				C
49	Rincon Meadows Av. / Kimball Av.	CSS	18.5	20.4	C	C	18.8	20.7	C	C	D
50	Mill Creek Av. / Kimball Av.	TS	15.7	11.7	B	B	16.4	11.9	B	B	D
51	Main St. / Kimball Av.	TS	15.2	11.6	B	B	15.6	11.8	B	B	D
52	Flight Av. / Kimball Av.	CSS	22.9	22.1	C	C	23.4	22.7	C	C	D
53	Meadow Valley Av. / Kimball Av.	CSS	15.8	16.0	C	C	16.0	16.1	C	C	D
54	Hellman Av. / Kimball Av.	AWS	**>100.0**	**65.7**	**F**	**F**	**96.9**	**55.2**	**F**	**F**	D
55	Archibald Av. / Limonite Av.	TS	33.5	46.9	C	D	Intersection Not Evaluated				D
56	Harrison Av. / Limonite Av.	TS	20.2	18.6	C	B	Intersection Not Evaluated				D
57	Sumner Av. / Limonite Av.	TS	17.4	16.2	B	B	Intersection Not Evaluated				D
58	Scholar Wy. / Limonite Av.	TS	16.5	15.2	B	B	Intersection Not Evaluated				D
59	Hamner Av. / Limonite Av.	TS	32.6	33.6	C	C	Intersection Not Evaluated				D
60	I-15 SB Ramps / Limonite Av.	TS	29.1	29.7	C	C	Intersection Not Evaluated				D
61	I-15 NB Ramps / Limonite Av.	TS	24.7	25.0	C	C	Intersection Not Evaluated				D

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

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

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

As shown on Tables 5-2 and 5-3, the following additional intersection is anticipated to operate at unacceptable LOS with the addition of Project (Phase 2) traffic, in addition to those identified previously for Existing and E+P (Phase 1) traffic conditions:

- Euclid Av. (SR-83) / Kimball Av. (#23) – LOS E AM and PM peak hour

There are no additional study area intersections anticipated to operate at an unacceptable LOS with the addition of Project (Project Buildout) traffic, in addition to those identified for Existing and E+P (Phase 1 & 2) traffic conditions.

Consistent with Tables 5-1, 5-2, and 5-3, a summary of the peak hour intersection LOS for E+P conditions are shown on Exhibits 5-7, 5-8, and 5-9 for E+P (Phase 1), E+P (Phase 2), and E+P (Project Buildout), respectively. The intersection operations analysis worksheets for E+P traffic conditions are included in Appendix 5.1, 5.2, and 5.3 of this TIA for each phase.

5.4 TRAFFIC SIGNAL WARRANTS ANALYSIS

The intersection of Mayhew Avenue and Kimball Avenue is anticipated to warrant a traffic signal under E+P (Phase 1) traffic conditions in addition to those previously warranted under Existing (2016) traffic conditions (see Appendix 5.4).

With addition of E+P (Phase 2) Project traffic conditions, the intersection of Street B and Kimball Avenue is anticipated to warrant a traffic signal (see Appendix 5.5).

There are no additional study area intersections that are anticipated to meet either peak hour or planning level (ADT) volume based traffic signal warrants for E+P (Project Buildout) traffic conditions in addition to those previously warranted under Existing (2016), E+P (Phase 1), or E+P (Phase 2) traffic conditions (see Appendices 5.4, 5.5, and 5.6).

5.5 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for E+P (Phase 1, Phase 2, and Project Buildout) are presented in Table 5-4. As shown on Table 5-4, there are no movements that are currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows with the addition of Project traffic. Worksheets for E+P (Phase 1, Phase 2, and Project buildout) traffic conditions off-ramp queuing analysis are provided in Appendices 5.7, 5.8, and 5.9, respectively.

5.6 BASIC FREEWAY SEGMENT ANALYSIS

E+P (Phase 1, Phase 2, and Project Buildout) mainline directional volumes for the AM and PM peak hours are provided on Exhibits 5-10, 5-11, and 5-12. As shown on Table 5-5, no additional freeway segments analyzed for this TIA were found to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours for E+P traffic conditions, in addition to those previously identified under Existing traffic conditions. E+P (Phase 1, Phase 2, and Project Buildout) basic freeway segment analysis worksheets are provided in Appendix 5.10, 5.11, and 5.12, respectively.

EXHIBIT 5-7: SUMMARY OF LOS FOR E+P (PHASE 1) CONDITIONS

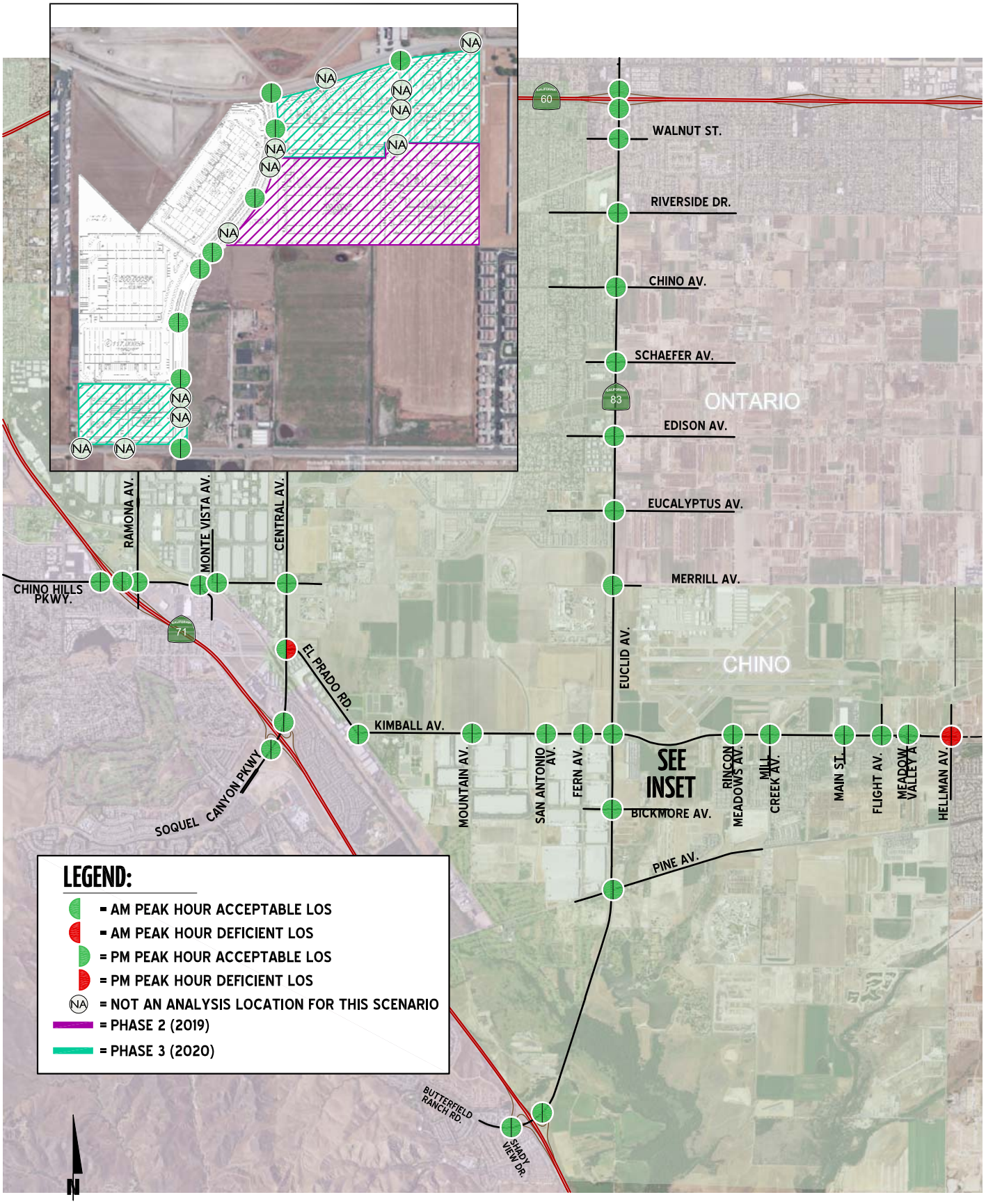

EXHIBIT 5-8: SUMMARY OF LOS FOR E+P (PHASE 2) CONDITIONS

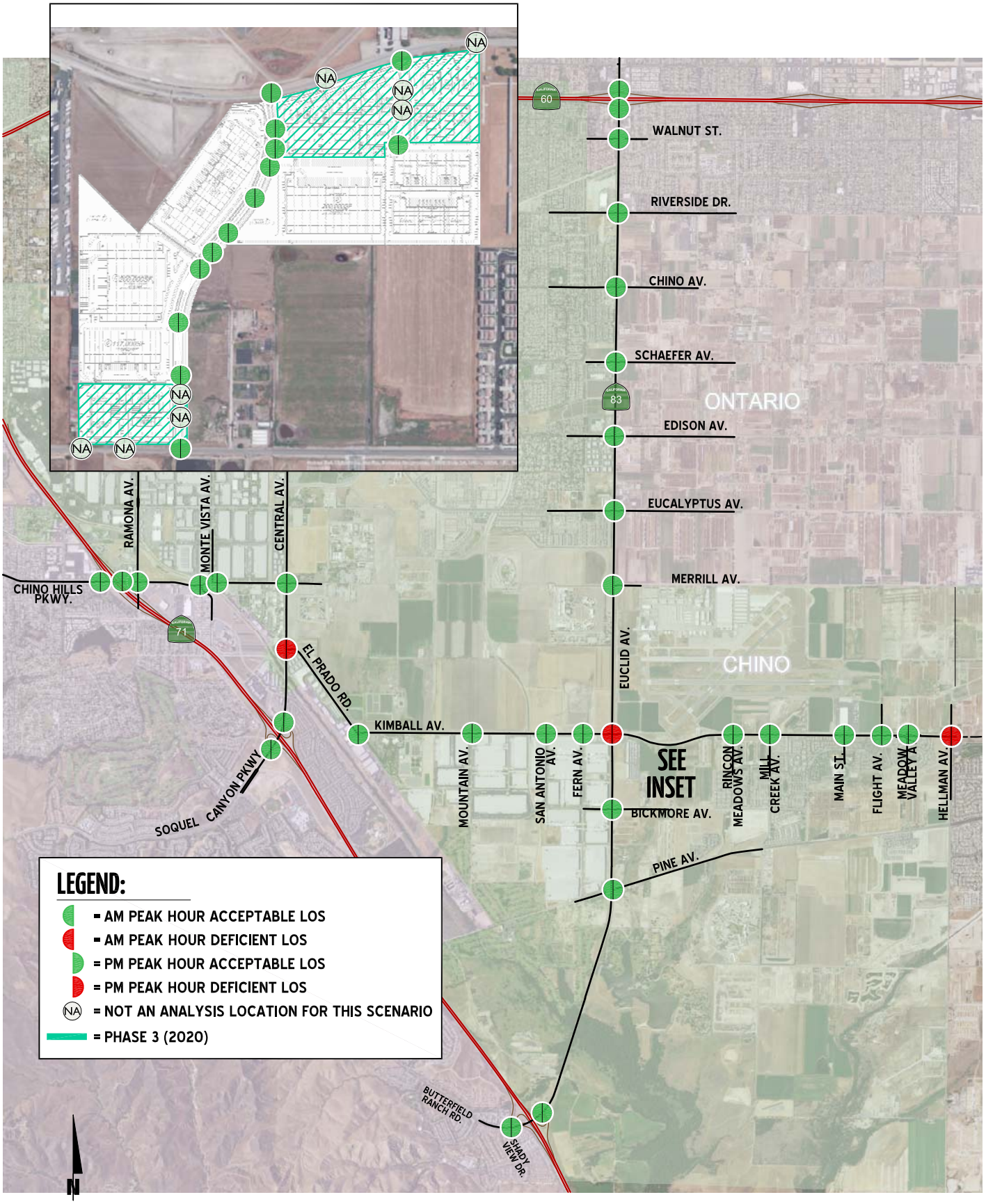

EXHIBIT 5-9: SUMMARY OF LOS FOR E+P (PROJECT BUILDOUT) CONDITIONS

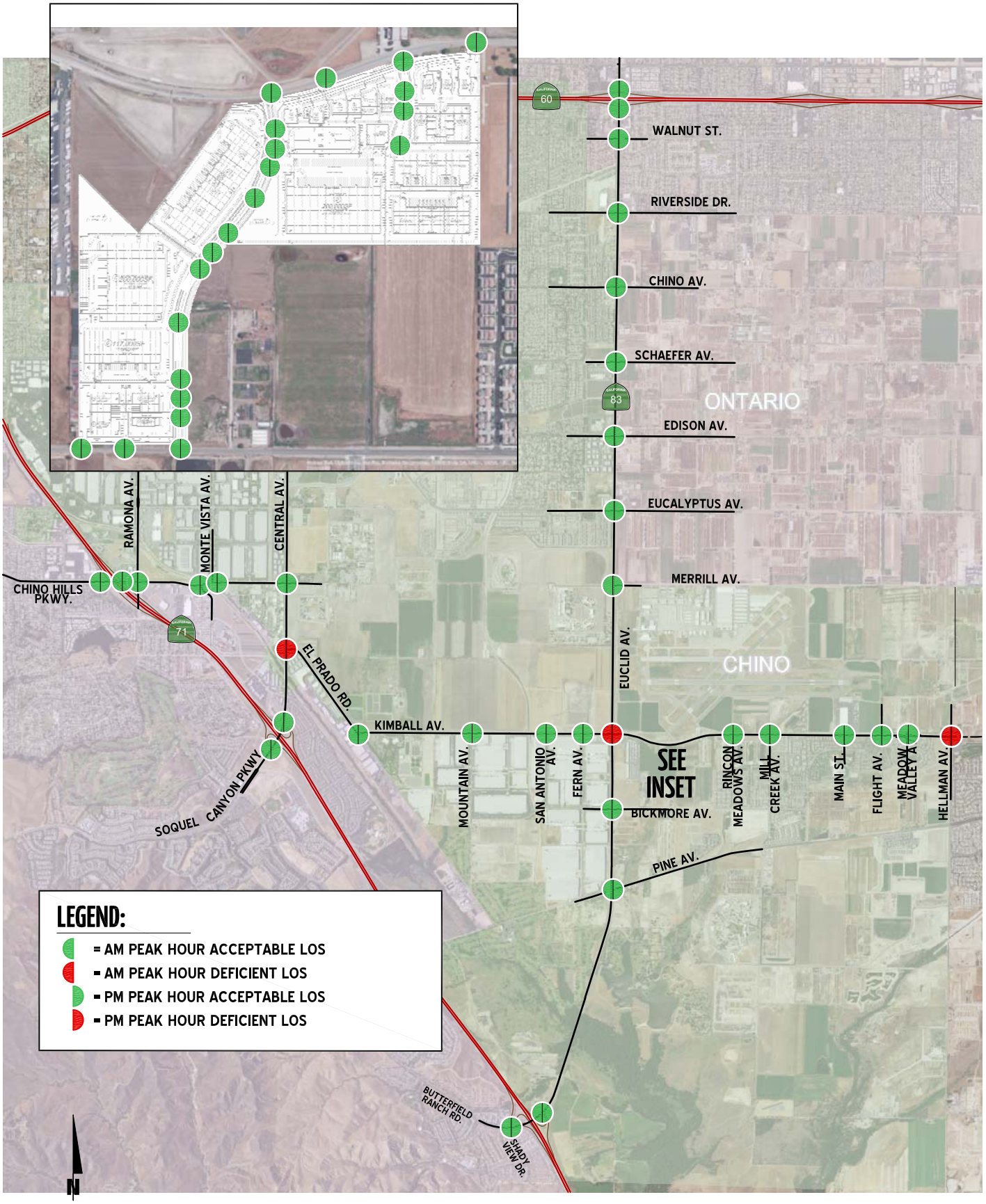

EXHIBIT 5-10: E+P (PHASE 1) FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

EXHIBIT 5-11: E+P (PHASE 2) FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

EXHIBIT 5-12: E+P (PROJECT BUILDOUT) FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

Table 5-2

Intersection Analysis for E+P (Phase 2) Conditions

#	Intersection	Traffic Control[2]	Existing (2016)				E+P (Phase 2)				Acceptable LOS
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
			AM	PM	AM	PM	AM	PM	AM	PM	
1	SR-71 SB Ramps / Chino Hills Pkwy.	TS	11.8	14.7	B	B	12.0	15.9	B	B	D
2	SR-71 NB Ramps / Chino Hills Pkwy.	TS	24.5	21.9	C	C	29.0	24.7	C	C	D
3	Ramona Av. / Chino Hills Pkwy.	TS	40.5	41.8	D	D	40.9	42.8	D	D	D
4	Monte Vista Av. West / Chino Hills Pkwy.	CSS	24.3	22.5	C	C	21.5	23.0	C	C	D
5	Monte Vista Av. East / Chino Hills Pkwy.	TS	18.5	16.1	B	B	18.9	16.2	B	B	D
6	Central Av. / Chino Hills Pkwy.	TS	24.9	36.9	C	D	25.6	41.2	C	D	D
7	Central Av. / El Prado Rd.	TS	50.3	**88.1**	D	**F**	**62.4**	**96.6**	**E**	**F**	D
8	Central Av. / SR-71 NB Ramps	TS	7.3	7.1	A	A	7.6	8.0	A	A	D
9	Central Av. / SR-71 SB Ramps	TS	14.3	25.8	B	C	15.0	34.9	B	C	D
10	El Prado Rd. / Kimball Av.	TS	22.3	47.3	C	D	28.1	50.4	C	D	D
11	Mountain Av. / Kimball Av.	TS	10.0	10.3	A	B	10.3	10.3	B	B	D
12	San Antonio Av. / Kimball Av.	TS	8.3	9.3	A	A	8.4	9.3	A	A	D
13	Fern Av. / Kimball Av.	TS	9.5	9.6	A	A	9.6	9.7	A	A	D
14	Euclid Av. (SR-83) / SR-60 WB Ramps	TS	27.9	22.3	C	C	30.6	24.6	C	C	D
15	Euclid Av. (SR-83) / SR-60 EB Ramps	TS	24.6	28.2	C	C	26.3	33.1	C	C	D
16	Euclid Av. (SR-83) / Walnut St.	TS	34.1	28.1	C	C	34.2	28.0	C	C	E
17	Euclid Av. (SR-83) / Riverside Dr.	TS	33.7	49.7	C	D	33.7	50.7	C	D	D
18	Euclid Av. (SR-83) / Chino Av.	TS	17.2	8.9	B	A	24.8	8.9	C	A	D
19	Euclid Av. (SR-83) / Schaefer Av.	TS	36.8	49.8	D	D	37.6	50.4	D	D	D
20	Euclid Av. (SR-83) / Edison Av.	TS	31.0	31.2	C	C	33.2	33.2	C	C	D
21	Euclid Av. (SR-83) / Eucalyptus Av.	TS	22.2	8.0	C	A	23.5	8.2	C	A	D
22	Euclid Av. (SR-83) / Merrill Av.	TS	28.3	23.0	C	C	28.5	23.2	C	C	D
23	Euclid Av. (SR-83) / Kimball Av.	TS	48.2	49.3	D	D	**71.5**	**64.8**	**E**	**E**	D
24	Euclid Av. (SR-83) / Bickmore Av.	TS	45.6	16.6	D	B	46.5	26.6	D	C	D
25	Euclid Av. (SR-83) / Pine Av.	TS	47.9	37.3	D	D	48.0	41.1	D	D	D
26	SR-71 NB Ramps / Euclid Av. (SR-83)	TS	16.3	13.0	B	B	19.5	13.2	B	B	D
27	SR-71 SB Ramps / Euclid Av. (SR-83)	TS	40.9	34.1	D	C	46.8	34.3	D	C	D
28	Dwy. 1 / Bickmore Av.		Intersection Does Not Exist				Intersection Does Not Exist				C
29	Dwy. 2 / Bickmore Av.		Intersection Does Not Exist				Intersection Does Not Exist				C
30	Mayhew Av. / Kimball Av.	**TS**	Intersection Does Not Exist				11.9	25.5	B	C	D
31	Mayhew Av. / Dwy. 3	**CSS**	Intersection Does Not Exist				9.4	8.7	A	A	C
32	Mayhew Av. / Dwy. 4		Intersection Does Not Exist				Intersection Does Not Exist				C
33	Mayhew Av. / Dwy. 5	**CSS**	Intersection Does Not Exist				8.8	9.5	A	A	C
34	Mayhew Av. / Dwy. 6	**CSS**	Intersection Does Not Exist				9.6	9.9	A	A	C
35	Mayhew Av. / Dwy. 7	**CSS**	Intersection Does Not Exist				8.9	9.5	A	A	C
36	Mayhew Av. / Dwy. 8	**CSS**	Intersection Does Not Exist				9.9	10.1	A	B	C
37	Mayhew Av. / Dwy. 9	**CSS**	Intersection Does Not Exist				9.4	9.5	A	A	C
38	Mayhew Av. / Dwy. 10	**CSS**	Intersection Does Not Exist				9.3	9.5	A	A	C
39	Mayhew Av. / Dwy. 11	**CSS**	Intersection Does Not Exist				9.0	9.3	A	A	C
40	Mayhew Av. / Dwy. 12		Intersection Does Not Exist				Intersection Does Not Exist				C
41	Mayhew Av. / Dwy. 13		Intersection Does Not Exist				Intersection Does Not Exist				C
42	Mayhew Av. / Bickmore Av.	**CSS**	Intersection Does Not Exist				14.3	10.8	B	B	D

Table 5-2

Intersection Analysis for E+P (Phase 2) Conditions

#	Intersection	Traffic Control[2]	Existing (2016)				E+P (Phase 2)				Acceptable LOS
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
			AM	PM	AM	PM	AM	PM	AM	PM	
43	Dwy. 14 / Kimball Av.		Intersection Does Not Exist				Intersection Does Not Exist				C
44	Street B / Kimball Av.	CSS/**TS**	20.1	0.0	C	A	23.5	10.0	C	A	C
45	Street B / Dwy. 15		Intersection Does Not Exist				Intersection Does Not Exist				C
46	Street B / Dwy. 16		Intersection Does Not Exist				Intersection Does Not Exist				C
47	Street B/Dwy. 17 / Dwy. 18		Intersection Does Not Exist				8.4	8.9	A	A	C
48	Dwy. 19 / Kimball Av.		Intersection Does Not Exist				Intersection Does Not Exist				C
49	Rincon Meadows Av. / Kimball Av.	CSS	18.5	20.4	C	C	19.4	21.5	C	C	D
50	Mill Creek Av. / Kimball Av.	TS	15.7	11.7	B	B	17.7	12.1	B	B	D
51	Main St. / Kimball Av.	TS	15.2	11.6	B	B	16.2	12.0	B	B	D
52	Flight Av. / Kimball Av.	CSS	22.9	22.1	C	C	24.5	24.0	C	C	D
53	Meadow Valley Av. / Kimball Av.	CSS	15.8	16.0	C	C	16.2	16.3	C	C	D
54	Hellman Av. / Kimball Av.	AWS	**>100.0**	**65.7**	**F**	**F**	**>100.0**	**58.0**	**F**	**F**	D
55	Archibald Av. / Limonite Av.	TS	33.5	46.9	C	D	Intersection Not Evaluated				D
56	Harrison Av. / Limonite Av.	TS	20.2	18.6	C	B	Intersection Not Evaluated				D
57	Sumner Av. / Limonite Av.	TS	17.4	16.2	B	B	Intersection Not Evaluated				D
58	Scholar Wy. / Limonite Av.	TS	16.5	15.2	B	B	Intersection Not Evaluated				D
59	Hamner Av. / Limonite Av.	TS	32.6	33.6	C	C	Intersection Not Evaluated				D
60	I-15 SB Ramps / Limonite Av.	TS	29.1	29.7	C	C	Intersection Not Evaluated				D
61	I-15 NB Ramps / Limonite Av.	TS	24.7	25.0	C	C	Intersection Not Evaluated				D

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

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

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

Table 5-3

Intersection Analysis for E+P (Project Buildout) Conditions

#	Intersection	Traffic Control[2]	Existing (2016)				E+P (Project Buildout)				Acceptable LOS
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
			AM	PM	AM	PM	AM	PM	AM	PM	
1	SR-71 SB Ramps / Chino Hills Pkwy.	TS	11.8	14.7	B	B	12.1	15.9	B	B	D
2	SR-71 NB Ramps / Chino Hills Pkwy.	TS	24.5	21.9	C	C	32.7	27.1	C	C	D
3	Ramona Av. / Chino Hills Pkwy.	TS	40.5	41.8	D	D	41.5	43.8	D	D	D
4	Monte Vista Av. West / Chino Hills Pkwy.	CSS	24.3	22.5	C	C	22.7	23.4	C	C	D
5	Monte Vista Av. East / Chino Hills Pkwy.	TS	18.5	16.1	B	B	19.2	16.3	B	B	D
6	Central Av. / Chino Hills Pkwy.	TS	24.9	36.9	C	D	27.3	45.7	C	D	D
7	Central Av. / El Prado Rd.	TS	50.3	**88.1**	D	**F**	**76.9**	**103.3**	**E**	**F**	D
8	Central Av. / SR-71 NB Ramps	TS	7.3	7.1	A	A	7.6	8.0	A	A	D
9	Central Av. / SR-71 SB Ramps	TS	14.3	25.8	B	C	15.8	35.1	B	D	D
10	El Prado Rd. / Kimball Av.	TS	22.3	47.3	C	D	34.3	54.7	C	D	D
11	Mountain Av. / Kimball Av.	TS	10.0	10.3	A	B	10.7	10.4	B	B	D
12	San Antonio Av. / Kimball Av.	TS	8.3	9.3	A	A	8.5	9.4	A	A	D
13	Fern Av. / Kimball Av.	TS	9.5	9.6	A	A	9.7	9.9	A	A	D
14	Euclid Av. (SR-83) / SR-60 WB Ramps	TS	27.9	22.3	C	C	32.9	26.3	C	C	D
15	Euclid Av. (SR-83) / SR-60 EB Ramps	TS	24.6	28.2	C	C	27.8	37.1	C	D	D
16	Euclid Av. (SR-83) / Walnut St.	TS	34.1	28.1	C	C	34.3	28.7	C	C	E
17	Euclid Av. (SR-83) / Riverside Dr.	TS	33.7	49.7	C	D	34.4	51.6	C	D	D
18	Euclid Av. (SR-83) / Chino Av.	TS	17.2	8.9	B	A	25.7	11.1	C	B	D
19	Euclid Av. (SR-83) / Schaefer Av.	TS	36.8	49.8	D	D	38.5	51.1	D	D	D
20	Euclid Av. (SR-83) / Edison Av.	TS	31.0	31.2	C	C	40.0	34.9	D	C	D
21	Euclid Av. (SR-83) / Eucalyptus Av.	TS	22.2	8.0	C	A	24.7	8.4	C	A	D
22	Euclid Av. (SR-83) / Merrill Av.	TS	28.3	23.0	C	C	29.2	23.5	C	C	D
23	Euclid Av. (SR-83) / Kimball Av.	TS	48.2	49.3	D	D	**118.1**	**82.3**	**F**	**F**	D
24	Euclid Av. (SR-83) / Bickmore Av.	TS	45.6	16.6	D	B	47.4	53.7	D	D	D
25	Euclid Av. (SR-83) / Pine Av.	TS	47.9	37.3	D	D	48.4	45.2	D	D	D
26	SR-71 NB Ramps / Euclid Av. (SR-83)	TS	16.3	13.0	B	B	21.2	13.3	C	B	D
27	SR-71 SB Ramps / Euclid Av. (SR-83)	TS	40.9	34.1	D	C	50.3	34.8	D	C	D
28	Dwy. 1 / Bickmore Av.	**CSS**	Intersection Does Not Exist				14.4	9.8	B	A	C
29	Dwy. 2 / Bickmore Av.	**CSS**	Intersection Does Not Exist				14.4	9.6	B	A	C
30	Mayhew Av. / Kimball Av.	**TS**	Intersection Does Not Exist				13.3	33.4	B	C	D
31	Mayhew Av. / Dwy. 3	**CSS**	Intersection Does Not Exist				9.5	8.7	A	A	C
32	Mayhew Av. / Dwy. 4	**CSS**	Intersection Does Not Exist				8.7	9.6	A	A	C
33	Mayhew Av. / Dwy. 5	**CSS**	Intersection Does Not Exist				8.8	9.3	A	A	C
34	Mayhew Av. / Dwy. 6	**CSS**	Intersection Does Not Exist				9.3	9.1	A	A	C
35	Mayhew Av. / Dwy. 7	**CSS**	Intersection Does Not Exist				9.1	9.4	A	A	C
36	Mayhew Av. / Dwy. 8	**CSS**	Intersection Does Not Exist				9.9	9.7	A	A	C
37	Mayhew Av. / Dwy. 9	**CSS**	Intersection Does Not Exist				9.5	9.6	A	A	C
38	Mayhew Av. / Dwy. 10	**CSS**	Intersection Does Not Exist				9.4	9.6	A	A	C
39	Mayhew Av. / Dwy. 11	**CSS**	Intersection Does Not Exist				9.0	9.2	A	A	C
40	Mayhew Av. / Dwy. 12	**CSS**	Intersection Does Not Exist				9.1	9.3	A	A	C
41	Mayhew Av. / Dwy. 13	**CSS**	Intersection Does Not Exist				9.3	9.4	A	A	C
42	Mayhew Av. / Bickmore Av.	**CSS**	Intersection Does Not Exist				15.1	11.4	C	B	D

Table 5-3

Intersection Analysis for E+P (Project Buildout) Conditions

#	Intersection	Traffic Control[2]	Existing (2016)				E+P (Project Buildout)				Acceptable LOS
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
			AM	PM	AM	PM	AM	PM	AM	PM	
43	Dwy. 14 / Kimball Av.	**CSS**	Intersection Does Not Exist				10.8	14.0	B	B	C
44	Street B / Kimball Av.	CSS/**TS**	20.1	0.0	C	A	25.2	15.2	C	B	C
45	Street B / Dwy. 15	**CSS**	Intersection Does Not Exist				12.3	12.3	B	B	C
46	Street B / Dwy. 16	**CSS**	Intersection Does Not Exist				10.3	10.4	B	B	C
47	Street B/Dwy. 17 / Dwy. 18	**CSS**	Intersection Does Not Exist				8.5	9.4	A	A	C
48	Dwy. 19 / Kimball Av.	**CSS**	Intersection Does Not Exist				9.6	13.7	A	B	C
49	Rincon Meadows Av. / Kimball Av.	CSS	18.5	20.4	C	C	20.3	22.4	C	C	D
50	Mill Creek Av. / Kimball Av.	TS	15.7	11.7	B	B	20.8	12.4	C	B	D
51	Main St. / Kimball Av.	TS	15.2	11.6	B	B	17.4	12.2	B	B	D
52	Flight Av. / Kimball Av.	CSS	22.9	22.1	C	C	26.7	25.7	D	D	D
53	Meadow Valley Av. / Kimball Av.	CSS	15.8	16.0	C	C	16.6	16.6	C	C	D
54	Hellman Av. / Kimball Av.	AWS	**>100.0**	**65.7**	**F**	**F**	**>100.0**	**62.8**	**F**	**F**	D
55	Archibald Av. / Limonite Av.	TS	33.5	46.9	C	D	Intersection Not Evaluated				D
56	Harrison Av. / Limonite Av.	TS	20.2	18.6	C	B	Intersection Not Evaluated				D
57	Sumner Av. / Limonite Av.	TS	17.4	16.2	B	B	Intersection Not Evaluated				D
58	Scholar Wy. / Limonite Av.	TS	16.5	15.2	B	B	Intersection Not Evaluated				D
59	Hamner Av. / Limonite Av.	TS	32.6	33.6	C	C	Intersection Not Evaluated				D
60	I-15 SB Ramps / Limonite Av.	TS	29.1	29.7	C	C	Intersection Not Evaluated				D
61	I-15 NB Ramps / Limonite Av.	TS	24.7	25.0	C	C	Intersection Not Evaluated				D

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

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

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

Table 5-4

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

Intersection	Movement	Available Stacking Distance (Feet)	E+P (Phase 1)				E+P (Phase 2)				E+P (Project Buildout)			
			95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
SR-71 SB Ramps / Chino Hills Pkwy.	SBL	775	156	174	Yes	Yes	163	176	Yes	Yes	173	180	Yes	Yes
	SBL/T	1,210	156	176	Yes	Yes	161	176	Yes	Yes	168	178	Yes	Yes
	SBR	510	171	476 [2]	Yes	Yes	171	476 [2]	Yes	Yes	171	476 [2]	Yes	Yes
SR-71 NB Ramps / Chino Hills Pkwy.	NBL	100	202 [2]	165 [2]	Yes[3]	Yes[3]	212 [2]	165 [2]	Yes[3]	Yes[3]	212 [2]	165 [2]	Yes[3]	Yes[3]
	NBT/R	530	160 [2]	91	Yes	Yes	173 [2]	91	Yes	Yes	173 [2]	91	Yes	Yes
Central Avenue / SR-71 NB Ramps	NBL	1,490	163	214	Yes	Yes	164	215	Yes	Yes	165	215	Yes	Yes
Central Avenue / SR-71 SB Ramps	SBL	1,530	292	498	Yes	Yes	321	504	Yes	Yes	337	517	Yes	Yes
	SBL/R	740	246	695	Yes	Yes	248	697	Yes	Yes	267	704	Yes	Yes
Euclid Avenue/ SR-60 WB Ramps	WBL	400	388 [2]	326 [2]	Yes	Yes	407 [2]	332 [2]	Yes	Yes	416 [2]	333 [2]	Yes[3]	Yes
	WBL/T/R	1,430	384 [2]	309 [2]	Yes	Yes	406 [2]	312 [2]	Yes	Yes	431 [2]	323 [2]	Yes	Yes
	WBR	400	203	202	Yes	Yes	209	202	Yes	Yes	249 [2]	207	Yes	Yes
Euclid Avenue/ SR-60 EB Ramps	EBL	900	301 [2]	334 [2]	Yes	Yes	301 [2]	334 [2]	Yes	Yes	301 [2]	334 [2]	Yes	Yes
	EBL/R	1,270	343 [2]	310 [2]	Yes	Yes	380 [2]	320 [2]	Yes	Yes	423 [2]	333 [2]	Yes	Yes
SR-71 NB Ramps / Euclid Avenue	NBL	1,745	40	78	Yes	Yes	40	78	Yes	Yes	40	78	Yes	Yes
	NBR	420	119	1,114 [2]	Yes	Yes[3]	272 [2]	1,192 [2]	Yes	Yes[3]	457 [2]	1,268 [2]	Yes[3]	Yes[3]
SR-71 SB Ramps / Euclid Avenue	SBL	1,100	173	403	Yes	Yes	173	403	Yes	Yes	173	403	Yes	Yes
	SBL/T	1,560	171	402	Yes	Yes	171	402	Yes	Yes	171	402	Yes	Yes
	SBR	255	0	40	Yes	Yes	0	40	Yes	Yes	0	40	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-71 or SR-60 Freeway mainline.

Table 5-5

Basic Freeway Segment Analysis for E+P Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	Existing (2016)				E+P (Phase 1)				E+P (Phase 2)				E+P (Phase 3)			
				Density[2]		LOS		Density[2]		LOS		Density[2]		LOS		Density[2]		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
SR-71 Freeway	SB	North of Chino Hills Pkwy.	3	19.8	17.5	C	B	19.9	17.5	C	B	20.1	17.6	C	B	20.4	17.7	C	B
		South of Chino Hills Pkwy.	3	15.1	11.1	B	B	15.2	11.1	B	B	15.3	11.1	B	B	15.4	11.2	B	B
		North of Central Av.	3	18.3	17.9	C	B	18.4	18.0	C	B	18.5	18.0	C	B	18.8	18.0	C	C
		South of Euclid Av. (SR-83)	2	**37.9**	26.6	**E**	D	**38.0**	26.8	**E**	D	**38.1**	27.2	**E**	D	**38.3**	27.7	**E**	D
	NB	North of Chino Hills Pkwy.	3	22.1	21.8	C	C	22.2	21.9	C	C	22.2	22.1	C	C	22.4	22.5	C	C
		South of Chino Hills Pkwy.	3	16.7	16.4	B	B	16.7	16.5	B	B	16.7	16.6	B	B	16.7	16.8	B	B
		North of Central Av.	3	**37.6**	30.5	**E**	D	**37.6**	30.6	**E**	D	**37.7**	30.7	**E**	D	**37.7**	31.0	**E**	D
		South of Euclid Av. (SR-83)	3	23.7	24.2	C	C	23.8	24.3	C	C	24.2	24.3	C	C	24.5	24.4	C	C
SR-60 Freeway	WB	West of Euclid Av. (SR-83)	4	26.6	27.6	D	D	26.6	27.8	D	D	26.6	27.9	D	D	26.6	28.0	D	D
		East of Euclid Av. (SR-83)	4	27.2	28.7	D	D	27.2	28.7	D	D	27.3	28.7	D	D	27.6	28.7	D	D
	EB	West of Euclid Av. (SR-83)	4	27.7	24.2	D	C	27.7	24.3	D	C	27.8	24.3	D	C	27.9	24.3	D	C
		East of Euclid Av. (SR-83)	4	28.3	24.7	D	C	28.4	24.8	D	C	28.4	24.9	D	C	28.4	25.0	D	C

* **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).

5.7 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for E+P (Phase 1, Phase 2, and Project Buildout) conditions and the results of this analysis are presented in Table 5-6. As shown in Table 5-6, there are no additional merge and diverge areas that currently operate at LOS E or LOS F for E+P (Phase 1 and Phase 2). However, the following merge and diverge area is anticipated to operate at an unacceptable LOS during one or more peak hours under E+P (Project Buildout) traffic conditions:

- SR-71 Freeway, Northbound On-Ramp at Central Av. (#6) – LOS E AM peak hour only

E+P (Phase 1, Phase 2, and Project Buildout) freeway ramp junction operations analysis worksheets are provided in Appendices 5.13, 5.14, and 5.15, respectively.

5.8 PROJECT IMPACTS AND RECOMMENDED IMPROVEMENTS

This section provides a summary of Project impacts and recommended improvements. Based on the City of Chino significance criteria discussed in Section 2.8 *Thresholds of Significance*, the following intersections were found to be impacted by Project. Improvements necessary to reduce project-related traffic impacts to less-than-significant are also discussed below.

5.8.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

The effectiveness of the improvements needed to achieve acceptable levels of service are presented in Table 5-7 for E+P traffic conditions. With the implementation of the intersection mitigation measures discussed below, there are no project-related impacts anticipated to the study area intersections.

Phase 1

Central Avenue / El Prado Road (#7) – Although this intersection was found to operate at an unacceptable LOS (LOS F) during the PM peak hour under Existing traffic conditions, the intersection is anticipated to continue to operate at unacceptable levels during the PM peak hour only with the addition of Project (Phase 1) traffic. However, the Project (Phase 1) is anticipated to contribute less than 50 peak hour trips to this intersection. As such, the impact is considered less than significant.

Hellman Avenue / Kimball Avenue (#54) – Although this intersection was found to operate at an unacceptable LOS (LOS F) during the AM and PM peak hours under Existing traffic conditions, the intersection is anticipated to continue to operate at unacceptable levels during both peak hours with the addition of Project (Phase 1) traffic. However, the Project (Phase 1) is anticipated to contribute less than 50 peak hour trips to this intersection. As such, the impact is considered less than significant.

No mitigation measures have been identified as the impacts to the deficient intersections are less than significant for Phase 1.

Table 5-6

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

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	Existing (2016)				E+P (Phase 1)				E+P (Phase 2)				E+P (Project Buildout)			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS
SR-71 Freeway	SB	Off-Ramp at Chino Hills Pkwy.	3	27.9	C	26.7	C	28.0	D	26.7	C	28.2	D	26.7	C	28.5	D	26.8	C
		Off-Ramp at Central Av.	3	26.2	C	27.8	C	26.3	C	27.8	C	26.4	C	27.9	C	26.8	C	27.9	C
		Loop On-Ramp at Euclid Av. (SR-83) (Upstream)	2	32.4	D	29.1	D	32.4	D	29.3	D	32.5	D	29.6	D	32.6	D	30.0	D
		Loop On-Ramp at Euclid Av. (SR-83) (Downstream)	2	32.4	D	29.1	D	32.4	D	29.3	D	32.5	D	29.6	D	32.6	D	30.0	D
	NB	On-Ramp at Chino Hills Pkwy.	3	26.7	C	26.3	C	26.7	C	26.4	C	26.7	C	26.6	C	26.8	C	27.0	C
		On-Ramp at Central Av.	3	35.0	D	30.6	D	35.0	D	30.7	D	35.0	D	30.9	D	**35.0**	**E**	31.1	D
		Off-Ramp at Euclid Av. (SR-83)	3	31.9	D	33.4	D	32.0	D	33.4	D	32.4	D	33.5	D	32.7	D	33.6	D
SR-60	WB	On-Ramp at Euclid Av. (SR-83)	4	25.9	C	26.7	C	25.9	C	26.8	C	26.0	C	27.0	C	26.0	C	27.2	C
		Off-Ramp at Euclid Av. (SR-83)	4	33.8	D	**35.2**	**E**	33.9	D	**35.2**	**E**	34.1	D	**35.2**	**E**	34.5	D	**35.3**	**E**
	EB	Off-Ramp at Euclid Av. (SR-83)	4	32.6	D	30.4	D	32.7	D	30.4	D	32.9	D	30.4	D	33.1	D	30.5	D
		On-Ramp at Euclid Av. (SR-83)	4	28.7	D	26.7	C	28.7	D	26.8	C	28.7	D	27.0	C	28.8	D	27.2	C

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).

Table 5-7

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
7	Central Av. / El Prado Rd.																	
	- Existing Conditions	TS	1	2	1	1	3	0	1	1	0	1	1	1>	50.3	**88.1**	D	**F**
	- With Improvements	TS	1	2	**1>**	1	3	0	1	1	0	1	1	1>	41.5	39.5	D	D
	- E+P (Phase 1)	TS	1	2	1	1	3	0	1	1	0	1	1	1>	54.3	**92.2**	D	**F**
	- E+P (Phase 2)	TS	1	2	1	1	3	0	1	1	0	1	1	1>	**62.4**	**96.6**	**E**	**F**
	- With Improvements[4]	TS	1	2	**1>**	1	3	0	1	1	0	1	1	1>	46.9	42.0	D	D
	- E+P (Project Buildout)	TS	1	2	1	1	3	0	1	1	0	1	1	1>	**76.9**	**103.3**	**E**	**F**
	- With Improvements[4]	TS	1	2	**1>**	1	3	0	1	1	0	1	1	1>	52.8	44.9	D	D
23	Euclid Av. (SR-83) / Kimball Av.																	
	- Existing Conditions	TS	1	2	1	1	2	0	1	2	0	1	2	0	48.2	49.3	D	D
	- E+P (Phase 1)	TS	1	2	1	1	2	0	1	2	0	1	2	0	52.4	53.0	D	D
	- E+P (Phase 2)	TS	1	2	1	1	2	0	1	2	0	1	2	0	**71.5**	**64.8**	**E**	**E**
	- With Improvements[5]	TS	1	2	1	1	2	**1>**	**2**	2	0	1	2	0	47.3	49.3	D	D
	- E+P (Project Buildout)	TS	1	2	1	1	2	0	1	2	0	1	2	0	**118.1**	**82.3**	**F**	**F**
	- With Improvements	TS	1	2	1	**2**	2	**1>**	**2**	2	0	1	2	**1**	39.1	46.0	D	D
54	Hellman Av. / Kimball Av.																	
	- Existing Conditions	AWS	1	0	0	0	0	0	0	0	1	0	0	0	**>100.0**	**65.7**	**F**	**F**
	- With Improvements	**TS**	1	0	0	0	0	0	0	0	1	0	0	0	3.4	1.9	A	A
	- E+P (Phase 1)	AWS	1	0	0	0	0	0	0	0	1	0	0	0	**96.9**	**55.2**	**F**	**F**
	- E+P (Phase 2)	AWS	1	0	0	0	0	0	0	0	1	0	0	0	**>100.0**	**58.0**	**F**	**F**
	- With Improvements[4]	**TS**	1	0	0	0	0	0	0	0	1	0	0	0	3.4	1.9	A	A
	- E+P (Project Buildout)	AWS	1	0	0	0	0	0	0	0	1	0	0	0	**>100.0**	**62.8**	**F**	**F**
	- With Improvements[4]	**TS**	1	0	0	0	0	0	0	0	1	0	0	0	3.5	1.9	A	A

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

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

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

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

[4] Mitigation measure consists of fair share contribution towards the improvements (as the same improvements are required for existing conditions).

[5] Improvements shown are consistent with those currently under construction.

Mitigation Measure 2.1 – Hellman Avenue / Kimball Avenue (#54) – The following improvements are necessary to reduce the Project's Phase 1 proportionate increase in delay to pre-project levels or better, thus reducing the Project's cumulative impact to less-than-significant:

- Payment of the Project's DIF fees to be applied towards the installation of a traffic signal to improve the existing deficiency.

Phase 2

Impact 1.1 – Central Avenue / El Prado Road (#7) – Although this intersection was found to operate at an unacceptable LOS (LOS F) during the PM peak hour under Existing traffic conditions, the intersection is anticipated to continue to operate at unacceptable levels during the PM peak hour only with the addition of Project (Phase 2) traffic (as measured by 50 or more peak hour trips). As such, the impact is considered cumulatively significant (Impact 1.1).

Mitigation Measure 1.1 – Central Avenue / El Prado Road (#7) – The following improvement is necessary to reduce the Project's Phase 2 proportionate increase in delay to pre-project levels or better, thus reducing the Project's cumulative impact to less-than-significant:

- Modify the traffic signal to implement overlap phasing on the northbound right turn lane to improve the existing deficiency (currently under construction). This improvement may be eligible for DIF fee credit.

Impact 2.1 – Euclid Avenue (SR-83) / Kimball Avenue (#23) – This intersection was found to operate at an acceptable LOS (LOS D or better) during the peak hours under Existing traffic conditions, however, the intersection is anticipated to operate at an unacceptable LOS during the AM and PM peak hours with the addition of Project (Phase 2) traffic (as measured by 50 or more peak hour trips). As such, the impact is considered significant (Impact 2.1).

Mitigation Measure 2.1 – Euclid Avenue (SR-83) / Kimball Avenue (#23) – The Project will be required to construct or pay their fair share towards the following improvements necessary to reduce the Project's Phase 2 impact to less-than-significant:

- Add a southbound right turn lane with overlap phasing (currently under construction).
- Add a 2nd eastbound left turn lane (currently under construction).

Hellman Avenue / Kimball Avenue (#54) – Although this intersection was found to operate at an unacceptable LOS (LOS F) during the AM and PM peak hours under Existing traffic conditions, the intersection is anticipated to continue to operate at unacceptable levels during both peak hours with the addition of Project (Phase 2) traffic. However, the Project (Phase 2) is anticipated to contribute less than 50 peak hour trips to this intersection. As such, the impact is considered less than significant.

Project Buildout

Impact 1.1 – Central Avenue / El Prado Road (#7) – Although this intersection was found to operate at an unacceptable LOS (LOS F) during the PM peak hour under Existing traffic conditions, the intersection is anticipated to continue to operate at unacceptable levels during the PM peak

hour only with the addition of Project (Project Buildout) traffic (as measured by 50 or more peak hour trips). As such, the impact is considered cumulatively significant (Impact 1.1).

Mitigation Measure 1.1 – Central Avenue / El Prado Road (#7) – The following improvement is necessary to reduce the Project's Phase 2 proportionate increase in delay to pre-project levels or better, thus reducing the Project's cumulative impact to less-than-significant:

- Same as Phase 2 mitigation.

Impact 2.1 – Euclid Avenue (SR-83) / Kimball Avenue (#23) – This intersection was found to operate at an acceptable LOS (LOS D or better) during the peak hours under Existing traffic conditions, however, the intersection is anticipated to operate at an unacceptable LOS during the AM and PM peak hours with the addition of Project (Project Buildout) traffic (as measured by 50 or more peak hour trips). As such, the impact is considered significant (Impact 2.1).

Mitigation Measure 2.1 – Euclid Avenue (SR-83) / Kimball Avenue (#23) – The Project will be required to construct or pay their fair share towards the following improvements necessary to reduce the Project's (Project Buildout) impact to less-than-significant:

- Same as Phase 2 mitigation plus a 2nd southbound left turn lane and westbound right turn lane.

Hellman Avenue / Kimball Avenue (#54) – Although this intersection was found to operate at an unacceptable LOS (LOS F) during the AM and PM peak hours under Existing traffic conditions, the intersection is anticipated to continue to operate at unacceptable levels during both peak hours with the addition of Project (Project Buildout) traffic. However, the Project (Project Buildout) is anticipated to contribute less than 50 peak hour trips to this intersection. As such, the impact is considered less than significant.

5.8.2 Recommended Improvements To Address Deficiencies On Off-Ramp Queues

As shown previously on Table 5-4, there are no peak hour queuing issues at SR-71 Freeway and Chino Hills Parkway, SR-71 Freeway and Central Avenue, Euclid Avenue (SR-83) and SR-60 Freeway, and SR-71 Freeway and Euclid Avenue (SR-83) interchanges. As such, no improvements have been recommended.

5.8.3 Recommended Improvements To Address Deficiencies On Freeway Facilities

At this time, Caltrans has no fee programs or other improvement programs in place to address the deficiencies caused by development projects in the City of Chino (or other neighboring jurisdictions) on SHS roadway segments. As such, no improvements have been recommended to address the Existing (2016) deficiencies on the SHS, because there is no feasible mitigation available.

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6 OPENING YEAR CUMULATIVE (2018) TRAFFIC CONDITIONS

This section discusses the methods used to develop Opening Year Cumulative (2018) Without and With Project traffic forecasts, and the resulting intersection operations, freeway mainline operations, and traffic signal warrant analyses.

6.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Opening Year Cumulative (2018) conditions are consistent with those shown previously on Exhibit 3-1, with the exception of the following:

- Project driveways and those facilities assumed to be constructed by the Project to provide site access are also assumed to be in place for Opening Year Cumulative conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for Opening Year Cumulative conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways such as the northern extension of Meadow Valley Avenue at Kimball Avenue and the northern extension of Hellman Avenue north of Kimball Avenue).

6.2 OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth of 4.04% (total ambient growth at 2 percent per year compounded over 2 years) 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 (2018) Without Project traffic conditions are shown on Exhibits 6-1 and 6-2.

6.3 OPENING YEAR CUMULATIVE (2018) WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Opening Year Cumulative (2018) Without Project traffic in conjunction with the addition of Project (Phase 1) traffic. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Opening Year Cumulative (2018) With Project traffic conditions are shown on Exhibits 6-3 and 6-4.

EXHIBIT 6-1: OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT AVERAGE DAILY TRAFFIC (ADT)

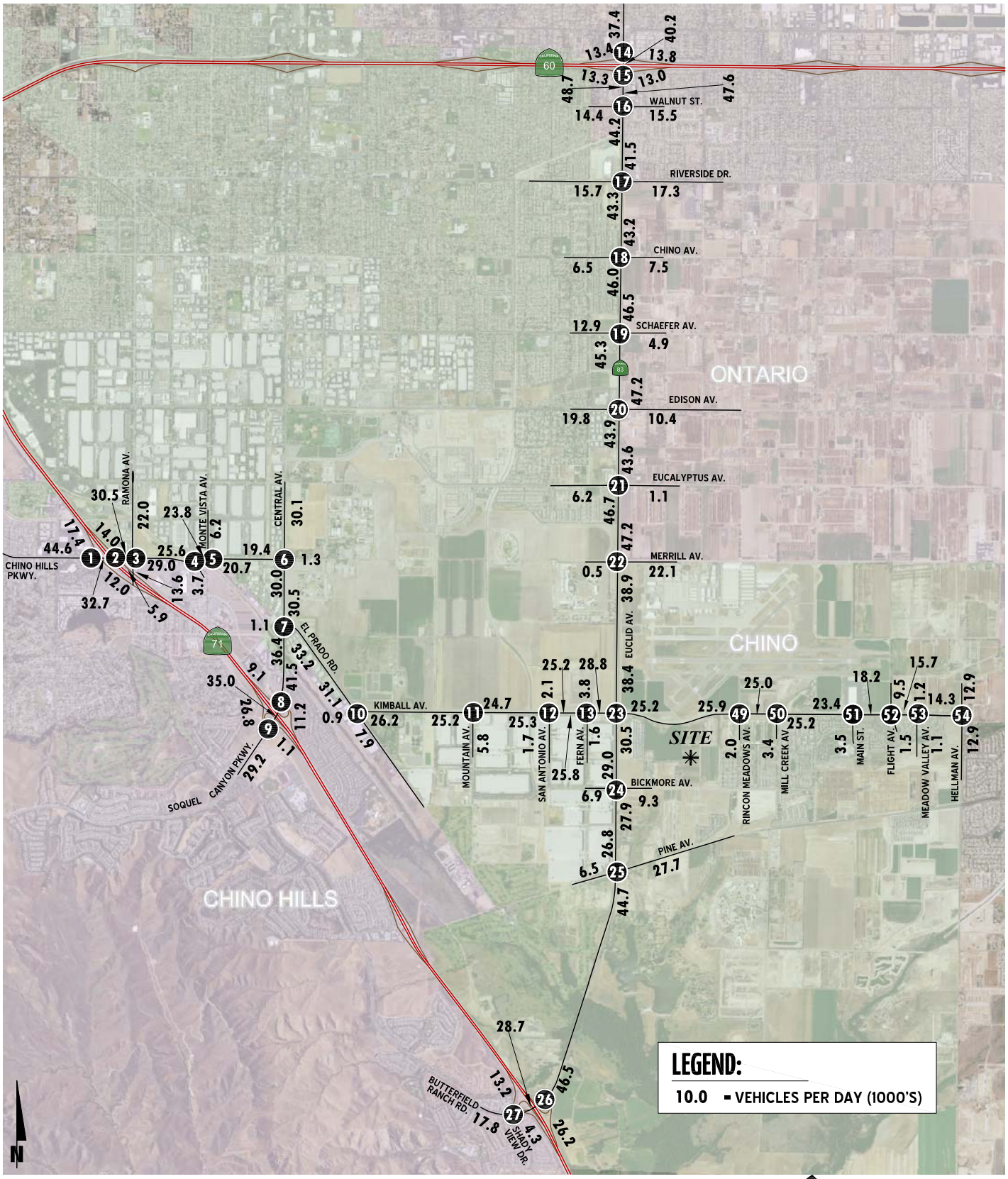

EXHIBIT 6-2 (1OF2): OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT TRAFFIC VOLUMES (IN PCE)

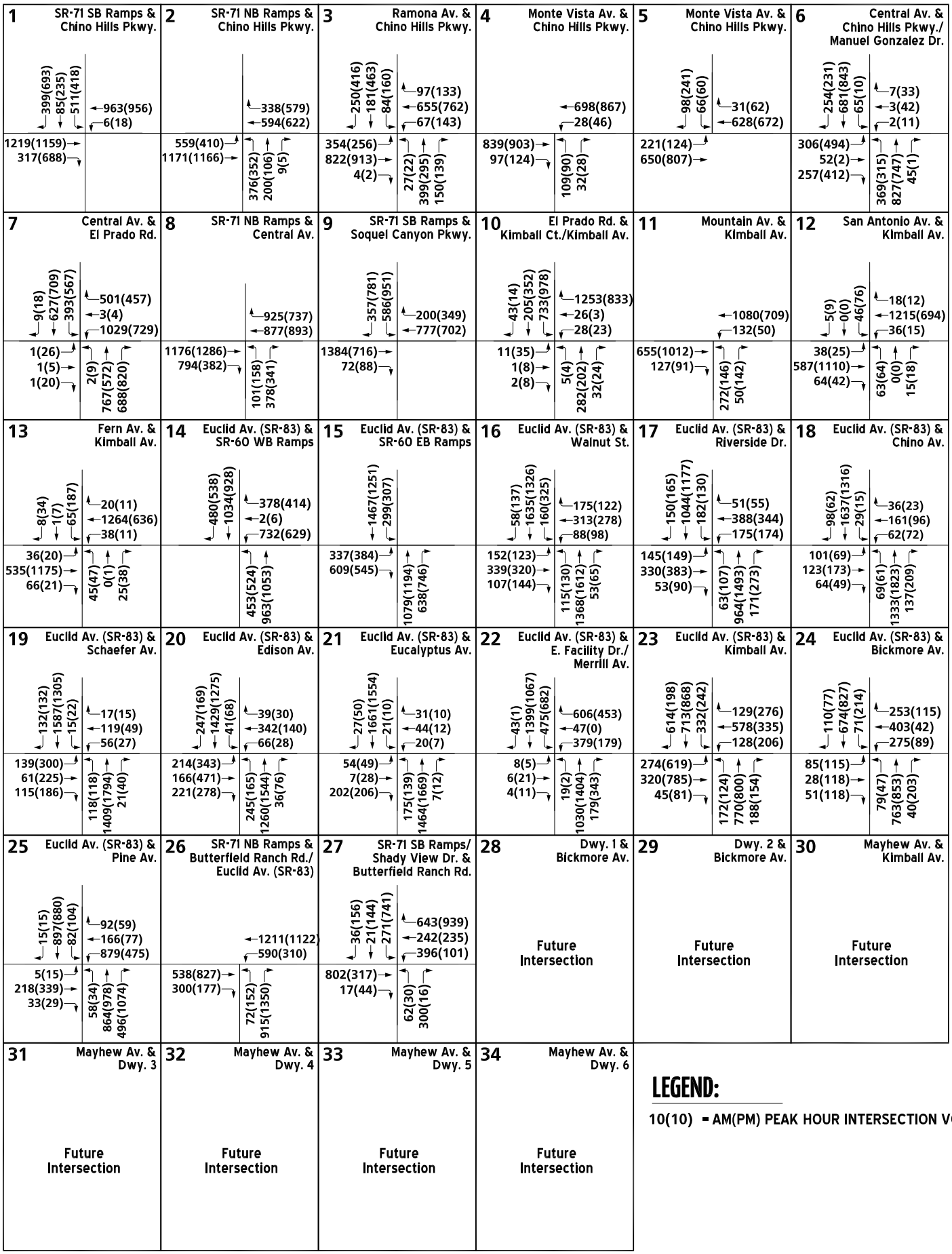

EXHIBIT 6-2 (2OF2): OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT TRAFFIC VOLUMES (IN PCE)

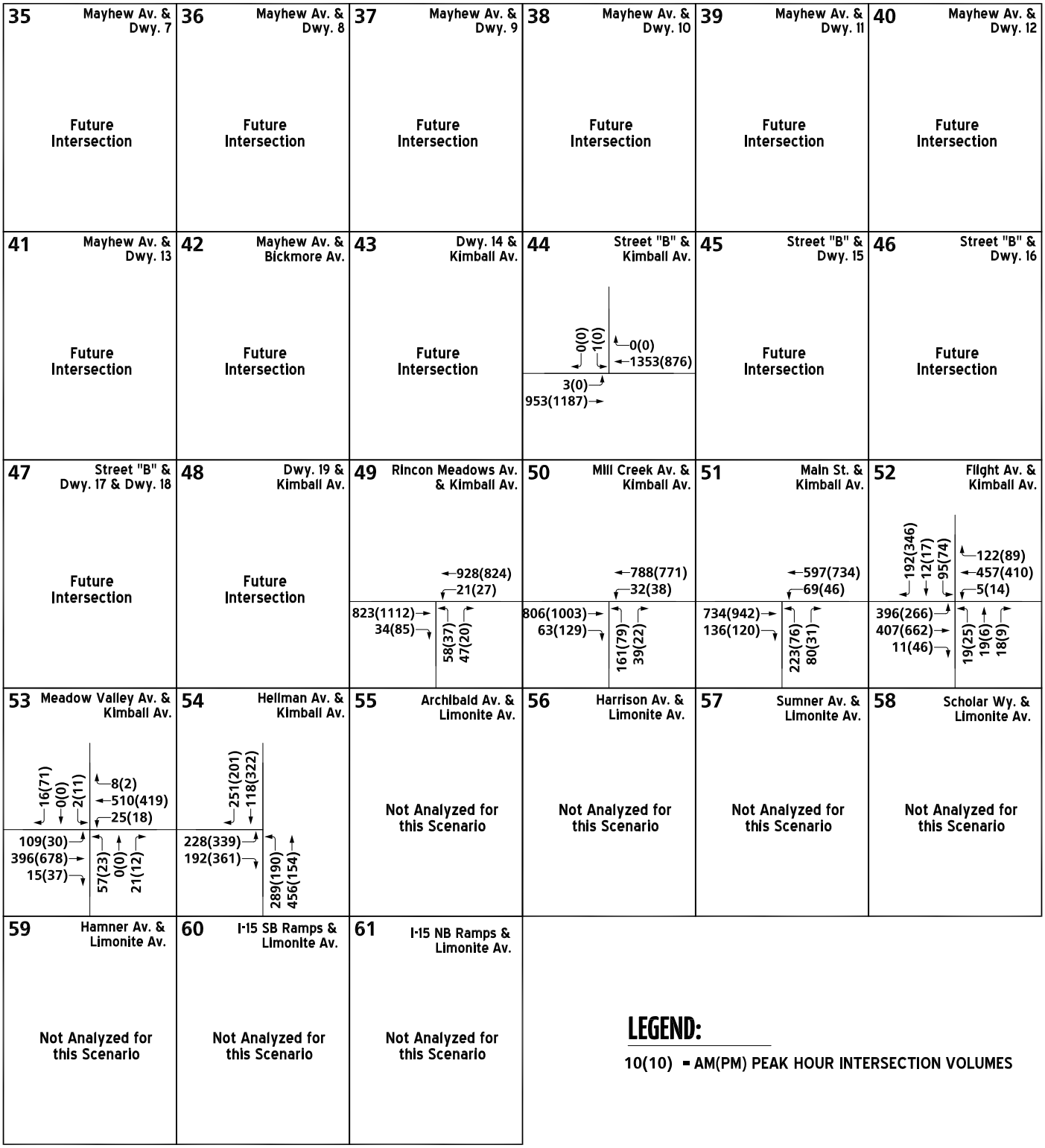

EXHIBIT 6-3 (1OF2): OPENING YEAR CUMULATIVE (2018) WITH PROJECT AVERAGE DAILY TRAFFIC (ADT)

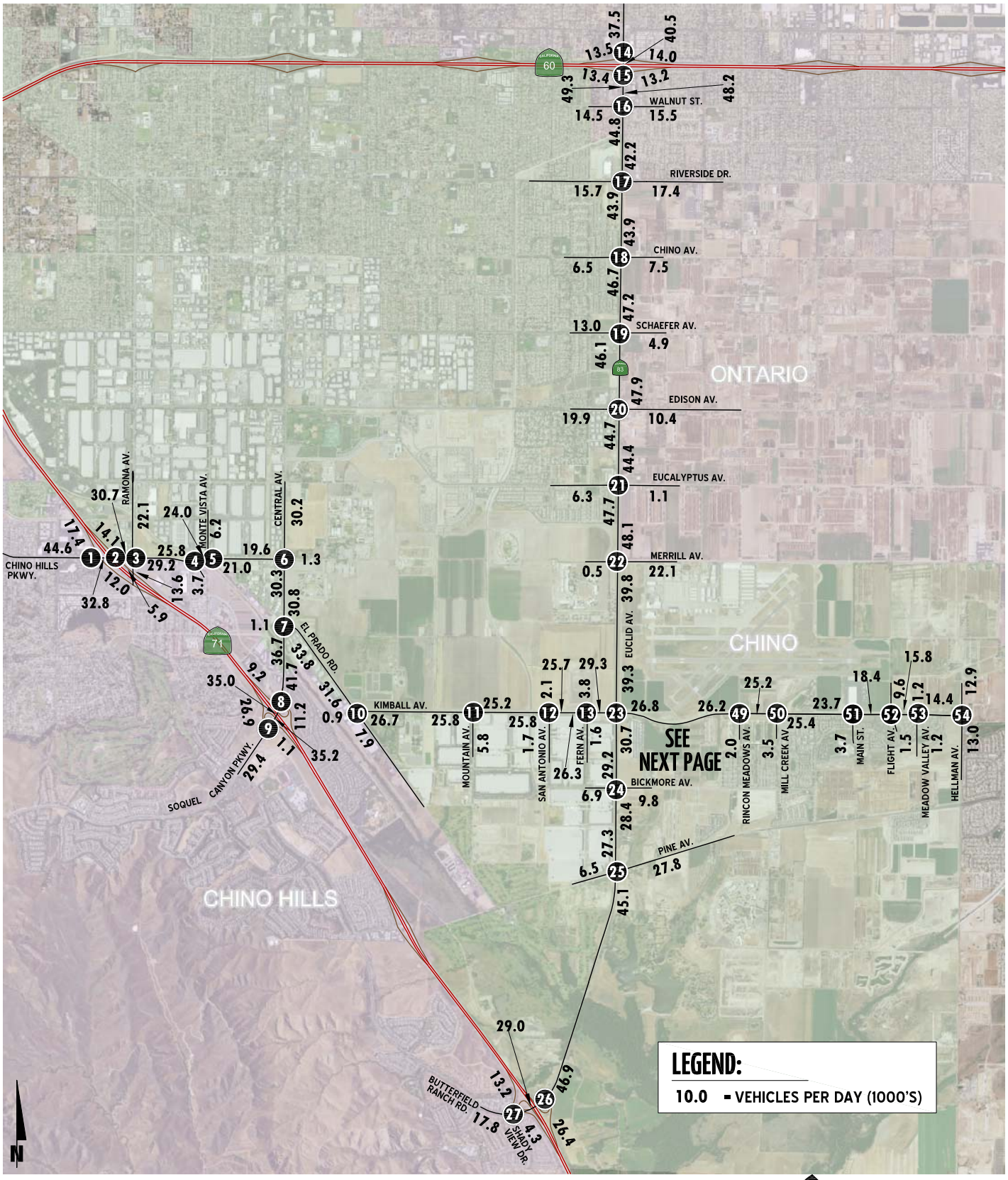

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EXHIBIT 6-3 (2OF2): OPENING YEAR CUMULATIVE (2018) WITH PROJECT AVERAGE DAILY TRAFFIC (ADT)

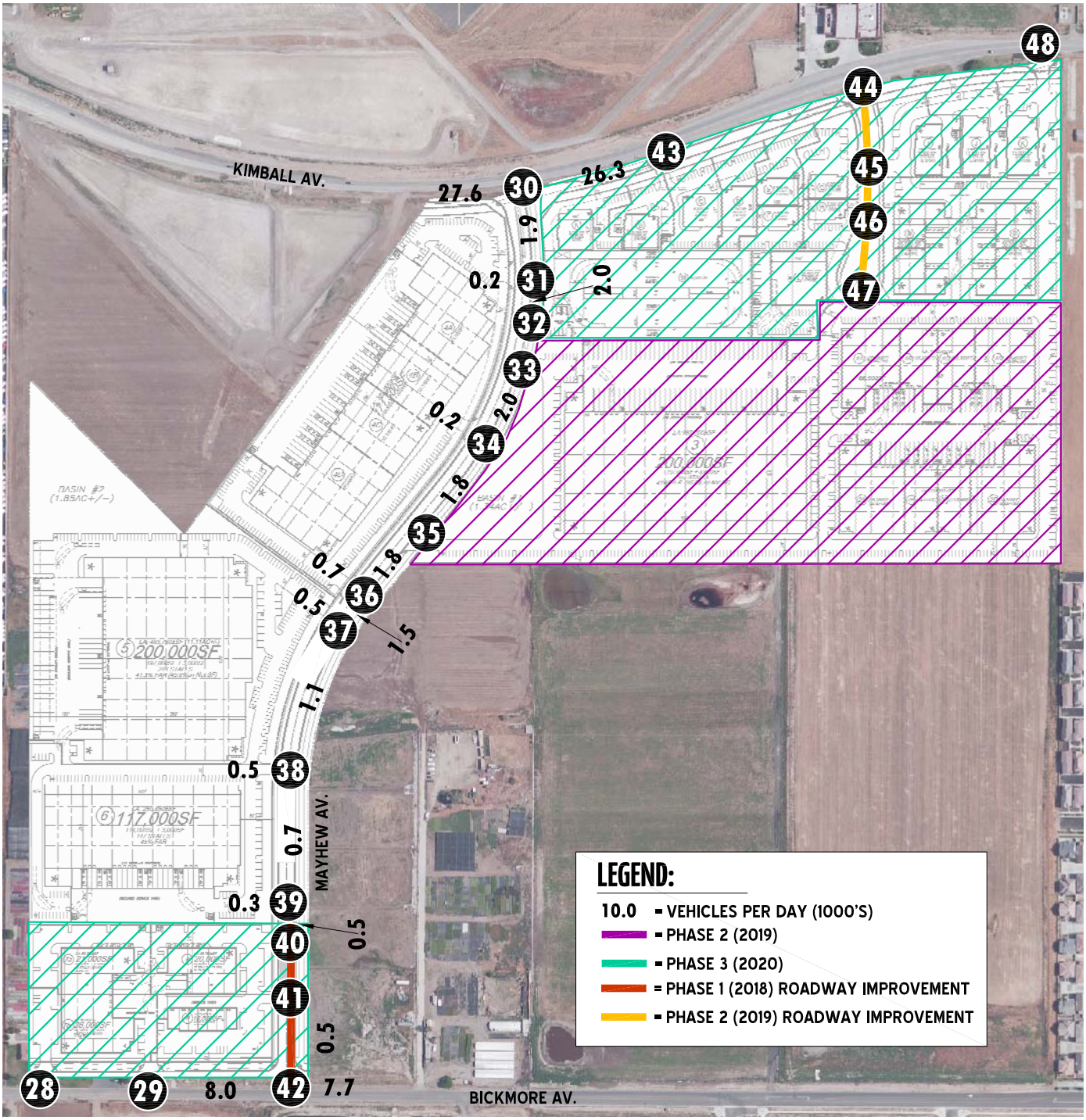


EXHIBIT 6-4 (1OF2): OPENING YEAR CUMULATIVE (2018) WITH PROJECT TRAFFIC VOLUMES (IN PCE)

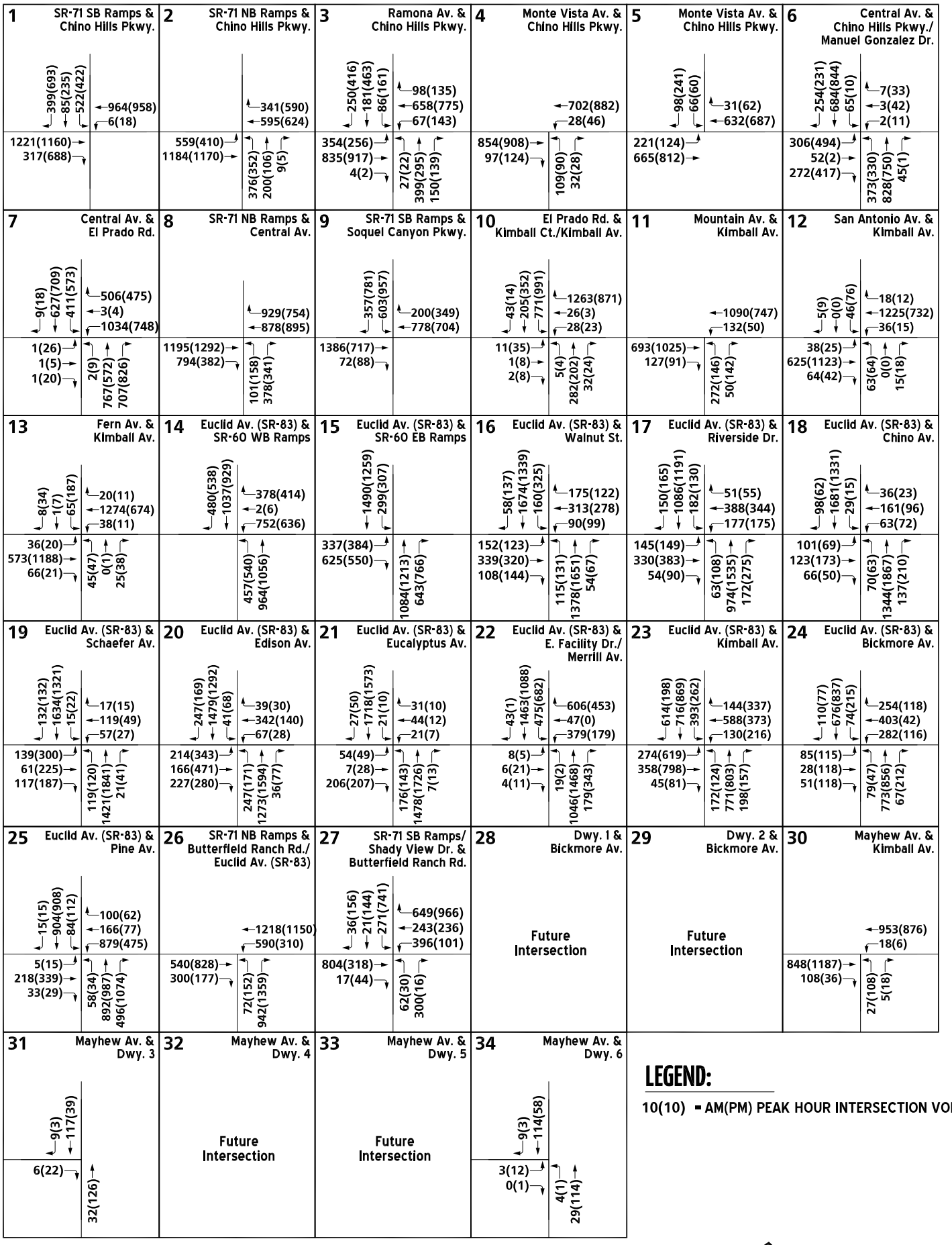
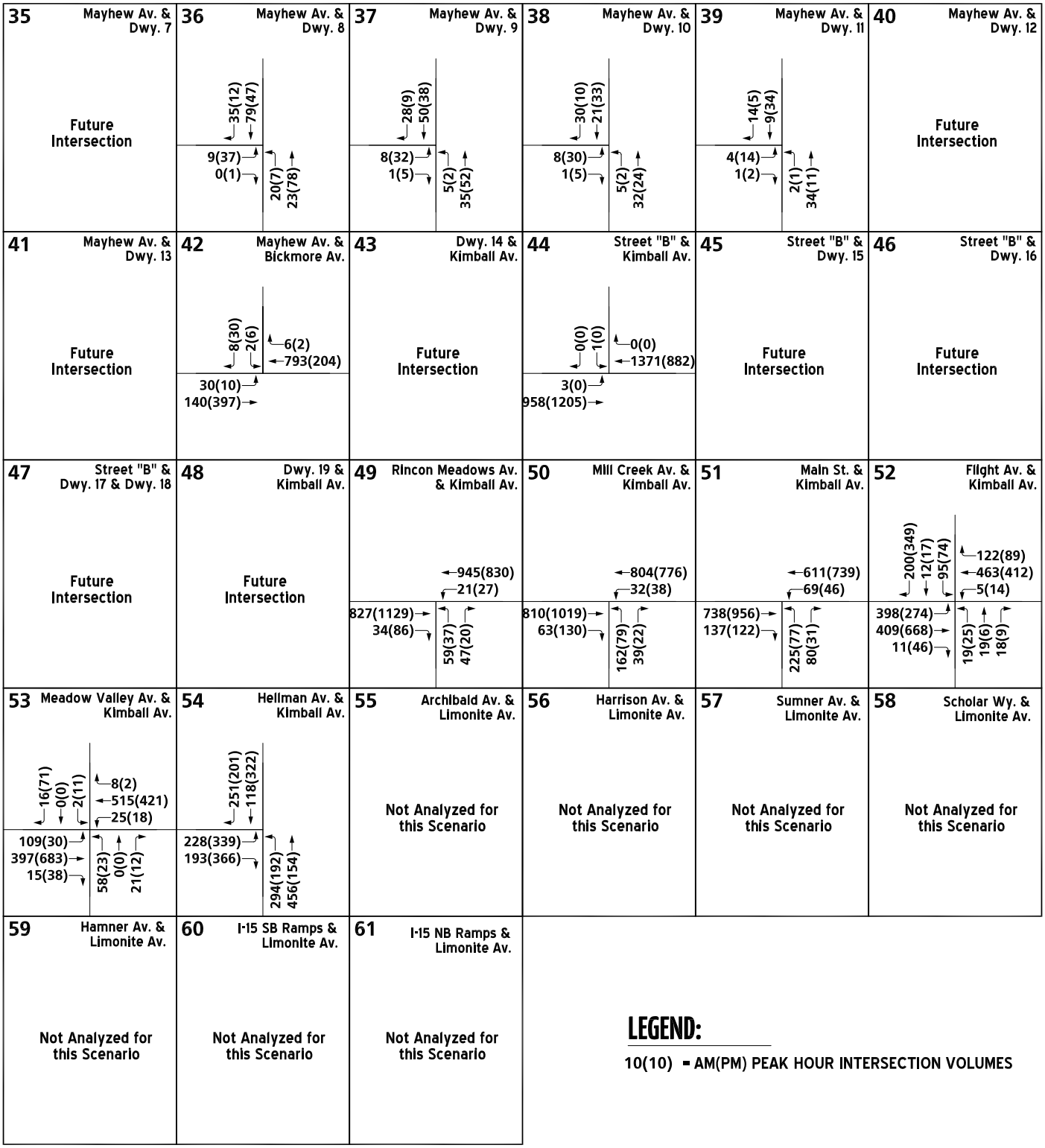


EXHIBIT 6-4 (1OF2): OPENING YEAR CUMULATIVE (2018) WITH PROJECT TRAFFIC VOLUMES (IN PCE)



6.4 INTERSECTION OPERATIONS ANALYSIS

6.4.1 OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT TRAFFIC CONDITIONS

LOS calculations were conducted for the study intersections to evaluate their operations under Opening Year Cumulative (2018) Without Project conditions with roadway and intersection geometrics consistent with Section 6.1 *Roadway Improvements*. As shown in Table 6-1, the following additional study area intersections are anticipated to operate at an unacceptable LOS under Opening Year Cumulative (2018) Without Project traffic conditions, in addition to the location previously identified under E+P traffic conditions:

- El Prado Rd. / Kimball Av. (#10) – LOS F PM peak hour only
- Euclid Av. (SR-83) / SR-60 WB Ramps (#14) – LOS E AM and PM peak hours
- Euclid Av. (SR-83) / SR-60 EB Ramps (#15) – LOS E AM and PM peak hours
- Euclid Av. (SR-83) / Riverside Dr. (#17) – LOS F PM peak hour only
- Euclid Av. (SR-83) / Schaefer Av. (#19) – LOS E PM peak hour only
- Euclid Av. (SR-83) / Edison Av. (#20) – LOS F AM peak hour; LOS E PM peak hour
- Euclid Av. (SR-83) / Merrill Av. (#22) – LOS F AM and PM peak hours
- Euclid Av. (SR-83) / Kimball Av. (#23) – LOS F AM and PM peak hours
- Euclid Av. (SR-83) / Bickmore Av. (#24) – LOS E AM peak hour only
- Euclid Av. (SR-83) / Pine Av. (#25) – LOS E AM peak hour only
- Flight Av. / Kimball Av. (#52) – LOS F AM and PM peak hours

A summary of the peak hour intersection LOS for Opening Year Cumulative (2018) Without Project conditions is shown on Exhibit 6-5. The intersection operations analysis worksheets for Opening Year Cumulative (2018) Without Project traffic conditions are included in Appendix 6.1 of this TIA.

6.4.2 OPENING YEAR CUMULATIVE (2018) WITH PROJECT TRAFFIC CONDITIONS

As shown on Table 6-1 and illustrated on Exhibit 6-6, there are no additional study area intersections anticipated to experience unacceptable LOS with the addition of Project traffic during one or more peak hours. The intersection operations analysis worksheets for Opening Year Cumulative (2018) With Project traffic conditions are included in Appendix 6.2 of this TIA.

6.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

The intersections of Rincon Meadows Avenue at Kimball Avenue and Meadow Valley Avenue at Kimball Avenue are anticipated to warrant a traffic signal under Opening Year Cumulative (2018) Without Project traffic conditions in addition to those previously warranted under Existing and E+P traffic conditions. There are no additional study area intersections that are anticipated to meet either peak hour or planning level (ADT) volume based traffic signal warrants for Opening Year Cumulative (2018) With Project traffic conditions in addition to those previously warranted under Opening Year Cumulative (2018) Without traffic conditions (see Appendix 6.3 and 6.4).

Table 6-1

Intersection Analysis for Opening Year Cumulative (2018) Conditions

#	Intersection	Traffic Control[2]	2018 Without Project				2018 With Project				Acceptable LOS
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
			AM	PM	AM	PM	AM	PM	AM	PM	
1	SR-71 SB Ramps / Chino Hills Pkwy.	TS	12.2	18.1	B	B	12.2	18.1	B	B	D
2	SR-71 NB Ramps / Chino Hills Pkwy.	TS	31.7	30.5	C	C	38.6	32.1	D	C	D
3	Ramona Av. / Chino Hills Pkwy.	TS	42.9	46.9	D	D	43.2	47.5	D	D	D
4	Monte Vista Av. West / Chino Hills Pkwy.	CSS	24.1	26.0	C	D	24.6	26.2	C	D	D
5	Monte Vista Av. East / Chino Hills Pkwy.	TS	18.7	16.4	B	B	19.1	16.4	B	B	D
6	Central Av. / Chino Hills Pkwy.	TS	29.4	52.7	C	D	30.5	54.4	C	D	D
7	Central Av. / El Prado Rd.	TS	**102.1**	**160.1**	**F**	**F**	**110.0**	**163.3**	**F**	**F**	D
8	Central Av. / SR-71 NB Ramps	TS	8.5	7.9	A	A	8.5	7.9	A	A	D
9	Central Av. / SR-71 SB Ramps	TS	17.7	37.3	B	D	18.2	37.4	B	D	D
10	El Prado Rd. / Kimball Av.	TS	39.9	**95.4**	D	**F**	46.5	**98.1**	D	**F**	D
11	Mountain Av. / Kimball Av.	TS	13.1	15.7	B	B	13.7	16.0	B	B	D
12	San Antonio Av. / Kimball Av.	TS	16.3	13.3	B	B	16.4	13.5	B	B	D
13	Fern Av. / Kimball Av.	TS	14.8	18.5	B	B	15.0	18.9	B	B	D
14	Euclid Av. (SR-83) / SR-60 WB Ramps	TS	**57.2**	**69.5**	**E**	**E**	**59.8**	**73.6**	**E**	**E**	D
15	Euclid Av. (SR-83) / SR-60 EB Ramps	TS	**66.4**	**78.2**	**E**	**E**	**69.5**	**83.5**	**E**	**F**	D
16	Euclid Av. (SR-83) / Walnut St.	TS	37.4	28.5	D	C	37.7	28.6	D	C	E
17	Euclid Av. (SR-83) / Riverside Dr.	TS	35.0	**82.7**	C	**F**	35.7	**88.5**	D	**F**	D
18	Euclid Av. (SR-83) / Chino Av.	TS	23.8	7.0	C	A	24.5	7.0	C	A	D
19	Euclid Av. (SR-83) / Schaefer Av.	TS	48.3	**56.8**	D	**E**	49.1	**57.6**	D	**E**	D
20	Euclid Av. (SR-83) / Edison Av.	TS	**101.7**	**67.1**	**F**	**E**	**111.0**	**74.3**	**F**	**E**	D
21	Euclid Av. (SR-83) / Eucalyptus Av.	TS	29.3	10.7	C	B	30.0	11.0	C	B	D
22	Euclid Av. (SR-83) / Merrill Av.	TS	**183.8**	**>200.0**	**F**	**F**	**186.2**	**>200.0**	**F**	**F**	D
23	Euclid Av. (SR-83) / Kimball Av.	TS	**101.0**	**145.7**	**F**	**F**	**117.8**	**174.3**	**F**	**F**	D
24	Euclid Av. (SR-83) / Bickmore Av.	TS	**55.3**	29.5	**E**	C	**56.1**	34.9	**E**	C	D
25	Euclid Av. (SR-83) / Pine Av.	TS	**55.2**	49.5	**E**	D	**55.5**	51.8	**E**	D	D
26	SR-71 NB Ramps / Euclid Av. (SR-83)	TS	18.2	11.4	B	B	20.5	11.4	C	B	D
27	SR-71 SB Ramps / Euclid Av. (SR-83)	TS	46.1	33.4	D	C	46.1	33.4	D	D	D
28	Dwy. 1 / Bickmore Av.		Intersection Does Not Exist				Intersection Does Not Exist				C
29	Dwy. 2 / Bickmore Av.		Intersection Does Not Exist				Intersection Does Not Exist				C
30	Mayhew Av. / Kimball Av.	**TS**	Intersection Does Not Exist				11.9	23.3	B	C	D
31	Mayhew Av. / Dwy. 3	**CSS**	Intersection Does Not Exist				8.9	8.6	A	A	C
32	Mayhew Av. / Dwy. 4		Intersection Does Not Exist				Intersection Does Not Exist				C
33	Mayhew Av. / Dwy. 5		Intersection Does Not Exist				Intersection Does Not Exist				C
34	Mayhew Av. / Dwy. 6	**CSS**	Intersection Does Not Exist				9.5	9.7	A	A	C
35	Mayhew Av. / Dwy. 7		Intersection Does Not Exist				Intersection Does Not Exist				C
36	Mayhew Av. / Dwy. 8	**CSS**	Intersection Does Not Exist				9.6	9.7	A	A	C
37	Mayhew Av. / Dwy. 9	**CSS**	Intersection Does Not Exist				9.2	9.4	A	A	C
38	Mayhew Av. / Dwy. 10	**CSS**	Intersection Does Not Exist				9.1	9.2	A	A	C
39	Mayhew Av. / Dwy. 11	**CSS**	Intersection Does Not Exist				8.9	9.0	A	A	C
40	Mayhew Av. / Dwy. 12		Intersection Does Not Exist				Intersection Does Not Exist				C
41	Mayhew Av. / Dwy. 13		Intersection Does Not Exist				Intersection Does Not Exist				C
42	Mayhew Av. / Bickmore Av.	**CSS**	Intersection Does Not Exist				15.3	11.4	C	B	D

Table 6-1

Intersection Analysis for Opening Year Cumulative (2018) Conditions

#	Intersection	Traffic Control[2]	2018 Without Project				2018 With Project				Acceptable LOS
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
			AM	PM	AM	PM	AM	PM	AM	PM	
43	Dwy. 14 / Kimball Av.		Intersection Does Not Exist				Intersection Does Not Exist				C
44	Street B / Kimball Av.	CSS	24.3	0.0	C	A	24.6	0.0	C	A	C
45	Street B / Dwy. 15	**CSS**	Intersection Does Not Exist				Intersection Does Not Exist				C
46	Street B / Dwy. 16	**CSS**	Intersection Does Not Exist				Intersection Does Not Exist				C
47	Street B/Dwy. 17 / Dwy. 18	**CSS**	Intersection Does Not Exist				Intersection Does Not Exist				C
48	Dwy. 19 / Kimball Av.	**CSS**	Intersection Does Not Exist				Intersection Does Not Exist				C
49	Rincon Meadows Av. / Kimball Av.	CSS	18.7	28.9	C	D	24.5	29.2	C	D	D
50	Mill Creek Av. / Kimball Av.	TS	12.9	13.0	B	B	13.1	13.2	B	B	D
51	Main St. / Kimball Av.	TS	15.6	12.2	B	B	15.7	12.4	B	B	D
52	Flight Av. / Kimball Av.	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	D
53	Meadow Valley Av. / Kimball Av.	CSS	17.5	18.3	C	C	17.6	18.4	C	C	D
54	Hellman Av. / Kimball Av.[3]	AWS	25.7	23.7	D	C	25.9	23.9	D	C	D
55	Archibald Av. / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D
56	Harrison Av. / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D
57	Sumner Av. / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D
58	Scholar Wy. / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D
59	Hamner Av. / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D
60	I-15 SB Ramps / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D
61	I-15 NB Ramps / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D

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

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

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

[3] Includes additional lanes needed to serve future cumulative development projects. Specifically, a northbound through lane, southbound through lane, southbound right turn lane, and eastbound left turn lane.

EXHIBIT 6-5: SUMMARY OF LOS FOR OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT CONDITIONS

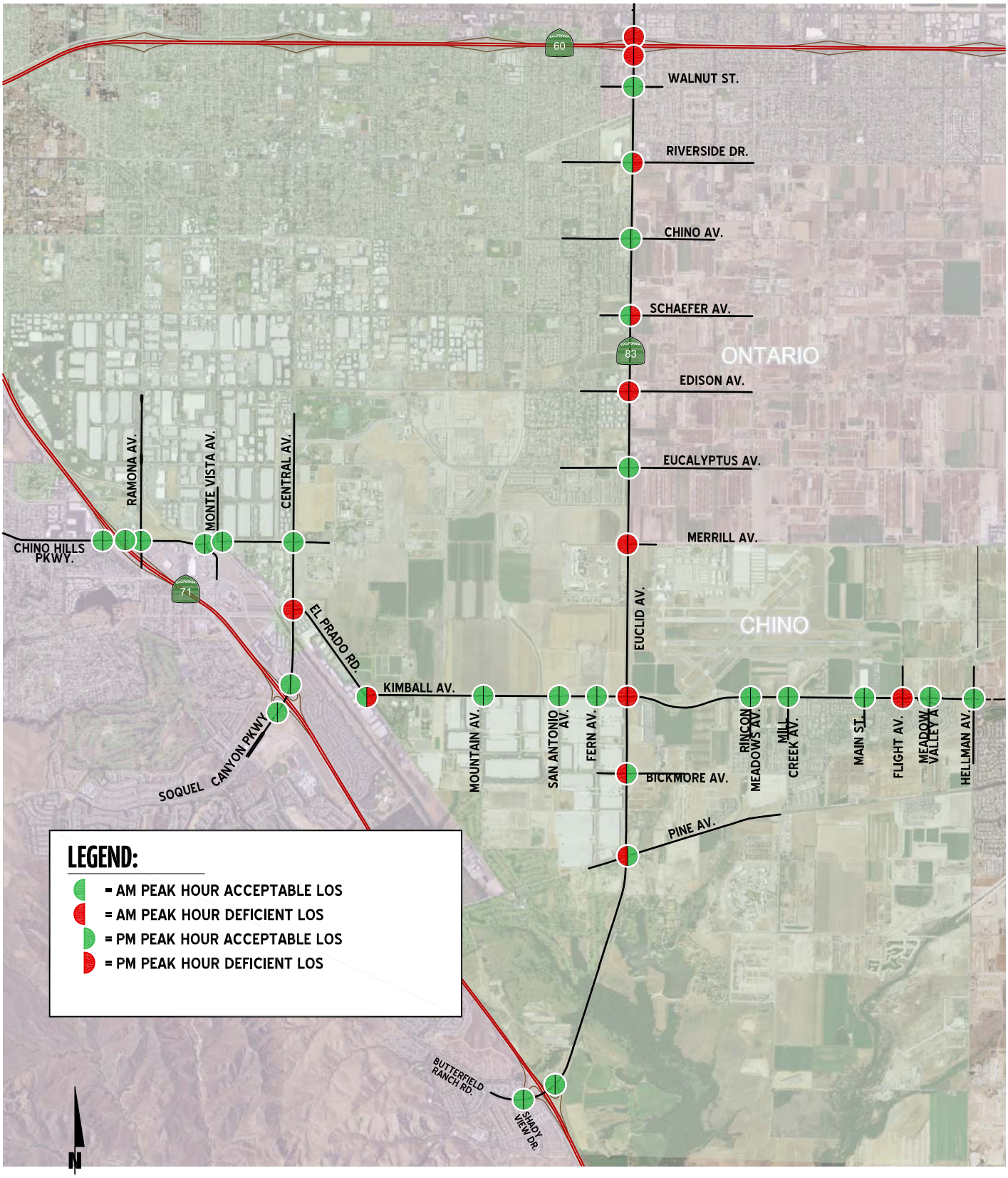
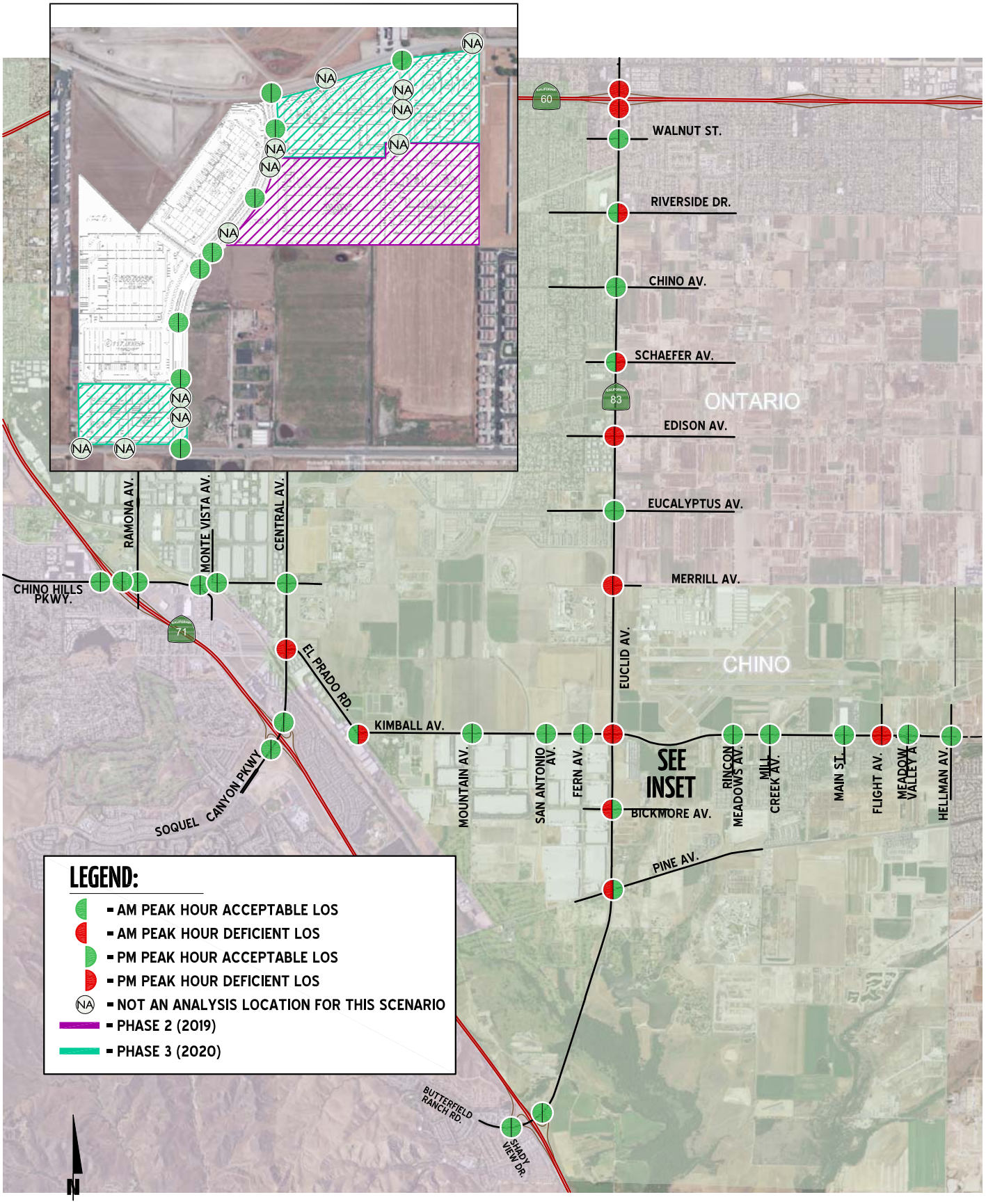


EXHIBIT 6-6: SUMMARY OF LOS FOR OPENING YEAR CUMULATIVE (2018) WITH PROJECT CONDITIONS



6.6 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for Opening Year Cumulative (2018) Without and With Project traffic conditions are shown in 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 (Phase 1) traffic. Worksheets for Opening Year Cumulative (2018) Without and With Project traffic conditions off-ramp queuing analysis are provided in Appendices 6.5 and 6.6, respectively.

6.7 BASIC FREEWAY SEGMENT ANALYSIS

Opening Year Cumulative (2018) 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, no additional freeway segments are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours, in addition to those previously identified under Existing and E+P traffic conditions. Opening Year Cumulative (2018) Without and With Project basic freeway segment analysis worksheets are provided in Appendix 6.7 and 6.8, respectively.

6.8 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for Opening Year Cumulative (2018) conditions and the results of this analysis are presented in Table 6-4. As shown in Table 6-4, the following additional merge and diverge areas are anticipated operate at LOS E or LOS F for Opening Year Cumulative (2018) Without Project, in addition to those previously identified under Existing and E+P traffic conditions:

- SR-71 Freeway, Northbound Off-Ramp at Euclid Av. (SR-83) (#7) – LOS E PM peak hour only
- SR-60 Freeway, Eastbound Off-Ramp at Euclid Av. (SR-83) (#10) – LOS E AM peak hour only

The following merge and diverge area is anticipated to operate at an unacceptable LOS during the peak hours with the addition of Project (Phase 1) traffic:

- SR-71 Freeway, Southbound Loop On-Ramp at Euclid Av. (SR-83) (#3 and #4)– LOS E AM peak hour only (both the upstream and downstream)

Opening Year Cumulative (2018) Without and With Project freeway ramp junction operations analysis worksheets are provided in Appendices 6.9 and 6.10, respectively.

Table 6-2

Peak Hour Freeway Off-Ramp Queuing Summary for Opening Year Cumulative (2018) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	2018 Without Project				2018 With Project			
			95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
SR-71 SB Ramps / Chino Hills Pkwy.	SBL	775	171	197 [2]	Yes	Yes	175	193 [2]	Yes	Yes
	SBL/T	1,210	168	190	Yes	Yes	171	194	Yes	Yes
	SBR	510	190 [2]	500 [2]	Yes	Yes	190 [2]	500 [2]	Yes	Yes
SR-71 NB Ramps / Chino Hills Pkwy.	NBL	100	210 [2]	175 [2]	Yes[3]	Yes[3]	210 [2]	175 [2]	Yes[3]	Yes[3]
	NBT/R	530	169 [2]	93	Yes	Yes	169 [2]	93	Yes	Yes
Central Avenue / SR-71 NB Ramps	NBL	1,490	172	231	Yes	Yes	172	231	Yes	Yes
	NBL/R	1,070	172	231	Yes	Yes	172	231	Yes	Yes
Central Avenue / SR-71 SB Ramps	SBL	1,530	385	718	Yes	Yes	393	728	Yes	Yes
	SBL/R	740	312	898 [2]	Yes	Yes[3]	321	902 [2]	Yes	Yes[3]
Euclid Avenue/ SR-60 WB Ramps	WBL	400	465 [2]	386 [2]	Yes[3]	Yes	483 [2]	383 [2]	Yes[3]	Yes
	WBL/T/R	1,430	478 [2]	380 [2]	Yes	Yes	492 [2]	387 [2]	Yes	Yes
	WBR	400	293 [2]	252 [2]	Yes	Yes	293 [2]	274 [2]	Yes	Yes
Euclid Avenue/ SR-60 EB Ramps	EBL	900	320 [2]	352 [2]	Yes	Yes	320 [2]	352 [2]	Yes	Yes
	EBL/R	1,270	773 [2]	657 [2]	Yes	Yes	796 [2]	665 [2]	Yes	Yes
SR-71 NB Ramps / Euclid Avenue	NBL	1,745	42	81	Yes	Yes	42	81	Yes	Yes
	NBR	420	702 [2]	1,618 [2]	Yes[3]	Yes[3]	763 [2]	1,667 [2]	Yes[3]	Yes[3]
SR-71 SB Ramps / Euclid Avenue	SLB	1,100	184	437	Yes	Yes	184	437	Yes	Yes
	SBL/T	1,560	181	431	Yes	Yes	181	431	Yes	Yes
	SBR	255	0	41	Yes	Yes	0	41	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-71 or SR-60 Freeway mainline.

Table 6-3

Basic Freeway Segment Analysis for Opening Year Cumulative (2018) Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	2018 Without Project				2018 With Project			
				Density[2]		LOS		Density[2]		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM
SR-71 Freeway	SB	North of Chino Hills Pkwy.	3	21.4	19.1	C	C	21.6	19.1	C	C
		South of Chino Hills Pkwy.	3	16.3	12.1	B	B	16.4	12.1	B	B
		North of Central Av.	3	19.8	19.3	C	C	19.8	19.3	C	C
		South of Euclid Av. (SR-83)	2	**44.4**	31.4	**E**	D	**44.6**	31.7	**E**	D
	NB	North of Chino Hills Pkwy.	3	24.1	24.0	C	C	24.1	24.1	C	C
		South of Chino Hills Pkwy.	3	17.8	17.8	B	B	17.8	17.8	B	B
		North of Central Av.	3	**41.9**	33.6	**E**	D	**41.9**	33.7	**E**	D
		South of Euclid Av. (SR-83)	3	26.4	27.0	D	D	26.6	27.0	D	D
SR-60 Freeway	WB	West of Euclid Av. (SR-83)	4	28.7	30.7	D	D	28.7	30.7	D	D
		East of Euclid Av. (SR-83)	4	29.5	30.8	D	D	29.6	30.9	D	D
	EB	West of Euclid Av. (SR-83)	4	30.6	26.2	D	D	30.6	26.2	D	D
		East of Euclid Av. (SR-83)	4	30.5	26.8	D	D	30.5	26.9	D	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).

Table 6-4

Freeway Ramp Junction Merge/Diverge Analysis for Opening Year Cumulative (2018) Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	2018 Without Project				2018 With Project			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS
SR-71 Freeway	SB	Off-Ramp at Chino Hills Pkwy.	3	29.4	D	28.4	D	29.5	D	28.4	D
		Off-Ramp at Central Av.	3	27.8	C	29.5	D	27.9	C	29.5	D
		Loop On-Ramp at Euclid Av. (SR-83) (Upstream)	2	35.0	D	32.3	D	**35.0**	**E**	32.5	D
		Loop On-Ramp at Euclid Av. (SR-83) (Downstream)	2	35.0	D	32.3	D	**35.0**	**E**	32.5	D
	NB	On-Ramp at Chino Hills Pkwy.	3	28.3	D	28.2	D	28.4	D	28.4	D
		On-Ramp at Central Av.	3	**37.0**	**E**	32.8	D	**37.0**	**E**	32.9	D
		Off-Ramp at Euclid Av. (SR-83)	3	34.2	D	**35.7**	**E**	34.3	D	**35.8**	**E**
SR-60 Freeway	WB	On-Ramp at Euclid Av. (SR-83)	4	27.8	C	29.4	D	27.8	C	29.5	D
		Off-Ramp at Euclid Av. (SR-83)	4	**36.1**	**E**	**37.1**	**E**	**36.3**	**E**	**37.2**	**E**
	EB	Off-Ramp at Euclid Av. (SR-83)	4	**35.7**	**E**	32.8	D	**35.8**	**E**	32.9	D
		On-Ramp at Euclid Av. (SR-83)	4	30.3	D	28.7	D	30.3	D	28.8	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).

EXHIBIT 6-7: OPENING YEAR CUMULATIVE (2018) WITHOUT PROJECT FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

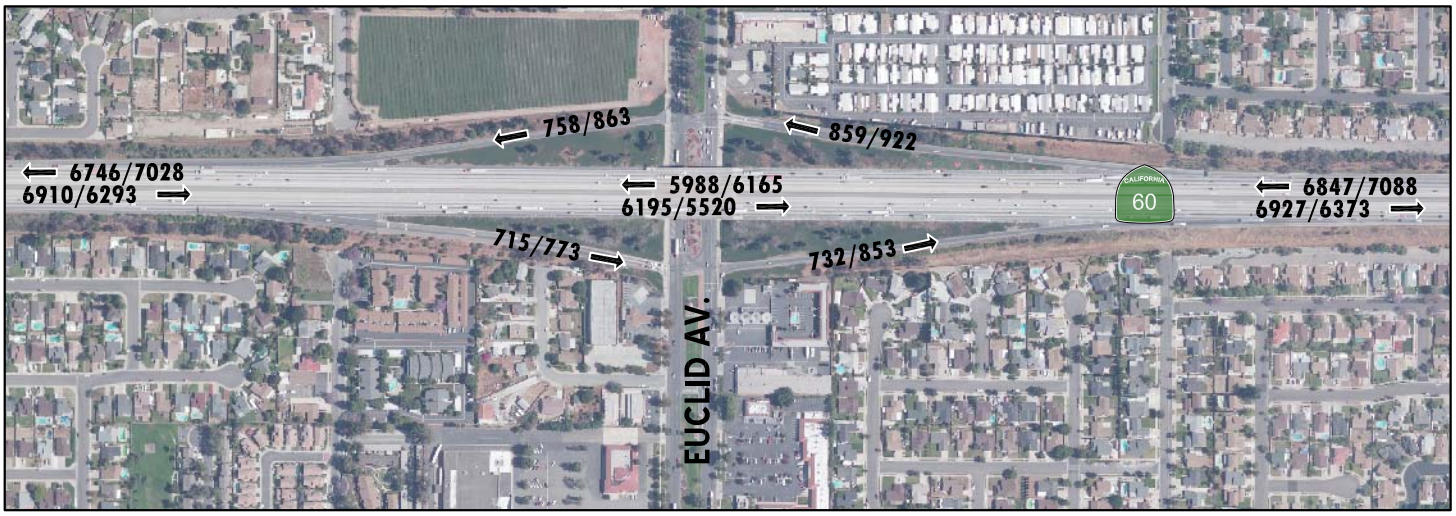


EXHIBIT 6-8: OPENING YEAR CUMULATIVE (2018) WITH PROJECT FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

6.9 RECOMMENDED IMPROVEMENTS

6.9.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as deficient in an effort to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS D or better). The effectiveness of the recommended improvement strategies discussed below to address Opening Year Cumulative (2018) traffic deficiencies is presented in Table 6-5. Exhibit 6-9 shows the intersection layout for the intersection of Central Avenue and El Prado Road for Opening Year Cumulative (2018) traffic conditions, as provided by the City of Chino.

Worksheets for Opening Year Cumulative (2018) Without and With Project conditions, with improvements, HCM calculation worksheets are provided in Appendix 6.11 and Appendix 6.12.

6.9.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON OFF-RAMP QUEUES

As shown previously on Table 6-2, there are no movements that are currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows with addition of Project (Phase 1) traffic. However, Table 6-6 shows the queuing results with the proposed intersection improvements shown previously on Table 6-5. Worksheets for Opening Year Cumulative (2018) Without and With Project traffic conditions, with improvements, off-ramp queuing analysis are provided in Appendices 6.13 and 6.14, respectively.

6.9.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

At this time, Caltrans has no fee programs or other improvement programs in place to address the deficiencies caused by development projects in the City of Chino (or other neighboring jurisdictions) on SHS roadway segments. As such, no improvements have been recommended to address the Opening Year Cumulative (2018) deficiencies on the SHS, because there is no feasible mitigation available.

Table 6-5

Intersection Analysis for Opening Year Cumulative (2018) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
7	Central Av. / El Prado Rd.																	
	- Without Project	TS	1	2	**1>**	**2**	3	0	1	1	0	1	1	1>	39.0	34.2	D	C
	- With Project	TS	1	2	**1>**	**2**	3	0	1	1	0	1	1	1>	39.7	34.9	D	C
10	El Prado Rd. / Kimball Av.																	
	- Without Project[4]	TS	1	1	1	**2**	**1**	0	1	1	0	0	1	1>	21.2	23.6	C	C
	- With Project[4]	TS	1	1	1	**2**	**1**	0	1	1	0	0	1	1>	21.4	23.9	C	C
14	Euclid Av. (SR-83) / SR-60 WB Ramps																	
	- Without Project	TS	**2**	2	0	0	2	1	0	0	0	1	1	1	37.9	37.6	D	D
	- With Project	TS	**2**	2	0	0	2	1	0	0	0	1	1	1	39.0	38.6	D	D
15	Euclid Av. (SR-83) / SR-60 EB Ramps																	
	- Without Project	TS	0	2	1	**2**	2	0	1	1	**1**	0	0	0	46.3	43.7	D	D
	- With Project	TS	0	2	1	**2**	2	0	1	1	**1**	0	0	0	48.8	46.5	D	D
17	Euclid Av. (SR-83) / Riverside Dr.																	
	- Without Project	TS	1	**3**	1	1	**3**	1>	1	2	0	1	2	d	46.4	52.0	D	D
	- With Project	TS	1	**3**	1	1	**3**	1>	1	2	0	1	2	d	46.5	52.2	D	D
19	Euclid Av. (SR-83) / Schaefer Av.																	
	- Without Project	TS	1	**3**	1	1	**3**	1	1	1	1	1	1	0	38.1	49.7	D	D
	- With Project	TS	1	**3**	1	1	**3**	1	1	1	1	1	1	0	38.3	49.7	D	D
20	Euclid Av. (SR-83) / Edison Av.																	
	- Without Project	TS	1	**3**	1	1	**3**	1	1	1	1	1	1	0	35.9	35.3	D	D
	- With Project	TS	1	**3**	1	1	**3**	1	1	1	1	1	1	0	36.7	35.9	D	D
22	Euclid Av. (SR-83) / Merrill Av.																	
	- Without Project	TS	1	**3**	1	1	**3**	0	0	1	0	0	1	**1>**	54.6	35.5	D	D
	- With Project	TS	1	**3**	1	1	**3**	0	0	1	0	0	1	**1>**	54.9	38.7	D	D
23	Euclid Av. (SR-83) / Kimball Av.																	
	- Without Project	TS	1	**3**	1	**2**	**3**	**1>**	**2**	2	0	1	2	**1**	45.2	46.5	D	D
	- With Project	TS	1	**3**	1	**2**	**3**	**1>**	**2**	2	0	1	2	**1**	45.1	54.5	D	D
24	Euclid Av. (SR-83) / Bickmore Av.																	
	- Without Project[5]	TS	1	2	0	1	2	1	1	1	1	1	1	**1**	31.9	33.6	C	C
	- With Project[5]	TS	1	2	0	1	2	1	1	1	1	1	1	**1**	32.2	33.8	C	C
25	Euclid Av. (SR-83) / Pine Av.																	
	- Without Project	TS	1	**3**	1>	1	**3**	0	1	1	1>>	2	1	0	50.3	40.3	D	D
	- With Project	TS	1	**3**	1>	1	**3**	0	1	1	1>>	2	1	0	50.3	40.8	D	D
52	Flight Av. / Kimball Av.																	
	- Without Project	**TS**	0	1	0	0	1	0	1	2	0	1	**2**	0	25.2	24.2	C	C
	- With Project	**TS**	0	1	0	0	1	0	1	2	0	1	**2**	0	26.0	24.9	C	C

Table 6-5

Intersection Analysis for Opening Year Cumulative (2018) Conditions With Improvements

#	Intersection	Traffic Control[3]	Intersection Approach Lanes[1]												Delay[2] (secs.)		Level of Service	
			Northbound			Southbound			Eastbound			Westbound						
			L	T	R	L	T	R	L	T	R	L	T	R	AM	PM	AM	PM
54	Hellman Av. / Kimball Av.																	
	- Without Project[6]	**TS**	1	**1**	0	0	**1**	**1**	**1**	0	1	0	0	0	15.1	19.7	B	B
	- With Project[6]	**TS**	1	**1**	0	0	**1**	**1**	**1**	0	1	0	0	0	15.3	20.0	B	C

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

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

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

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

[4] Restripe the southbound approach to provide dual left turns and a single shared through-right turn lane.

[5] Includes new lanes on the westbound approach, implementing split phase for the eastbound and westbound approaches and removing the eastbound (south leg) crosswalk.

[6] Includes additional lanes needed to serve future cumulative development projects. Specifically, a northbound through lane, southbound through lane, southbound right turn lane, and eastbound left turn lane.

Table 6-6

Peak Hour Freeway Off-Ramp Queuing Summary for Opening Year Cumulative (2018) Conditions With Improvements

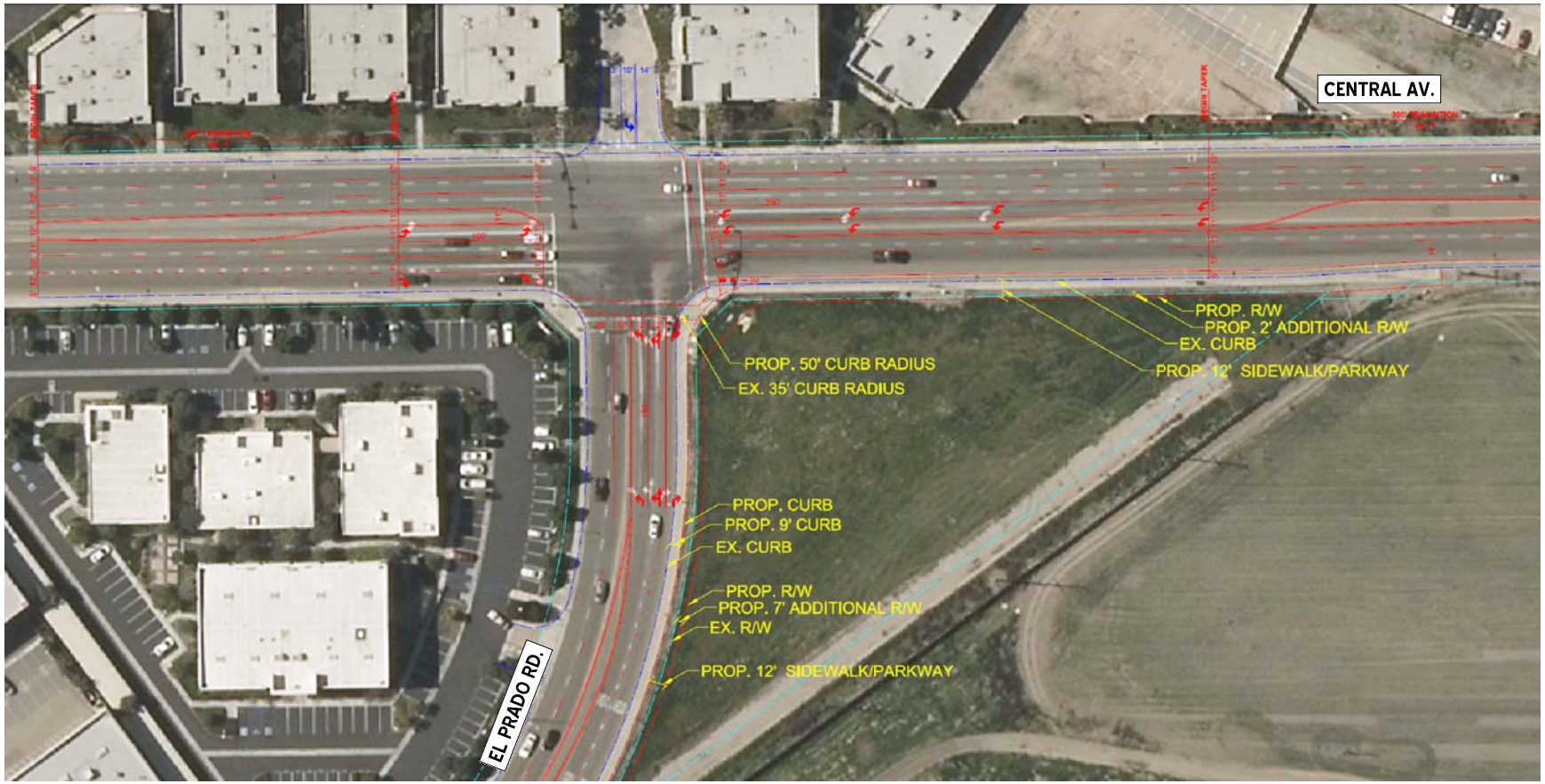
Intersection	Movement	Available Stacking Distance (Feet)	2018 Without Project				2018 With Project			
			95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak	PM Peak Hour	AM	PM	AM Peak	PM Peak Hour	AM	PM
Euclid Avenue/ SR-60 WB Ramps	WBL	400	422 [2]	397 [2]	Yes[3]	Yes	440 [2]	393 [2]	Yes[3]	Yes
	WBL/T/R	1,430	430 [2]	391 [2]	Yes	Yes	446 [2]	401 [2]	Yes	Yes
	WBR	400	257 [2]	271 [2]	Yes	Yes	257 [2]	281 [2]	Yes	Yes
Euclid Avenue/ SR-60 EB Ramps	EBL	900	268	363 [2]	Yes	Yes	268	363 [2]	Yes	Yes
	EBL/R	1,270	718 [2]	665 [2]	Yes	Yes	742 [2]	672 [2]	Yes	Yes
	EBR	**500**	397 [2]	387	Yes	Yes	401 [2]	397	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 bacl and affecting the SR-60 Freeway mainline.

EXHIBIT 6-9: CONCEPTUAL LAYOUT FOR CENTRAL AVENUE AND EL PRADO ROAD



7 OPENING YEAR CUMULATIVE (2019) TRAFFIC CONDITIONS

This section discusses the methods used to develop Opening Year Cumulative (2019) Without and With Project traffic forecasts, and the resulting intersection operations, freeway mainline operations, and traffic signal warrant analyses.

7.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Opening Year Cumulative (2019) 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).
- The intersection of Street "B" and Kimball Avenue would be constructed under Phase 2 (2019) of the Project and operate with split phasing for the northbound and southbound approaches and with protected left turn phasing on the eastbound and westbound approaches (see Exhibit 7-1). It is our understanding that fire engines enter the westerly driveway, drive behind the building, then pull forward into the garage aligning with Street "B". Emergency preemption would be utilized for the egress of emergency vehicles. However, the intersection would operate similar to any other signalized intersection during non-emergency times. The median cannot be extended to the east in order to accommodate returning fire engines. Passenger vehicles wishing to make a southbound left turn, can do so at the signalized intersection of Street "B" and Kimball Avenue.
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for Opening Year Cumulative conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways such as the northern extension of Meadow Valley Avenue at Kimball Avenue and the northern extension of Hellman Avenue north of Kimball Avenue).

7.2 OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth of 6.12% (total ambient growth at 2 percent per year compounded over 3 years) 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 (2019) Without Project traffic conditions are shown on Exhibits 7-2 and 7-3.

7.3 OPENING YEAR CUMULATIVE (2019) WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Opening Year Cumulative (2018) Without Project traffic in conjunction with the addition of Project (Phase 2) traffic. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Opening Year Cumulative (2019) With Project traffic conditions are shown on Exhibits 7-4 and 7-5.

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EXHIBIT 7-1: CONCEPT SIGNAL PLAN

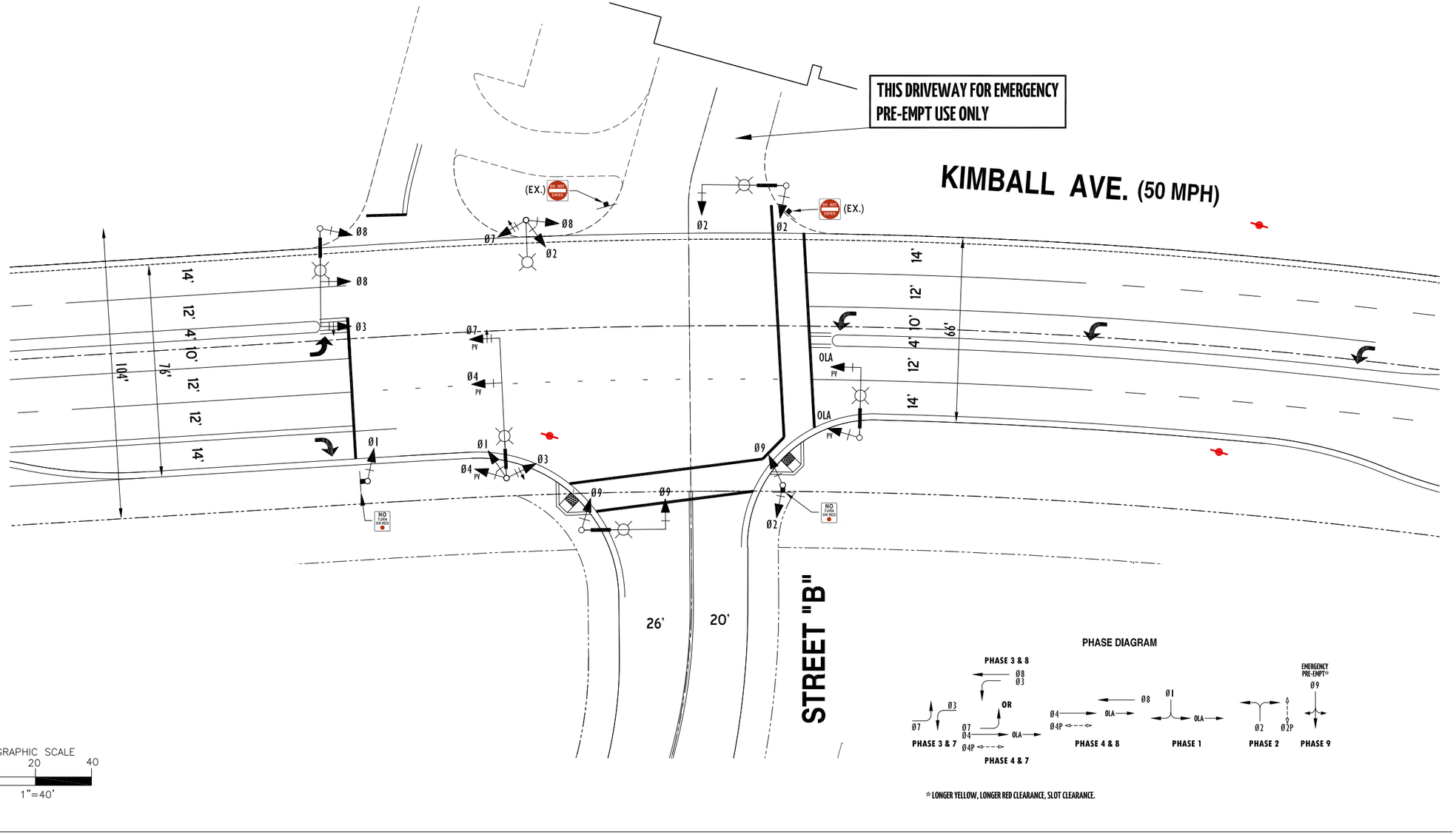

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EXHIBIT 7-2: OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT AVERAGE DAILY TRAFFIC (ADT)

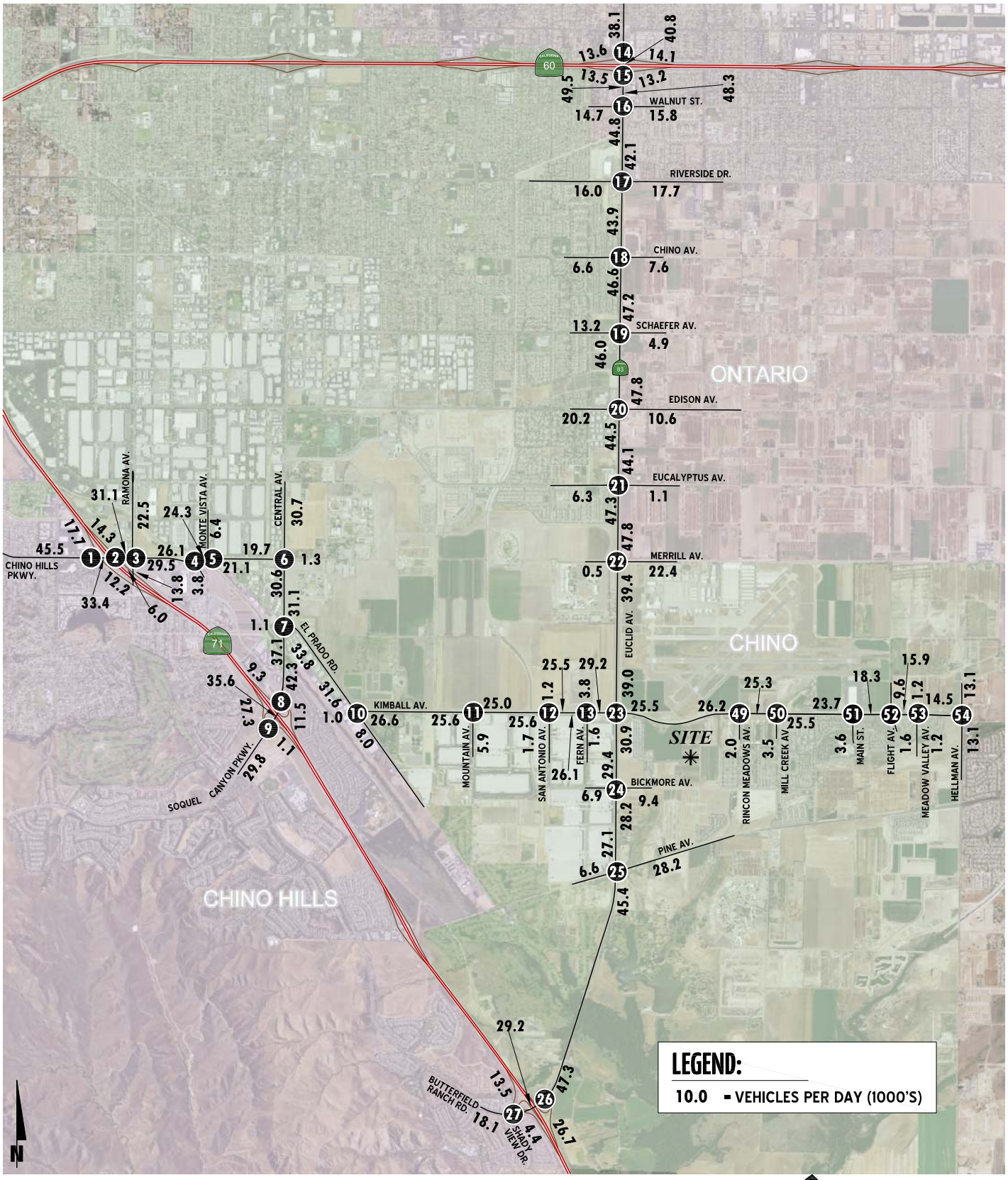

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EXHIBIT 7-3 (1OF2): OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT TRAFFIC VOLUMES (IN PCE)

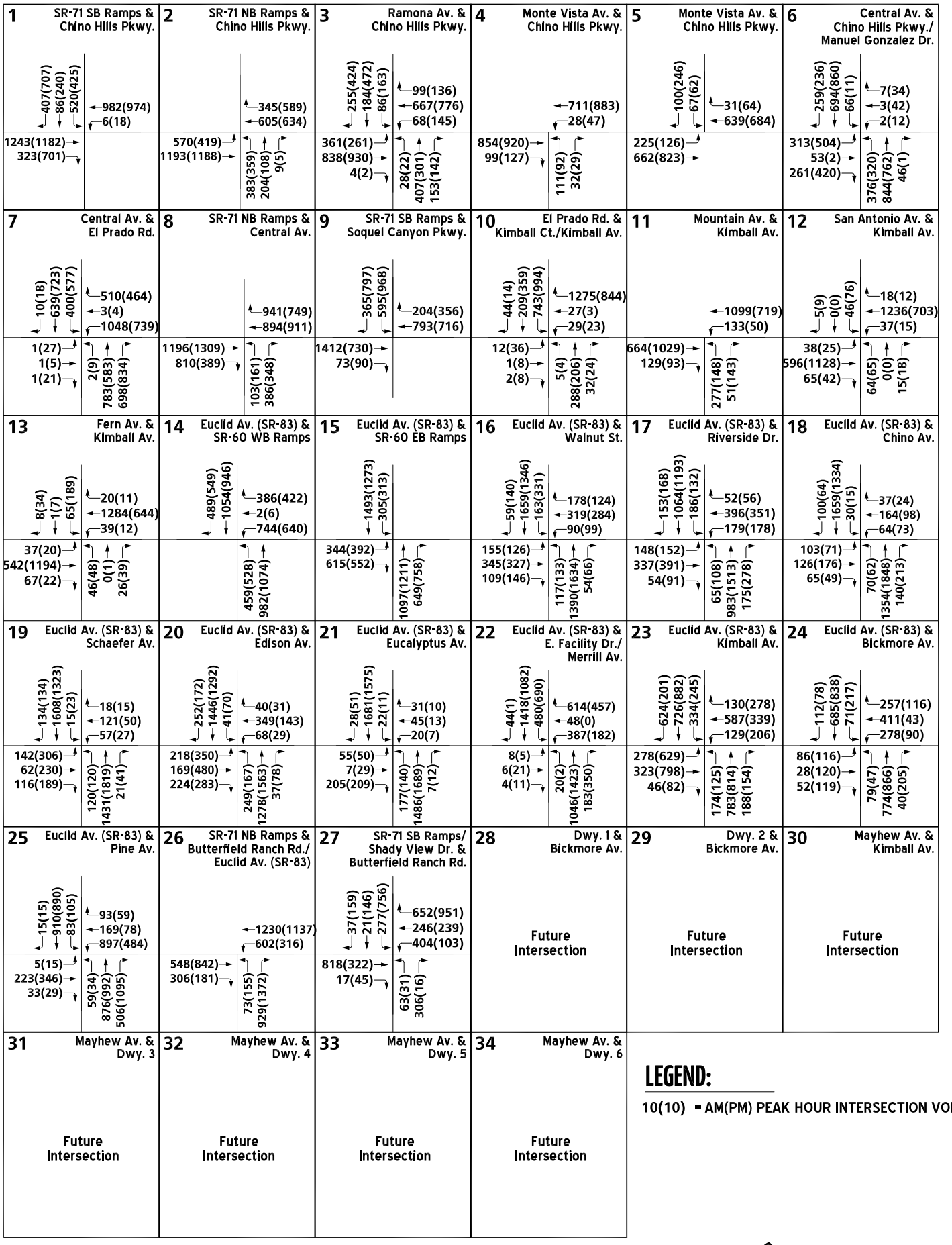


EXHIBIT 7-3 (2OF2): OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT TRAFFIC VOLUMES (IN PCE)

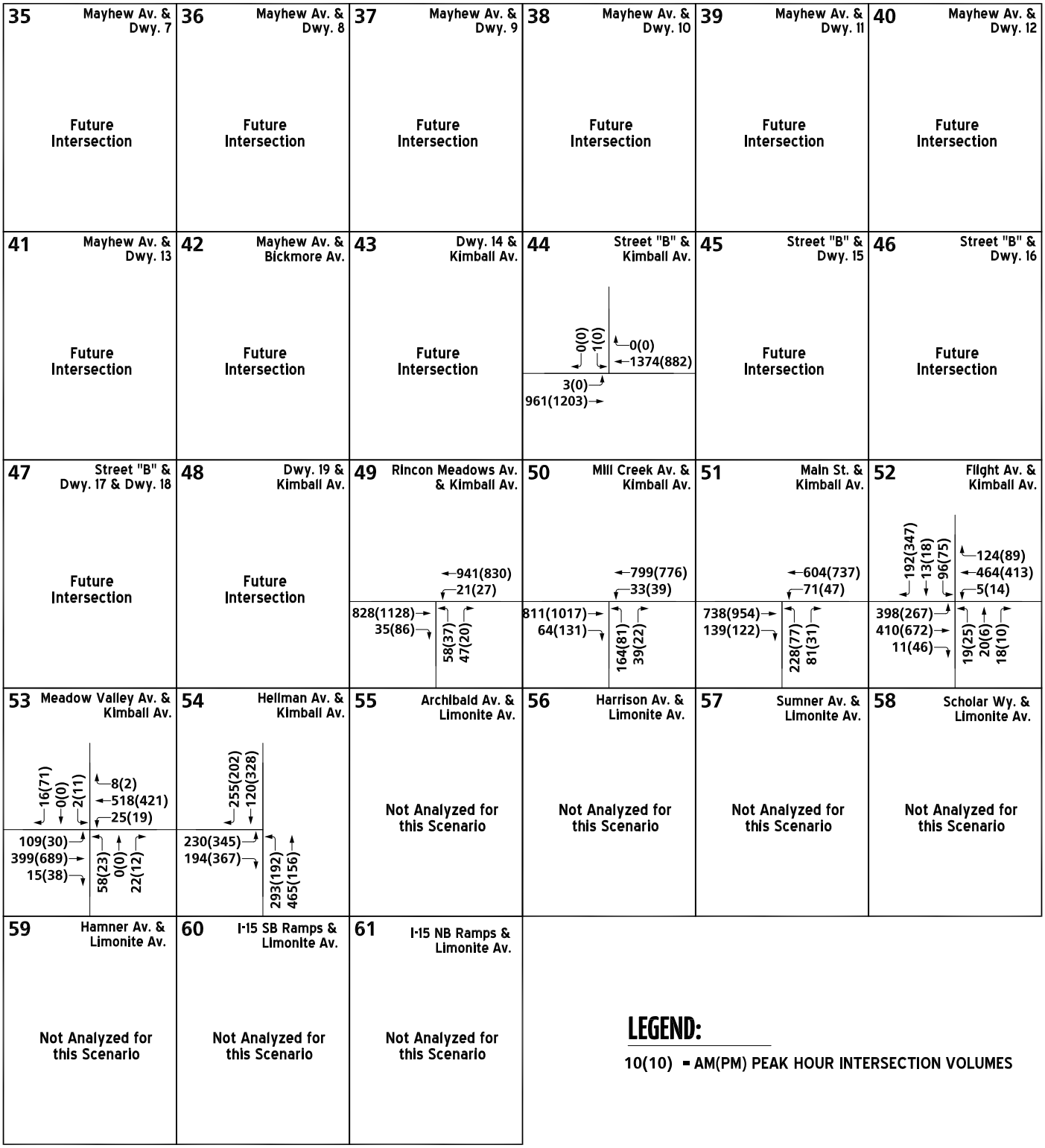


EXHIBIT 7-4 (1OF2): OPENING YEAR CUMULATIVE (2019) WITH PROJECT AVERAGE DAILY TRAFFIC (ADT)

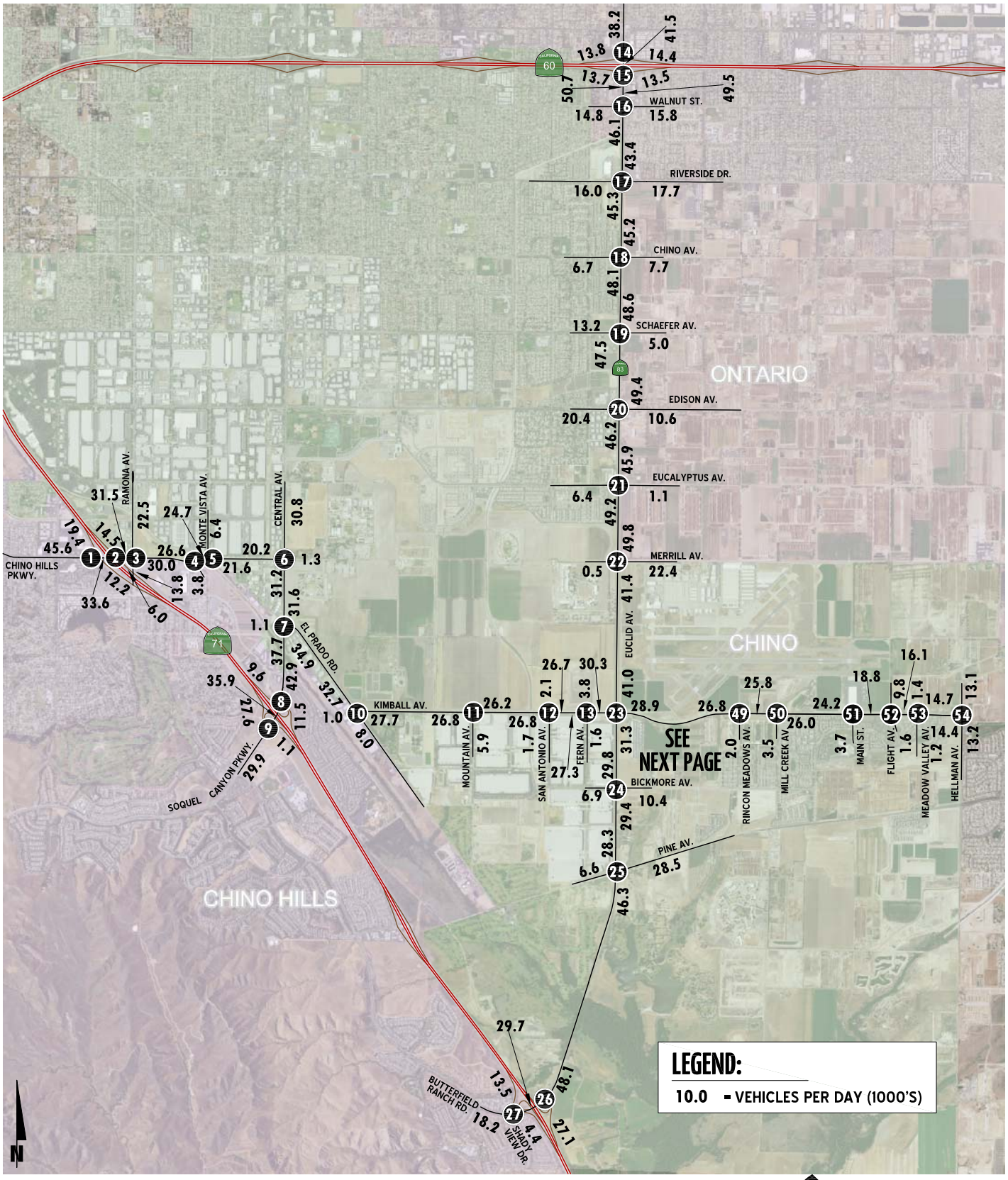


EXHIBIT 7-4 (2OF2): OPENING YEAR CUMULATIVE (2019) WITH PROJECT AVERAGE DAILY TRAFFIC (ADT)

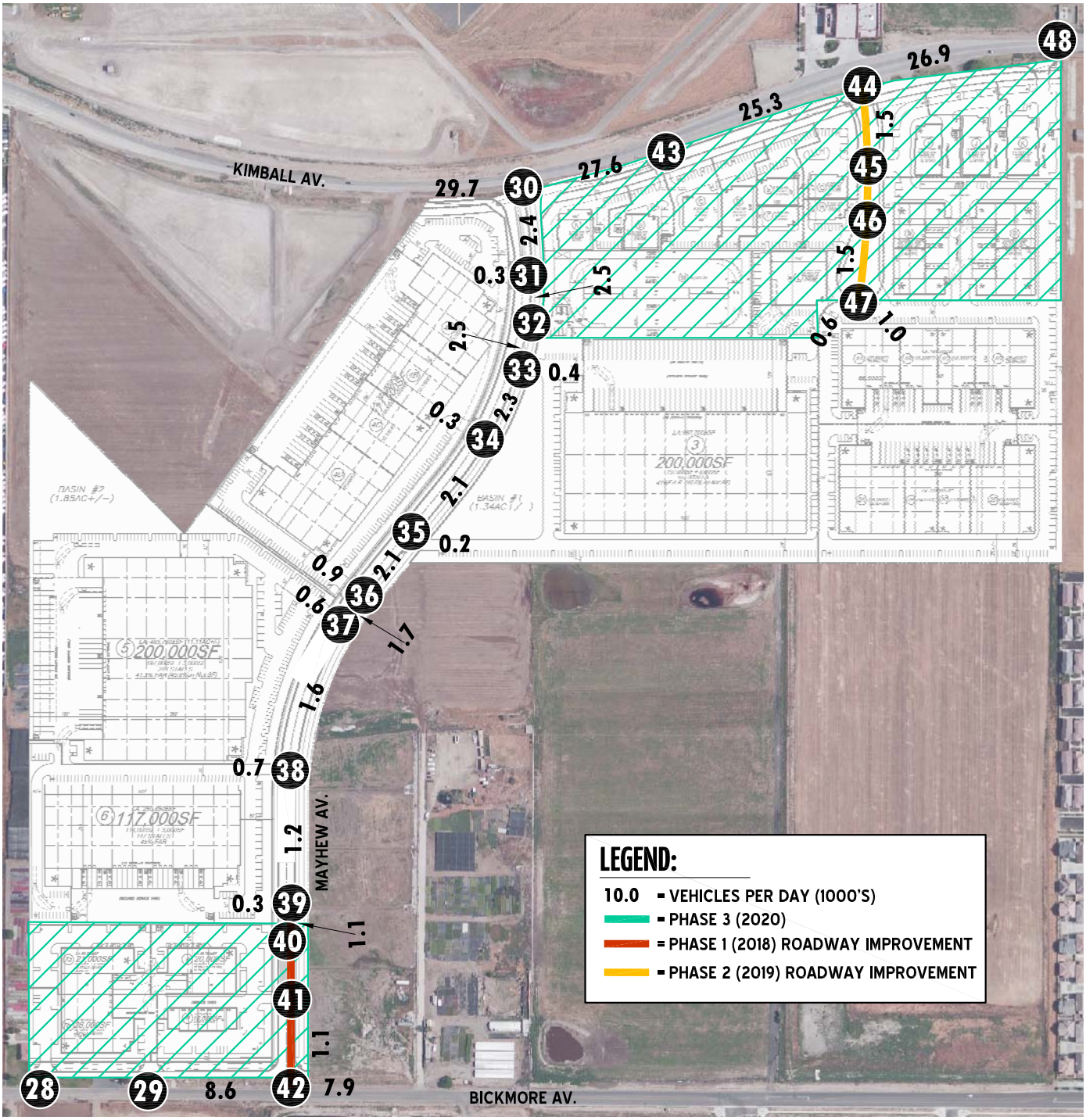


EXHIBIT 7-5 (1OF2): OPENING YEAR CUMULATIVE (2019) WITH PROJECT TRAFFIC VOLUMES (IN PCE)

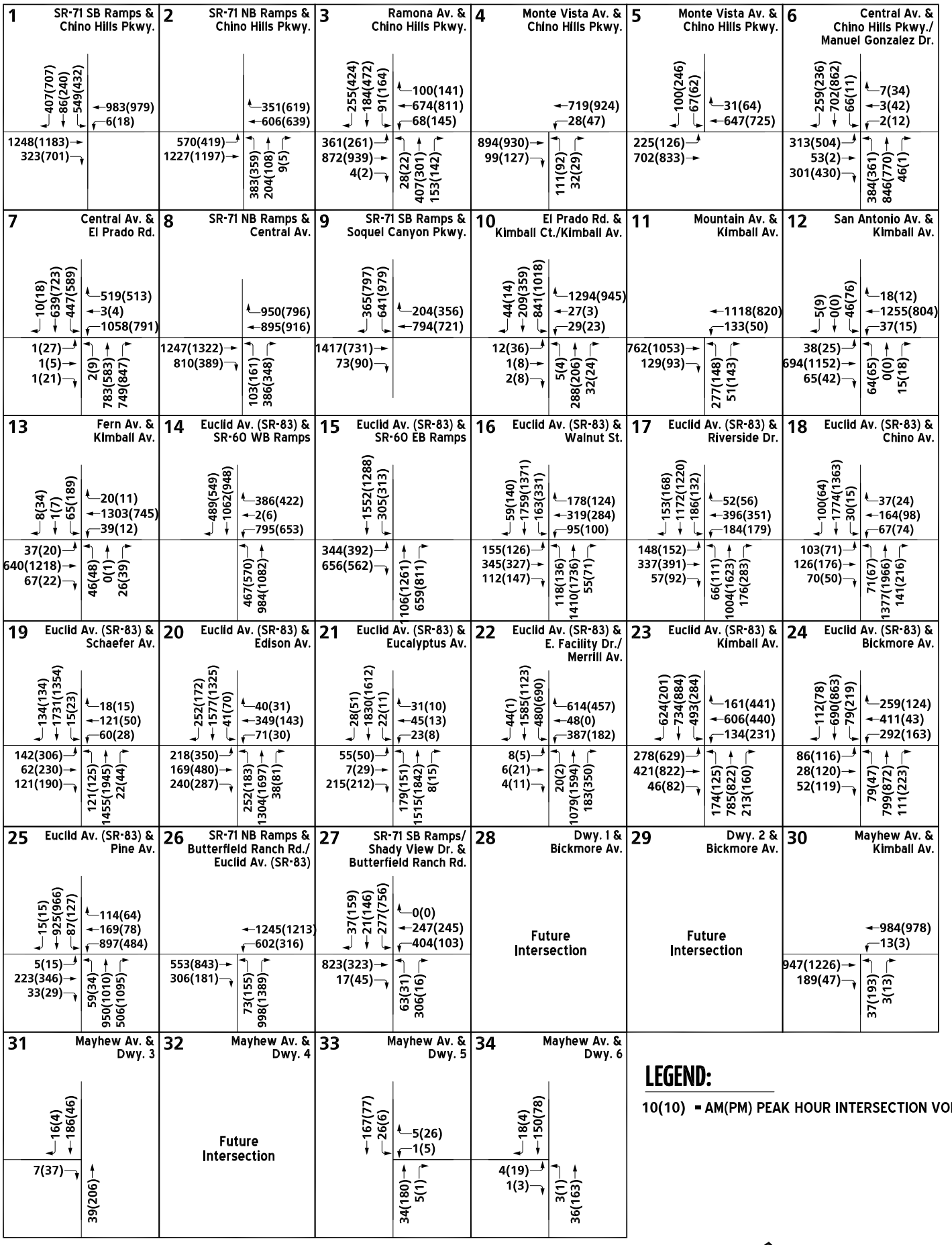
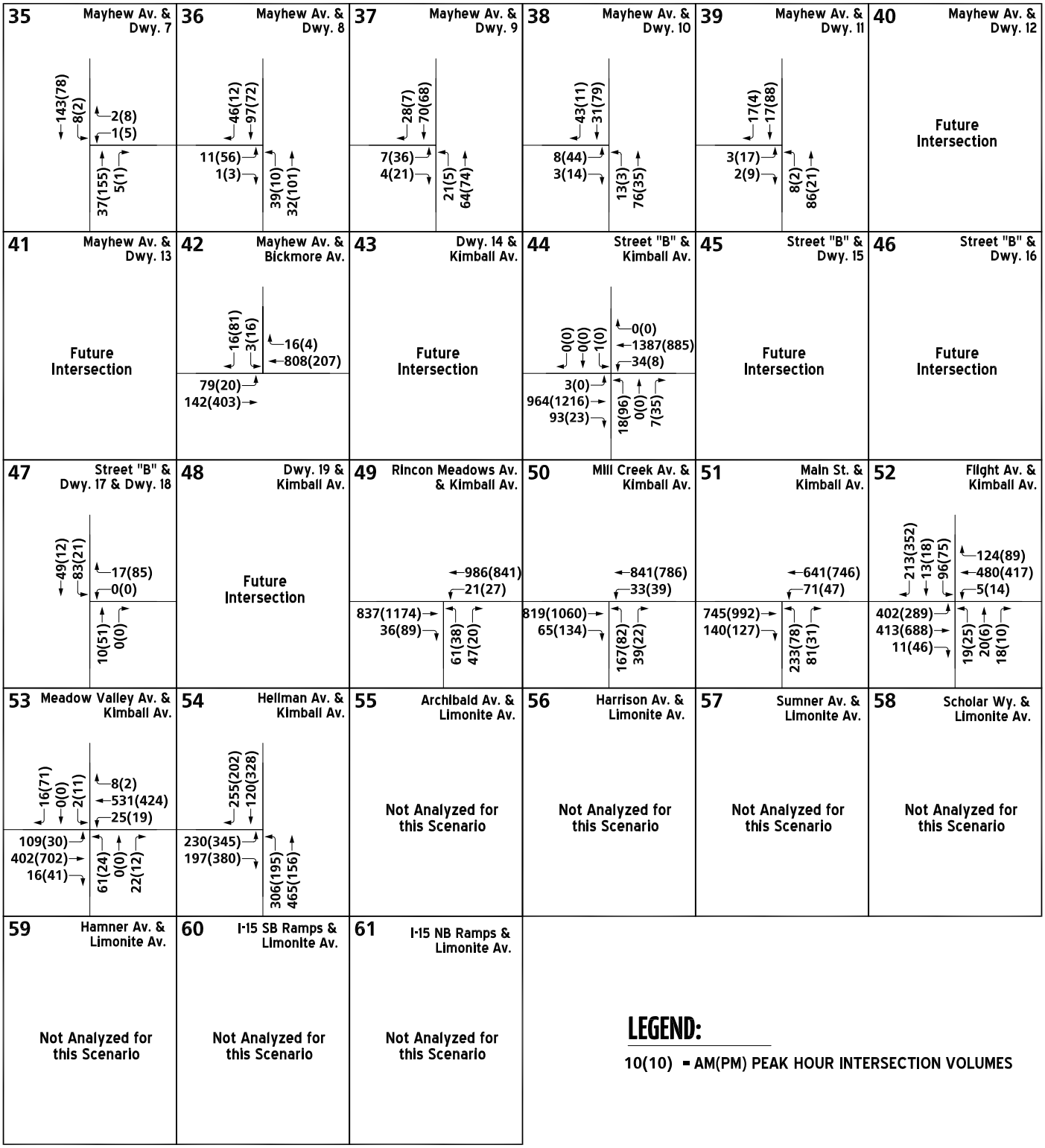


EXHIBIT 7-5 (2OF2): OPENING YEAR CUMULATIVE (2019) WITH PROJECT TRAFFIC VOLUMES (IN PCE)



7.4 INTERSECTION OPERATIONS ANALYSIS

7.4.1 OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT TRAFFIC CONDITIONS

LOS calculations were conducted for the study intersections to evaluate their operations under Opening Year Cumulative (2019) Without Project conditions with roadway and intersection geometrics consistent with Section 7.1 *Roadway Improvements*. As shown in Table 7-1, the following additional study area intersection is anticipated to operate at an unacceptable LOS under Opening Year Cumulative (2019) Without Project traffic conditions, in addition to the location previously identified under Existing, E+P, and Opening Year Cumulative (2018) traffic conditions:

- Central Av. / Chino Hills Pkwy. (#6) – LOS E PM peak hour only

A summary of the peak hour intersection LOS for Opening Year Cumulative (2019) Without Project conditions is shown on Exhibit 7-66. The intersection operations analysis worksheets for Opening Year Cumulative (2019) Without Project traffic conditions are included in Appendix 7.1 of this TIA.

7.4.2 OPENING YEAR CUMULATIVE (2019) WITH PROJECT TRAFFIC CONDITIONS

As shown on Table 7-1 and illustrated on Exhibit 7-7, the following additional study area intersection is anticipated to experience unacceptable LOS with the addition of Project (Phase 2) traffic during the peak hours in addition to those previously identified under Existing, E+P, Opening Year Cumulative (2018), and Opening Year Cumulative (2019) Without Project traffic conditions:

- Street "B" / Kimball Av. (#44) – LOS E AM peak hour only

The intersection operations analysis worksheets for Opening Year Cumulative (2019) With Project traffic conditions are included in Appendix 7.2 of this TIA.

7.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no additional study area intersections that are anticipated to meet either peak hour or planning level (ADT) volume based traffic signal warrants under Opening Year Cumulative (2019) Without Project traffic conditions in addition to those previously warranted under Existing, E+P, and Opening Year Cumulative (2018) traffic conditions (see Appendix 7.3).

However, the intersection of Street B and Kimball is anticipated to meet a peak hour traffic signal warrant for Opening Year Cumulative (2019) With Project traffic conditions (see Appendix 7.4).

Table 7-1

Intersection Analysis for Opening Year Cumulative (2019) Conditions

#	Intersection	Traffic Control[2]	2019 Without Project				2019 With Project				Acceptable LOS
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
			AM	PM	AM	PM	AM	PM	AM	PM	
1	SR-71 SB Ramps / Chino Hills Pkwy.	TS	12.2	19.2	B	B	12.4	19.3	B	B	D
2	SR-71 NB Ramps / Chino Hills Pkwy.	TS	34.5	32.6	C	C	39.3	37.6	D	D	D
3	Ramona Av. / Chino Hills Pkwy.	TS	44.1	48.3	D	D	44.6	50.7	D	D	D
4	Monte Vista Av. West / Chino Hills Pkwy.	CSS	31.5	27.2	D	D	26.6	28.0	D	D	D
5	Monte Vista Av. East / Chino Hills Pkwy.	TS	19.3	16.4	B	B	19.7	16.5	B	B	D
6	Central Av. / Chino Hills Pkwy.	TS	30.2	**55.3**	C	**E**	33.3	**64.4**	C	**E**	D
7	Central Av. / El Prado Rd.	TS	**107.8**	**167.1**	**F**	**F**	**128.7**	**174.7**	**F**	**F**	D
8	Central Av. / SR-71 NB Ramps	TS	9.3	8.0	A	A	9.3	8.0	A	A	D
9	Central Av. / SR-71 SB Ramps	TS	18.2	37.9	B	D	19.7	38.2	B	D	D
10	El Prado Rd. / Kimball Av.	TS	42.2	**100.2**	D	**F**	**63.4**	**104.2**	**E**	**F**	D
11	Mountain Av. / Kimball Av.	TS	13.5	16.4	B	B	15.4	16.8	B	B	D
12	San Antonio Av. / Kimball Av.	TS	16.9	13.7	B	B	17.2	14.1	B	B	D
13	Fern Av. / Kimball Av.	TS	15.5	19.9	B	B	15.7	21.0	B	C	D
14	Euclid Av. (SR-83) / SR-60 WB Ramps	TS	**60.5**	**71.5**	**E**	**E**	**67.6**	**82.9**	**E**	**F**	D
15	Euclid Av. (SR-83) / SR-60 EB Ramps	TS	**70.0**	**84.0**	**E**	**F**	**78.1**	**99.0**	**E**	**F**	D
16	Euclid Av. (SR-83) / Walnut St.	TS	38.1	29.1	D	C	38.9	29.5	D	C	E
17	Euclid Av. (SR-83) / Riverside Dr.	TS	36.3	**88.3**	D	**F**	39.5	**101.2**	D	**F**	D
18	Euclid Av. (SR-83) / Chino Av.	TS	24.5	7.0	C	A	27.1	7.3	C	A	D
19	Euclid Av. (SR-83) / Schaefer Av.	TS	49.1	**58.2**	D	**E**	52.1	**62.3**	D	**E**	D
20	Euclid Av. (SR-83) / Edison Av.	TS	**105.1**	**75.4**	**F**	**E**	**134.9**	**95.8**	**F**	**F**	D
21	Euclid Av. (SR-83) / Eucalyptus Av.	TS	29.7	10.8	C	B	31.7	12.1	C	B	D
22	Euclid Av. (SR-83) / Merrill Av.	TS	**188.9**	**>200.0**	**F**	**F**	**190.3**	**>200.0**	**F**	**F**	D
23	Euclid Av. (SR-83) / Kimball Av.	TS	**104.2**	**147.0**	**F**	**F**	**153.4**	**192.2**	**F**	**F**	D
24	Euclid Av. (SR-83) / Bickmore Av.	TS	**56.0**	30.1	**E**	C	**57.7**	50.9	**E**	D	D
25	Euclid Av. (SR-83) / Pine Av.	TS	**57.1**	50.4	**E**	D	**57.5**	**57.3**	**E**	**E**	D
26	SR-71 NB Ramps / Euclid Av. (SR-83)	TS	22.3	11.7	C	B	25.1	13.4	C	B	D
27	SR-71 SB Ramps / Euclid Av. (SR-83)	TS	51.8	33.7	D	C	53.6	34.3	D	C	D
28	Dwy. 1 / Bickmore Av.		Intersection Does Not Exist				Intersection Does Not Exist				C
29	Dwy. 2 / Bickmore Av.		Intersection Does Not Exist				Intersection Does Not Exist				C
30	Mayhew Av. / Kimball Av.	**TS**	Intersection Does Not Exist				11.0	40.0	B	D	D
31	Mayhew Av. / Dwy. 3	**CSS**	Intersection Does Not Exist				9.4	8.7	A	A	C
32	Mayhew Av. / Dwy. 4	**CSS**	Intersection Does Not Exist				Intersection Does Not Exist				C
33	Mayhew Av. / Dwy. 5	**CSS**	Intersection Does Not Exist				8.8	9.5	A	A	C
34	Mayhew Av. / Dwy. 6	**CSS**	Intersection Does Not Exist				9.6	9.9	A	A	C
35	Mayhew Av. / Dwy. 7	**CSS**	Intersection Does Not Exist				8.9	9.5	A	A	C
36	Mayhew Av. / Dwy. 8	**CSS**	Intersection Does Not Exist				9.9	10.1	A	B	C
37	Mayhew Av. / Dwy. 9	**CSS**	Intersection Does Not Exist				9.4	9.5	A	A	C
38	Mayhew Av. / Dwy. 10	**CSS**	Intersection Does Not Exist				9.3	9.5	A	A	C
39	Mayhew Av. / Dwy. 11	**CSS**	Intersection Does Not Exist				9.0	9.3	A	A	C
40	Mayhew Av. / Dwy. 12		Intersection Does Not Exist				Intersection Does Not Exist				C
41	Mayhew Av. / Dwy. 13		Intersection Does Not Exist				Intersection Does Not Exist				C
42	Mayhew Av. / Bickmore Av.	**CSS**	Intersection Does Not Exist				15.8	11.7	C	B	D

Table 7-1

Intersection Analysis for Opening Year Cumulative (2019) Conditions

#	Intersection	Traffic Control[2]	2019 Without Project				2019 With Project				Acceptable LOS
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
			AM	PM	AM	PM	AM	PM	AM	PM	
43	Dwy. 14 / Kimball Av.		Intersection Does Not Exist				Intersection Does Not Exist				C
44	Street B / Kimball Av.	CSS/**TS**	**33.4**	0.0	**D**	A	**143.5**	10.9	**F**	B	C
45	Street B / Dwy. 15		Intersection Does Not Exist				Intersection Does Not Exist				C
46	Street B / Dwy. 16		Intersection Does Not Exist				Intersection Does Not Exist				C
47	Street B/Dwy. 17 / Dwy. 18	**CSS**	Intersection Does Not Exist				8.4	8.9	A	A	C
48	Dwy. 19 / Kimball Av.		Intersection Does Not Exist				Intersection Does Not Exist				C
49	Rincon Meadows Av. / Kimball Av.	CSS	18.8	23.8	C	C	25.8	31.0	D	D	D
50	Mill Creek Av. / Kimball Av.	TS	13.1	13.2	B	B	13.8	13.7	B	B	D
51	Main St. / Kimball Av.	TS	15.8	12.4	B	B	16.2	12.8	B	B	D
52	Flight Av. / Kimball Av.	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	D
53	Meadow Valley Av. / Kimball Av.	CSS	21.4	18.5	C	C	22.2	18.9	C	C	D
54	Hellman Av. / Kimball Av.[3]	AWS	28.3	24.7	D	C	28.7	25.4	D	D	D
55	Archibald Av. / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D
56	Harrison Av. / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D
57	Sumner Av. / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D
58	Scholar Wy. / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D
59	Hamner Av. / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D
60	I-15 SB Ramps / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D
61	I-15 NB Ramps / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D

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

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

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

[3] Includes additional lanes needed to serve future cumulative development projects. Specifically, a northbound through lane, southbound through lane, southbound right turn lane, and eastbound left turn lane.

EXHIBIT 7-6: SUMMARY OF LOS FOR OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT CONDITIONS

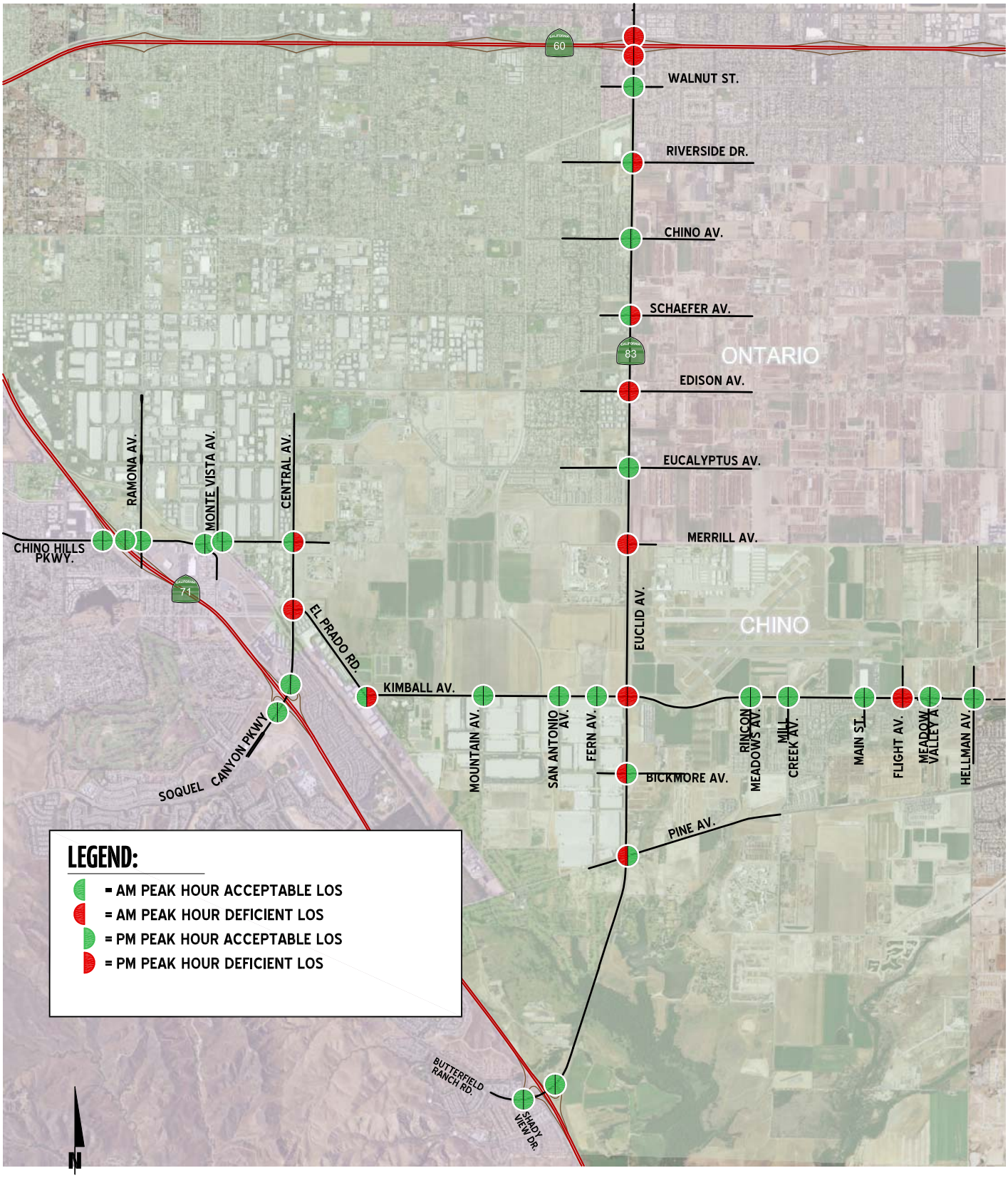
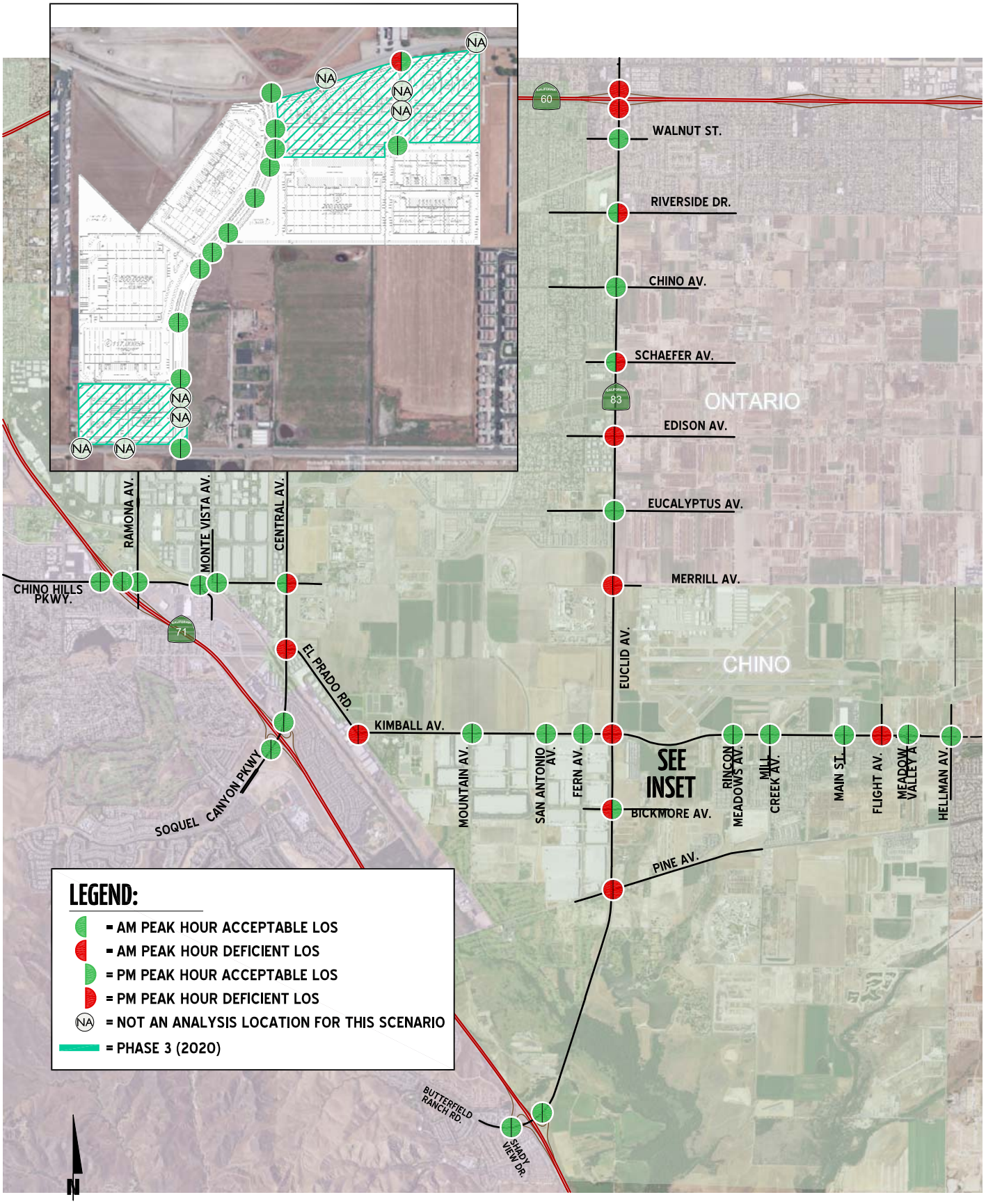


EXHIBIT 7-7: SUMMARY OF LOS FOR OPENING YEAR CUMULATIVE (2019) WITH PROJECT CONDITIONS



7.6 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for Opening Year Cumulative (2019) traffic conditions are presented in Table 7-2. 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 addition of Project (Phase 2) traffic. Worksheets for Opening Year Cumulative (2019) Without and With Project traffic conditions off-ramp queuing analysis are provided in Appendices 7.5 and 7.6.

7.7 BASIC FREEWAY SEGMENT ANALYSIS

Opening Year Cumulative (2019) Without and With Project mainline directional volumes for the AM and PM peak hours are provided on Exhibits 7-8 and 7-9, respectively. As shown on Table 7-3, there are no additional freeway segments that are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours, in addition to those previously identified under Existing, E+P, and Opening Year Cumulative (2018) Without and With Project traffic conditions. Opening Year Cumulative (2019) Without and With Project basic freeway segment analysis worksheets are provided in Appendix 7.7 and 7.8, respectively.

7.8 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for Opening Year Cumulative (2019) conditions and the results of this analysis are presented in Table 7-4. As shown in Table 7-4, the following additional merge and diverge areas are anticipated to operate at an unacceptable LOS during the peak hours for Opening Year Cumulative (2019) Without Project, in addition to those previously identified under Existing, E+P, and Opening Year Cumulative (2018) Without Project traffic conditions:

- SR-71 Freeway, Southbound Loop On-Ramp at Euclid Av. (SR-83) (#3 and #4)– LOS E AM peak hour only (both the upstream and downstream)

No additional merge and diverge areas are anticipated to operate at an unacceptable LOS during the peak hours with the addition of Project (Phase 2) traffic. Opening Year Cumulative (2019) Without and With Project freeway ramp junction operations analysis worksheets are provided in Appendices 7.9 and 7.10, respectively.

Table 7-2

Peak Hour Freeway Off-Ramp Queuing Summary for Opening Year Cumulative (2019) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	2019 Without Project				2019 With Project			
			95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak	PM Peak Hour	AM	PM	AM Peak	PM Peak Hour	AM	PM
SR-71 SB Ramps / Chino Hills Pkwy.	SBL	775	174	203 [2]	Yes	Yes	183	206 [2]	Yes	Yes
	SBL/T	1,210	171	195	Yes	Yes	182	200	Yes	Yes
	SBR	510	216 [2]	514 [2]	Yes	Yes	216 [2]	514 [2]	Yes	Yes
SR-71 NB Ramps / Chino Hills Pkwy.										
	NBL	100	226 [2]	180 [2]	Yes[3]	Yes[3]	226 [2]	180 [2]	Yes[3]	Yes[3]
	NBT/R	530	185 [2]	96	Yes	Yes	185 [2]	96	Yes	Yes
Central Avenue / SR-71 NB Ramps	NBL	1,490	174	235	Yes	Yes	175	236	Yes	Yes
	NBL/R	1,070	174	235	Yes	Yes	175	236	Yes	Yes
Central Avenue / SR-71 SB Ramps	SBL	1,530	393	749	Yes	Yes	432 [2]	777 [2]	Yes	Yes
	SBL/R	740	324	933 [2]	Yes	Yes[3]	346	935 [2]	Yes	Yes[3]
Euclid Avenue/ SR-60 WB Ramps	WBL	400	475 [2]	396 [2]	Yes[3]	Yes	516 [2]	397 [2]	Yes[3]	Yes
	WBL/T/R	1,430	489 [2]	390 [2]	Yes	Yes	527 [2]	402 [2]	Yes	Yes
	WBR	400	310 [2]	280 [2]	Yes	Yes	310 [2]	286 [2]	Yes	Yes
Euclid Avenue/ SR-60 EB Ramps	EBL	900	329 [2]	362 [2]	Yes	Yes	329 [2]	362 [2]	Yes	Yes
	EBL/R	1,270	784 [2]	672 [2]	Yes	Yes	844 [2]	688 [2]	Yes	Yes
SR-71 NB Ramps / Euclid Avenue	NBL	1,745	42	82	Yes	Yes	42	82	Yes	Yes
	NBR	420	734 [2]	1,723 [2]	Yes[3]	Yes[3]	871 [2]	1,848 [2]	Yes[3]	Yes[3]
SR-71 SB Ramps / Euclid Avenue	SLB	1,100	186	449	Yes	Yes	186	449	Yes	Yes
	SBL/T	1,560	183	443	Yes	Yes	183	443	Yes	Yes
	SBR	255	0	41	Yes	Yes	0	41	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-71 or SR-60 Freeway mainline.

Table 7-3

Basic Freeway Segment Analysis for Opening Year Cumulative (2019) Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	2019 Without Project				2019 With Project			
				Density[2]		LOS		Density[2]		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM
SR-71 Freeway	SB	North of Chino Hills Pkwy.	3	21.9	19.5	C	D	22.4	19.6	C	C
		South of Chino Hills Pkwy.	3	16.6	12.3	B	B	16.8	12.4	B	B
		North of Central Av.	3	20.2	19.7	C	C	20.4	19.7	C	C
		South of Euclid Av. (SR-83)	2	**46.4**	32.1	**F**	D	**46.7**	33.1	**F**	D
	NB	North of Chino Hills Pkwy.	3	24.7	24.5	C	C	24.8	24.9	C	C
		South of Chino Hills Pkwy.	3	18.2	18.1	C	C	18.2	18.3	C	C
		North of Central Av.	3	**43.7**	34.7	**E**	D	**43.8**	**35.1**	**E**	**E**
		South of Euclid Av. (SR-83)	3	27.1	27.7	D	D	27.5	27.8	D	D
SR-60 Freeway	WB	West of Euclid Av. (SR-83)	4	29.5	31.6	D	D	29.5	31.8	D	D
		East of Euclid Av. (SR-83)	4	30.4	31.8	D	D	30.6	31.9	D	D
	EB	West of Euclid Av. (SR-83)	4	31.5	26.9	D	D	31.7	26.9	D	D
		East of Euclid Av. (SR-83)	4	31.4	27.6	D	D	31.4	27.7	D	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).

Table 7-4

Freeway Ramp Junction Merge/Diverge Analysis for Opening Year Cumulative (2019) Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	2019 Without Project				2019 With Project			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS
SR-71 Freeway	SB	Off-Ramp at Chino Hills Pkwy.	3	29.8	D	28.8	D	30.2	D	28.8	D
		Off-Ramp at Central Av.	3	28.2	D	30.0	D	28.5	D	30.0	D
		Loop On-Ramp at Euclid Av. (SR-83) (Upstream)	2	**35.6**	**E**	32.9	D	**35.7**	**E**	33.3	D
		Loop On-Ramp at Euclid Av. (SR-83) (Downstream)	2	**35.6**	**E**	32.9	D	**35.7**	**E**	33.3	D
	NB	On-Ramp at Chino Hills Pkwy.	3	28.8	D	28.7	D	28.9	D	29.1	D
		On-Ramp at Central Av.	3	**37.6**	**E**	33.4	D	**37.7**	**E**	33.7	D
		Off-Ramp at Euclid Av. (SR-83)	3	34.6	D	**36.2**	**E**	35.0	D	**36.3**	**E**
SR-60 Freeway	WB	On-Ramp at Euclid Av. (SR-83)	4	28.3	D	29.9	D	28.4	D	30.2	D
		Off-Ramp at Euclid Av. (SR-83)	4	**36.8**	**E**	**37.8**	**E**	**37.1**	**E**	**37.9**	**E**
	EB	Off-Ramp at Euclid Av. (SR-83)	4	**36.3**	**E**	33.4	D	**36.6**	**E**	33.5	D
		On-Ramp at Euclid Av. (SR-83)	4	30.8	D	29.2	D	30.9	D	29.5	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).

EXHIBIT 7-8: OPENING YEAR CUMULATIVE (2019) WITHOUT PROJECT FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

EXHIBIT 7-9: OPENING YEAR CUMULATIVE (2019) WITH PROJECT FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

7.9 RECOMMENDED IMPROVEMENTS

7.9.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as deficient in an effort to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS D or better). The effectiveness of the recommended improvement strategies discussed below to address Opening Year Cumulative (2019) traffic deficiencies is presented in Table 7-5.

Worksheets for Opening Year Cumulative (2019) Without and With Project conditions, with improvements, HCM calculation worksheets are provided in Appendix 7.11 and Appendix 7.12.

7.9.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON OFF-RAMP QUEUES

As shown previously on Table 7-2, there are no movements that are currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows with addition of Project (Phase 2) traffic. However, Table 7-6 shows the queuing results with the proposed intersection improvements shown previously on Table 7-5. Worksheets for Opening Year Cumulative (2019) Without and With Project traffic conditions, with improvements, off-ramp queuing analysis are provided in Appendices 7.13 and 7.14, respectively.

7.9.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

At this time, Caltrans has no fee programs or other improvement programs in place to address the deficiencies caused by development projects in the City of Chino (or other neighboring jurisdictions) on SHS roadway segments. As such, no improvements have been recommended to address the Opening Year Cumulative (2019) deficiencies on the SHS, because there is no feasible mitigation available.

Table 7-5

Intersection Analysis for Opening Year Cumulative (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
6	Central Av. / Chino Hills Pkwy.																	
	- Without Project	TS	1	2	1	1	2	1	1	1	**1>**	1	1	1	28.0	44.2	C	D
	- With Project	TS	1	2	1	1	2	1	1	1	**1>**	1	1	1	28.4	48.3	C	D
7	Central Av. / El Prado Rd.																	
	- Without Project	TS	1	2	**1>**	**2**	3	0	1	1	0	1	1	1>	40.1	35.3	D	D
	- With Project	TS	1	2	**1>**	**2**	3	0	1	1	0	1	1	1>	43.1	36.3	D	D
10	El Prado Rd. / Kimball Av.																	
	- Without Project[4]	TS	1	1	1	**2**	**1**	0	1	1	0	0	1	1>	21.7	24.1	C	C
	- With Project[4]	TS	1	1	1	**2**	**1**	0	1	1	0	0	1	1>	22.3	25.0	C	C
14	Euclid Av. (SR-83) / SR-60 WB Ramps																	
	- Without Project	TS	**2**	2	0	0	2	1	0	0	0	1	1	1	39.7	39.4	D	D
	- With Project	TS	**2**	2	0	0	2	1	0	0	0	1	1	1	43.0	42.4	D	D
15	Euclid Av. (SR-83) / SR-60 EB Ramps																	
	- Without Project	TS	0	2	1	**2**	2	0	1	1	**1**	0	0	0	30.6	32.4	C	C
	- With Project	TS	0	2	1	**2**	2	0	1	1	**1**	0	0	0	36.5	38.2	D	D
17	Euclid Av. (SR-83) / Riverside Dr.																	
	- Without Project	TS	1	**3**	1	1	**3**	1>	1	2	0	1	2	d	46.9	52.7	D	D
	- With Project	TS	1	**3**	1	1	**3**	1>	1	2	0	1	2	d	47.3	53.3	D	D
19	Euclid Av. (SR-83) / Schaefer Av.																	
	- Without Project	TS	1	**3**	1	1	**3**	1	1	1	1	1	1	0	38.8	51.0	D	D
	- With Project	TS	1	**3**	1	1	**3**	1	1	1	1	1	1	0	39.0	53.8	D	D
20	Euclid Av. (SR-83) / Edison Av.																	
	- Without Project	TS	1	**3**	1	1	**3**	1	1	1	1	1	1	0	37.2	35.9	D	D
	- With Project	TS	1	**3**	1	1	**3**	1	1	1	1	1	1	0	37.6	37.7	D	D
22	Euclid Av. (SR-83) / Merrill Av.																	
	- Without Project	TS	1	**3**	1	**2**	**3**	0	0	1	0	0	1	**1>**	39.2	43.3	D	D
	- With Project	TS	1	**3**	1	**2**	**3**	0	0	1	0	0	1	**1>**	40.7	50.4	D	D
23	Euclid Av. (SR-83) / Kimball Av.																	
	- Without Project	TS	1	**3**	1	**2**	**3**	**1>**	**2**	2	0	1	2	**1>**	45.4	44.0	D	D
	- With Project	TS	1	**3**	1	**2**	**3**	**1>**	**2**	2	0	1	2	**1>**	46.5	47.6	D	D
24	Euclid Av. (SR-83) / Bickmore Av.																	
	- Without Project[5]	TS	1	2	0	1	2	1	1	1	1	1	1	**1**	31.9	34.4	C	C
	- With Project[5]	TS	1	2	0	1	2	1	1	1	1	1	1	**1**	33.9	39.5	C	D
25	Euclid Av. (SR-83) / Pine Av.																	
	- Without Project	TS	1	**3**	1>	1	**3**	0	1	1	1>>	2	1	0	52.1	41.0	D	D
	- With Project	TS	1	**3**	1>	1	**3**	0	1	1	1>>	2	1	0	54.1	43.4	D	D
44	Street B / Kimball Av.																	
	- Without Project	**TS**	0	0	0	0	1	0	1	**2**	0	0	**2**	1	3.4	0.0	A	A
	- With Project	**TS**	0	**1**	0	0	1	0	1	**2**	**1**	**1**	**2**	1	18.2	9.1	B	A
52	Flight Av. / Kimball Av.																	
	- Without Project	**TS**	0	1	0	0	1	0	1	2	0	1	**2**	0	25.7	24.5	C	C
	- With Project	**TS**	0	1	0	0	1	0	1	2	0	1	**2**	0	28.1	26.4	C	C

Table 7-5

Intersection Analysis for Opening Year Cumulative (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
54	Hellman Av. / Kimball Av.																	
	- Without Project[6]	**TS**	1	**1**	0	0	**1**	**1**	**1**	0	1	0	0	0	15.4	20.3	B	C
	- With Project[6]	**TS**	1	**1**	0	0	**1**	**1**	**1**	0	1	0	0	0	16.0	21.2	B	C

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

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

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

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

[4] Restripe the southbound approach to provide dual left turns and a single shared through-right turn lane.

[5] Includes new lanes on the westbound approach, implementing split phase for the eastbound and westbound approaches and removing the eastbound (south leg) crosswalk.

[6] Includes additional lanes needed to serve future cumulative development projects. Specifically, a northbound through lane, southbound through lane, southbound right turn lane, and eastbound left turn lane.

Table 7-6

Peak Hour Freeway Off-Ramp Queuing Summary for Opening Year Cumulative (2019) Conditions With Improvements

Intersection	Movement	Available Stacking Distance (Feet)	2019 Without Project				2019 With Project			
			95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak	PM Peak Hour	AM	PM	AM Peak	PM Peak Hour	AM	PM
Euclid Avenue/ SR-60 WB Ramps	WBL	400	432 [2]	407 [2]	Yes[3]	Yes[3]	473 [2]	408 [2]	Yes[3]	Yes[3]
	WBL/T/R	1,430	441 [2]	401 [2]	Yes	Yes	480 [2]	414 [2]	Yes	Yes
	WBR	400	291 [2]	287 [2]	Yes	Yes	291 [2]	294 [2]	Yes	Yes
Euclid Avenue/ SR-60 EB Ramps	EBL	900	307 [2]	338 [2]	Yes	Yes	307 [2]	345 [2]	Yes	Yes
	EBL/R	1,270	292 [2]	285 [2]	Yes	Yes	336 [2]	289 [2]	Yes	Yes
	EBR	**500**	266 [2]	225	Yes	Yes	300 [2]	234 [2]	Yes	Yes

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

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

[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 bacl and affecting the SR-60 Freeway mainline.

8 OPENING YEAR CUMULATIVE (2020) TRAFFIC CONDITIONS

This section discusses the methods used to develop Opening Year Cumulative (2020) Without and With Project traffic forecasts, and the resulting intersection operations, freeway mainline operations, and traffic signal warrant analyses.

8.1 ROADWAY IMPROVEMENTS

The lane configurations and traffic controls assumed to be in place for Opening Year Cumulative (2020) 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).
- The intersection of Street "B" and Kimball Avenue would be constructed under Phase 2 (2019) of the Project and operate with split phasing for the northbound and southbound approaches and with protected left turn phasing on the eastbound and westbound approaches (see previous Exhibit 7-1). It is our understanding that fire engines enter the westerly driveway, drive behind the building, then pull forward into the garage aligning with Street "B". Emergency preemption would be utilized for the egress of emergency vehicles. However, the intersection would operate similar to any other signalized intersection during non-emergency times. The median cannot be extended to the east in order to accommodate returning fire engines. Passenger vehicles wishing to make a southbound left turn, can do so at the signalized intersection of Street "B" and Kimball Avenue.
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for Opening Year Cumulative conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways such as the northern extension of Meadow Valley Avenue at Kimball Avenue and the northern extension of Hellman Avenue north of Kimball Avenue).

8.2 OPENING YEAR CUMULATIVE (2020) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Existing traffic volumes plus an ambient growth of 8.24% (total ambient growth at 2 percent per year compounded over 4 years) 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 (2020) Without Project traffic conditions are shown on Exhibits 8-1 and 8-2.

8.3 OPENING YEAR CUMULATIVE (2020) WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes Opening Year Cumulative (2018) Without Project traffic in conjunction with the addition of Project (Project Buildout) traffic. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Opening Year Cumulative (2020) With Project traffic conditions are shown on Exhibits 8-3 and 8-4.

EXHIBIT 8-1: OPENING YEAR CUMULATIVE (2020) WITHOUT PROJECT AVERAGE DAILY TRAFFIC (ADT)

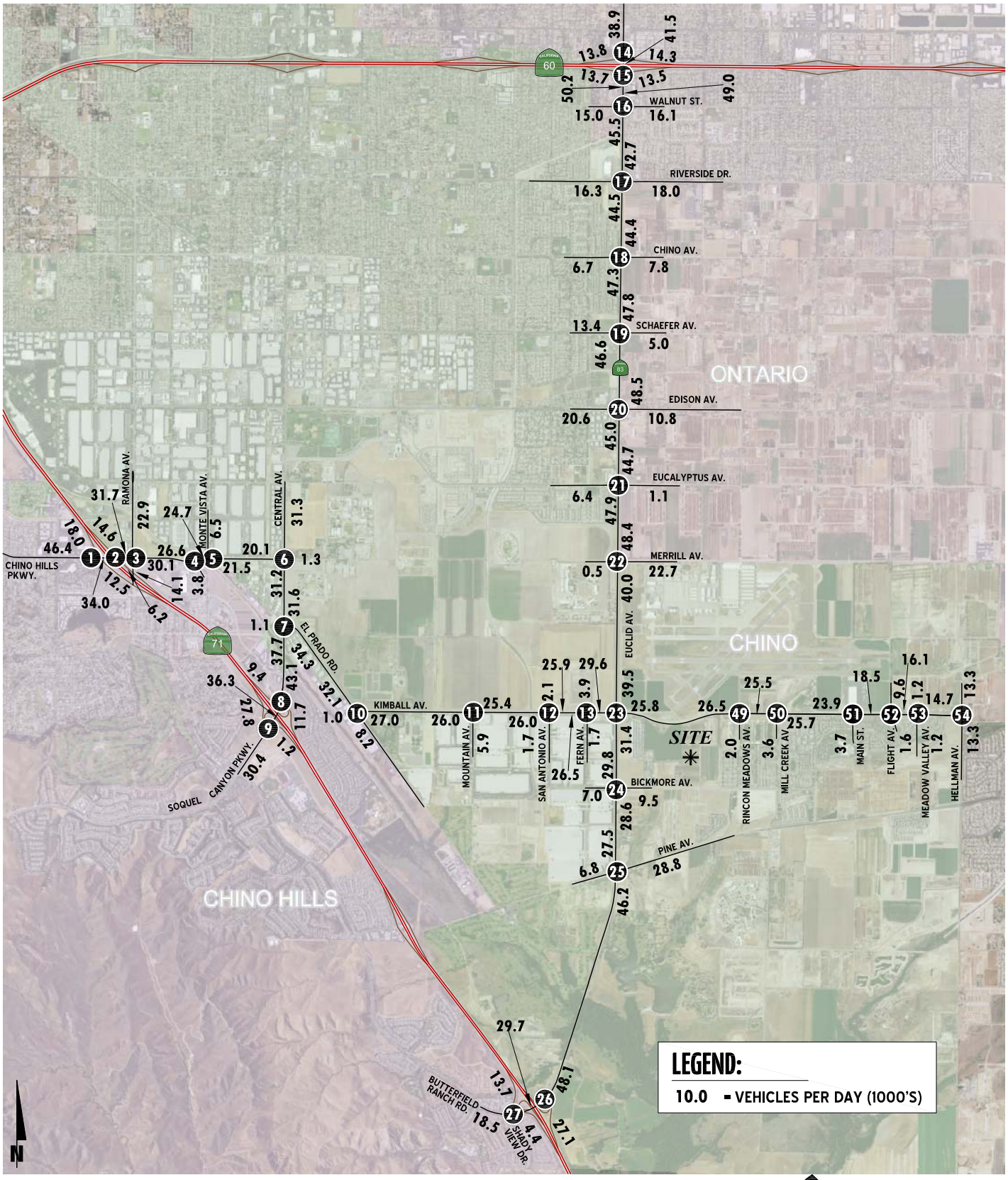


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EXHIBIT 8-2 (1OF2): OPENING YEAR CUMULATIVE (2020) WITHOUT PROJECT TRAFFIC VOLUMES (IN PCE)

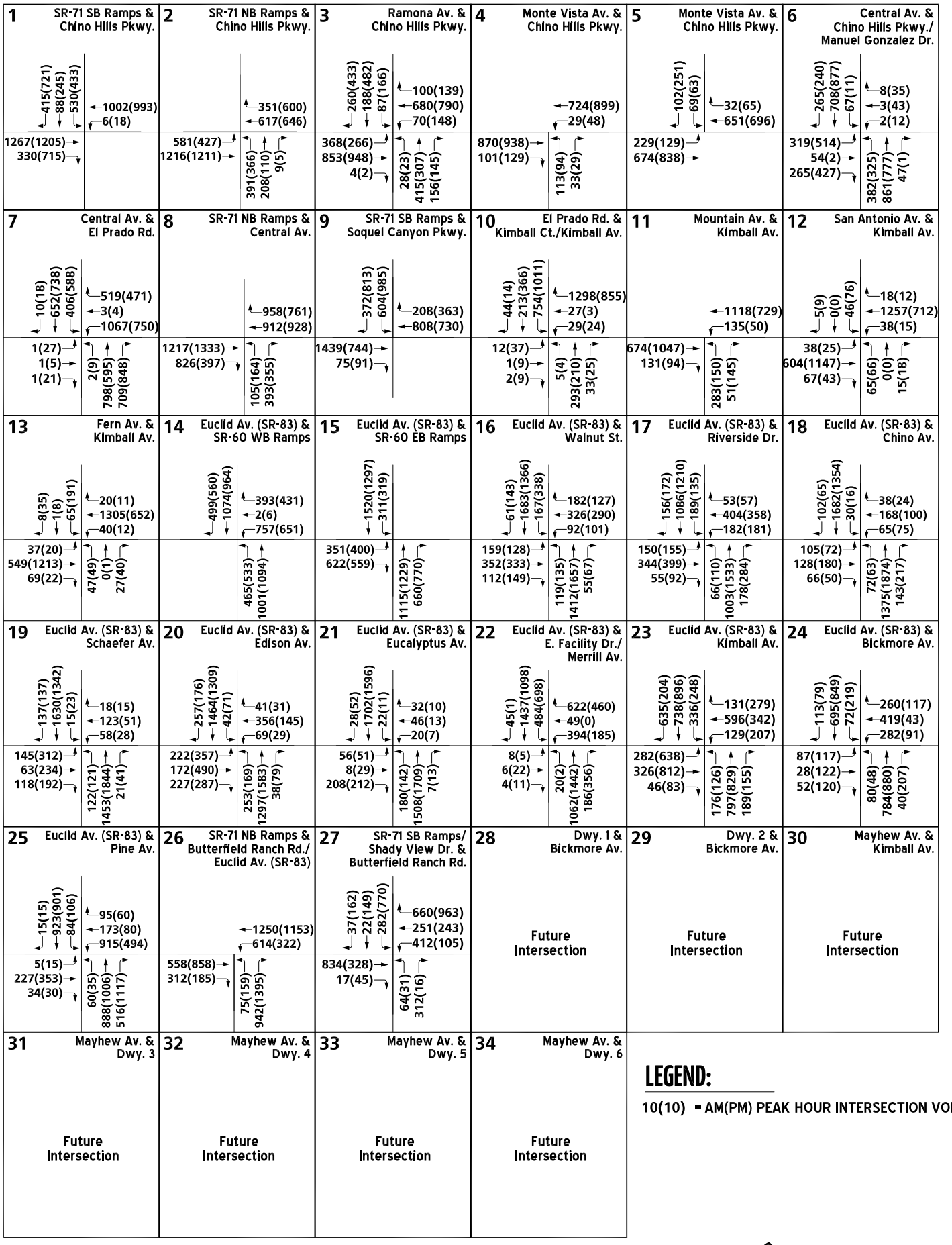

EXHIBIT 8-2 (2OF2): OPENING YEAR CUMULATIVE (2020) WITHOUT PROJECT TRAFFIC VOLUMES (IN PCE)

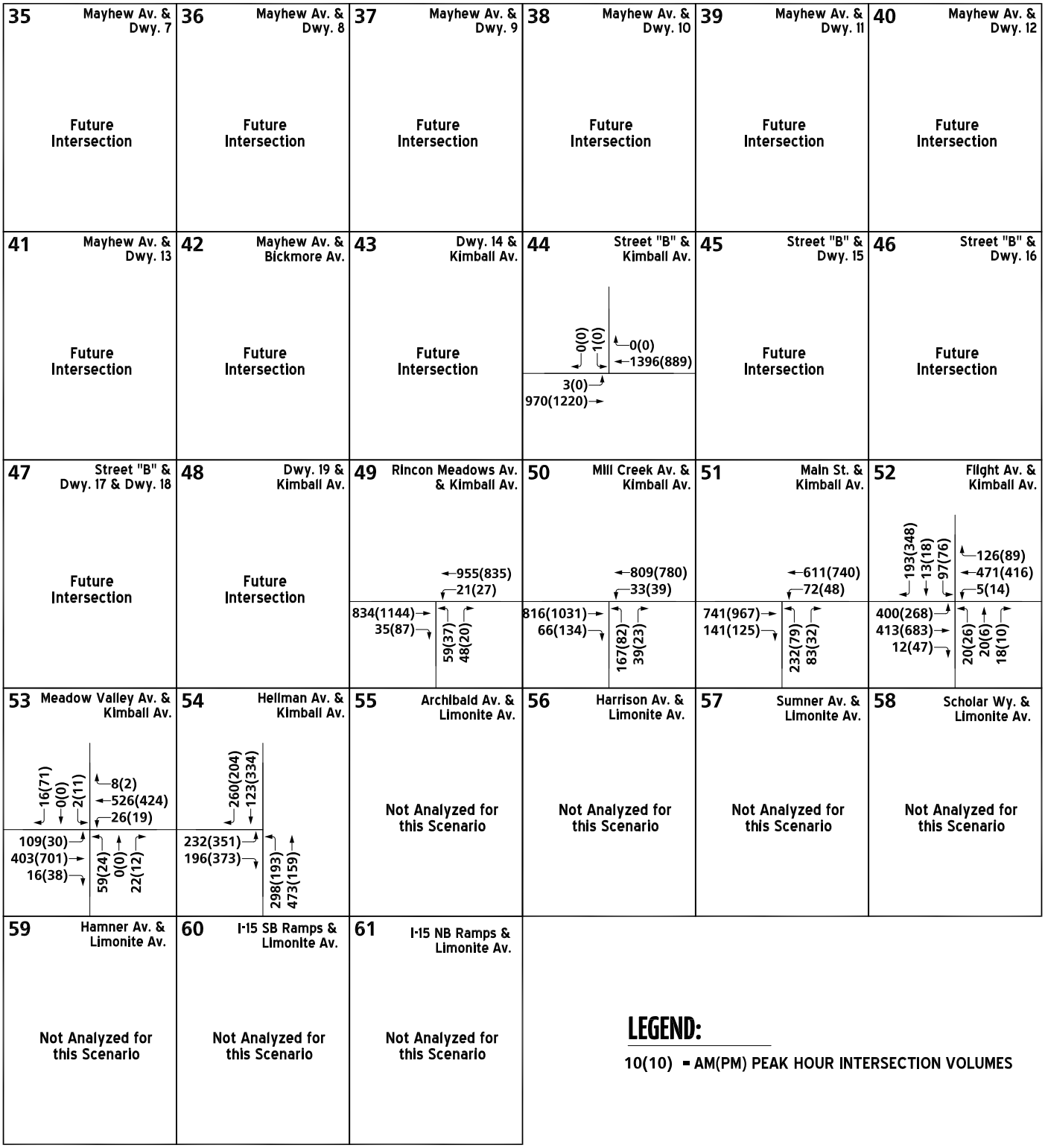

EXHIBIT 8-3 (1OF2): OPENING YEAR CUMULATIVE (2020) WITH PROJECT AVERAGE DAILY TRAFFIC (ADT)

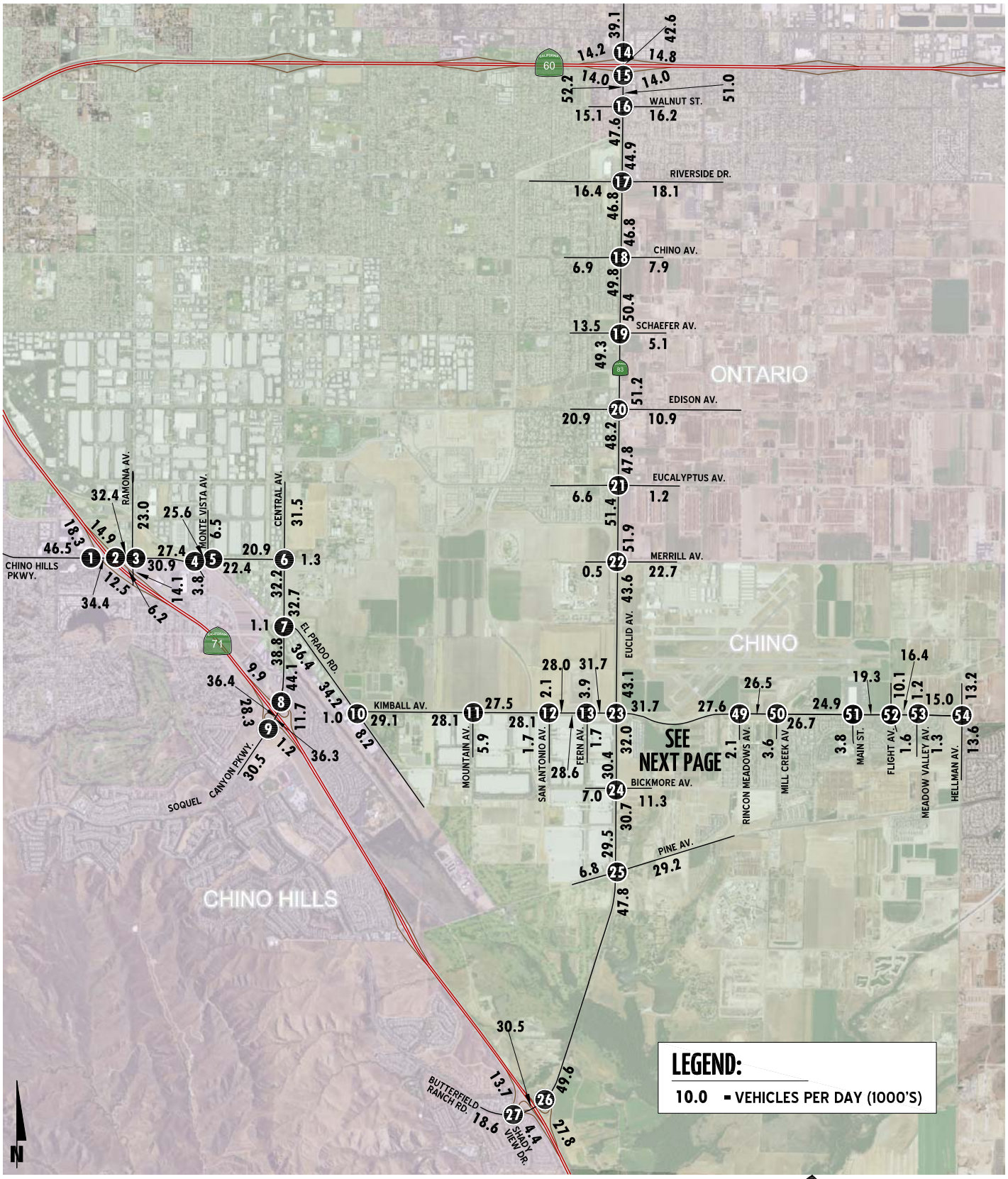

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EXHIBIT 8-3 (2OF2): OPENING YEAR CUMULATIVE (2020) WITH PROJECT AVERAGE DAILY TRAFFIC (ADT)

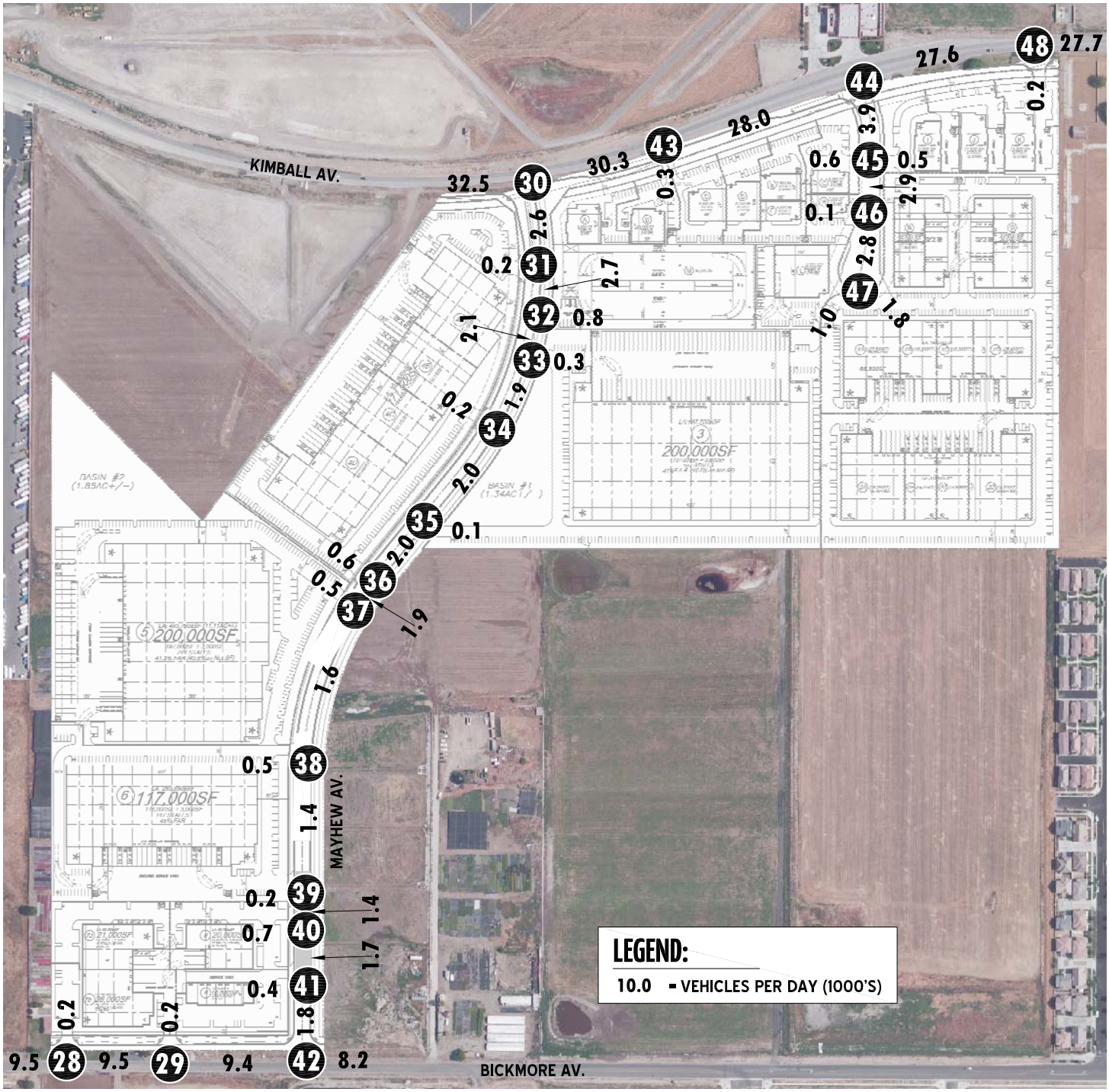


EXHIBIT 8-4 (1OF2): OPENING YEAR CUMULATIVE (2020) WITH PROJECT TRAFFIC VOLUMES (IN PCE)

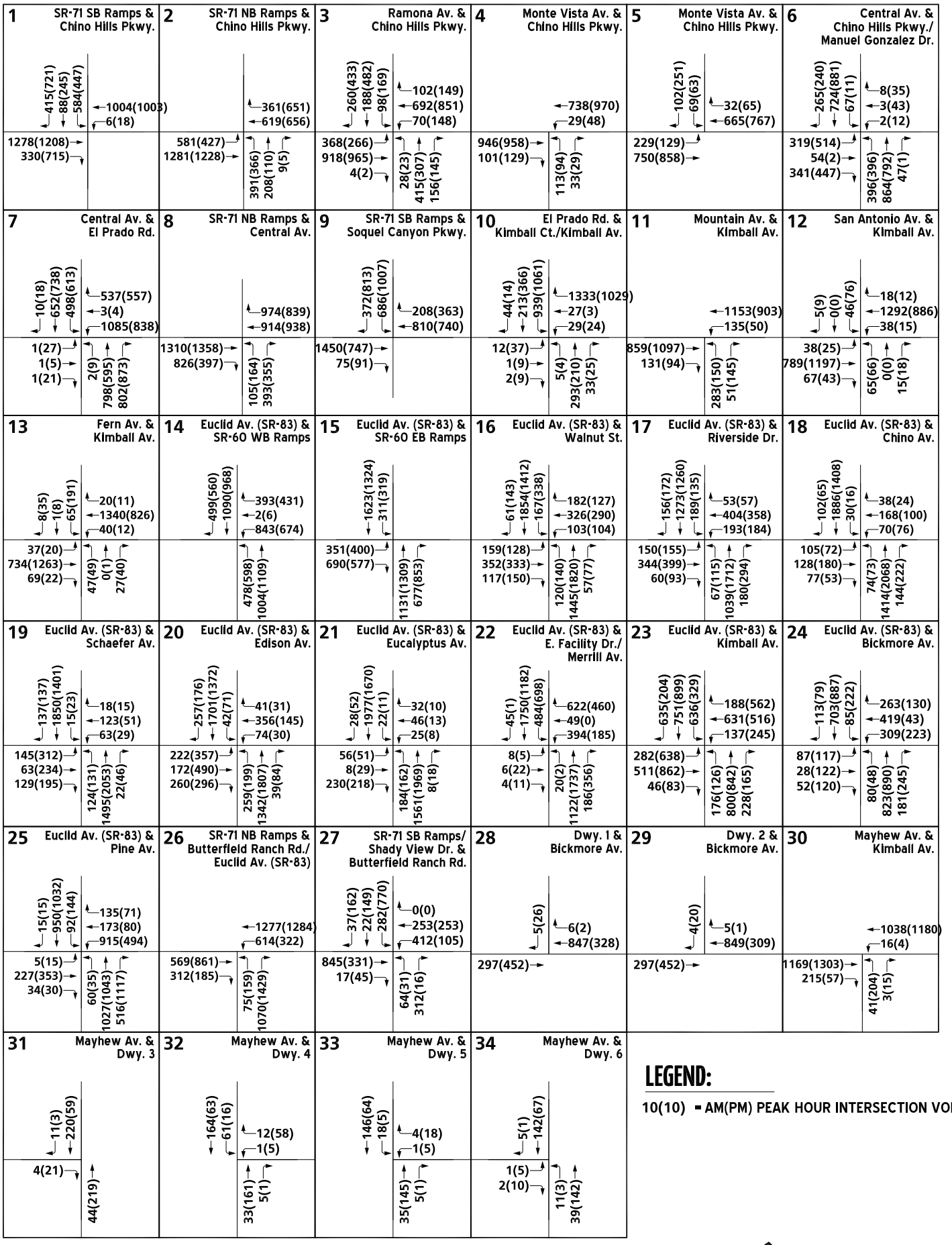
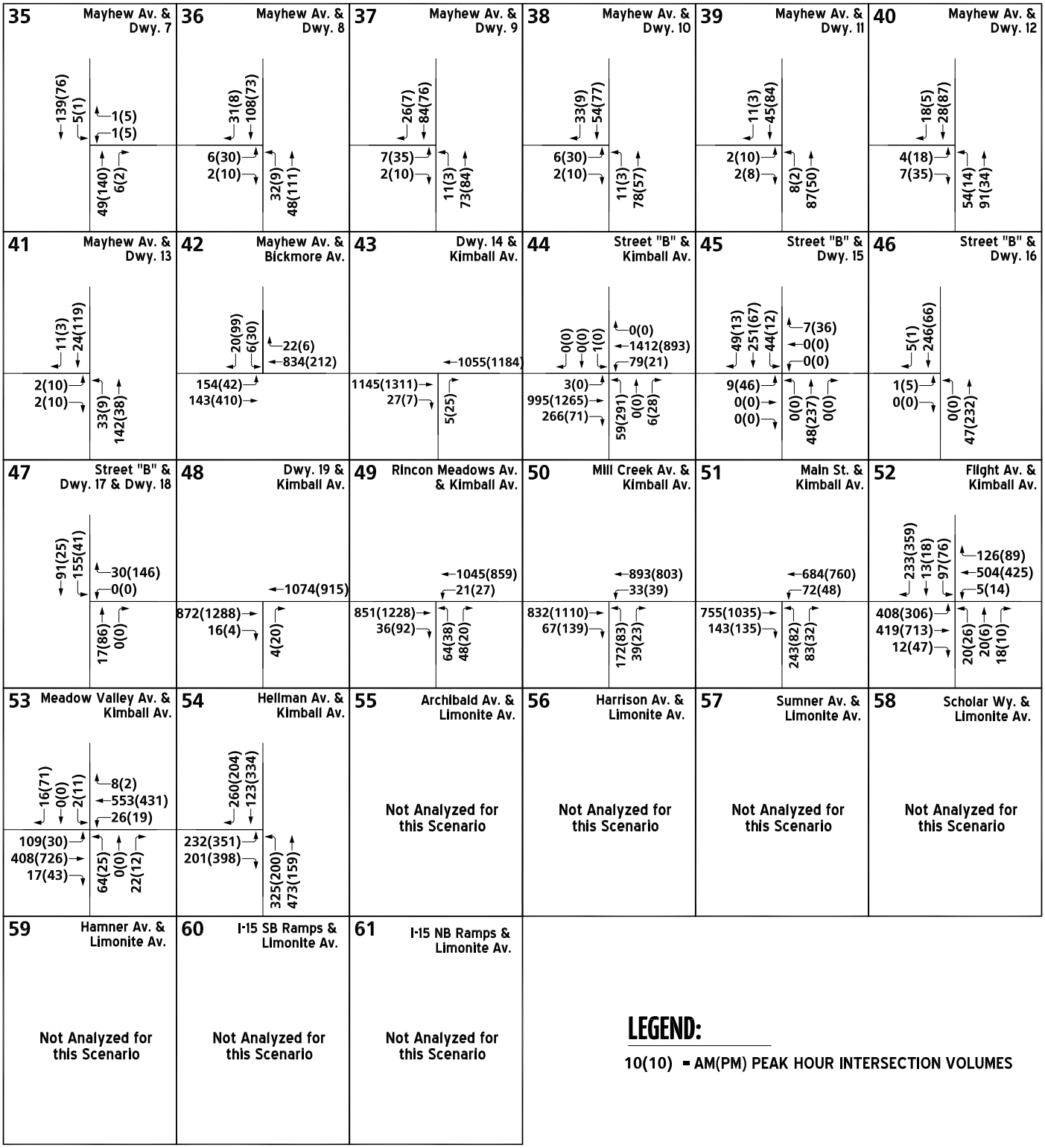


EXHIBIT 8-4 (2OF2): OPENING YEAR CUMULATIVE (2020) WITH PROJECT TRAFFIC VOLUMES (IN PCE)



8.4 INTERSECTION OPERATIONS ANALYSIS

8.4.1 OPENING YEAR CUMULATIVE (2020) WITHOUT PROJECT TRAFFIC CONDITIONS

LOS calculations were conducted for the study intersections to evaluate their operations under Opening Year Cumulative (2020) Without Project conditions with roadway and intersection geometrics consistent with Section 8.1 *Roadway Improvements*. As shown in Table 8-1, the following additional study area intersections are anticipated to operate at an unacceptable LOS under Opening Year Cumulative (2020) Without Project traffic conditions, in addition to the intersections previously identified under Existing, E+P, and Opening Year Cumulative (2018 and 2019) traffic conditions:

- SR-71 Southbound Ramps / Euclid Av. (SR-83) (#27) – LOS E AM peak hour only

A summary of the peak hour intersection LOS for Opening Year Cumulative (2020) Without Project conditions is shown on Exhibit 8-5. The intersection operations analysis worksheets for Opening Year Cumulative (2020) Without Project traffic conditions are included in Appendix 8.1 of this TIA.

8.4.2 OPENING YEAR CUMULATIVE (2020) WITH PROJECT TRAFFIC CONDITIONS

As shown on Table 8-1 and illustrated on Exhibit 8-6, the following additional study area intersections are anticipated to experience unacceptable LOS with the addition of Project (Project Buildout) traffic during one or more peak hours in addition to those previously identified under Existing, E+P, Opening Year Cumulative (2018 and 2019), and Opening Year Cumulative (2020) Without Project traffic conditions:

- Mayhew Av. / Kimball Av. (#30) – LOS E PM peak hour only
- Street “B” / Kimball Av. (#44) – LOS F AM peak hour only

The intersection operations analysis worksheets for Opening Year Cumulative (2020) With Project traffic conditions are included in Appendix 8.2 of this TIA.

8.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

There are no additional study area intersections that are anticipated to meet either peak hour or planning level (ADT) volume based traffic signal warrants under Opening Year Cumulative (2020) Without and With Project traffic conditions in addition to those previously warranted under Existing, E+P, and Opening Year Cumulative (2018 and 2019) traffic conditions (see Appendix 8.3 and Appendix 8.4).

Table 8-1

Intersection Analysis for Opening Year Cumulative (2020) Conditions

#	Intersection	Traffic Control[2]	2020 Without Project				2020 With Project				Acceptable LOS
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
			AM	PM	AM	PM	AM	PM	AM	PM	
1	SR-71 SB Ramps / Chino Hills Pkwy.	TS	12.3	20.5	B	C	12.6	20.6	B	C	D
2	SR-71 NB Ramps / Chino Hills Pkwy.	TS	42.4	34.8	D	C	49.4	43.8	D	D	D
3	Ramona Av. / Chino Hills Pkwy.	TS	45.3	49.8	D	D	46.5	54.8	D	D	D
4	Monte Vista Av. West / Chino Hills Pkwy.	CSS	25.9	28.4	D	D	29.8	30.2	D	D	D
5	Monte Vista Av. East / Chino Hills Pkwy.	TS	19.9	16.5	B	B	20.2	16.7	C	B	D
6	Central Av. / Chino Hills Pkwy.	TS	31.2	**57.7**	C	**E**	38.6	**75.8**	D	**E**	D
7	Central Av. / El Prado Rd.	TS	**113.7**	**173.3**	**F**	**F**	**154.7**	**189.5**	**F**	**F**	D
8	Central Av. / SR-71 NB Ramps	TS	10.2	8.1	B	A	10.2	8.1	B	A	D
9	Central Av. / SR-71 SB Ramps	TS	18.7	38.7	B	D	21.7	39.1	C	D	D
10	El Prado Rd. / Kimball Av.	TS	44.4	**105.7**	D	**F**	**90.9**	**115.1**	**F**	**F**	D
11	Mountain Av. / Kimball Av.	TS	13.9	17.1	B	B	19.1	18.6	B	B	D
12	San Antonio Av. / Kimball Av.	TS	17.5	14.0	B	B	18.5	15.1	B	B	D
13	Fern Av. / Kimball Av.	TS	16.1	21.2	B	C	17.0	24.6	B	C	D
14	Euclid Av. (SR-83) / SR-60 WB Ramps	TS	**64.1**	**73.9**	**E**	**E**	**77.1**	**92.0**	**E**	**F**	D
15	Euclid Av. (SR-83) / SR-60 EB Ramps	TS	**74.6**	**90.6**	**E**	**F**	**88.6**	**115.6**	**F**	**F**	D
16	Euclid Av. (SR-83) / Walnut St.	TS	38.9	29.7	D	C	41.2	29.9	D	C	E
17	Euclid Av. (SR-83) / Riverside Dr.	TS	37.8	**94.3**	D	**F**	41.1	**121.8**	D	**F**	D
18	Euclid Av. (SR-83) / Chino Av.	TS	25.3	7.2	C	A	34.2	10.5	C	B	D
19	Euclid Av. (SR-83) / Schaefer Av.	TS	49.7	**59.7**	D	**E**	**57.3**	**73.9**	**E**	**E**	D
20	Euclid Av. (SR-83) / Edison Av.	TS	**108.9**	**83.3**	**F**	**F**	**160.5**	**120.5**	**F**	**F**	D
21	Euclid Av. (SR-83) / Eucalyptus Av.	TS	30.1	11.0	C	B	34.7	14.0	C	B	D
22	Euclid Av. (SR-83) / Merrill Av.	TS	**193.3**	**>200.0**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**	D
23	Euclid Av. (SR-83) / Kimball Av.	TS	**107.6**	**147.9**	**F**	**F**	**>200.0**	**159.8**	**F**	**F**	D
24	Euclid Av. (SR-83) / Bickmore Av.	TS	**55.5**	30.6	**E**	C	**71.4**	**80.7**	**E**	**F**	D
25	Euclid Av. (SR-83) / Pine Av.	TS	**59.2**	51.3	**E**	D	**60.2**	**63.1**	**E**	**E**	D
26	SR-71 NB Ramps / Euclid Av. (SR-83)	TS	27.8	11.8	C	B	30.7	12.7	C	B	D
27	SR-71 SB Ramps / Euclid Av. (SR-83)	TS	**58.2**	33.8	**E**	C	**62.5**	35.1	**E**	D	D
28	Dwy. 1 / Bickmore Av.	**CSS**	Intersection Does Not Exist				16.1	10.4	C	B	C
29	Dwy. 2 / Bickmore Av.	**CSS**	Intersection Does Not Exist				16.1	10.2	C	B	C
30	Mayhew Av. / Kimball Av.	**TS**	Intersection Does Not Exist				20.9	**59.7**	C	**E**	D
31	Mayhew Av. / Dwy. 3	**CSS**	Intersection Does Not Exist				9.5	8.7	A	A	C
32	Mayhew Av. / Dwy. 4	**CSS**	Intersection Does Not Exist				8.7	9.6	A	A	C
33	Mayhew Av. / Dwy. 5	**CSS**	Intersection Does Not Exist				8.8	9.3	A	A	C
34	Mayhew Av. / Dwy. 6	**CSS**	Intersection Does Not Exist				9.3	9.1	A	A	C
35	Mayhew Av. / Dwy. 7	**CSS**	Intersection Does Not Exist				9.1	9.4	A	A	C
36	Mayhew Av. / Dwy. 8	**CSS**	Intersection Does Not Exist				9.7	9.7	A	A	C
37	Mayhew Av. / Dwy. 9	**CSS**	Intersection Does Not Exist				9.5	9.6	A	A	C
38	Mayhew Av. / Dwy. 10	**CSS**	Intersection Does Not Exist				9.4	9.5	A	A	C
39	Mayhew Av. / Dwy. 11	**CSS**	Intersection Does Not Exist				9.0	9.2	A	A	C
40	Mayhew Av. / Dwy. 12	**CSS**	Intersection Does Not Exist				9.1	9.3	A	A	C
41	Mayhew Av. / Dwy. 13	**CSS**	Intersection Does Not Exist				9.3	9.4	A	A	C
42	Mayhew Av. / Bickmore Av.	**CSS**	Intersection Does Not Exist				16.8	12.5	C	B	D

Table 8-1

Intersection Analysis for Opening Year Cumulative (2020) Conditions

#	Intersection	Traffic Control[2]	2020 Without Project				2020 With Project				Acceptable LOS
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
			AM	PM	AM	PM	AM	PM	AM	PM	
43	Dwy. 14 / Kimball Av.	**CSS**	Intersection Does Not Exist				13.4	15.2	B	C	C
44	Street B / Kimball Av.	CSS/**TS**	**34.3**	0.0	**D**	A	**150.1**	16.1	**F**	B	C
45	Street B / Dwy. 15	**CSS**	Intersection Does Not Exist				12.3	12.3	B	B	C
46	Street B / Dwy. 16	**CSS**	Intersection Does Not Exist				10.7	10.4	B	B	C
47	Street B/Dwy. 17 / Dwy. 18	**CSS**	Intersection Does Not Exist				8.5	9.4	A	A	C
48	Dwy. 19 / Kimball Av.	**CSS**	Intersection Does Not Exist				11.7	14.9	B	B	C
49	Rincon Meadows Av. / Kimball Av.	CSS	19.2	24.4	C	C	27.7	33.2	D	D	D
50	Mill Creek Av. / Kimball Av.	TS	13.3	13.4	B	B	15.1	14.5	B	B	D
51	Main St. / Kimball Av.	TS	16.0	12.6	B	B	16.9	13.5	B	B	D
52	Flight Av. / Kimball Av.	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	D
53	Meadow Valley Av. / Kimball Av.	CSS	21.9	18.9	C	C	23.6	19.7	C	C	D
54	Hellman Av. / Kimball Av.[3]	AWS	30.0	25.9	D	D	31.2	27.3	D	D	D
55	Archibald Av. / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D
56	Harrison Av. / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D
57	Sumner Av. / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D
58	Scholar Wy. / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D
59	Hamner Av. / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D
60	I-15 SB Ramps / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D
61	I-15 NB Ramps / Limonite Av.	TS	Intersection Not Evaluated				Intersection Not Evaluated				D

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

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

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

[3] Includes additional lanes needed to serve future cumulative development projects. Specifically, a northbound through lane, southbound through lane, southbound right turn lane, and eastbound left turn lane.

EXHIBIT 8-5: SUMMARY OF LOS FOR OPENING YEAR CUMULATIVE (2020) WITHOUT PROJECT CONDITIONS

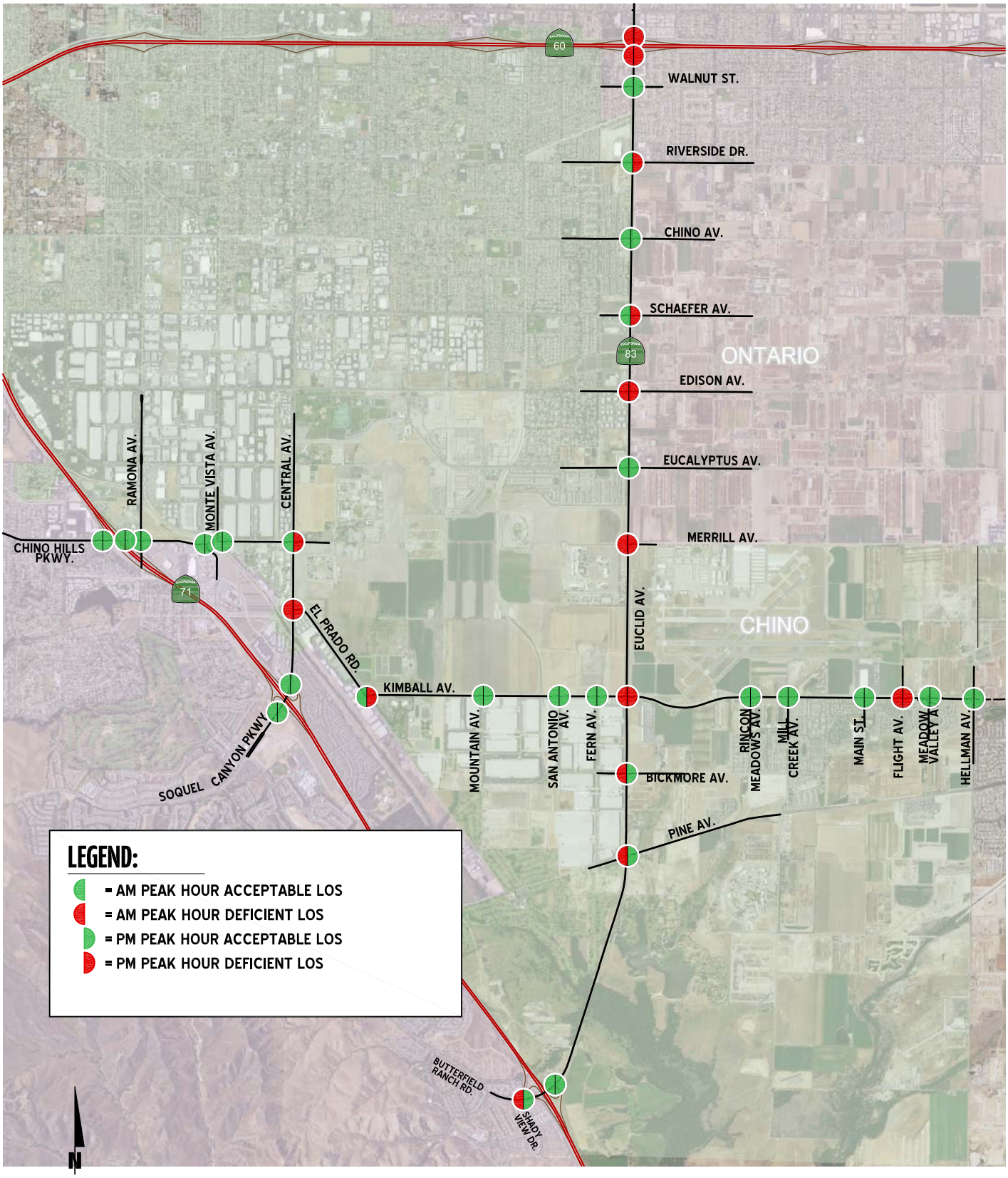
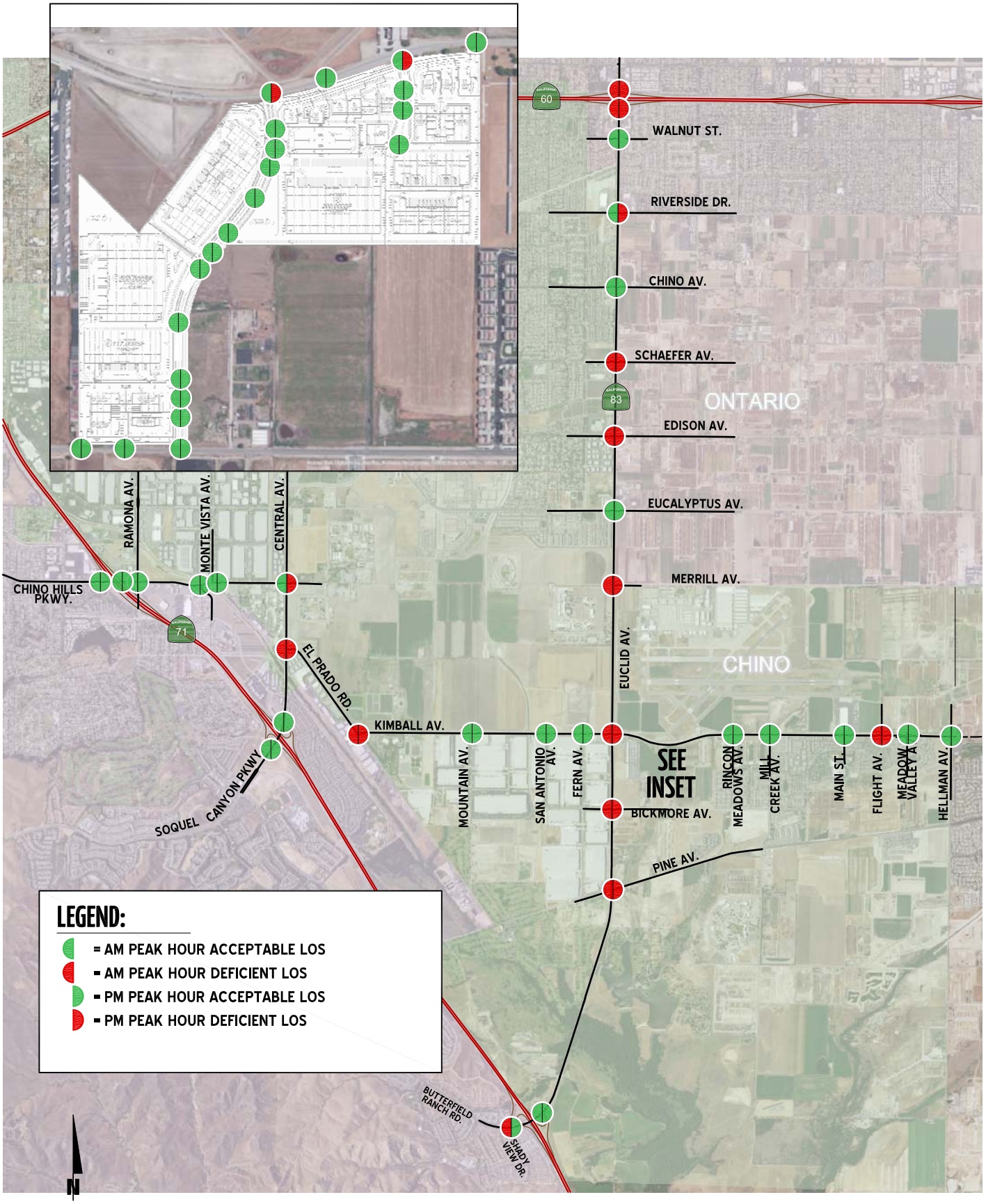


EXHIBIT 8-6: SUMMARY OF LOS FOR OPENING YEAR CUMULATIVE (2020) WITH PROJECT CONDITIONS



8.6 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for Opening Year Cumulative (2020) traffic conditions are presented in Table 8-2. As shown on Table 8-2, there are no movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows with addition of Project (Project Buildout) traffic. Worksheets for Opening Year Cumulative (2020) Without and With Project traffic conditions off-ramp queuing analysis are provided in Appendices 8.5 and 8.6.

8.7 BASIC FREEWAY SEGMENT ANALYSIS

Opening Year Cumulative (2020) mainline directional volumes for the AM and PM peak hours are provided on Exhibits 8-7 and 8-8. As shown on Table 8-3, there are no additional freeway segments that are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours, in addition to those previously identified under Existing, E+P, and Opening Year Cumulative (2018 and 2019) Without and With Project traffic conditions. Opening Year Cumulative (2020) Without and With Project basic freeway segment analysis worksheets are provided in Appendix 8.7 and 8.8, respectively.

8.8 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for Opening Year Cumulative (2020) conditions and the results of this analysis are presented in Table 8-4. As shown in Table 8-4, there are no additional merge and diverge areas anticipated to operate at an unacceptable LOS for Opening Year Cumulative (2020) Without Project, in addition to those previously identified under Existing, E+P, and Opening Year Cumulative (2018 and 2019) traffic conditions.

There are no additional merge and diverge areas that are anticipated to operate at an unacceptable LOS during the peak hours with the addition of Project (Project buildout) traffic conditions. Opening Year Cumulative (2020) Without and With Project freeway ramp junction operations analysis worksheets are provided in Appendices 8.9 and 8.10, respectively.

Table 8-2

Peak Hour Freeway Off-Ramp Queuing Summary for Opening Year Cumulative (2020) Conditions

Intersection	Movement	Available Stacking Distance (Feet)	2020 Without Project				2020 With Project			
			95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak	PM Peak Hour	AM	PM	AM Peak	PM Peak Hour	AM	PM
SR-71 SB Ramps / Chino Hills Pkwy.	SBL	775	178	225 [2]	Yes	Yes	202 [2]	232 [2]	Yes	Yes
	SBL/T	1,210	174	201	Yes	Yes	193	205	Yes	Yes
	SBR	510	224 [2]	527 [2]	Yes	Yes[3]	224 [2]	527 [2]	Yes	Yes[3]
SR-71 NB Ramps / Chino Hills Pkwy.										
	NBL	100	230 [2]	184 [2]	Yes[3]	Yes[3]	230 [2]	184 [2]	Yes[3]	Yes[3]
	NBT/R	530	190 [2]	97	Yes	Yes	190 [2]	97	Yes	Yes
Central Avenue / SR-71 NB Ramps	NBL	1,490	178	241	Yes	Yes	180	242	Yes	Yes
	NBL/R	1,070	178	241	Yes	Yes	180	242	Yes	Yes
Central Avenue / SR-71 SB Ramps	SBL	1,530	405	806 [2]	Yes	Yes	502 [2]	929 [2]	Yes	Yes
	SBL/R	740	334	965 [2]	Yes	Yes[3]	383	968 [2]	Yes	Yes[3]
Euclid Avenue/ SR-60 WB Ramps	WBL	400	485 [2]	405 [2]	Yes[3]	Yes	554 [2]	415 [2]	Yes[3]	Yes
	WBL/T/R	1,430	498 [2]	400 [2]	Yes	Yes	564 [2]	413 [2]	Yes	Yes
	WBR	400	326 [2]	291 [2]	Yes	Yes	327 [2]	305 [2]	Yes	Yes
Euclid Avenue/ SR-60 EB Ramps	EBL	900	338 [2]	372 [2]	Yes	Yes	338 [2]	372 [2]	Yes	Yes
	EBL/R	1,270	795 [2]	686 [2]	Yes	Yes	894 [2]	717 [2]	Yes	Yes
SR-71 NB Ramps / Euclid Avenue	NBL	1,745	43	84	Yes	Yes	43	84	Yes	Yes
	NBR	420	780 [2]	1,816 [2]	Yes[3]	Yes[3]	1,019 [2]	1,938 [2]	Yes[3]	Yes[3]
SR-71 SB Ramps / Euclid Avenue	SLB	1,100	190	461	Yes	Yes	190	461	Yes	Yes
	SBL/T	1,560	187	454	Yes	Yes	187	454	Yes	Yes
	SBR	255	0	42	Yes	Yes	0	42	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 bacl and affecting the SR-71 or SR-60 Freeway mainline.

Table 8-3

Basic Freeway Segment Analysis for Opening Year Cumulative (2020) Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	2020 Without Project				2020 With Project			
				Density[2]		LOS		Density[2]		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM
SR-71 Freeway	SB	North of Chino Hills Pkwy.	3	22.4	19.8	C	C	23.2	20.0	C	C
		South of Chino Hills Pkwy.	3	17.0	12.6	B	B	17.3	12.7	B	B
		North of Central Av.	3	20.6	20.1	C	C	21.0	20.3	C	C
		South of Euclid Av. (SR-83)	2	**48.6**	33.1	**F**	D	**49.1**	34.8	**F**	D
	NB	North of Chino Hills Pkwy.	3	25.3	25.1	C	C	25.5	25.8	C	C
		South of Chino Hills Pkwy.	3	18.5	18.5	C	C	18.6	18.8	C	C
		North of Central Av.	3	**45.6**	**35.9**	**F**	**E**	**45.8**	**36.6**	**F**	**E**
		South of Euclid Av. (SR-83)	3	27.8	28.5	D	D	28.7	28.7	D	D
SR-60 Freeway	WB	West of Euclid Av. (SR-83)	4	30.4	32.6	D	D	30.4	32.9	D	D
		East of Euclid Av. (SR-83)	4	31.3	32.8	D	D	31.7	32.9	D	D
	EB	West of Euclid Av. (SR-83)	4	32.5	27.6	D	D	32.8	27.7	D	D
		East of Euclid Av. (SR-83)	4	32.4	28.3	D	D	32.4	28.6	D	D

* **BOLD** = Unacceptable Level of Service

[1] Number of lanes are in the specified direction and is b

[2] Density is measured by passenger cars per mile per la

Table 8-4

Freeway Ramp Junction Merge/Diverge Analysis for Opening Year Cumulative (2020) Conditions

Freeway	Direction	Ramp or Segment	Lanes on Freeway[1]	2020 Without Project				2020 With Project			
				AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
				Density[2]	LOS	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS
SR-71 Freeway	SB	Off-Ramp at Chino Hills Pkwy.	3	30.3	D	29.1	D	30.9	D	29.4	D
		Off-Ramp at Central Av.	3	28.6	D	30.4	D	29.1	D	30.6	D
		Loop On-Ramp at Euclid Av. (SR-83) (Upstream)	2	**36.3**	**E**	33.4	D	**36.4**	**E**	34.3	D
		Loop On-Ramp at Euclid Av. (SR-83) (Downstream)	2	**36.3**	**E**	33.4	D	**36.4**	**E**	34.3	D
	NB	On-Ramp at Chino Hills Pkwy.	3	29.3	D	29.2	D	29.5	D	29.9	D
		On-Ramp at Central Av.	3	**38.3**	**F**	34.0	D	**38.5**	**F**	34.5	D
		Off-Ramp at Euclid Av. (SR-83)	3	**35.0**	**E**	**36.7**	**E**	**35.7**	**E**	**36.9**	**E**
SR-60 Freeway	WB	On-Ramp at Euclid Av. (SR-83)	4	28.9	D	30.5	D	28.9	D	30.9	D
		Off-Ramp at Euclid Av. (SR-83)	4	**37.5**	**E**	**38.5**	**E**	**38.0**	**E**	**38.6**	**E**
	EB	Off-Ramp at Euclid Av. (SR-83)	4	**37.0**	**E**	34.0	D	**37.4**	**E**	34.1	D
		On-Ramp at Euclid Av. (SR-83)	4	31.4	D	29.7	D	31.5	D	30.2	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).

EXHIBIT 8-7: OPENING YEAR CUMULATIVE (2020) WITHOUT PROJECT FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

EXHIBIT 8-8: OPENING YEAR CUMULATIVE (2020) WITH PROJECT FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

8.9 RECOMMENDED IMPROVEMENTS

8.9.1 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES AT INTERSECTIONS

Improvement strategies have been recommended at intersections that have been identified as deficient in an effort to reduce each location's peak hour delay and improve the associated LOS grade to an acceptable LOS (LOS D or better). The effectiveness of the recommended improvement strategies discussed below to address Opening Year Cumulative (2020) traffic deficiencies is presented in Table 8-5.

Worksheets for Opening Year Cumulative (2020) Without and With Project conditions, with improvements, HCM calculation worksheets are provided in Appendix 8.11 and Appendix 8.12.

8.9.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON OFF-RAMP QUEUES

As shown previously on Table 8-2, there are no movements that are currently experiencing queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows with addition of Project (Project Buildout) traffic. However, Table 8-6 shows the queuing results with the proposed intersection improvements shown previously on Table 8-5. Worksheets for Opening Year Cumulative (2020) Without and With Project traffic conditions, with improvements, off-ramp queuing analysis are provided in Appendices 8.13 and 8.14, respectively.

8.9.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

At this time, Caltrans has no fee programs or other improvement programs in place to address the deficiencies caused by development projects in the City of Chino (or other neighboring jurisdictions) on SHS roadway segments. As such, no improvements have been recommended to address the Opening Year Cumulative (2019) deficiencies on the SHS, because there is no feasible mitigation available.

Table 8-5

Intersection Analysis for Opening Year Cumulative (2020) 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
6	Central Av. / Chino Hills Pkwy.																	
	- Without Project	TS	1	2	1	1	2	1	1	1	1>	1	1	1	28.9	46.8	C	D
	- With Project	TS	1	2	1	1	2	1	1	1	1>	1	1	1	29.9	54.8	C	D
7	Central Av. / El Prado Rd.																	
	- Without Project	TS	1	2	1>	2	3	0	1	1	0	1	1	1>	41.9	36.3	D	D
	- With Project	TS	1	2	1>	2	3	0	1	1	0	1	1	1>	42.2	36.6	D	D
10	El Prado Rd. / Kimball Av.																	
	- Without Project[4]	TS	1	1	1	2	1	0	1	1	0	0	1	1>	22.1	24.8	C	C
	- With Project[4]	TS	1	1	1	2	1	0	1	1	0	0	1	1>	23.3	27.3	C	C
14	Euclid Av. (SR-83) / SR-60 WB Ramps																	
	- Without Project	TS	2	2	0	0	2	1	0	0	0	1	1	1	41.8	41.4	D	D
	- With Project	TS	2	2	0	0	2	1	0	0	0	1	1	1	47.9	46.3	D	D
15	Euclid Av. (SR-83) / SR-60 EB Ramps																	
	- Without Project	TS	0	2	1	2	2	0	1	1	1	0	0	0	35.1	33.9	D	C
	- With Project	TS	0	2	1	2	2	0	1	1	1	0	0	0	40.3	46.5	D	D
17	Euclid Av. (SR-83) / Riverside Dr.																	
	- Without Project	TS	1	3	1	1	3	1>	1	2	0	1	2	d	47.3	53.6	D	D
	- With Project	TS	1	3	1	1	3	1>	1	2	0	1	2	d	47.9	54.8	D	D
19	Euclid Av. (SR-83) / Schaefer Av.																	
	- Without Project	TS	1	3	1	1	3	1	1	1	1	1	1	0	39.4	52.4	D	D
	- With Project	TS	1	3	1	1	3	1	1	1	1	1	1	0	39.9	52.3	D	D
20	Euclid Av. (SR-83) / Edison Av.																	
	- Without Project	TS	1	3	1	1	3	1	1	1	1	1	1	0	38.7	36.4	D	D
	- With Project	TS	1	3	1	1	3	1	1	1	1	1	1	0	46.4	39.7	D	D
22	Euclid Av. (SR-83) / Merrill Av.																	
	- Without Project	TS	1	3	1	2	3	0	0	1	0	0	1	1>	40.0	44.0	D	D
	- With Project	TS	1	3	1	2	3	0	0	1	0	0	1	1>	41.9	52.0	D	D
23	Euclid Av. (SR-83) / Kimball Av.																	
	- Without Project	TS	1	3	1	2	3	1>	2	2	0	1	2	1>	45.8	44.1	D	D
	- With Project	TS	1	3	1	2	3	1>	2	2	0	1	2	1>	45.8	50.0	D	D
24	Euclid Av. (SR-83) / Bickmore Av.																	
	- Without Project[5]	TS	1	3	0	1	3	1	1	1	1	1	1	1	33.1	35.0	C	C
	- With Project[5]	TS	1	3	0	1	3	1	1	1	1	1	1	1	37.7	46.3	D	D
25	Euclid Av. (SR-83) / Pine Av.																	
	- Without Project	TS	1	3	1>	1	3	0	1	1	1>>	2	1	0	54.0	41.8	D	D
	- With Project	TS	1	3	1>	1	3	0	1	1	1>>	2	1	0	54.0	45.4	D	D
27	SR-71 SB Ramps / Euclid Av. (SR-83)																	
	- Without Project	TS	1	0	1	2	1	1	0	2	0	1	2	1>>	38.9	32.8	D	C
	- With Project	TS	1	0	1	2	1	1	0	2	0	1	2	1>>	39.2	34.7	D	C
30	Mayhew Av. / Kimball Av.																	
	- Without Project		Intersection Does Not Exist															
	- With Project	TS	1	0	1	0	0	0	0	2	1	1	2	0	7.6	10.4	A	B

Table 8-5
Page 2 of 2

Intersection Analysis for Opening Year Cumulative (2020) 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
42	Mayhew Av. / Bickmore Av.																	
	- Without Project		Intersection Does Not Exist															
	- With Project	**TS**	0	0	0	**1**	0	**1**	**1**	**2**	0	0	**2**	**d**	14.6	9.3	B	A
44	Street B / Kimball Av.																	
	- Without Project	**TS**	0	0	0	0	1	0	1	**2**	0	0	**2**	1	2.5	0.8	A	A
	- With Project	**TS**	0	**1**	0	0	1	0	1	**2**	**1**	**1**	**2**	1	12.1	13.4	B	B
52	Flight Av. / Kimball Av.																	
	- Without Project	**TS**	0	1	0	0	1	0	1	2	0	1	**2**	0	26.3	24.7	C	C
	- With Project	**TS**	0	1	0	0	1	0	1	2	0	1	**2**	0	31.4	28.5	C	C
54	Hellman Av. / Kimball Av.																	
	- Without Project[6]	**TS**	1	**1**	0	0	**1**	**1**	**1**	0	1	0	0	0	15.8	20.9	B	C
	- With Project[6]	**TS**	1	**1**	0	0	**1**	**1**	**1**	0	1	0	0	0	17.1	22.9	B	C

[1] When a right turn is designated, the lane can either be striped or unstriped. To function as a right turn lane there must be sufficient width for right turning vehicles to travel outside the through lanes.
L = Left; T = Through; R = Right; > = Right-Turn Overlap Phasing; >> = Free Right Turn Lane; d= Defacto Right Turn Lane; **1** = Improvement

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

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

[4] Restripe the southbound approach to provide dual left turns and two through lanes.

[5] Includes restriping the westbound shared left-through lane to an exclusive through lane.

[6] Includes additional lanes needed to serve future cumulative development projects. Specifically, a northbound through lane, southbound through lane, southbound right turn lane, and eastbound left turn lane.

Table 8-6

Peak Hour Freeway Off-Ramp Queuing Summary for Opening Year Cumulative (2020) Conditions With Improvements

Intersection	Movement	Available Stacking Distance (Feet)	2020 Without Project				2020 With Project			
			95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak	PM Peak Hour	AM	PM	AM Peak	PM Peak Hour	AM	PM
Euclid Avenue/ SR-60 WB Ramps	WBL	400	443 [2]	416 [2]	Yes[3]	Yes[3]	551 [2]	426 [2]	Yes[3]	Yes[3]
	WBL/T/R	1,430	452 [2]	412 [2]	Yes	Yes	516 [2]	425 [2]	Yes	Yes
	WBR	400	307 [2]	300 [2]	Yes	Yes	308 [2]	314 [2]	Yes	Yes
Euclid Avenue/ SR-60 EB Ramps	EBL	900	317 [2]	344 [2]	Yes	Yes	317 [2]	355 [2]	Yes	Yes
	EBL/R	1,270	308 [2]	293 [2]	Yes	Yes	362 [2]	305 [2]	Yes	Yes
	EBR	**500**	257 [2]	244 [2]	Yes	Yes	328 [2]	261 [2]	Yes	Yes
SR-71 SB Ramps / Euclid Avenue	SBL	1,100	148	335	Yes	Yes	148	317	Yes	Yes
	SBL/T	1,560	37	133	Yes	Yes	37	126	Yes	Yes
	SBR	255	0	45	Yes	Yes	0	43	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 bacl and affecting the SR-71 or SR-60 Freeway mainline.

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9 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 mainline operations, and traffic signal warrant analyses.

9.1 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 Opening Year Cumulative conditions only (e.g., intersection and roadway improvements along the Project's frontage and driveways).
- The intersection of Street "B" and Kimball Avenue would be constructed under Phase 2 (2019) of the Project and operate with split phasing for the northbound and southbound approaches and with protected left turn phasing on the eastbound and westbound approaches (see previous Exhibit 7-1). It is our understanding that fire engines enter the westerly driveway, drive behind the building, then pull forward into the garage aligning with Street "B". Emergency preemption would be utilized for the egress of emergency vehicles. However, the intersection would operate similar to any other signalized intersection during non-emergency times. The median cannot be extended to the east in order to accommodate returning fire engines. Passenger vehicles wishing to make a southbound left turn, can do so at the signalized intersection of Street "B" and Kimball Avenue.
- Driveways and those facilities assumed to be constructed by cumulative developments to provide site access are also assumed to be in place for Opening Year Cumulative conditions only (e.g., intersection and roadway improvements along the cumulative development's frontages and driveways such as the northern extension of Meadow Valley Avenue at Kimball Avenue and the northern extension of Hellman Avenue north of Kimball Avenue).
- The Pine Avenue extension between El Prado Road and the SR-71 Freeway.
- 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., The Preserve Specific Plan roadway network, Schaefer Avenue east of Archibald Avenue, Eucalyptus Avenue east of Archibald Avenue, Merrill Avenue east of Archibald Avenue, etc.).

9.2 HORIZON YEAR (2040) WITHOUT PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-process volumes obtained from the SBTAM (see Section 4.7 *Horizon Year (2040) Volume Development* of this TIA for a detailed discussion on the post-processing methodology). The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Horizon Year (2040) Without Project, Without Limonite Extension traffic conditions are shown on Exhibits 9-1 and 9-2. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Horizon Year (2040) Without Project, With Limonite Extension traffic conditions are shown on Exhibits 9-3.

9.3 HORIZON YEAR (2040) WITH PROJECT TRAFFIC VOLUME FORECASTS

This scenario includes the refined post-process volumes obtained from the CTM, plus the traffic generated by the proposed Project (see Section 4.7 *Horizon Year (2040) Volume Development* of this TIA for a detailed discussion on the post-processing methodology). The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Horizon Year (2040) With Project, Without Limonite Extension traffic conditions are shown on Exhibits 9-4 and 9-5. The weekday ADT and weekday AM and PM peak hour volumes which can be expected for Horizon Year (2040) With Project, With Limonite Extension traffic conditions are shown on Exhibits 9-6.

9.4 INTERSECTION OPERATIONS ANALYSIS

9.4.1 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 9.1 *Roadway Improvements*. As shown in Table 9-1, the following additional study area intersections are anticipated to operate at an unacceptable LOS under Horizon Year (2040) Without Project traffic conditions, in addition to the intersections previously identified under Existing, E+P, and Opening Year Cumulative (2018, 2019, and 2020) traffic conditions:

- SR-71 Northbound Ramps / Chino Hills Pkwy. (#2) – LOS F AM peak hour; LOS E PM peak hour
- Ramona Av. / Chino Hills Pkwy. (#3) – LOS E AM and PM peak hours
- Monte Vista Av. West / Chino Hills Pkwy. (#4) – LOS F AM and PM peak hours
- Euclid Av. (SR-83) / Chino Av. (#18) – LOS F AM and PM peak hours
- Meadow Valley Av. / Kimball Av. (#53) – LOS F AM and PM peak hours (With Limonite Extension Only)
- Hellman Av. / Kimball Av. (#54) – LOS F AM and PM peak hours (Without and With Limonite Extension)
- Archibald Av. / Limonite Av. (#55) – LOS F AM and PM peak hours (Without and With Limonite Extension)
- Harrison Av. / Limonite Av. (#56) – LOS F PM peak hour only
- Sumner Av. / Limonite Av. (#57) – LOS E AM peak hour; LOS F PM peak hour

- Scholar Wy. / Limonite Av. (#58) – LOS E PM peak hour only
- Hamner Av. / Limonite Av. (#59) – LOS E AM peak hour; LOS F PM peak hour
- I-15 Southbound Ramps / Limonite Av. (#60) – LOS F AM peak hour; LOS E PM peak hour
- I-15 Northbound Ramps / Limonite Av. (#61) – LOS E AM peak hour; LOS F PM peak hour

A summary of the peak hour intersection LOS for Horizon Year (2040) Without Project conditions is shown on Exhibit 9-7. The intersection operations analysis worksheets for Horizon Year (2040) Without Project traffic conditions are included in Appendix 9.1 of this TIA.

9.4.2 HORIZON YEAR (2040) WITH PROJECT TRAFFIC CONDITIONS

As shown on Table 9-1 and illustrated on Exhibit 9-8, the following additional study area intersection is anticipated to experience unacceptable LOS with the addition of Project (Project Buildout) traffic during one or more peak hours, in addition to those previously identified for Horizon Year (2040) Without Project traffic conditions:

- Mayhew Av. / Kimball Av. (#30) – LOS E PM peak hour only

The intersection operations analysis worksheets for Horizon Year (2040) With Project traffic conditions are included in Appendix 9.2 of this TIA.

9.5 TRAFFIC SIGNAL WARRANTS ANALYSIS

No additional study area intersections are anticipated to meet either ADT or peak hour volume based traffic signal warrants for Horizon Year (2040) Without and With Project traffic conditions in addition to those previously warranted under Existing, E+P, and Opening Year Cumulative (2018-2020) traffic conditions (see Appendix 9.3 and 9.4).

9.6 OFF-RAMP QUEUING ANALYSIS

Queuing analysis findings for Horizon Year (2040) traffic conditions are presented in Table 9-2. As shown on Table 9-2, the 95th percentile peak hour queues during the AM and PM peak hours are anticipated to exceed the existing available storage for the northbound left turn lane at the SR-71 Northbound ramps and Chino Hills Parkway for Horizon Year (2040) Without Project traffic conditions. There are no additional movements that are anticipated to experience queuing issues during the weekday AM or weekday PM peak 95th percentile traffic flows with addition of Project (Project Buildout) traffic. Worksheets for Horizon Year (2040) traffic conditions off-ramp queuing analysis are provided in Appendices 9.5 and 9.6.

EXHIBIT 9-1: HORIZON YEAR (2040) WITHOUT PROJECT AVERAGE DAILY TRAFFIC (ADT)

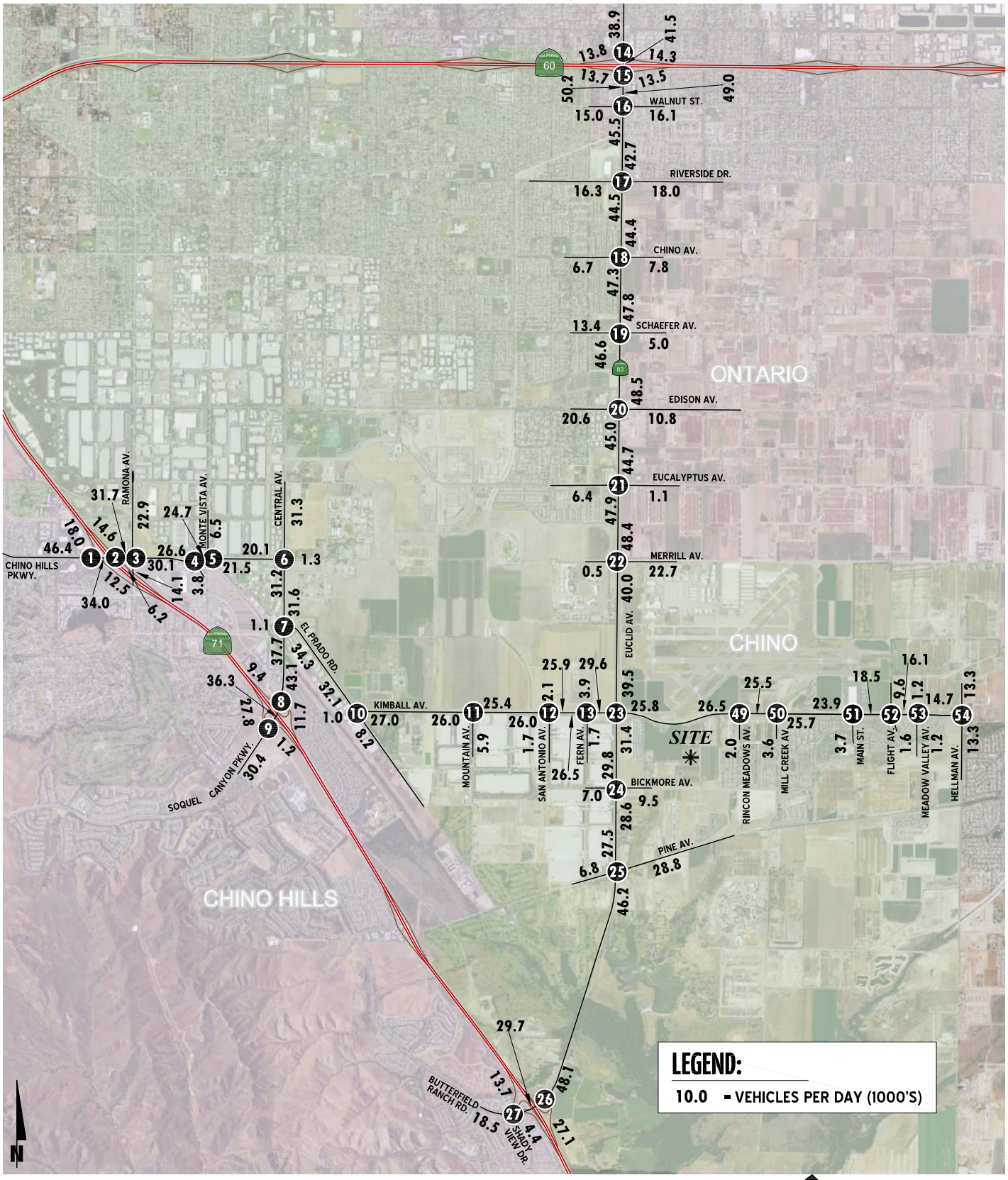

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EXHIBIT 9-2 (1OF2): HORIZON YEAR (2040) WITHOUT PROJECT, WITHOUT LIMONITE AVENUE EXTENSION TRAFFIC VOLUMES (IN PCE)

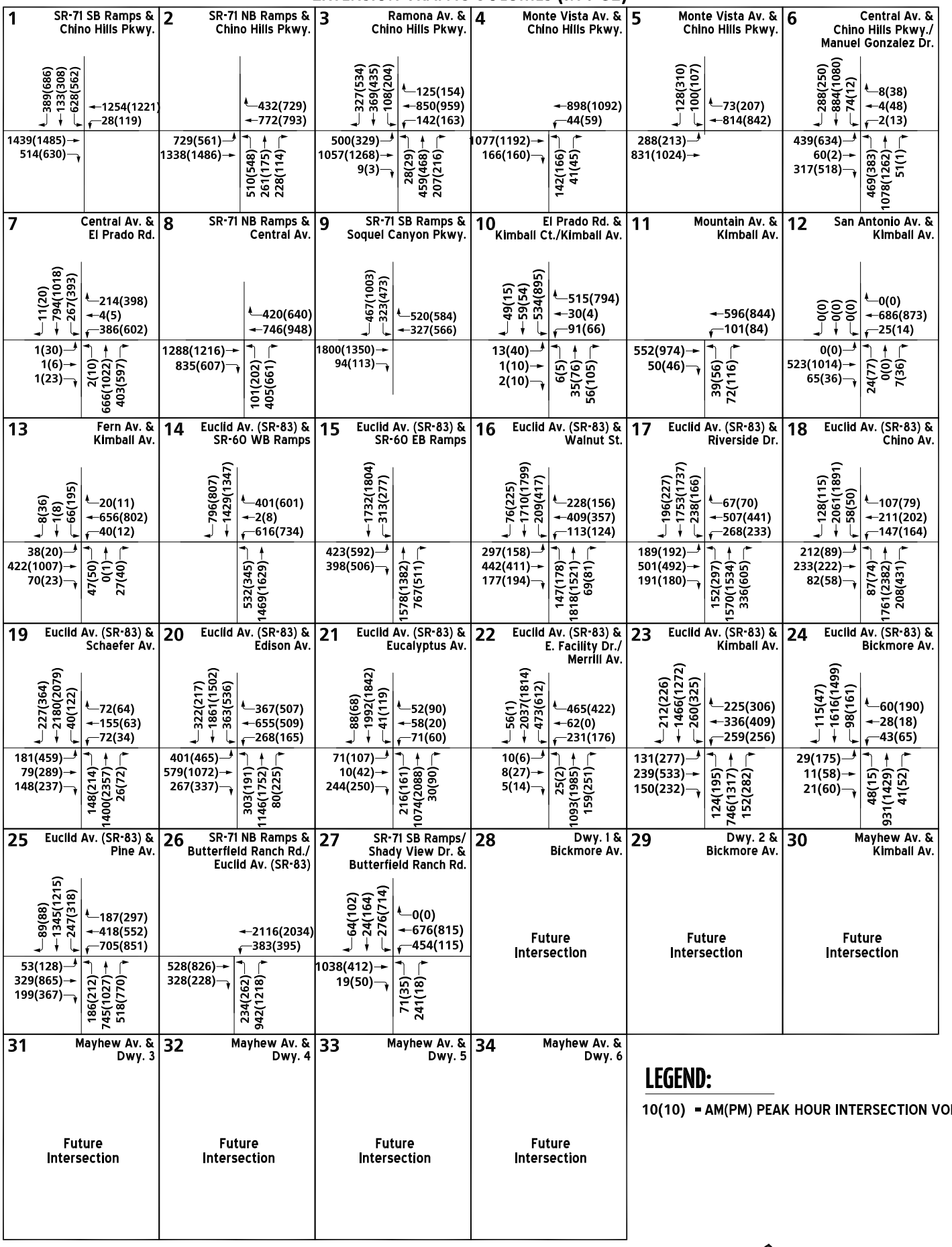
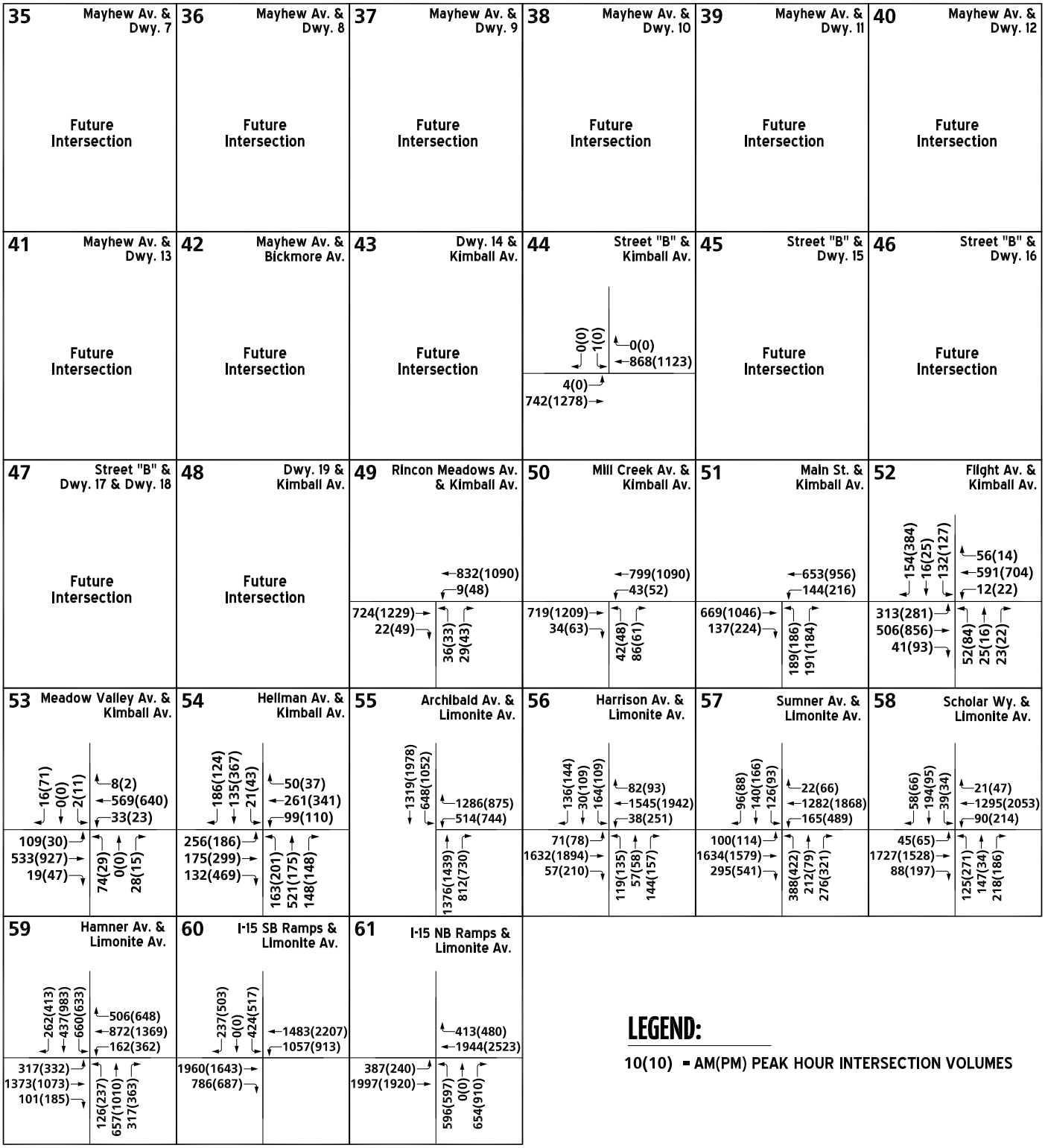


EXHIBIT 9-2 (2OF2): HORIZON YEAR (2040) WITHOUT PROJECT, WITHOUT LIMONITE AVENUE EXTENSION TRAFFIC VOLUMES (IN PCE)

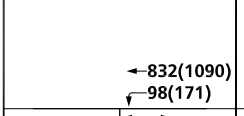


LEGEND:

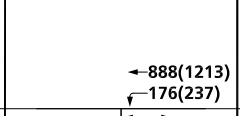
10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES

EXHIBIT 9-3: HORIZON YEAR (2040) WITHOUT PROJECT, WITH LIMONITE AVENUE EXTENSION TRAFFIC VOLUMES

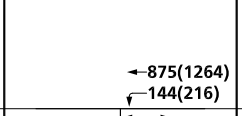
49 Rincon Meadows Av. & Kimball Av.



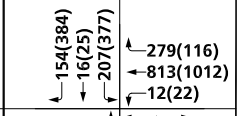
50 Mill Creek Av. & Kimball Av.



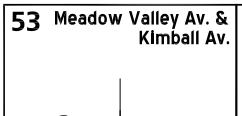
51 Main St. & Kimball Av.



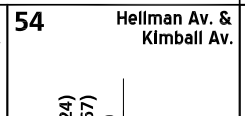
52 Flight Av. & Kimball Av.



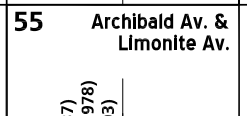
53 Meadow Valley Av. & Kimball Av.



54 Hellman Av. & Kimball Av.



55 Archibald Av. & Limonite Av.



LEGEND:

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

EXHIBIT 9-4 (1OF2): HORIZON YEAR (2040) WITH PROJECT, WITHOUT LIMONITE AVENUE EXTENSION AVERAGE DAILY TRAFFIC (ADT)

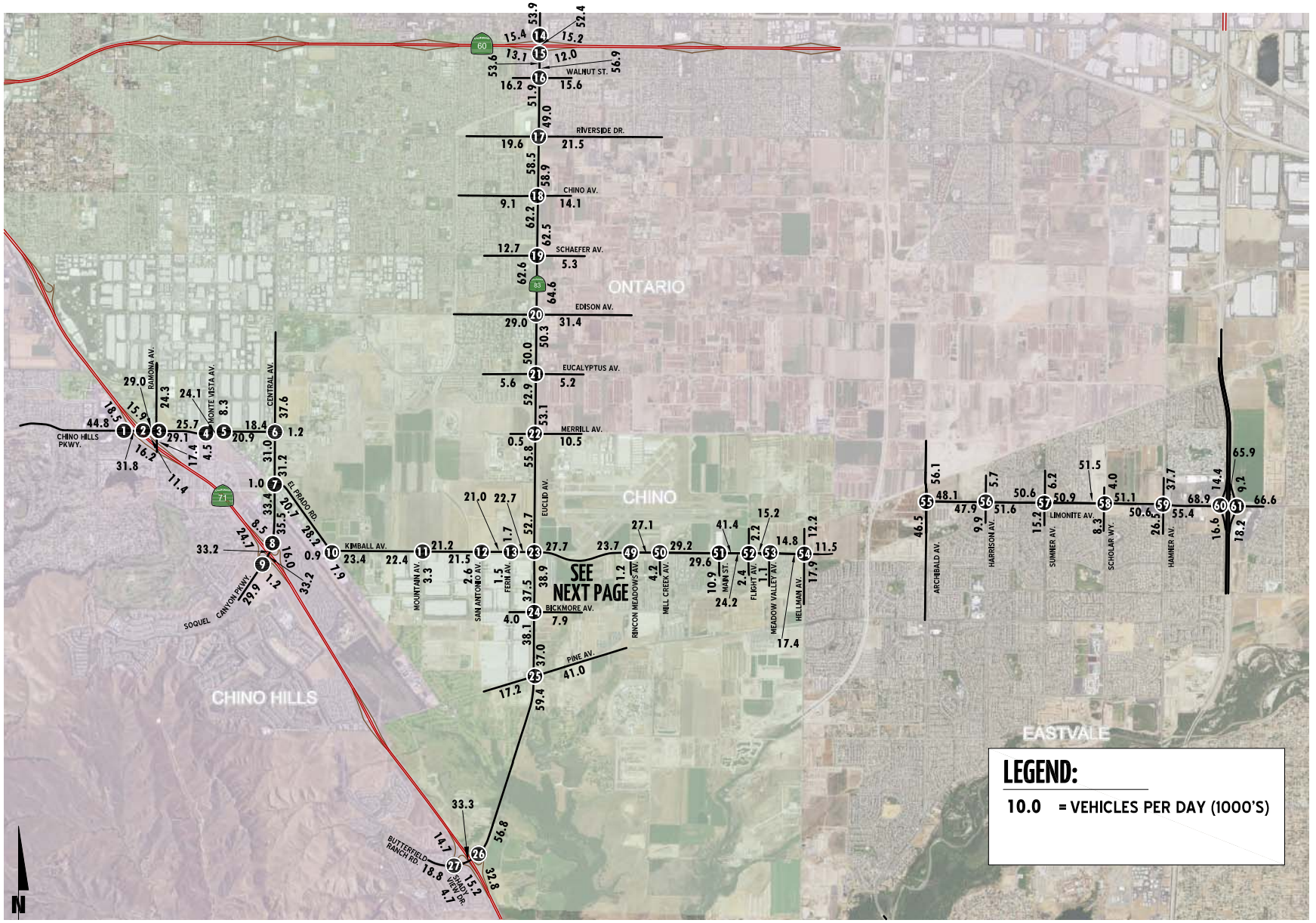


EXHIBIT 9-4 (2OF2): HORIZON YEAR (2040) WITH PROJECT, WITHOUT LIMONITE AVENUE EXTENSION AVERAGE DAILY TRAFFIC (ADT)

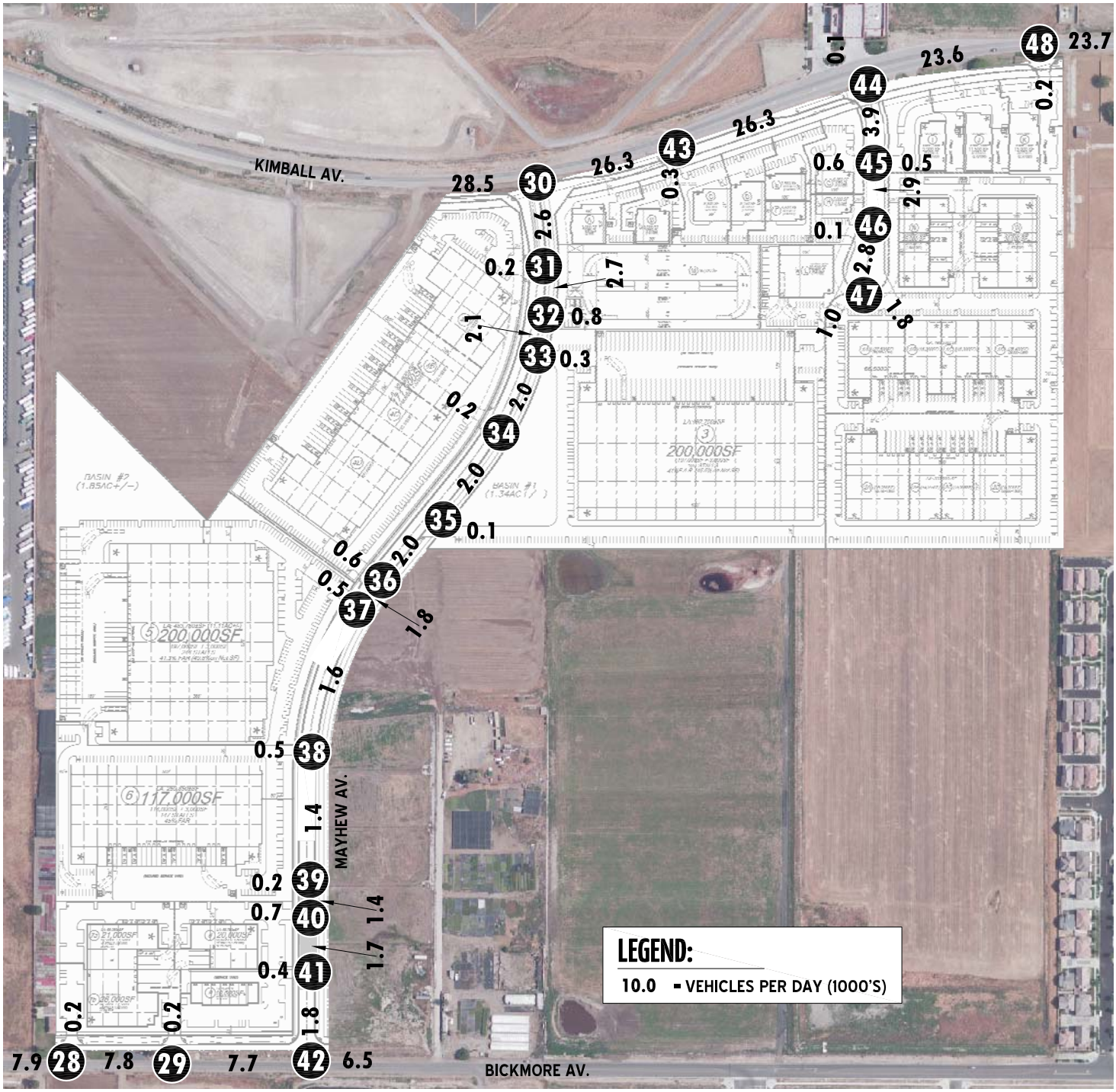


EXHIBIT 9-5 (1OF2): HORIZON YEAR (2040) WITH PROJECT, WITHOUT LIMONITE AVENUE EXTENSION TRAFFIC VOLUMES (IN PCE)

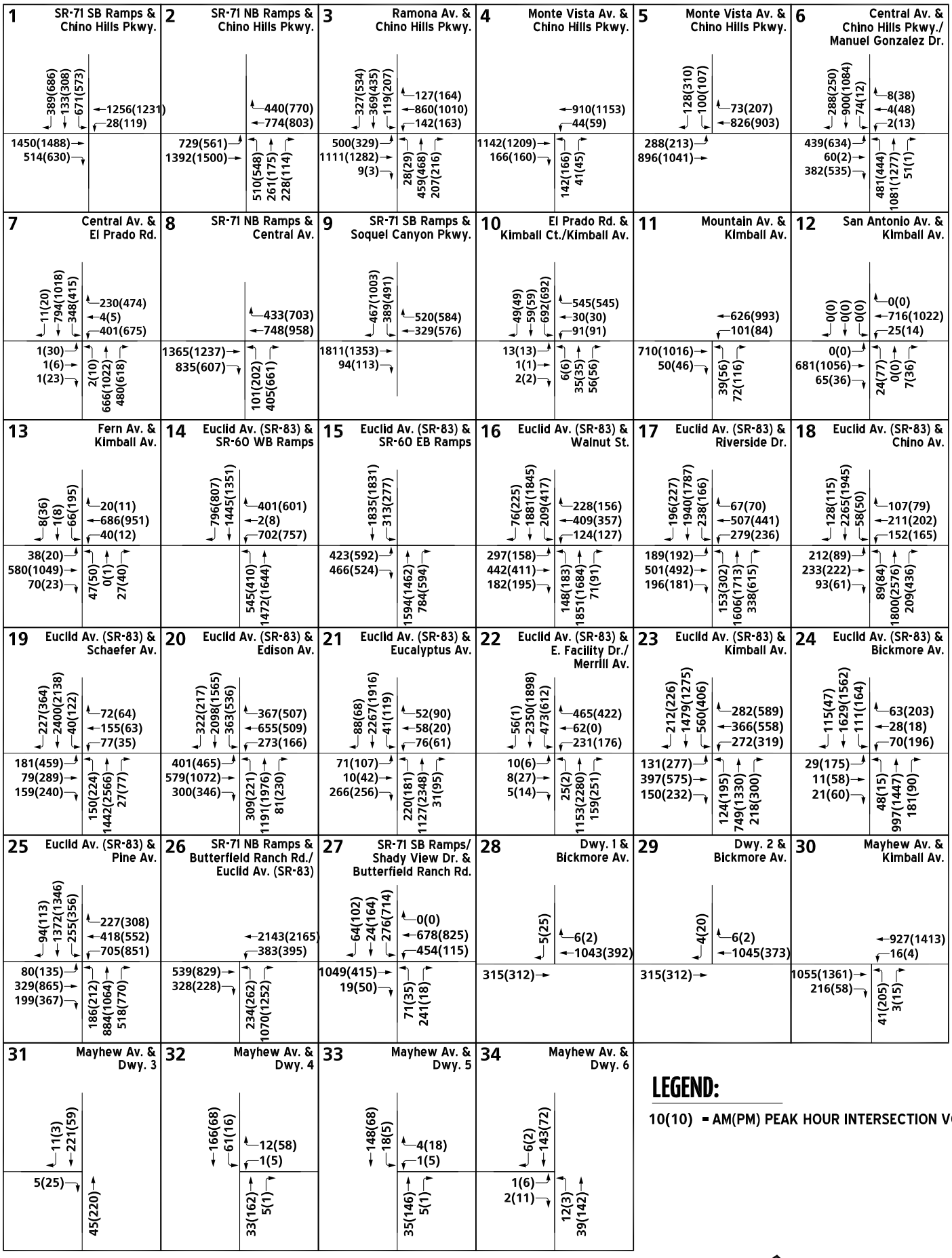


EXHIBIT 9-5 (2OF2): HORIZON YEAR (2040) WITH PROJECT, WITHOUT LIMONITE AVENUE EXTENSION TRAFFIC VOLUMES (IN PCE)

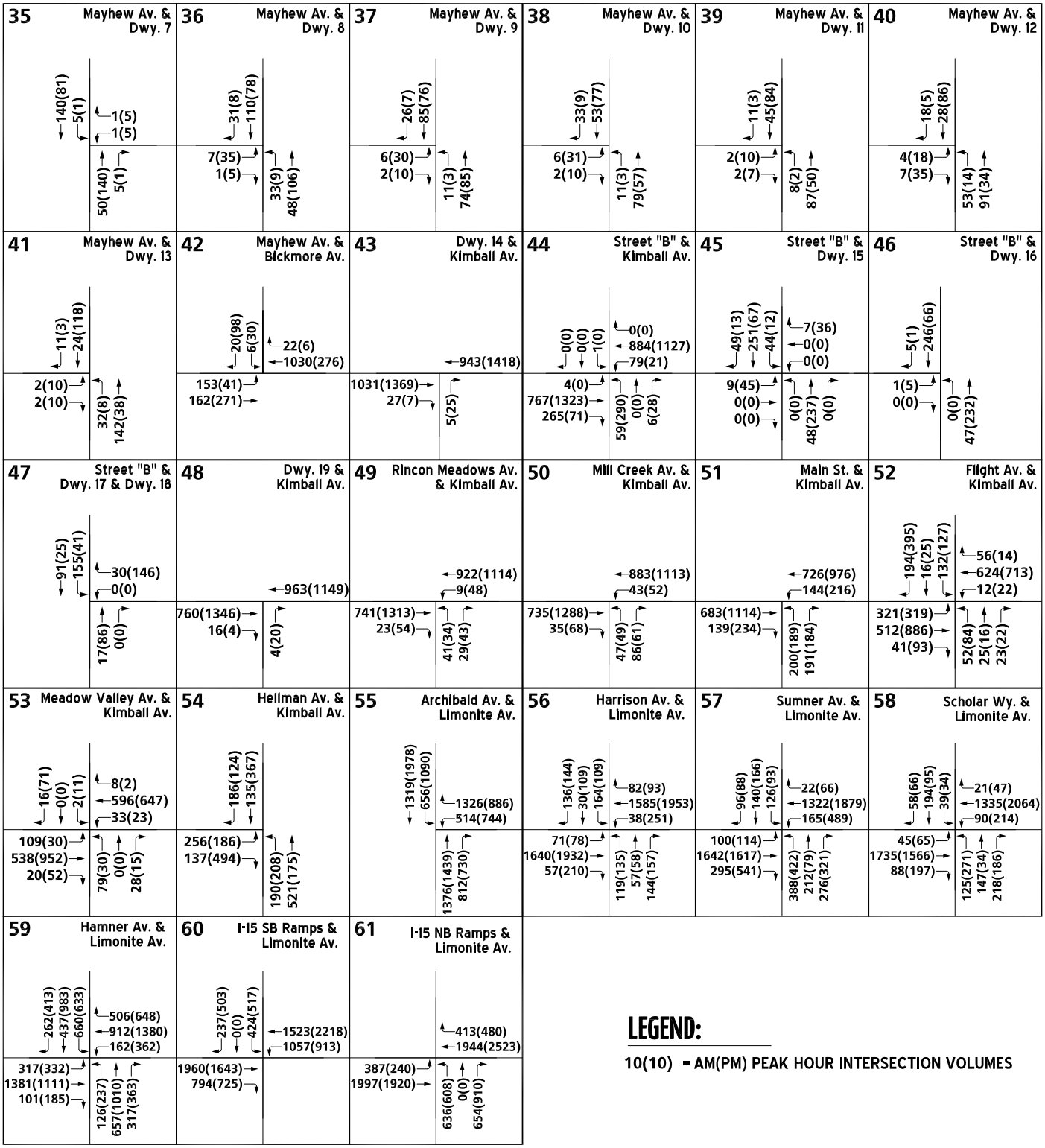
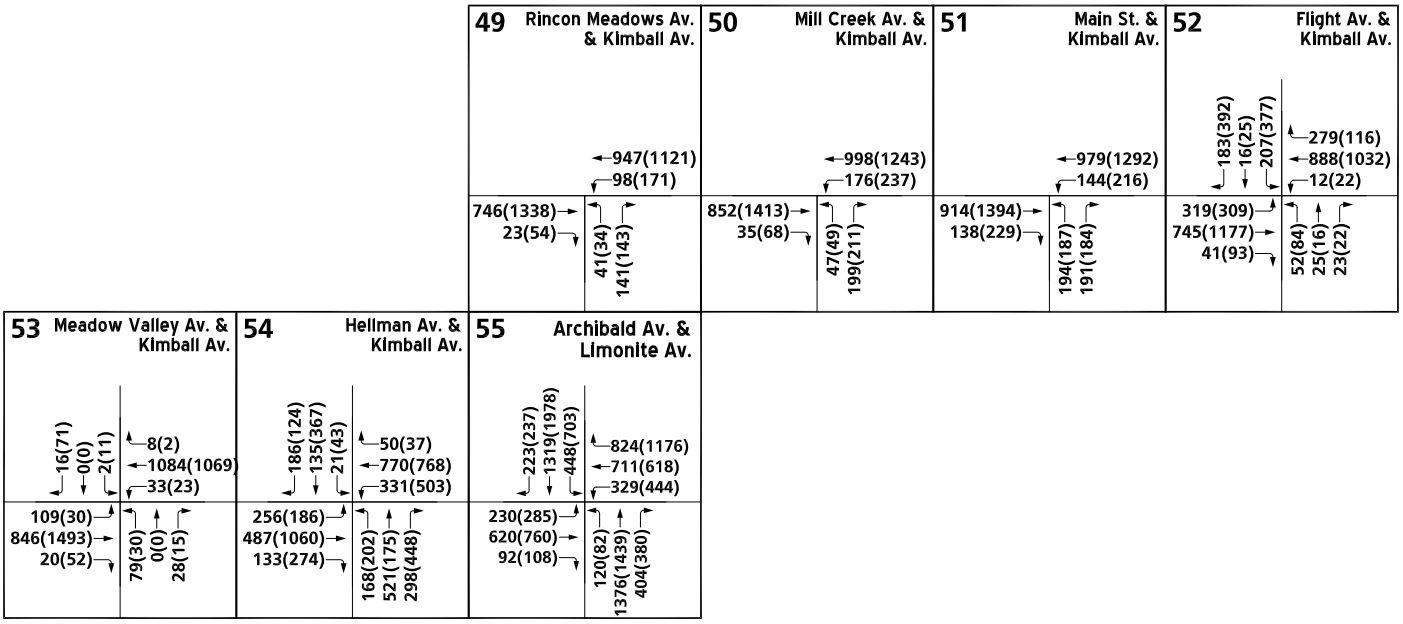


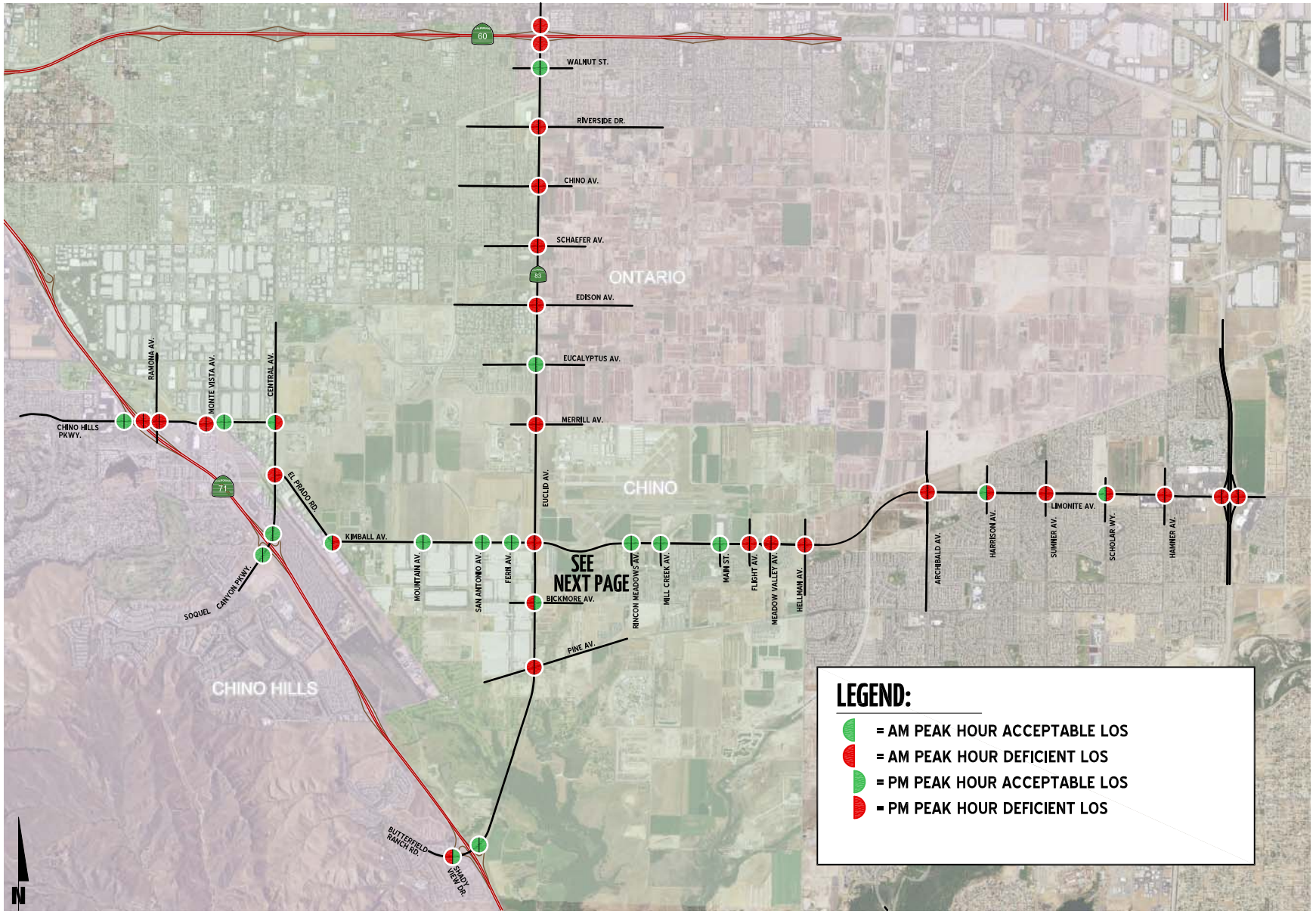
EXHIBIT 9-6: HORIZON YEAR (2040) WITH PROJECT, WITH LIMONITE AVENUE EXTENSION TRAFFIC VOLUMES



LEGEND:

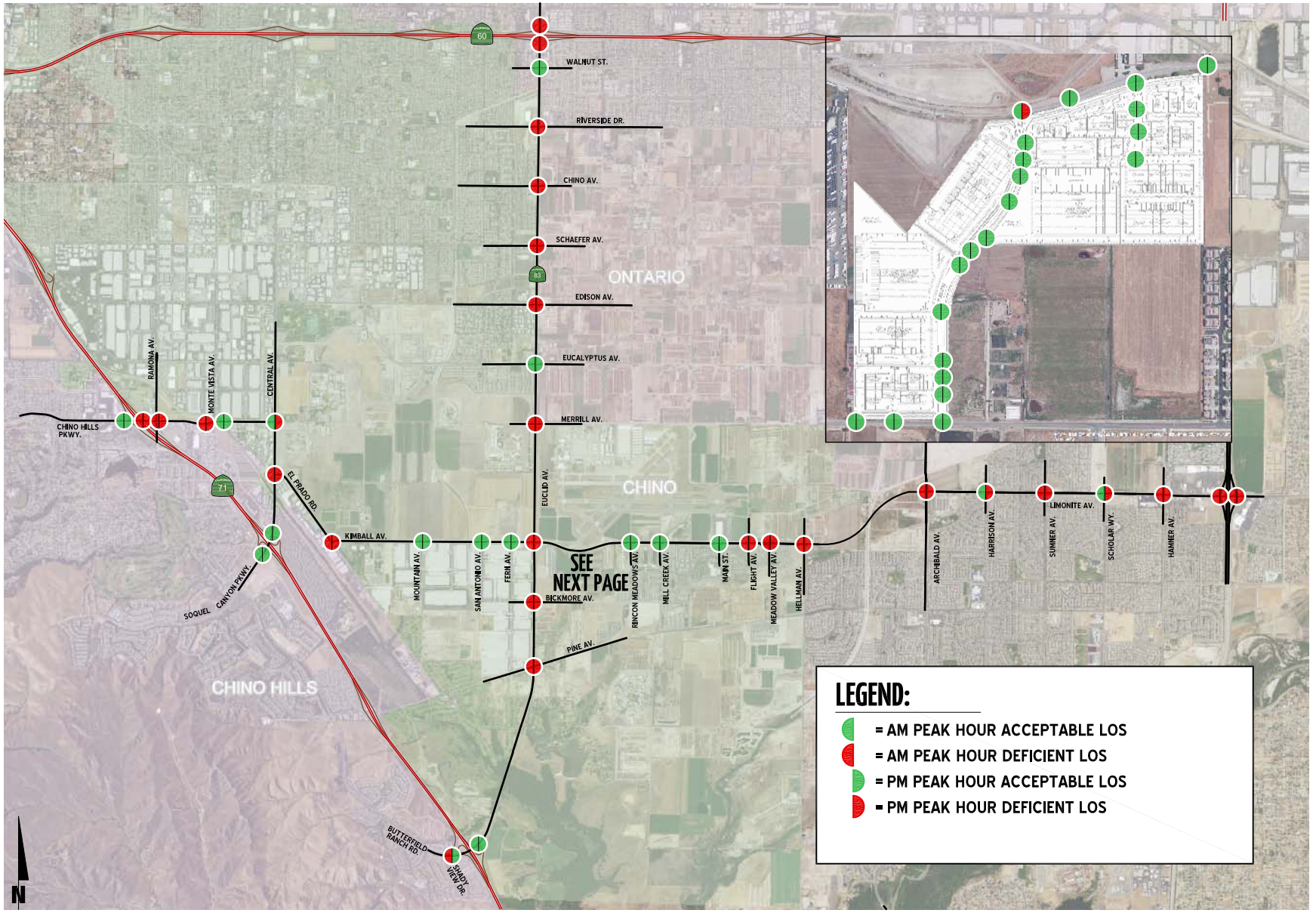
10(10) = AM(PM) PEAK HOUR INTERSECTION VOLUMES
10.0 = VEHICLES PER DAY (1000'S)

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



URBAN CROSSROADS

EXHIBIT 9-8: SUMMARY OF LOS FOR HORIZON YEAR (2040) WITH PROJECT, WITH LIMONITE AVENUE EXTENSION



URBAN CROSSROADS

Table 9-1

Intersection Analysis for Horizon Year (2040) Conditions

#	Intersection	Traffic Control[2]	2040 Without Project				2040 With Project				Acceptable LOS
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
			AM	PM	AM	PM	AM	PM	AM	PM	
1	SR-71 SB Ramps / Chino Hills Pkwy.	TS	13.9	20.9	B	C	14.2	21.1	B	C	D
2	SR-71 NB Ramps / Chino Hills Pkwy.	TS	**147.7**	**60.0**	**F**	**E**	**157.6**	**66.6**	**F**	**E**	D
3	Ramona Av. / Chino Hills Pkwy.	TS	**67.0**	**67.5**	**E**	**E**	**68.2**	**73.3**	**E**	**E**	D
4	Monte Vista Av. West / Chino Hills Pkwy.	CSS	**59.3**	**>100.0**	**F**	**F**	**73.9**	**>100.0**	**F**	**F**	D
5	Monte Vista Av. East / Chino Hills Pkwy.	TS	22.7	20.0	C	C	23.3	20.6	C	C	D
6	Central Av. / Chino Hills Pkwy.	TS	43.0	**85.1**	D	**F**	51.2	**99.7**	D	**F**	D
7	Central Av. / El Prado Rd.	TS	**119.6**	**189.3**	**F**	**F**	**159.8**	**>200.0**	**F**	**F**	D
8	Central Av. / SR-71 NB Ramps	TS	11.2	20.2	B	C	12.1	21.0	B	C	D
9	Central Av. / SR-71 SB Ramps	TS	18.7	39.2	B	D	22.1	44.3	B	D	D
10	El Prado Rd. / Kimball Av.	TS	46.7	**106.9**	D	**F**	**95.5**	**116.8**	**F**	**F**	D
11	Mountain Av. / Kimball Av.	TS	19.6	18.9	C	C	21.0	22.0	C	C	D
12	San Antonio Av. / Kimball Av.	TS	21.5	29.0	C	C	23.0	33.2	C	C	D
13	Fern Av. / Kimball Av.	TS	21.4	25.6	C	C	21.4	29.8	C	C	D
14	Euclid Av. (SR-83) / SR-60 WB Ramps	TS	**104.7**	**89.3**	**F**	**F**	**119.4**	**96.8**	**F**	**F**	D
15	Euclid Av. (SR-83) / SR-60 EB Ramps	TS	**92.8**	**91.3**	**F**	**F**	**97.8**	**119.9**	**F**	**F**	D
16	Euclid Av. (SR-83) / Walnut St.	TS	49.9	44.1	D	D	56.9	44.3	E	D	E
17	Euclid Av. (SR-83) / Riverside Dr.	TS	**148.0**	**176.7**	**F**	**F**	**174.3**	**>200.0**	**F**	**F**	D
18	Euclid Av. (SR-83) / Chino Av.	TS	**83.8**	**96.3**	**F**	**F**	**111.6**	**134.2**	**F**	**F**	D
19	Euclid Av. (SR-83) / Schaefer Av.	TS	**118.8**	**164.4**	**F**	**F**	**145.6**	**191.0**	**F**	**F**	D
20	Euclid Av. (SR-83) / Edison Av.	TS	**>200.0**	**>200.0**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**	D
21	Euclid Av. (SR-83) / Eucalyptus Av.	TS	38.4	31.0	D	C	54.1	46.5	D	D	D
22	Euclid Av. (SR-83) / Merrill Av.	TS	**197.9**	**>200.0**	**F**	**F**	**>200.0**	**>200.0**	**F**	**F**	D
23	Euclid Av. (SR-83) / Kimball Av.	TS	**165.7**	**154.4**	**F**	**F**	**>200.0**	**160.5**	**F**	**F**	D
24	Euclid Av. (SR-83) / Bickmore Av.	TS	**58.0**	54.2	**E**	D	**74.2**	**81.5**	**E**	**F**	D
25	Euclid Av. (SR-83) / Pine Av.	TS	**175.4**	**>200.0**	**F**	**F**	**181.8**	**>200.0**	**F**	**F**	D
26	SR-71 NB Ramps / Euclid Av. (SR-83)	TS	29.7	17.3	C	B	31.9	17.3	C	B	D
27	SR-71 SB Ramps / Euclid Av. (SR-83)	TS	**58.6**	33.8	**E**	C	**63.1**	37.4	**E**	D	D
28	Dwy. 1 / Bickmore Av.	**CSS**	Intersection Does Not Exist				19.8	11.0	C	B	C
29	Dwy. 2 / Bickmore Av.	**CSS**	Intersection Does Not Exist				19.8	10.7	C	B	C
30	Mayhew Av. / Kimball Av.	**TS**	Intersection Does Not Exist				13.5	**68.3**	B	**E**	D
31	Mayhew Av. / Dwy. 3	**CSS**	Intersection Does Not Exist				9.5	8.7	A	A	C
32	Mayhew Av. / Dwy. 4	**CSS**	Intersection Does Not Exist				8.7	9.6	A	A	C
33	Mayhew Av. / Dwy. 5	**CSS**	Intersection Does Not Exist				8.8	9.3	A	A	C
34	Mayhew Av. / Dwy. 6	**CSS**	Intersection Does Not Exist				9.3	9.1	A	A	C
35	Mayhew Av. / Dwy. 7	**CSS**	Intersection Does Not Exist				9.1	9.4	A	A	C
36	Mayhew Av. / Dwy. 8	**CSS**	Intersection Does Not Exist				9.9	9.9	A	A	C
37	Mayhew Av. / Dwy. 9	**CSS**	Intersection Does Not Exist				9.5	9.6	A	A	C
38	Mayhew Av. / Dwy. 10	**CSS**	Intersection Does Not Exist				9.4	9.5	A	A	C
39	Mayhew Av. / Dwy. 11	**CSS**	Intersection Does Not Exist				9.0	9.2	A	A	C
40	Mayhew Av. / Dwy. 12	**CSS**	Intersection Does Not Exist				9.1	9.3	A	A	C
41	Mayhew Av. / Dwy. 13	**CSS**	Intersection Does Not Exist				9.3	9.3	A	A	C
42	Mayhew Av. / Bickmore Av.	**CSS**	Intersection Does Not Exist				20.5	11.7	C	B	D

Table 9-1

Intersection Analysis for Horizon Year (2040) Conditions

#	Intersection	Traffic Control[2]	2040 Without Project				2040 With Project				Acceptable LOS
			Delay[1] (secs.)		Level of Service		Delay[1] (secs.)		Level of Service		
			AM	PM	AM	PM	AM	PM	AM	PM	
43	Dwy. 14 / Kimball Av.	**CSS**	Intersection Does Not Exist				12.6	15.8	B	C	C
44	Street B / Kimball Av.	CSS/**TS**	19.1	0.0	C	A	10.5	12.4	B	B	C
45	Street B / Dwy. 15	**CSS**	Intersection Does Not Exist				12.3	12.2	B	B	C
46	Street B / Dwy. 16	**CSS**	Intersection Does Not Exist				10.3	10.4	B	B	C
47	Street B/Dwy. 17 / Dwy. 18	**CSS**	Intersection Does Not Exist				8.5	9.4	A	A	C
48	Dwy. 19 / Kimball Av.	**CSS**	Intersection Does Not Exist				11.1	15.4	B	C	C
49	Rincon Meadows Av. / Kimball Av.	CSS	19.1	24.6	C	C	20.8	27.3	C	D	D
	- *With Limonite Avenue Extension*		23.2	27.3	C	D	16.0	31.9	C	D	
50	Mill Creek Av. / Kimball Av.	TS	13.3	19.3	B	B	13.8	21.6	B	C	D
	- *With Limonite Avenue Extension*		28.4	28.6	C	C	32.8	31.2	C	C	
51	Main St. / Kimball Av.	TS	20.0	34.7	C	D	20.7	36.3	C	D	D
	- *With Limonite Avenue Extension*		24.9	32.3	C	C	30.3	35.7	C	D	
52	Flight Av. / Kimball Av.	CSS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	D
	- *With Limonite Avenue Extension*		**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	
53	Meadow Valley Av. / Kimball Av.	CSS	30.1	28.6	D	D	33.4	30.1	D	D	D
	- *With Limonite Avenue Extension*		**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	
54	Hellman Av. / Kimball Av.[3]	AWS	**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	D
	- *With Limonite Avenue Extension*		**>100.0**	**>100.0**	**F**	**F**	**>100.0**	**>100.0**	**F**	**F**	
55	Archibald Av. / Limonite Av.	TS	**>200.0**	**>100.0**	**F**	**F**	**>200.0**	**>100.0**	**F**	**F**	D
	- *With Limonite Avenue Extension*		**>200.0**	**>100.0**	**F**	**F**	**>200.0**	**>100.0**	**F**	**F**	
56	Harrison Av. / Limonite Av.	TS	48.3	**133.8**	D	**F**	50.9	**139.1**	D	**F**	D
57	Sumner Av. / Limonite Av.	TS	**58.7**	**100.6**	**E**	**F**	**59.4**	**103.5**	**E**	**F**	D
58	Scholar Wy. / Limonite Av.	TS	40.6	**63.3**	D	**E**	41.4	**64.0**	D	**E**	D
59	Hamner Av. / Limonite Av.	TS	**76.4**	**96.1**	**E**	**F**	**76.4**	**96.6**	**E**	**F**	D
60	I-15 SB Ramps / Limonite Av.	TS	**124.8**	**64.4**	**F**	**E**	**125.0**	**64.4**	**F**	**E**	D
61	I-15 NB Ramps / Limonite Av.	TS	**70.2**	**117.0**	**E**	**F**	**75.5**	**117.3**	**E**	**F**	D

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

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

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

[3] Includes additional lanes needed to serve future cumulative development projects. Specifically, a northbound through lane, southbound through lane, southbound right turn lane, and eastbound left turn lane.

Table 9-2

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)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak	PM Peak Hour	AM	PM	AM Peak	PM Peak Hour	AM	PM
SR-71 SB Ramps / Chino Hills Pkwy.	SBL	775	249 [2]	309 [2]	Yes	Yes	269 [2]	317 [2]	Yes	Yes
	SBL/T	1,210	221 [2]	304 [2]	Yes	Yes	265 [2]	307 [2]	Yes	Yes
	SBR	510	168 [2]	482 [2]	Yes	Yes	168 [2]	482 [2]	Yes	Yes
SR-71 NB Ramps / Chino Hills Pkwy.										
	NBL	100	**380 [2]**	**290 [2]**	**No**	**No**	**380 [2]**	**290 [2]**	**No**	**No**
	NBT/R	530	298 [2]	225 [2]	Yes	Yes	302 [2]	226 [2]	Yes	Yes
Central Avenue / SR-71 NB Ramps	NBL	1,490	182	324	Yes	Yes	184	412 [2]	Yes	Yes
	NBL/R	1,070	182	324	Yes	Yes	184	412 [2]	Yes	Yes
Central Avenue / SR-71 SB Ramps	SBL	1,530	186	200	Yes	Yes	231	210	Yes	Yes
	SBL/R	740	189	1,153	Yes	Yes[3]	195	1,157	Yes	Yes[3]
Euclid Avenue/ SR-60 WB Ramps	WBL	400	394 [2]	516 [2]	Yes	Yes[3]	448 [2]	526 [2]	Yes[3]	Yes[3]
	WBL/T/R	1,430	396 [2]	520 [2]	Yes	Yes	450 [2]	535 [2]	Yes	Yes
	WBR	400	282 [2]	407 [2]	Yes	Yes	313 [2]	417 [2]	Yes	Yes[3]
Euclid Avenue/ SR-60 EB Ramps	EBL	900	423 [2]	607 [2]	Yes	Yes	423 [2]	607 [2]	Yes	Yes
	EBL/R	1,270	454 [2]	658 [2]	Yes	Yes	558 [2]	686 [2]	Yes	Yes
SR-71 NB Ramps / Euclid Avenue	NBL	1,745	113	134	Yes	Yes	113	134	Yes	Yes
	NBR	420	764 [2]	1,529 [2]	Yes[3]	Yes[3]	992 [2]	1,591 [2]	Yes[3]	Yes[3]
SR-71 SB Ramps / Euclid Avenue	SBL	1,100	184	421	Yes	Yes	184	421	Yes	Yes
	SBL/T	1,560	184	412	Yes	Yes	184	412	Yes	Yes
	SBR	255	0	15	Yes	Yes	0	15	Yes	Yes
I-15 SB Ramps / Limonite Avenue	SBL	400	342 [2]	434 [2,4]	Yes	Yes[3]	342 [2]	434 [2]	Yes	Yes[3]
	SBL/T/R	400	267 [2]	383 [2]	Yes	Yes	267 [2]	383 [2]	Yes	Yes
	SBR	1,200	226 [2]	343 [2]	Yes	Yes	226 [2]	343 [2]	Yes	Yes
I-15 NB Ramps / Limonite Avenue	NBL	450	738 [2,4]	650 [2,4]	Yes[3]	Yes[3]	758 [2,4]	655 [2,4]	Yes[3]	Yes[3]
	NBL/T/R	1,235	673 [2]	613 [2]	Yes	Yes	704 [2]	610 [2]	Yes	Yes
	NBR	400	611 [2,4]	550 [2,4]	Yes[3]	Yes[3]	636 [2,4]	565 [2,4]	Yes[3]	Yes[3]

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

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

[3] Although 95th percentile queue is anticipated to exceed the available storage for the turn lane, the adjacent through lane has sufficient storage to accommodate any spillover without spilling back and affecting the SR-71, SR-60, or I-15 Freeway mainline.

9.7 BASIC FREEWAY SEGMENT ANALYSIS

Horizon Year (2040) mainline directional volumes for the AM and PM peak hours are provided on Exhibits 9-9 and 9-10. As shown on Table 9-3, the following freeway segments analyzed for this study are anticipated to operate at an unacceptable LOS (i.e., LOS E or worse) during the peak hours, in addition to those previously identified in Horizon Year (2040) traffic conditions:

- SR-71 Freeway Northbound, North of Chino Hills Pkwy. (#5) – LOS E AM peak hour; LOS F PM peak hour
- SR-71 Freeway Northbound, South of Euclid Av. (SR-83) (#8) – LOS F AM and PM peak hours
- SR-60 Freeway Westbound, West of Euclid Av. (SR-83) (#9) – LOS E PM peak hour only
- SR-60 Freeway Westbound, East of Euclid Av. (SR-83) (#10) – LOS E PM peak hour only
- SR-60 Freeway Eastbound, West of Euclid Av. (SR-83) (#11) – LOS E AM and PM peak hours
- SR-60 Freeway Eastbound, East of Euclid Av. (SR-83) (#12) – LOS E AM and PM peak hours
- I-15 Freeway Southbound, North of Limonite Av. (#13) – LOS E AM peak hour only
- I-15 Freeway Southbound, South of Limonite Av. (#14) – LOS F AM peak hour only

There are no additional freeway segments that are anticipated to operate at an unacceptable LOS during the peak hours with the addition of Project (Project Buildout) traffic conditions. Horizon Year (2040) basic freeway segment analysis worksheets are provided in Appendix 9.7 and 8.9, respectively.

9.8 FREEWAY MERGE/DIVERGE ANALYSIS

Ramp merge and diverge operations were also evaluated for Horizon Year (2040) conditions and the results of this analysis are presented in Table 9-4. As shown in Table 9-4, the following merge and diverge areas are anticipated to operate at LOS E or LOS F for Horizon Year (2040) Without Project, in addition to those previously identified under Existing, E+P, and Opening Year Cumulative (2018-2020) traffic conditions:

- SR-71 Freeway, Southbound Off-Ramp at Chino Hills Pkwy. (#1) – LOS E AM peak hour only
- SR-71 Freeway, Southbound Off-Ramp at Central Av. (#2) – LOS E PM peak hour only
- SR-71 Freeway, Northbound On-Ramp at Chino Hills Pkwy. (#5) – LOS E AM peak hour; LOS F PM peak hour
- SR-60 Freeway, Eastbound On-Ramp at Euclid Av. (SR-83) (#11) – LOS E AM peak hour only
- I-15 Freeway, Southbound Off-Ramp at Limonite Av. (#12) – LOS E AM peak hour only
- I-15 Freeway, Southbound On-Ramp at Limonite Av. (#13) – LOS F AM peak hour only
- I-15 Freeway, Northbound Off-Ramp at Limonite Av. (#15) – LOS E AM and PM peak hours

There are no additional merge and diverge areas that are anticipated to operate at an unacceptable LOS during the peak hours with the addition of Project (Project Buildout) traffic. Horizon Year (2040) Without and With Project freeway ramp junction operations analysis worksheets are provided in Appendices 9.9 and 9.10, respectively.

EXHIBIT 9-9: HORIZON YEAR (2040) WITHOUT PROJECT FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

EXHIBIT 9-10: HORIZON YEAR (2040) WITH PROJECT FREEWAY MAINLINE VOLUMES (ACTUAL VEHICLES)

Table 9-3

Basic Freeway Segment Analysis for Horizon Year (2040) Conditions

Freeway	Direction	Mainline Segment	Lanes[1]	2040 Without Project				2040 With Project			
				Density[2]		LOS		Density[2]		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM
SR-71 Freeway	SB	North of Chino Hills Pkwy.	3	30.8	24.0	D	C	31.7	24.3	D	C
		South of Chino Hills Pkwy.	3	22.0	15.1	C	B	22.4	15.2	C	B
		North of Central Av.	3	30.1	27.9	D	D	30.7	28.0	D	D
		South of Euclid Av. (SR-83)	2	**856.4**	**300.1**	**F**	**F**	**989.9**	**448.7**	**F**	**F**
	NB	North of Chino Hills Pkwy.	3	**42.9**	**49.0**	**E**	**F**	**43.2**	**51.3**	**E**	**F**
		South of Chino Hills Pkwy.	3	27.6	30.7	D	D	27.7	31.5	D	D
		North of Central Av.	3	**93.9**	**78.7**	**F**	**F**	**94.9**	**81.6**	**F**	**F**
		South of Euclid Av. (SR-83)	3	**86.1**	**105.4**	**F**	**F**	**91.4**	**107.4**	**F**	**F**
SR-60 Freeway	WB	West of Euclid Av. (SR-83)	4	27.4	**38.0**	D	**E**	27.4	**38.3**	D	**E**
		East of Euclid Av. (SR-83)	4	26.0	**39.7**	C	**E**	26.2	**39.8**	D	**E**
	EB	West of Euclid Av. (SR-83)	4	**41.1**	**39.9**	**E**	**E**	**42.0**	**40.4**	**E**	**E**
		East of Euclid Av. (SR-83)	4	**44.4**	**37.4**	**E**	**E**	**44.5**	**38.2**	**E**	**E**
I-15 Freeway	SB	North of Limonite Av.	3	**36.4**	24.7	**E**	C	**36.4**	24.7	**E**	C
		South of Limonite Av.	3	**54.0**	29.0	**F**	D	**54.2**	29.3	**F**	D
	NB	North of Limonite Av.	3	28.7	23.2	D	C	28.7	23.2	D	C
		South of Limonite Av.	3	32.4	28.7	D	D	32.8	28.8	D	D

* **BOLD** = Unacceptable Level of Service

[1] Number of lanes are in the specified direction and is b

[2] Density is measured by passenger cars per mile per la

Table 9-4

Freeway Ramp Junction Merge/Diverge 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	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS
SR-71 Freeway	SB	Off-Ramp at Chino Hills Pkwy.	3	**35.8**	**E**	32.9	D	**36.3**	**E**	33.2	D
		Off-Ramp at Central Av.	3	34.7	D	**35.1**	**E**	**35.1**	**E**	**35.2**	**E**
		Loop On-Ramp at Euclid Av. (SR-83) (Upstream)	2	**52.0**	**F**	**54.9**	**F**	**52.1**	**F**	**55.7**	**F**
		Loop On-Ramp at Euclid Av. (SR-83) (Downstream)	2	**52.0**	**F**	**54.9**	**F**	**52.1**	**F**	**55.7**	**F**
	NB	On-Ramp at Chino Hills Pkwy.	3	**39.4**	**E**	**41.5**	**F**	**39.5**	**E**	**42.2**	**F**
		On-Ramp at Central Av.	3	**51.6**	**F**	**48.7**	**F**	**51.8**	**F**	**49.0**	**F**
		Off-Ramp at Euclid Av. (SR-83)	3	**57.2**	**F**	**60.4**	**F**	**58.2**	**F**	**60.7**	**F**
SR-60 Freeway	WB	On-Ramp at Euclid Av. (SR-83)	4	29.8	D	34.3	D	29.8	D	34.3	D
		Off-Ramp at Euclid Av. (SR-83)	4	34.6	D	**43.9**	**E**	**35.1**	**E**	**44.1**	**E**
	EB	Off-Ramp at Euclid Av. (SR-83)	4	**41.5**	**E**	**42.3**	**E**	**42.1**	**E**	**42.6**	**E**
		On-Ramp at Euclid Av. (SR-83)	4	**37.4**	**E**	33.7	D	**37.5**	**E**	34.2	D
I-15 Freeway	SB	Off-Ramp at Limonite Av.	3	**36.7**	**E**	31.6	D	**36.7**	**E**	31.6	D
		On-Ramp at Limonite Av.	3	**43.0**	**F**	32.2	D	**43.0**	**F**	32.4	D
	NB	On-Ramp at Limonite Av.	3	29.6	D	25.3	C	29.6	D	25.3	C
		Off-Ramp at Limonite Av.	3	**36.3**	**E**	**35.1**	**E**	**36.5**	**E**	**35.2**	**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).

9.9 HORIZON YEAR (2040) DEFICIENCIES AND RECOMMENDED IMPROVEMENTS

9.9.1 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). The effectiveness of the recommended improvement strategies discussed below to address Horizon Year (2040) traffic deficiencies is presented in Table 9-5 for both the Without and With Limonite Avenue Extension alternatives.

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 Chino 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 Chino, 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 discussed above have been identified as being included as part of City DIF fee program or fair share contribution in Section 1.5 *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 9.11 and Appendix 9.12, respectively.

9.9.2 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON OFF-RAMP QUEUES

Table 9-6 shows the queuing results with the proposed intersection improvements shown previously on Table 9-5. As shown, the 95th percentile peak hour queues during the AM and PM peak hours are anticipated to continue to exceed the existing available storage for the northbound left turn lane at the SR-71 Northbound ramps and Chino Hills Parkway with the proposed improvements. However, if the intersection were improved to provide a trap lane for the northbound left turn lane (extending the turn pocket back to Ramona Avenue), then the Horizon Year (2040) 95th percentile peak hour queues could be accommodated. Worksheets for Horizon Year (2040) Without and With Project traffic conditions, with improvements, off-ramp queuing analysis are provided in Appendices 9.13 and 9.14, respectively.

Table 9-5

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
2	SR-71 NB Ramps / Chino Hills Pkwy.																	
	- Without Project[4]	TS	1	2	0	0	0	0	2	2	0	0	2	1	39.0	41.2	D	D
	- With Project[4]	TS	1	2	0	0	0	0	2	2	0	0	2	1	39.1	44.7	D	D
3	Ramona Av. / Chino Hills Pkwy.																	
	- Without Project	TS	1	2	0	1	2	d	**2**	3	0	1	2	1	42.8	51.4	D	D
	- With Project	TS	1	2	0	1	2	d	**2**	3	0	1	2	1	43.9	54.6	D	D
4	Monte Vista Av. West / Chino Hills Pkwy.																	
	- Without Project	**TS**	0	1	0	0	0	0	0	2	1	1	2	0	11.0	11.6	B	B
	- With Project	**TS**	0	1	0	0	0	0	0	2	1	1	2	0	11.5	11.7	B	B
6	Central Av. / Chino Hills Pkwy.																	
	- Without Project	TS	**2**	2	**0**	1	2	**1>**	1	1	**1>**	1	1	1	28.2	43.3	C	D
	- With Project	TS	**2**	2	**0**	1	2	**1>**	1	1	**1>**	1	1	1	28.7	46.9	C	D
7	Central Av. / El Prado Rd.																	
	- Without Project	TS	1	2	**1>**	**2**	3	0	1	1	0	1	1	1>	19.2	31.9	B	C
	- With Project	TS	1	2	**1>**	**2**	3	0	1	1	0	1	1	1>	20.7	34.6	C	C
10	El Prado Rd. / Kimball Av.																	
	- Without Project[5]	TS	1	1	1	**2**	**1**	0	1	1	0	0	1	1>	20.2	31.7	C	C
	- With Project[5]	TS	1	1	1	**2**	**1**	0	1	1	0	0	1	1>	25.5	32.3	C	C
14	Euclid Av. (SR-83) / SR-60 WB Ramps																	
	- Without Project	TS	**2**	2	0	0	2	1	0	0	0	1	1	1	51.0	49.5	D	D
	- With Project	TS	**2**	2	0	0	2	1	0	0	0	1	1	1	51.5	50.2	D	D
15	Euclid Av. (SR-83) / SR-60 EB Ramps																	
	- Without Project	TS	0	2	1	**2**	2	0	1	1	**1**	0	0	0	25.9	21.7	C	C
	- With Project	TS	0	2	1	**2**	2	0	1	1	**1**	0	0	0	27.2	21.9	C	C
17	Euclid Av. (SR-83) / Riverside Dr.																	
	- Without Project	TS	1	**3**	1	1	**3**	1>	1	2	0	1	2	d	48.8	54.1	D	D
	- With Project	TS	1	**3**	1	1	**3**	1>	1	2	0	1	2	d	49.4	54.9	D	D
18	Euclid Av. (SR-83) / Chino Av.																	
	- Without Project	TS	1	**3**	1	1	**3**	1	1	1	1	**1**	1	0	26.0	13.6	C	B
	- With Project	TS	1	**3**	1	1	**3**	1	1	1	1	**1**	1	0	33.4	19.7	C	B
19	Euclid Av. (SR-83) / Schaefer Av.																	
	- Without Project	TS	1	**3**	1	1	**3**	1	**2**	1	1	1	1	0	36.2	26.8	D	C
	- With Project	TS	1	**3**	1	1	**3**	1	**2**	1	1	1	1	0	40.5	27.9	D	C
20	Euclid Av. (SR-83) / Edison Av.																	
	- Without Project	TS	**2**	**3**	1	**2**	**3**	1	**2**	**2**	1	**2**	**2**	**1>**	49.7	53.4	D	D
	- With Project	TS	**2**	**3**	1	**2**	**3**	1	**2**	**2**	1	**2**	**2**	**1>**	54.9	53.8	D	D
22	Euclid Av. (SR-83) / Merrill Av.																	
	- Without Project	TS	1	**3**	1	**2**	**3**	0	0	1	0	0	1	**1>**	29.8	31.4	C	C
	- With Project	TS	1	**3**	1	**2**	**3**	0	0	1	0	0	1	**1>**	31.6	36.5	C	D

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
23	Euclid Av. (SR-83) / Kimball Av.																	
	- Without Project	TS	1	**3**	1	**2**	**3**	**1>**	**2**	2	0	**2**	2	**1>**	43.9	39.7	D	D
	- With Project	TS	1	**3**	1	**2**	**3**	**1>**	**2**	2	0	**2**	2	**1>**	44.3	39.7	D	D
24	Euclid Av. (SR-83) / Bickmore Av.																	
	- Without Project	TS	1	**3**	**1**	**2**	**3**	1	1	1	1	**2**	1	**1**	12.6	37.8	B	D
	- With Project	TS	1	**3**	**1**	**2**	**3**	1	1	1	1	**2**	1	**1**	12.9	39.3	B	D
25	Euclid Av. (SR-83) / Pine Av.																	
	- Without Project	TS	**2**	**3**	1>	**2**	**3**	0	1	**2**	1>>	2	**2**	**1**	41.3	53.7	D	D
	- With Project	TS	**2**	**3**	1>	**2**	**3**	0	1	**2**	1>>	2	**2**	**1**	41.9	54.8	D	D
27	SR-71 SB Ramps / Euclid Av. (SR-83)																	
	- Without Project[6]	TS	1	0	1	**2**	1	1	0	2	0	1	2	1>>	47.1	33.6	D	C
	- With Project[6]	TS	1	0	1	**2**	1	1	0	2	0	1	2	1>>	48.6	33.7	D	C
30	Mayhew Av. / Kimball Av.																	
	- Without Project		Intersection Does Not Exist															
	- With Project	**TS**	**1**	0	**1**	0	0	0	0	**2**	**1**	**1**	**2**	0	7.6	10.5	A	B
52	Flight Av. / Kimball Av.																	
	- Without Project																	
	Without Limonite Av. Extension	**TS**	0	1	0	0	1	0	1	2	0	1	**2**	**1**	19.0	32.5	B	C
	With Limonite Av. Extension	**TS**	0	1	0	**1**	1	0	1	2	0	1	**2**	**1**	21.4	36.7	C	D
	- With Project																	
	Without Limonite Av. Extension	**TS**	0	1	0	0	1	0	1	2	0	1	**2**	**1**	22.5	40.9	C	D
	With Limonite Av. Extension	**TS**	0	1	0	**1**	1	0	1	2	0	1	**2**	**1**	25.0	44.3	C	D
53	Meadow Valley Av. / Kimball Av.																	
	- Without Project																	
	Without Limonite Av. Extension	**TS**	0	1	0	0	**1**	0	**1**	2	0	1	**2**	0	12.8	11.3	B	B
	With Limonite Av. Extension	**TS**	0	1	0	0	**1**	0	**1**	2	0	1	**2**	0	13.2	12.5	B	B
	- With Project																	
	Without Limonite Av. Extension	**TS**	0	1	0	0	**1**	0	**1**	2	0	1	**2**	0	12.8	11.4	B	B
	With Limonite Av. Extension	**TS**	0	1	0	0	**1**	0	**1**	2	0	1	**2**	0	13.6	13.2	B	B
54	Hellman Av. / Kimball Av.																	
	- Without Project[7]																	
	Without Limonite Av. Extension	**TS**	1	**2**	0	**1**	**2**	**1**	**1**	**1**	**1>**	**1**	**2**	0	29.3	31.7	C	C
	With Limonite Av. Extension	**TS**	1	**2**	**1>**	**1**	**2**	**1**	**1**	**2**	**1>**	**1**	**2**	0	34.1	42.8	C	D
	- With Project[7]																	
	Without Limonite Av. Extension	**TS**	1	**2**	0	**1**	**2**	**1**	**1**	**1**	**1>**	**1**	**2**	0	30.6	32.3	C	C
	With Limonite Av. Extension	**TS**	1	**2**	**1>**	**1**	**2**	**1**	**1**	**2**	**1>**	**1**	**2**	0	36.2	45.9	D	D
55	Archibald Av. / Limonite Av.																	
	- Without Project																	
	Without Limonite Av. Extension	TS	0	**3**	1>	**2**	**3**	0	0	0	0	**2**	0	**2>**	29.3	49.7	C	D
	With Limonite Av. Extension	TS	**2**	**3**	1>	**2**	**3**	**1**	**2**	**2**	**1**	**2**	**2**	**2>**	32.4	52.7	C	D
	- With Project																	
	Without Limonite Av. Extension	TS	0	**3**	1>	**2**	**3**	0	0	0	0	**2**	0	**2>**	30.1	53.5	C	D
	With Limonite Av. Extension	TS	**2**	**3**	1>	**2**	**3**	**1**	**2**	**2**	**1**	**2**	**2**	**2>**	33.3	54.9	C	D
56	Harrison Av. / Limonite Av.																	
	- Without Project	TS	1	1	1	1	1	0	1	3	d	1	**3**	1	23.8	51.3	C	D
	- With Project	TS	1	1	1	1	1	0	1	3	d	1	**3**	1	24.0	53.9	C	D

Table 9-5

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
57	Sumner Av. / Limonite Av.																	
	- Without Project	TS	**2**	2	0	1	2	0	2	3	**1>**	2	3	1	27.5	33.1	C	C
	- With Project	TS	**2**	2	0	1	2	0	2	3	**1>**	2	3	1	27.5	33.4	C	C
58	Scholar Wy. / Limonite Av.																	
	- Without Project	TS	1	1	1	1	2	1	1	**3**	1	1	**3**	1	21.6	28.6	C	C
	- With Project	TS	1	1	1	1	2	1	1	**3**	1	1	**3**	1	21.6	28.8	C	C
59	Hamner Av. / Limonite Av.																	
	- Without Project	TS	2	3	1	2	**3**	**1>**	2	3	1	2	**3**	**1>**	45.8	53.2	D	D
	- With Project	TS	2	3	1	2	**3**	**1>**	2	3	1	2	**3**	**1>**	46.0	53.8	D	D
60	I-15 SB Ramps / Limonite Av.																	
	- Without Project[8]	TS	0	0	0	1	1	**2**	0	**3**	**1>>**	0	**3**	**1>>**	16.7	8.0	B	A
	- With Project[8]	TS	0	0	0	1	1	**2**	0	**3**	**1>>**	0	**3**	**1>>**	16.8	8.0	B	A
61	I-15 NB Ramps / Limonite Av.																	
	- Without Project[8]	TS	1	1	**2**	0	0	0	**0**	**3**	**1>>**	0	**3**	**1>>**	9.1	12.9	A	B
	- With Project[8]	TS	1	1	**2**	0	0	0	**0**	**3**	**1>>**	0	**3**	**1>>**	9.4	12.9	A	B

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

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

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

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

[4] No lane geometric changes. Improvement is to modify the signal timing for a 120 second cycle length from the current 60 second cycle length. This improvement also includes modifying the signal timing at the adjacent southbound ramp to maintain the coordination between the two ramps.

[5] Restripe the southbound approach to provide dual left turns and a single shared through-right turn lane.

[6] Improvements include restriping the southbound approach only.

[7] Includes additional lanes needed to serve future cumulative development projects. Specifically, a northbound through lane, southbound through lane, southbound right turn lane, and eastbound left turn lane. LOS results previously presented on Table 8-1.

[8] Improvements are consistent with planned partial cloverleaf interchange.

9.9.3 RECOMMENDED IMPROVEMENTS TO ADDRESS DEFICIENCIES ON FREEWAY FACILITIES

The Final Transportation Report for the California State Route 60 Freeway (prepared by Caltrans in July 2005), includes the construction of an additional high-occupancy vehicle (HOV) lane in each direction of the SR-60 Freeway and the construction of two truck by-pass lanes within the vicinity of the Euclid Avenue (SR-83) interchange. (9) Improvements along the I-15 Freeway near the vicinity of Limonite Avenue includes the addition of one to two tolled express lanes in each direction between the SR-60 Freeway and Cajalco Road. At the time of study preparation, an analysis of the future planned improvements along the SR-71 Freeway was not readily available (i.e., no study has been conducted to date). As such, no additional analysis has been performed for these freeway mainline segments and ramp merge/diverge junctions and no improvements are assumed within this analysis.

Caltrans typically assumes a reduction of fourteen percent to the freeway mainline through volumes in this region to account for vehicles utilizing the carpool (high-occupancy vehicle) lanes. The reduction to the SR-60 and I-15 Freeway mainline volumes has been applied to account for the proposed HOV/Express Toll lanes and truck bypass lanes. The analysis has been performed assuming the same number of mixed-flow lanes and on and off-ramp configurations as existing baseline conditions at the SR-60 Freeway at Euclid Avenue (SR-83) and I-15 Freeway at Limonite Avenue interchanges. Reductions to mainline volumes have been taken into account for the HOV/Express Toll lanes and truck bypass lanes, but HCM analyses for the freeway facility only considers the mixed-flow lanes.

As shown on Table 9-7, the SR-60 freeway mainline segments are anticipated to operate at an acceptable LOS with the improvements discussed above. The I-15 Freeway Southbound segment south of Limonite Avenue is anticipated to continue to operate at an unacceptable LOS during the AM peak hour only; however, the segment is anticipated to operate at an improved density as compared to the "without improvement" condition.

Similarly, Table 9-8 shows that the following SR-60 and I-15 Freeway ramp junctions are also anticipated to continue to operate at an unacceptable LOS with the improvements discussed above (i.e., LOS E or worse), although they are anticipated to operate at an improved density as compared to the "without improvement" condition:

- SR-60 Freeway, Westbound Off-Ramp at Euclid Av. (SR-83) (#9) – LOS E PM peak hour only
- SR-60 Freeway, Eastbound Off-Ramp at Euclid Av. (SR-83) (#10) – LOS E AM and PM peak hours
- I-15 Freeway, Southbound On-Ramp at Limonite Av. (#13) – LOS E AM peak hour only

Worksheets for Horizon Year (2040) Without and With Project conditions freeway mainline level of service analysis, with improvements, are provided in Appendix 9.15 and Appendix 9.16. Horizon Year (2040) Without and With Project freeway ramp junction level of service analysis worksheets, with improvements, are provided in Appendix 9.17 and Appendix 9.18.

Table 9-6

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

Intersection	Movement	Available Stacking Distance (Feet)	2040 Without Project				2040 With Project			
			95th Percentile Queue (Feet)		Acceptable? [1]		95th Percentile Queue (Feet)		Acceptable? [1]	
			AM Peak Hour	PM Peak Hour	AM	PM	AM Peak Hour	PM Peak Hour	AM	PM
SR-71 NB Ramps / Chino Hills Pkwy.										
	NBL	**200**	**457** [2]	**461** [2]	**No**	**No**	**457** [2]	**461** [2]	**No**	**No**
	NBT/R	530	328	362 [2]	Yes	Yes	331	362 [2]	Yes	Yes
Euclid Avenue/ SR-60 WB Ramps	WBL	400	498 [2]	622 [2]	Yes[3]	Yes[3]	570 [2]	635 [2]	Yes[3]	Yes[3]
	WBL/T/R	1,430	502 [2]	623 [2]	Yes	Yes	572 [2]	640 [2]	Yes	Yes
	WBR	400	363 [2]	495 [2]	Yes	Yes[3]	403 [2]	507 [2]	Yes	Yes[3]
Euclid Avenue/ SR-60 EB Ramps	EBL	900	375 [2]	471 [2]	Yes	Yes	428 [2]	482 [2]	Yes	Yes
	EBL/R	1,270	286	453 [2]	Yes	Yes	339 [2]	469 [2]	Yes	Yes
SR-71 SB Ramps / Euclid Avenue	SBL	1,100	143	320	Yes	Yes	143	320	Yes	Yes
	SBL/T	1,560	40	154	Yes	Yes	40	154	Yes	Yes
	SBR	255	0	17	Yes	Yes	0	17	Yes	Yes
I-15 SB Ramps / Limonite Avenue	SBL	400	145	205	Yes	Yes	145	205	Yes	Yes
	SBL/T/R	1,200	145	205	Yes	Yes	145	205	Yes	Yes
	SBR	400	68	182	Yes	Yes	68	182	Yes	Yes
I-15 NB Ramps / Limonite Avenue	NBL	450	202	207	Yes	Yes	221 [2]	211	Yes	Yes
	NBL/T/R	1,235	202	208	Yes	Yes	222 [2]	211	Yes	Yes
	NBR	400	236 [2]	387 [2]	Yes	Yes	236 [2]	387 [2]	Yes	Yes

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

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

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

Table 9-7

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

Freeway	Direction	Mainline Segment	Lanes[1]	2040 Without Project				2040 With Project			
				Density[2]		LOS		Density[2]		LOS	
				AM	PM	AM	PM	AM	PM	AM	PM
SR-60 Freeway	WB	West of Euclid Av. (SR-83)	4	22.6	29.1	C	D	22.6	29.6	C	D
		East of Euclid Av. (SR-83)	4	21.3	30.5	C	D	21.5	30.6	C	D
	EB	West of Euclid Av. (SR-83)	4	30.5	30.2	D	D	30.7	30.3	D	D
		East of Euclid Av. (SR-83)	4	32.2	28.5	D	D	32.3	28.8	D	D
I-15 Freeway	SB	North of Limonite Av.	3	28.8	20.7	D	C	28.8	20.7	D	C
		South of Limonite Av.	3	**40.9**	24.4	**E**	C	**41.0**	24.7	**E**	C
	NB	North of Limonite Av.	3	23.6	19.5	C	C	23.6	19.5	C	C
		South of Limonite Av.	3	26.7	24.4	D	C	26.9	24.5	D	C

* **BOLD** = Unacceptable Level of Service

[1] Number of lanes are in the specified direction and is based on additional HOV and truck bypass on SR-60 Freeway and 1 tolled express lane on I-15 Freeway.

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

Table 9-8

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

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	Density[2]	LOS	Density[2]	LOS	Density[2]	LOS
SR-60 Freeway	WB	On-Ramp at Euclid Av. (SR-83)	4	26.5	C	30.2	D	26.6	C	30.2	D
		Off-Ramp at Euclid Av. (SR-83)	4	30.6	D	**39.2**	**E**	31.2	D	**39.3**	**E**
	EB	Off-Ramp at Euclid Av. (SR-83)	4	**36.0**	**E**	**37.3**	**E**	**36.5**	**E**	**37.4**	**E**
		On-Ramp at Euclid Av. (SR-83)	4	32.8	D	29.4	D	32.9	D	29.9	D
I-15 Freeway	SB	Off-Ramp at Limonite Av.	3	33.4	D	28.6	D	33.4	D	28.6	D
		On-Ramp at Limonite Av.	3	**38.9**	**E**	29.1	D	**39.0**	**E**	29.4	D
	NB	On-Ramp at Limonite Av.	3	26.0	C	22.3	C	26.0	C	22.3	C
		Off-Ramp at Limonite Av.	3	33.4	D	32.6	D	33.6	D	32.7	D

* **BOLD** = Unacceptable Level of Service

[1] Number of lanes are in the specified direction and is based on additional HOV and truck bypass on SR-60 Freeway and 1 tolled express lane on I-15 Freeway.

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

10 REFERENCES

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